TG 23

Culture in Construction - Part of the Deal?

Culture in Construction

CIB Proceedings

Edited by
Dr. ir. Wilco Tijhuis

DISCLAIMER

Culture in Construction - Part of the Deal?

Proceedings of Workshop of CIB Task Group TG23 'Culture in Construction', held at 22nd and 23rd of May 2000 at the University of Twente in Enschede, The Netherlands.

Edited by

Dr.ir. Wilco Tijhuis

Preface

Dear reader,

The CIB-Task Group TG23 'Culture in Construction', especially Dr. Richard Fellows from Hong Kong, asked us at the CIB W92 conference (about Harmony and Profit in Procurement) in Chiang Mai, Thailand, to search for possibilities for organising a workshop in The Netherlands. This, to discuss further on several culture-related themes in construction-research. Although it was a very short question, it had a strong impact, and not that easy as it may seem at first glance!

It took time to arrange the organisation-team, to put together an interesting programme, to get experienced keynote-speakers and, of course, to schedule the whole event somewhere in the overloaded agendas of international academics and industry.

Nevertheless we reached the final closure day of the subscription-date and it pointed out that there were enough several highly motivated and enthusiastic participants to start-up the workshop.

And this is what we had on 22nd and 23rd of May 2000: An enthusiastic group of researchers and practitioners, dealing with the subject 'culture' in their daily work. Therefore we thank everyone for taking the opportunity to participate actively in the discussions and to take further the research in this interesting research-area. Not to break-down some structures or statements, but:

- *To build on a structured research-agenda,*

...which leads to an answer to the question and theme:

- *Culture in Construction – Part of the Deal?*

I also thank our host, the University of Twente, and CIB for their gracious support, and also thanks to our sponsor from industry, WT/Consult, for their assistance in organising this event.
And last but not least I wish to thank the other members of the organisation-team for keeping their enthusiasm and support, especially Jeroen Hulzebos and Yolanda Bosch, who did a great job during the organisation of the workshop, and Hanneke van de Weerd, who assisted in finalising this proceedings!

Enschede, December 2000,
Dr.ir. Wilco Tijhuis

Summary

Introduction

The workshop of CIB Task Group TG23 'Culture in Construction' was held on 22nd and 23rd May 2000, and discussed about the theme: 'Culture in Construction – Part of the Deal?'. It was organised by the University of Twente in Enschede, the Netherlands, Faculty of Technology & Management, Department of Construction Technology & Construction Process. The organising committee, led by Dr.ir.Wilco Tijhuis and his team, put together a two-day-programme, in which several aspects of culture and its role in the construction industry were discussed.

The main goal of the workshop was to examine and structurize the research, undertaken by members of TG23 (with its joint co-ordinators Dr.Richard Fellows and Dr.David Seymour) in the broad context of construction industry practices and issues, to promote more extensive examination of the operation, perspectives and 'dimensions' of 'culture' in construction. The results of the workshop suggest that progress towards this goal is well under way.

The participants

An enthusiastic group of circa 10 persons of several nationalities (especially British, Hong Kong-Chinese, Australian and Dutch) participated in the workshop. By bringing together academics and practitioners in the field to exchange and critically review their knowledge, viewpoints and experiences, many interesting discussions took place.

Discussions

Starting with a number of presentations to provide initial direction for discussions, the main themes were defined quite clearly. Especially the role of culture-research and its practice in research and industry led to interesting issues. Experiences from an academic viewpoint were crossed and interlinked with experiences from a business/industry and consultancy viewpoint. This gave food for fruitful thoughts.

Some Outcomes

In a general way, some particular outcomes were grouped into key-issues. Not only from an academic viewpoint, but also from a viewpoint of practical use:

Awareness:

- Participants in construction industry should become aware of the importance of 'culture' and its impact and influence on the process and product of construction business;
- To stimulate such awareness, it is essential to put together multi-cultural teams for undertaking research in this field.

Trust and Understanding:

- The role of 'trust' (and 'distrust') was discussed, especially in the field of possible reasons for understanding (or misunderstanding) differences in culture.

Theoretical Framework:

- Doing desk-research means, in a lot of cases, that the existing frameworks of research in this field (e.g. 'Hofstede') provide valuable starting-points. Nevertheless, it was agreed that 'the' framework does not exist - continuous improvements and adaptations are needed;
- The need for clear definitions was quite obvious, and certain progress is being made.

Methodology:

- Doing field-research in culture-issues needs good and realistic access to organisations; reporting from 'inside' gives the best guarantee for realistic viewpoints and outcomes.
- However, reporting from inside organisations introduces the risk of 'becoming too close' (a so called 'third-culture-person').
- One very specific aspect of 'the field' was discussed: If it is possible to apply for (international) funding schemes and research-programmes; such frameworks could stimulate further progress in research.

Conclusions and Recommendations

The discussions were interesting, especially to understand how doing research into 'cultural' issues in the construction industry can be quite different from doing research in other subject areas and in other industries. Notably, it became very clear that we can learn from experiences in other branches of industry as 'cultures' are multidimensional and operate at a variety of 'levels' in societies. No longer should it be acceptable for 'culture' to be used as a 'black box excuse' for effects that have not been explained in an investigation.

Exchange of information world-wide becomes easier, more rapid and ubiquitous due to modern media, but the cultural differences seem to remain. The awareness about existing differences and its cultural dimensions therefore should become an integrated part of research in construction industry.

This was also one of the major observations, which was also emphasized by the CIB through the words of its secretary-general in his closing speech:
As construction is a peoples' business, and will stay so, 'culture' should become an essential part of the deal!

Samenvatting

Inleiding

De workshop van de CIB-Taakgroep TG23 'Culture in Construction' werd gehouden op op 22 en 23 mei 2000, en droeg als thema: 'Cultuur in de Bouwbedrijfstak – Structureel Onderdeel van het Zakendoen?'. De workshop werd georganiseerd door de Universiteit Twente te Enschede, Nederland, Faculteit Technololgie & Management, Vakgroep Bouwtechnologie & Bouwproces. De organiserende commissie, geleid door Dr.ir.Wilco Tijhuis en zijn team, had een programma opgezet, verspreid over twee dagen, waarin verschillende aspecten van "cultuur' en haar plaats in de bouwbedrijfstak besproken werden.

Het hoofddoel van de workshop was om de onderzoeksactiviteiten te inventariseren en te stroomlijnen van de leden van TG23 (met de gezamenlijke coördinatoren Dr.Richard Fellows en Dr.David Seymour) in een brede context van de dagelijkse bouwpraktijk en de problemen daarin. Een en ander vooral om daarmee een uitgebreid beeld van bezigheden, perspectieven en 'dimensies' van 'cultuur' in de bouwbedrijfstak te promoten. De uitkomst van de workshop geeft aan dat het proces om dit doel te bereiken op de goede weg is.

De deelnemers

Een enthousiaste groep van circa tien personen met verschillende nationaliteiten (met name Britse, Hong Kong-Chinese, Australische en Nederlandse) heeft deelgenomen aan de workshop. Door het bij elkaar brengen van academici en praktijkmensen rondom het uitwisselen en kritisch herbeschouwen van kennis, gezichtspunten en ervaringen, kwamen er vele interessante discussies los.

Discussies

Er werd gestart met een aantal presentaties als een aanzet tot discussies. De meeste thema's waren daarbij helder geformuleerd. Vooral de rol van cultuuronderzoek en de ervaringen daarmee in zowel de academische wereld almede bouwbedrijfstak, leidden tot interessante discussies. Ervaringen vanuit een academisch gezichtspunt overlapten en stonden in verband met het gezichtspunt vanuit het bedrijfsleven. Dit gaf aanzet voor interessante aanknopingspunten.

Enkele Uitkomsten

In algemene zin zijn de uitkomsten gegroepeerd in enkele hoofdaandachtsgebieden. Niet allen vanuit een academisch oogpunt, maar vooral ook vanuit een oogpunt van praktisch nut:

Bewustwording:

- Partijen in de bouwbedrijfstak zouden zich bewust moeten worden van de belangrijkheid van 'cultuur' en haar invloed op het bouwproces en het bouwproduct.
- Om zulke bewustwording te simuleren is het belangrijk om multiculturele groepen samen te stellen die onderzoek gaan doen in dit aandachtsgebied.

Vertrouwen en Begrip:

- De rol van 'vertrouwen' (en ook 'wantrouwen') is bediscussieerd, vooral als mogelijke oorzaak voor het al of niet begrip hebben voor verschillen in culturen in de dagelijkse praktijk.

Theoretisch Kader:

- Burau-onderzoek houdt in dat in veel gevallen de bestaande kaders van onderzoek rondom 'cultuur' (bv. 'Hofstede') waardevolle beginpunten geven. Niettemin, het werd algemeen aanvaard dat 'het' kader niet bestaat – continue verbeteringen en aanpassingen zijn nodig.
- De behoefte voor heldere definities werd duidelijk gevoeld, en daarin is dan ook een goede vooruitgang geboekt.

Methodologie:

- Voor het doen van veldonderzoek naar cultuur-kwesties is een goede en realistische toegang tot organisaties nodig; rapporteren 'van binnenuit' geeft de beste garantie voor het verkrijgen van realistische gezichtspunten en uitkomsten.
- Echter, rapporteren van binnenuit de organisatie heeft het risico om 'te hecht' te worden (de zogenaamde 'derde-cultuur-persoon').
- Een specifiek aspect uit de praktijk is bediscussieerd: De mogelijkheden voor het aanvragen van (internationale) financiering schema's en onderzoekprogramma's; zulke kaders zouden het onderzoeksproces verder kunnen stimuleren.

Conclusies en Aanbevelingen

De discussies waren interessant, vooral om te begrijpen hoe anders onderzoek naar 'cultuur'-aspecten in de bouwbedrijfstak kan zijn vergeleken met ander onderzoek in andere bedrijfstakken. Met name werd het duidelijk dat geleerd kan worden van de ervaringen uit andere bedrijfstakken, omdat 'culturen' multi-dimensioneel zijn, en aanwezig zijn binnen de verschillende lagen van de maatschappij. Het zou dan ook niet langer geaccepteerd moeten worden dat 'cultuur' nogal eens gebruikt wordt als een soort 'black box' excuus, om daarmee onduidelijke effecten in onderzoeksresultaten te kunnen verklaren.

Uitwisselen van informatie over de gehele wereld word gemakkelijker, sneller en betrouwbaarder, met name door de moderne media, maar de cultuurverschillen lijken te blijven bestaan. Het bewustzijn van de bestaande verschillen en de culturele dimensies daarvan zouden daarom een integraal onderdeel dienen te gaan uitmaken van onderzoeksactiviteiten in de bouwbedrijfstak.

Dit laatste was dan ook een van de belangrijkste opmerkingen die namens de CIB door haar sectretaris-generaal benadrukt werd in zijn slottoespraak:
Omdat het in de bouwbedrijfstak met name om mensenwerk gaat en zal blijven gaan, zal aandacht voor 'cultuur' daarvan structureel deel dienen uit te maken!

Index

INTRODUCTION

Background

The workshop about "Culture in construction" was one of the outcomes from previous discussions and research-activities on several parts of international construction-research. Brought together in Task Group TG23 ("Culture in Construction") of the CIB-Working-Commission W92 ("Procurement Systems") several parts of theory and practice are being discussed and exchanged in this task group.

CIB in Brief

CIB is the acronym of the abbreviated French (former) name: "Conseil International du Bâtiment" (in English this is: International Council for Building). In the course of 1998, the abbreviation has been kept but the full name changed into:

> *INTERNATIONAL COUNCIL FOR RESEARCH*
> *AND INNOVATION IN BUILDING AND CONSTRUCTION*

In the Appendix E more detailed information about CIB is given.

TG 23 "Culture in Construction"

Although the theme "Culture" seems quite apart from the technical and organisational oriented construction-business, nowadays it becomes more important. Due to e.g. the impact of large and/or international projects, in which several international partners were involved, the problem of keeping smooth and efficient construction-processes became increasingly actual. In fact it is part of the process-chain *Contact* (Culture) - *Contract* (Project organisation) and *Conflict* (Technology)

Developments

Besides the international policy of opening barriers between countries (like the European Union), also modern technology plays an important role in these opening barriers:

- *The increase of communication-possibilities and the speed of information-exchange.*

15

And these developments indicates an important aspect:

Although information-exchange can be processed very quickly nowadays (look at developments in e.g. the e-commerce, etc.), the controlling and steering of several (international) parties working together in a construction-process still is quite difficult, leading to a relatively increase of risks, resulting into (failure-) costs. Several examples from actual construction-practice can be mentioned in this scope, not only in The Netherlands, but also abroad. In some of the papers in these proceedings, these practices are being described briefly.

Improvement of Construction

But how to improve these risks for failures and costs? Where to look at? What are the reasons for these failures?, etc. These items are important "drives" to intensifying the culture-research in business, especially in construction-industry, while in this branch "culture" seems still an underdeveloped area of knowledge. And still seems to be '*no part of the deal.....?!'.*

Goal

To get to know "culture" more as an integrated part of construction, as an element of real influence in the whole process, the workshop focuses on the organising and structuring the research-themes within the aspect "culture in construction". Not only by looking at optimising it's theoretical frameworks, but also and especially at its implementation and experiences in the practice of daily construction-business.

Resume

It may be clear that doing research into "Culture in Construction" it should take place not only in the office, but also and especially at the site, there where and with whom it happens:

- *Through people and by people;*

This, while culture has to do with people (clients, governments, banks, architects, contractors, consultants, neighbours, etc.) and because:

- *Construction is a people's business;*

Not only on a national level, but also and especially on a international level, which also immediately introduces issues related to:
Culture as part of the business...as part of the deal?!

CHAPTER 1: CIB TG23 - Culture in Construction

Joint co-ordinators of TG23 are David Seymour and Richard Fellows. Below they trace the history of the Group since its inception a couple of years ago and identify the two themes that continue to be the focal points of TG23's attention.

In their report they pose a number of fascinating questions and come up with some equally fascinating if hypothetical answers.

Provisional plans are already in place for up-coming meetings. If successful this will chart a clear course for TG23 in the future.

Introduction and Background

TG23 was formed in 1997 on the premise that the word 'culture' was being used with increasing frequency within the construction management and research community. The first meeting was held in September at the University of Cambridge, United Kingdom and attended by over 20 delegates. It aimed to find out what people meant by the word 'culture' and establish what the nature of the interest was. Through workshop discussions the initial objectives of TG23 were defined as:

- To identify and define concepts of culture in the international construction industry and to carry out research into their manifestations and effects.
- To discuss and develop appropriate methodologies for the study of culture in construction.
- To determine and, where appropriate, adopt methodologies used in other disciplines, with special reference to the social sciences, for researching culture in the international construction industry.

Towards the realisation of the objectives, three research working groups were established:

- Overview of Culture - Definitions, Perspectives, Dimensions, etc.
- Topics as Focii for Culture in Construction
- Current Research on Culture in Construction

Two further meetings of the Task Group have been held - at Gävle, Sweden (in conjunction with the CIB Congress June 1998) and at Chiang Mai, Thailand (in conjunction with W92 (Procurement Systems in Construction), for a joint

symposium, in January 1999). The last meeting was held in Enschede, the Netherlands in May 2000, of which these proceedings have been published. A further meeting is being arranged at the CIB World Congress in 2001 in Wellington, New Zealand.

State of the Art

Two substantive themes continue to attract the majority of interest. The first (1) concerns the *international transfer of technology/skills/techniques*. The second (2) concerns the *perceived need to transform attitudes and conventional ways of working* in order to facilitate innovation, to implement methods of continuous improvement and to encourage cross-organisational collaboration, (respectively through such initiatives as benchmarking and partnering).

It is expected that these themes will remain central to the work of the Group.

However, we emphasise that for the work of TG23 to proceed effectively, it continues to be necessary explicitly to address questions that are often taken for granted: Why do we want to study culture? What kinds of findings do we expect to produce? For what purposes and for whom? Making these questions explicit may be expected to bring greater clarity to matters of method and treatment.

We take it that answers to these questions will be of the following kind:

- To be able to get on with, work with, do business with people who differ from us in various respects.
- To be able to record, provide an account or analysis of what facilitates and impedes this.
- To communicate findings for the benefit of others.
- To assess the utility of management techniques in different cultural contexts, bearing in mind the kinds of value differences identified by, for example, Hofstede.
- To help manage the transfer of skills and techniques across different cultures.
- To provide means of assessing the cultures of particular organisations, or occupations (SWOT analyses of cultures).
- To study attitudes and reactions to change in organisations.
- To investigate and propagate the skills of change management.

The 'deliverables' may take many forms:

- To provide a 'guidebook' - the do's and don'ts when you relate to e.g. Muslims, Arabs, Italians, Swedes (e.g. Trompenaars).
- To provide abstract descriptions in order to make comparisons of cultures (e.g. Hofstede).
- To provide ethnographic accounts of cultures.
- To establish connections (e.g. impact of culture on safety/accidents; impact of the 'macho' culture of construction on female careers; impact of national culture on 'take-up' of new forms of procurement; transfer of technology).

What Next?

The legitimate concerns of the study of culture are wide. However, the raison d'être for TG23 is the conviction that the study of culture provides a distinctive mode of entry into a range of issues and can cast a distinctive light upon them. This seems to be the conclusion within the social sciences where conventional themes are being revisited from a cultural perspective.

An emergent view within TG23, therefore, is that, in construction, research into cultural issues has been constrained by a certain academic parochialism in seldom searching beyond the borders of the literature particular to that industry. Further, that there is much to be learnt from the social sciences, notably sociology, anthropology and psychology.

However, there are significant signs that the situation in construction research is changing as methods and findings from the fundamental and applied disciplines are being used in construction work to an increasing extent. Thus, it is becoming apparent that: first, within these disciplines, there is a considerable and rich body of research, continually developing, and available for use by construction researchers, and, second, that the methodological and conceptual issues which construction management research is now addressing have already been addressed.

To provide a focus for the future, it is intended to take the lead from the fundamental body of work which exists in the social sciences. Thus, (1) first, culture is an intensely complex phenomenon and is manifest in a range of different ways throughout the subject matters of these disciplines. And (2) second, as researchers in construction management are themselves discovering, it is difficult, as it were, to 'contain' culture as a distinct and clearly identifiable 'variable'. And (3) third, a promising direction for the study of culture to follow, if it is to make a distinct contribution to our understanding, is

19

in the concept 'signifying systems' which is being used in the social sciences to focus cultural studies. The concept refers to the way people convey meaning and intention to each other and is to be seen in various communicative methods and techniques.

An approach to culture using the concept 'signifying system' is expected to provide a strong link between the concerns of theory and practice.

Workshop on Culture in Construction

The workshop held on the 22nd and 23rd May 2000 was titled "Culture in Construction: Part of the Deal?". It aimed to explore the significance of these developments for construction. The workshop was a two-day event bringing together the theoretical and practical experiences of culture in an international context within the construction industry and construction research. The University of Twente in Enschede in the Netherlands hosted it. Organiser was Dr.Ir. Wilco Tijhuis with his team as a members of the Faculty of Technology and Management, Department of Civil Engineering and Management, Section of Construction Technology & Construction Process.

Amongst the topics that had been identified for presentation and discussion at the workshop were:
- The use of the EFQM. This is a methodological framework, devised for practitioners, which makes explicit a number of cultural issues which firms need to manage in order to improve performance.
- The take up and use of a design management system. Here, the interest is in the way a highly formalised set of techniques is being introduced and used and what kinds of organisational re-alignments and cultural changes become necessary in order to assimilate it.
- Doing organisation research whilst addressing culture-related issues. This reflects a way of acting as e.g. a "third culture person" within an organisation, caring for the inside-outside approach.
- International experiences in construction; how projects with a multi-cultural background and projects-teams succeed or fail. These aspects are related to company strategies and working methods.

Thus, the workshop brought together the theoretical and practical experiences of ways in which culture is seen to be important in both an organisational and international context within the construction industry and construction research.

Goal and Outcomes

The goal of the workshop was to define a research agenda with which TG23 can adapt its research programme both from the viewpoints of academics and industry. The outcomes should provide a common basis and framework for further research-activities in international construction industry, focussing on the issue of culture and it's impact on the daily construction business.

Organisation

The Host of the Workshop was the University of Twente in Enschede in the Netherlands. The state-of-the-art research and collaboration with international research-institutes and industry gives the University of Twente a unique position in the international community. To improve insight into the construction process by means of an integrated approach that contributes to the improvement of both construction processes and the constructed object itself is the present strategy and programme of the Faculty, attracting several international contacts and projects.

Programme of the Workshop

Day 1 - Monday 22nd of May 2000
the past and present situation - experiences

09:00 Welcome-session
- Wilco Tijhuis (Chairman of the workshop)

09:15 Introduction of the theme
- Wilco Tijhuis (University of Twente NL)
- Richard Fellows (The Hong Kong Polytechnic University)

10:00 National and organisational cultures: implicit images
- Bram Neuijen (University of Groningen NL)

10:45 Coffee break

11:00 Developing a Culture of Quality in the British Constuction Industry
- John Rooke (University of Birmingham UK)
- David Seymour (University of Birmingham UK)
- Richard Fellows (The Hong Kong Polytechnic University)

11:45 Conclusions, leading to central theme (A)

12:30 Lunch

13:30 Introduction
- Richard Fellows (The Hong Kong Polytechnic University)

14:00 Case study: Building, a behavioural science:
- Hans de Waard (IM-TeaM Netherlands Intercultural management team)

14:45 Aspects of Culture
- David Root (Loughborough University UK)

15:30 Tea break

15:45 Differences in international construction process: some Dutch/German experience
- Wilco Tijhuis (University of Twente NL)

16:30 Panel-discussion, leading to central theme (B)

17:30 Closing
- Wilco Tijhuis (University of Twente NL)

20:30 Tour and Dinner

Day 2 - Tuesday 23rd of May 2000
the future - research agenda 2002

09:00 Welcome and reflection / introduction
- Wilco Tijhuis (University of Twente NL)
- Richard Fellows (The Hong Kong Polytechnic University)

09:15 Culture in a (changing) construction research environment
- Wim Bakens (CIB)

09:30 Reflection on the themes (A and B)

10:00 Division into small groups for discussion about theme (A):
- Sub themes
- Main problems
- Research methods
- Conlusions with research-strategy, related to sub-themes

10:45 Cofee break

11:00 Discussion about theme in small groups

12:00 Short plenary session

12:30 Lunch

13:30 Changing culture in CIB
- Wim Bakens (CIB)

13:45 Division into small groups for discussion about theme (B):
- Sub themes
- Main problems
- Research methods
- Conlusions with research-strategy, related to sub-themes

14:45 Tea break

15:00 Plenary session
- Main themes
- Main goals
- Main strategy

16:00 Decision for the research agenda 2002 and outlook

17:00 Closing-session

17:30 End

Chapter 2: Construction Research and Culture's Impact

Introduction

The presented papers during day 1 were all focussing on the common issue during the whole workshop: What role culture can play into construction research at the one hand, and what are experiences into daily-life projects, related to the issue of culture.

The participants raised several issues relating research, not only looking to barriers but also and especially to opportunities for improving the research-methodologies. And also from the practitioner's point of view several useful suggestions were brought in front, for keeping the view on the different cultures into projects as clear as possible during transactions and processes in construction business.

The following papers represent the presentations held during the first day. In the Appendix A and B also some transparencies are being printed to give a more clear understanding and illustration of issues discussed during this day.

National and Organisational Cultures: Implicit Images

Bram Neuijen
He works at the Faculty of Management and Organisation at the University of Groningen and is senior-consultant in IM-TeaM Netherlands.

> *"The art of management has no homeland".*

Introduction

Culture defines the way we are born, the way we live and the way we will die. It has to do with how we grow up, how we are socialised and what we learn about what is good and bad, beautiful or ugly, rational and irrational or about differences between male and female.

Hofstede is among the most cited researchers in the field of culture.
National cultures, according to Hofstede, are embedded in values. These values form the mental programming of the mind.

Hofstede identified 5 dimensions that express separate characteristics of national cultures. Hofstede claims that with these value-orientations many of the cultural differences can be explained or understood [Hofstede, 1991]. However, what is to be expected proves to be extremely difficult to forecast. In my view Hofstede's framework is extremely helpful in trying to understand new experiences or in trying to explain observed behaviour of groups of people with which we work. It may enlarge our cultural awareness and may prepare us for unexpected surprises.

In the eighties and early nineties I worked with Hofstede and Sanders in a research-project on measuring organisational cultures. We studied twenty companies or divisions of companies and developed tools to compare these company-cultures on a limited number of dimensions and developed tools for making in-depth case-descriptions of each organisation separately [Hofstede, 1991; Neuijen 1992].

National cultures are embedded in values. Organisational cultures, however, would be based on practices. Organisational culture according to this view can be defined as: 'the way we do things around here.'
These practices can be described in terms of symbols, rituals, (unwritten) rules and norms that guide our behaviour.
The rituals, rules and norms relate to questions about loyalty and commitment to the organisation, how to handle your boss and your subordinates, how to relate to each other etc.
Professional cultures will be somewhere in the middle, between national and organisational culture: a mixture of practices and values. You may find the shared practises in professional competencies, whereas the values may be found in the ethical code of a profession.
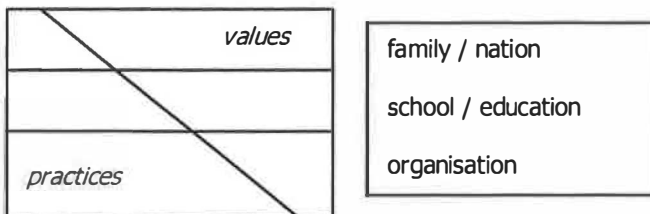
Figure 1: national, professional or organisational culture

However, the difference between national and organisational culture is not a dichotomous difference between values and practices. They are much more intertwined than Hofstede suggests.

Schein defines organisational culture as a pattern of assumptions that is taught to new members as the correct way to perceive, to think and to feel in relation to problems that the organisation faces.

This means that 'the way we do things around here' not only relates to behavioural patterns, but also to our perception, our thinking and to our feeling about these matters.

'Culture in construction' refers to organisations co-operating jointly in one or many projects, where we have to deal with different nationalities and value-patterns and with different organisational cultures, corporate policies, languages and norms about 'how to behave in new situations?' And we have to do with different groups of professionals.

One of the discussions in the field of multicultural management focuses on the convergence or divergence of management-values.

The convergence perspective implies that business practices and managerial values become more homogeneous as a result of more uniform organisational structures, technologies and processes. These homogeneous values and practices can be described as 'management-concepts'. Management concepts suggest a solution for general problems of management and are illustrated by many successful examples [Karsten and van Veen, 1999].

Selmer and de Leon studied the acculturation process of Singaporean middle-managers working for Swedish multinational companies [Selmer and de Leon, 1996]. They found that the work-values these middle-managers held were more similar to Swedish work-values compared to the work-values held by other Singaporean middle-managers, working for non-Swedish companies. Results revealed that the Singaporean middle-managers acculturated considerably on Uncertainty avoidance, Power distance and on Individualism. The acculturation process had fewer impact on their Masculine value orientation.

The divergence perspective implies that significant differences exist in the values held by managers in organisations in different cultures as a result of their respective national cultures. From the divergence perspective the notion of 'common and universal business values' is questioned.

Gopalan and Dixon find both the convergence and divergence of values in their research [Gopalan and Dixon, 1996]. This illustrates that there is a complex interaction between national cultures and the requirements of the modern business organisation in developing countries.

André Laurent also studied the influence of national culture on organisational practices. He interviewed a large number of managers on their problem-solving strategies by using cases. Laurent finds a number of favourite problem-solving orientations in relation to nationality. In a conflict-situation between professionals the French prefer to move this problem up in the hierarchy: If they cannot solve their problem, their boss will have to judge. The English tend to send these professionals to a management-course: They think the professionals should enlarge their personal capabilities; they should learn to bargain. The Germans prefer to hire a consultant. To them it is quite clear that responsibilities and task-descriptions are not properly described n this case. There seems to be overlap.

The interesting part of Laurents research is that the problem solving strategies relate to implicit images people have in their minds about what an organisation is. Is it in principal an hierarchy, a market or a machine that should be tuned properly?

We think people do have implicit images based on their culture of what an organisation is and we think these images differ fundamentally, although it is not easy to describe them accurately.

We also think people have implicit images about what their markets are. These images disclose their assumptions about how to operate effectively in these markets. These images may be partly explicit, for instance in the management concepts that are used. They are partly implicit too, of course, especially in the differences in consequences that are linked to these management-concepts, for instance in terms of favourite solutions for 'problematic situations'.

This leads to the question how we can broaden our knowledge of implicit images of organisations and markets.

It also leads to the question how we can explore these images in concrete situations: how to deepen a shared understanding of what the project is about?

In my presentation have been discussed these two questions.

References

Benedict R. (1934) *Patterns of Culture;* London; Routledge & Kegan Paul.

Calori R. (1994) *The diversity of management sytsems*; Calori R. and P. de Woot; A European Management Model beyond diversity; Prentice Hall; pp.11-30.

Gopalan S. and R.Dixon (1996) An Exploratory Investigation of Organizational Values in the United States and India; *Journal of Transitional Management Development;* Vol. 2 (2).

Hofstede G. (1988) *Cultural dimensions in management and planning;* Asia Pacific Journal of Management; January; pp. 88.

Hofstede G. (1991*) Cultures and Organizations, software of the mind.*

Karsten L. and K.van Veen (1999) *Managementconcepten in beweging, tussen feit en vluchtigheid;* Assen: Van Gorcum.

Neuijen J.A. (1992) *Diagnosing organizational cultures: Patterns of continuance and change;* Ph.D.-thesis; Groningen: Wolters-Noordhoff.

Selmer J. and C.de Leon (1996) Parent cultural control through organizational acculturation; *Journal of organizational behaviour;* vol. 17, pp. 557-572.

Bram Neuijen works at the Faculty of Management and Organisation at the University of Groningen and is senior-consultant in IM-TeaM Netherlands, a small consulting firm, specialised in national +culture, organisational culture and human relations. His research-interests lie in the study of organisational culture, organisational change and working with culture in mergers and acquisitions.
e-mail: j.a.neuijen@bdk.rug.nl / neuijen@im-team.demon.nl

Adress:

Bram Neuijen
University of Groningen
Faculty of Management and Organization
P.O. Box 800
NL-9700 AV Groningen
The Netherlands

Developing a Culture of Quality in the British Construction Industry: a report on research in progress

John Rooke, David Seymour and Richard Fellows

John Rooke works at the University of Birmingham at the Department of Civil Engineering. David Seymour works at the University of Birmingham at the Department of Civil Engineering. Richard Fellows works at The Hong Kong Polytechnic University at the Department of building services engineering.

Currently, the research has two parallel and interdependent strands. The first involves the administration of a benchmarking exercise between a number of major construction contractors. The EFQM Excellence Model [EFQM, 1999], developed by the European Federation of Quality Managers is being used as a framework for the description of management processes and prevalent attitudes within the companies. Information on these processes and attitudes is gathered from a series of focus groups within each company and scored according to the model's criteria. These scores and attendant strengths and areas for improvement for each company will form a profile of that company. This approach was developed in close co-operation with quality managers from the companies involved. The findings are of limited academic interest and are primarily intended to serve the interests of those managers. However, much interesting data will be generated as a by product of the benchmarking process.

Thus, the second strand of the research involves treating the exercise as an opportunity to engage in participant observation with the quality managers. This approach raises such questions as, *inter alia*: how quality managers conceive of their organisations, such that they are reliably known to function in certain ways, some of which may be targeted for improvement; how do they devise and implement improvement strategies; how do they know whether improvement has taken place? The fact and process of choosing the Excellence Model provide partial answers to the first and third questions. One research task which is available to be undertaken is the analysis of tape recordings made at a consensus meeting for the Midlands Quality Awards. This involves a number of participants, who have read and scored an award application, discussing their assessments of the application in order to come to a consensus as to the objectively verifiable merit of that application. The findings from this strand of the research may be considered as products of the interpretive paradigm [Seymour and Rooke, 1995].

A second phase of the research was planned to begin in May 2000. This will involve the participating companies actively benchmarking against each other. Initially, this benchmarking will be based on the data we have collected and prepared for them in stage one. However, if the exercise is successful, representatives of the companies will then meet to learn more about each others practice. It is intended that researchers be present at these meetings.

The First Year of the Project

The original proposal drew upon a mixture of qualitative and quantitative methods: i) Hofstede and Hall's questionnaire approaches; ii) unstructured interviews; iii) the quantification of unstructured data. Successive research plans based on this proposal were reviewed by the project steering committee, made up of a quality manager from each of the participating companies and the participating academics. These approaches were subject to some scepticism by our industrial partners, who suggested that we substitute the industry developed Excellence model for the academic/management guru models we were proposing. They also asked for a more structured interview schedule and the use of group interviews rather than individual interviews. It became apparent that the aspect of the proposed research that was most attractive to our partners was the benchmarking exercise. Discussion over a period of several months led to a revised research plan, which it was felt would deliver immediate benefits to our partners, while providing a real contribution to both the academic discipline and the practice of construction management.

Subsequent to the decision to use the Excellence Model, three members of the research team undertook training in the use of the model and took part as assessors in the 1999 Midlands Quality Awards. Research is now underway in three companies. A fourth company has been forced to drop out due to restructuring. Discussions are taking place with a number of others, with the intention of introducing a possible further three companies into the research process. The possibility has been raised of introducing a non-construction company; this is very attractive to our industrial partners.

The New Research Plan

This plan contains all the original objectives outlined in the proposal. Components of culture will now be identified according to the framework of the Excellence Model and a comparison between this and other ways of modelling culture will be produced. The provision of quality in the respective companies will be examined in the course of the benchmarking exercise and the effective components of culture identified. Strategic orientations will be identified

through focus group meetings with directors of each of the participating companies. Orientations to change and networks of influence will be identified through involvement with the quality managers, the interview groups and the benchmarking exercise.

Initial data collection is done in one of two ways. For most companies, this involves this involves holding four group interviews aimed at: company (or divisional) directors; middle management; office staff; and project teams. However, for those companies who have previously performed self-assessments using the model, it is possible to draw directly on the data they have collected. Data is analysed and scored by the research team, who work to achieve a consensus on the strengths, areas for improvement and overall scores for each company. These assessments become the basis of a benchmarking exercise that will form phase two of the research.

Hypotheses

Four hypotheses were contained in the original proposal.

1. *A culture of quality can be identified and expressed in the form of a profile.*

The existence and use of the EFQM Excellence Model indicates confirmation of this hypothesis. This confirmation is based on the assumption that the profiles produced within the models framework are taken to be profiles of culture. Initial analysis of the model indicates that it can capture a comprehensive range of perceptions/attitudes/behaviours contributory to effective organisational functioning. However, aspects of culture captured by Handy's and Hofstede's surveys, are missed by the model [Handy, 1978; Hofstede, 1980]. This is not necessarily a flaw in the Excellence Model, since the relationship between Handy's and Hofstede's models and quality performance is yet to be demonstrated. It is proposed to perform a comparative analysis of these three models. In addition, if time allows, the analysis will be extended to cover work on organisational structure, such as that reviewed by Lansley [Lansley, 1984]. It seems unlikely that a useful distinction can be drawn between organisational culture and organisational structure.

2. *Achievement of high quality in the construction industry is dependent upon the presence of a 'Culture of Quality'.*

An ethnomethodological [Garfinkel, 1984] approach will be taken towards this hypothesis. Thus, rather than attempting to develop a method of determining the relationship between quality and culture, we will investigate those already existing methods in use by managers. We will draw on two sources for these methods. The relationship between culture and quality is accounted for in the model by the distinction between enabler criteria and results criteria. By analysing various data (tapes of focus group and steering group meetings, written accounts of focus group meetings, tapes of consensus meetings, EFQM and BQF publications), it will be possible to reveal perceived dependencies between the two classes of criteria. Phase two should provide further data on ways in which participating managers account for the effectiveness of quality provision.

3. *Effecting cultural change is a function of specifiable strategic orientations*

At least two of the participating companies appear to be undergoing major changes in strategic orientation. This provides an excellent opportunity to observe the relationship between strategic orientation and cultural change. Initial findings lend some support to the thesis that the British construction industry is beginning to undergo a considerable change: away from adversarial management styles and an emphasis on cash flow and claims management as significant sources of profit; towards continuous improvement in people, process and supply chain management and a renewed emphasis on customer focus.

4. *The personal qualities of change agents who influence cultural change successfully are those of the charismatic leader.*

This hypothesis is derived from previous research [McCabe et al., 1998] where it specifically relates to middle managers. Working in phase two with the quality managers participating in the project may provide an opportunity to further explore the qualities necessary in an effective change manager.

Deliverables

The following are anticipated deliverables from the research:

1. Improvement initiatives in participating companies.

2. A consultancy package to facilitate benchmarking of company cultures, using the EFQM framework.

3. Papers on: the developing relationship between construction management practice and construction management research; the methods used to achieve agreement at consensus meetings on the merits of a company, using the criteria of the EFQM Excellence Model; the literature on organisational culture and its relationship to EFQM Excellence Model.

References

EFQM (1999) *The EFQM Excellence Model;* European Foundation for Quality Management; EFQM & The British Quality Foundation; 32-34 Great Peter St.; London; SW1P 2QX.

Garfinkel H. (1984) *Studies in Ethnomethodology;* Polity Press; Cambridge.

Handy C. (1978) *Gods of Management;* Souvenir Press; London.

Hofstede, G. (1980) *Culture's Consequences: International Differences in Work-related values*; Sage; London.

Lansley P. (1994) 'Analysing Construction Organizations'; in *Construction Management and Economics;* 12:337-348.

McCabe S., J.Rooke, D.Seymour and P.Brown (1998) 'Quality Managers, Authority and Leadership' in *Construction Management and Economics;* 16, 447-457.

Seymour D. and J.Rooke (1995) 'The culture of the industry and culture of research'; in *Construction Management and Economics;* 13:511-523.

John Rooke works at the University of Birmingham at the Department of Civil Engineering.
e-mail:john@rooke88.freeserve.co.uk

Adress:

John Rooke
University of Birmingham
School of Civil Engineering
Edgbaston
Birmingham
B15 2TT
United Kingdom

David Seymour works at the University of Birmingham at the Department of Civil Engineering. He is joint co-ordinator of the CIB TG23 "Culture in Construction". CIB: www.cibworld.nl
e-mail: d.e.seymour@bham.ac.uk or seymour@civ-fs1.bham.ac.uk

Adress:

David Seymour
University of Birmingham
School of Civil Engineering
Edgbaston
Birmingham
B15 2TT
United Kingdom

Richard Fellows works at The Hong Kong Polytechnic University at the Department of building services engineering. He is also joint co-ordinator of the CIB TG23 "Culture in Construction". CIB: www.cibworld.nl
e-mail: berff@polyu.edu.hk or fellows@ctimail.com

Adress:

Richard Fellows, Room FJ605
The Hong Kong Polytechnic University
Department of building services engineering
Hung Hom
Kowloon, Hong Kong

Building as a behavioural science: A case—study

Hans de Waard
He works as a senior-consultant in IM-TeaMNetherlands, Intercultural management team.

Introduction

Over a good part of 1998 and 1999 a Dutch development company tried to acquire a huge contract in Switzerland.
The contract should include developing a stadium and a connected complex with apartments, shops, offices, a hotel and the infrastructure in the area.
About one month before the final decision (the choice between four competing developers) I was added to the Dutch project team.

A helicopter–view

A complex mixture of firms, groups, organisations and individuals were involved:

- The Dutch development company, MDC, Multi Development Corporation
- Their –legally independent– bureau for architectural design
- The director of their Paris' desk, the project team leader in this case
- The firm of Rem Koolhaas, OMA, Office for Metropolitan Architecture, his fame brought us the project
- The architects of OMA, involved in this project
- The Zürich city counsel, decision takers
- The Zürich department of urban development
- The aldermen for housing and sports in Zürich, both politically responsible for the final decision
- The public servants of the local city counsel, the most important one: the head of the department for building and planning.
- The owners of the land involved in the project; they have to consent to the political plans
- One of them, owner of by far the biggest part, a rich and influential local businessman
- The people, living in the district
- The population of the city, important because of their role in the Swiss political system, spinning around quarterly referenda
- The local press, informing the voters. It helped to subscribe to a local cutting agency
- Both local football–clubs, who will share the stadium

- The local representative of the development comp., an architect from Zürich
- The external consultants to the project team, a financial specialist and myself.

All parties and persons involved can be arranged in a scheme of concentric circles representing the different levels of system. The different levels of culture and communication –and their implications– will than become clearer.
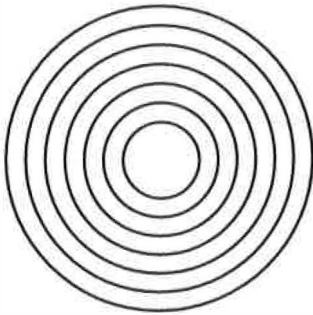
From inside outward we can distinguish:

1. The psychology and awareness of the persons involved
2. The patterns of communication
3. All kinds of group dynamics
4. The professional cultures of all the professions involved
5. The local political and cultural climate
6. The national culture of the client system
7. The national cultural differences of the parties involved

In this case–study we will work our way from outside inward.

LEVEL 7

As a first step we made a rough comparison between the Swiss and Dutch culture.

We found that the Swiss national culture is slightly lower on powerdistance than the Swiss.

The Dutch project team, used to take decisions over billions in whatever currency will probably feel at ease with a somewhat higher powerdistance than the Dutch will in general.

The Swiss politicians on the other hand will reflect the lower Swiss powerdistance, maybe they are even lower than general because the Swiss political system with all its referenda forces them to be careful in listening to their voters.

Uncertainty avoidance is higher in Switzerland than it is in Holland, especially in the field of finance. A rough estimation will not do in Zürich, accurate figures and facts, based on certainty, are compulsory.

Switzerland is a more collectivistic country than Holland, which is more a society that is dominated by individualism. We will have to invest in the quality of the relationships, and more so than we are used to. And we will have to grasp some understanding of living in a society were 'we' is more important than 'I'.

Switzerland is high on masculinity, winning, being the best and toughness are key–concepts. The Dutch culture is one of the three most feminine cultures on earth. Equality, being nice and tenderness are fare more important.

But the Swiss simply adore quality. They will always choose the most expensive solution because they expect it to be a better one.

They know they can afford this solution but they will want us to convince them about that (uncertainty avoidance again).

LEVEL 6

Secondly we made an in depth study of the Swiss culture by means of interviewing an expert: a German pro on Southeast Asian culture, living in Switzerland.

An outsider's point of view is essential in matters of culture. Otherwise ethnocentrism will fog our spectacles.

I will mention just two of the findings of this study:

1. The Swiss tend to be 'gespalten', always looking at both sides of the coin. For example: they adore fresh air and are afraid of draft.
2. They invented their own variation of Murphy's law, which is called Müllers law: Everything that can go wrong will go wrong, but … we are prepared.

It was not possible to simply stick to the facts about the Swiss national culture. The differences between the cantons are too big. Here we had some luck: Zürich is by far the most internationally oriented area. More so the Geneva, where the French cultural climate is dominating.

The 'Zürcher' are much more used to doing business across borders.

LEVEL 5

The Swiss political climate is interesting. Especially for its so-called direct democracy: every three months all the important issues are brought to the voters. A politician cannot be sent away by a vote of confidence, like in our country, but he or she can be made powerless by a simple 'no' of the people.

The Dutch project team had to build a solid bearing surface; had to work with the mind of the Zürcher minds in the backs of their heads constantly. Later on we will see that here they made mistakes.

LEVEL 4

The most important groups of professionals involved were
- architects / city planners, on the Dutch side free professionals, on the Swiss side civil servants and politicians,
- reel estate developers, again on the Dutch side free professionals, doing business on their own, on the Swiss side politicians and civil servants.

We have to keep in mind that Swiss civil servants represent a powerful force. They do not hold political power, but they are able to delay a project tremendously.

Often on a basis of person to person meetings professional culture will be more important than national culture. In one of the conferences that we attended a Swiss architect cried out: 'The only thing you (politicians) have to do is finally, finally decide!'

He was 'one of us' in no time and had no understanding whatsoever for the fact that the local politicians did not come to a decision about the development of the area in a whole century.

Working nationally crossing the borders of professional culture is doable. All people involved share the mutual understanding of their nation.

Working internationally professional communication is often a pitfall: professionals of one kind between themselves tend to forget the specific worries of other professions.

Proper, effective, multicultural project management is a must. All the architects that were involved in the project in one way or another easily reached a high level of mutual understanding. Other professionals however did not always share this understanding, even felt somewhat excluded from time to time.

LEVEL 3

The members of the project team represented different firms, and thus different interests. In this case their common goal was to acquire the contract, their common mean of reaching their goal was adrenaline.

Specific groupdynamic skills are important for a project manager. The project–leader in this case did a good job in the first phase, the competition with other teams.

The team was solid, good relationships were established, effective communication was possible.

And we actually won the contest and acquired the contract.

From that moment on, mistakes were made. There was less continuity, sharing the cake, changing the communicative patterns with the client system did not work out well. The project–team fell apart as a group.

LEVEL 2

The most important issue of communication is language. For us being non–native speakers in German, was an advantage. The Swiss consider German their second language. And although they speak it fluently, they feel more at ease with a counterpart that also has the working language as a second language than native German speakers.

The second most important issue of communication is congruency. In other words, the words spoken need to be an accurate reflection of all the non–verbal communication.
So we presented ourselves as self–aware Dutchies, willing to move culturally toward the Swiss and not willing to give up our own basic values.
The reaction on that state–of–mind was positive: it created space for the Swiss to stay Swiss and stick to their concerns as mentioned in connection to level 7.

LEVEL 1

It is often very hard to find out whether difficult, puzzling or even irritating behaviour of the other is based in his or her national culture, professional culture or psychological upbringing.
Important questions are: 'Who owns what?' (Is my irritation valid because my counterpart is crossing my personal borders or am I just projecting my own bad habits), 'Am I aware of the other persons values, norms and habits?', 'Is the other person aware of my confusions?'.
It always helps to change the thought 'Isn't it stupid?' into 'Isn't it interesting?'.

Critical moments in the process and the role of the consultant
- In the beginning of my participation I asked for the opportunity for a general briefing on culture and accepted a refusal.
- I accepted a contract (as a consultant) with a scope that appeared to be too small. The functioning of the project team as a whole and reflections on strong and weak points within the team should have been part of the scope.
- Investing a lot of time in really getting to know the local situation was an absolute necessity.
- Interviewing a local and not involved expert on culture contributed a lot and is recommended for every project.
- Feedback sessions tended to become rather informal. A mistake was to accept feedback communication with individual team members in stead of with the project team as a whole.

- Personal meetings that I could have with some of the key players were very helpful.
- Simply accepting the fact that I was sacked after the moment the project team won the contest, in stead of fighting a political battle to stay on board was a mistake.
- Not confronting the project management wit their shortcomings on multicultural awareness was an unforgivable weakness.

Pitfalls / lessons learned

1. Are items related to culture on the agenda of the project team? Is a certain willingness there to take time to address the issues related to culture?

Often project teams tend to consist of two groups of participants:
- those who are curious about cultural issues and
- those who consider cultural issues vague, a waist of time, not really important in a technical world etc.

It is often more comfortable to stick to the technical issues than to question the under–water part of the iceberg.

2. Does the project management include taking time for cultural issues?
Large building projects include many highly qualified professionals, vast amounts of money and political pressure so time is expensive and deadlines are important.

3. Do participants have a mutual understanding on concepts related to culture? Do they use more or less the same language?
An enormous advantage has been reached if information can be connected to an already existing conceptual base of knowledge. (Hofstede's 5–D model or Neuijen's dimensions have proven to be very helpful.)

4. Did participants reach a certain level of awareness of their own ethnocentrism, both nationally and professionally?
Often people who already worked in another national or professional setting assume they understand the other culture. If they were exposed to that culture without a proper base of knowledge, their 'understanding' (the result of a very natural process of jumping into conclusions) consists of quite a number of misunderstandings.

5. Are we addressing the right level of system? Is the hesitance towards decision taking of the Zürich city counsel typically Swiss, typically for the region, typical for the organisational culture of the city counsel offices,

typical for the Swiss political system or based in the personality of the key players?
And of course there is a strong synchronicity between the different levels of system:
The people of Zürich will have the politicians they deserve, the politicians will choose the project team they deserve and so on and visa versa.

6. Are we following the flow, or rowing against the stream? There is often a lack of decisive power (client) and time–pressure and a need for clarity (project team), there is technical curiosity and a need for building relationships, a need for authentic communication and a need for winning the competition can create constant dilemma's.

7. Working with cultural issues always is like a walk on a tightrope between stereotyping and characterising. Often we do not know whether our characterisation is correct or not. Dealing with such a situation demands a high level of social–emotional dexterity:

A lot of questions are not always easy to ask and yet necessary to build a bridge between cultures:
  *   'Am I correct assuming that you fear resistance of the civil servants (or a 'no' at the referendum) or do you consider our proposal not wise yourself?'
  *   'I really need to better understand your hesitance.'
  *   'I do not feel at ease with the present windless period.'
  *   'A typical Dutch (architectural) solutions to this dilemma would be to …. . Does that make sense to you or is it unwise in your situation?'
When the city counsel took a decision we did not understand, we reacted wrongly with a press–conference, stuck to 'Isn't that stupid'. The predictable Swiss reply was to withdraw the decision to give us the job.

We had forgotten Müllers law and were not prepared.

Hans de Waard is senior-consultant in IM-TeaMNetherlands, Intercultural management team; a small consulting firm, specialised in national culture, organisational culture and human relations.
e-mail: imteam@wxs.nl

Adress:

Hans de Waard
IM-team Netherlands
Mathenesserlaan 447 A
3023 GJ Rotterdam
The Netherlands

Aspects of Culture and Supply Chain Management – using SCM as a 'tool' for cultural change

David Root
He works at the Loughborough University at the Department of Civil and Building Engineering.

Introduction

This research discusses a variety of cultural issues that have arisen out of a research project involving a design-manage-construct (DMC) organisation and a number of its specialist suppliers/contractors. These issues relate to the themes of business lines within the construction industry, the professional culture in the industry and the impact this has on how construction organisations approach the management of their businesses.

The Research Context

The research project through which these cultural issues have emerged is titled Integrated Collaborative Design (ICD). ICD is funded in the UK by the Engineering and Physical Sciences Research Council and the Department of Transport and the Regions. The main aim of the ICD project is to develop a toolbox of techniques and strategies that can be applied within a new collaborative working framework to help the construction industry optimise supply-chains. The scope of the project is wide ranging and consists of five components which address issues and opportunities within:

Process Modeling, building on the work of Austin [Austin et al., 1999] and linking to the work of Kagioglou [Kagioglou et al. 1998] seeking to integrate design processes between primary designers and specialist suppliers/subcontractors

Value Engineering, drawing on the work of Male [Male et al.; 1998] throughout the project process

Supply Chain Management, drawing on the work of Evans [Evans et al., 1997] of developing strategic frameworks for the integration of the organisations

Implementation of Supply Chain Management within and across organisations and achieving cultural change within the supply chain [Fernie et al., 2000].

This paper specifically addresses the latter two areas although the issues impact on both Value Engineering and Process Modelling. Supply chain management has received a great deal of attention from the UK construction

industry recently through the reports of Latham and Egan [Latham, 1994; Egan DETR, 1998], although the term has been in use for a long time in the manufacturing industry. Indeed, Forrester [Forrester, 1961] refers to supply pipelines in much the same way that supply chains are referred to in current management literature, and Ford [Ford, 1991] makes reference to a similar concept in the 1920's. More recently Supply Chain Management has received attention from Spekman et al., Lamming, Chase et al., Davis and also referred to by Womack in their book recording the findings of an international study of the automobile industry [Spekman et al., 1998; Lamming, 1996; Chase et al., 1998; Davis, 1993; Womack et al., 1990].

The research into supply chain management and its applicability has lead the authors to identify a number of generic characteristics from the disparate definitions that exist within the literature [Fernie et al., 2000]:
- the concept is 'holistic' (requires a view beyond a single organisation);
- involves relationships (within and between organisations);
- relies on 'networks' (combining those organisations), and
- involves forming 'Chains' implying links within and between resources/competencies.

Origins of Supply Chain Management

As mentioned previously, the origin of SCM is rooted in manufacturing industries and so focuses on the production process of goods through the control of material flows. In focussing on SCM, the construction industry and its clients are seeking to gain the benefits that have demonstrably been achieved by sectors such as the automotive industry where large efficiency gains have been achieved through managing the interfaces between organisations. However, the perspective of continuous flow processes reflects a fundamentally different perspective to that of the construction industry's craft and professional traditions with its focus on the concept of the 'project'.

The Culture of the 'Project'

Whilst the notion of continuous, durable processes exists within other industries, within construction, the 'idea' of the project is the dominant world-view for the individuals within the industry and all relationships are mediated through that mental model. As a result, the relationships between organisations:
- are viewed as being short term with defined start and end points;
- currently informal/ad-hoc developed on a project-by-project basis;
- tend to be arms-length [Fernie et al., 2000];

- focus on the projects not businesses, and
- vary between projects because the competencies required from each organisation vary.

This lack of continuity in relationships:
- prevents process innovation and improvement (there is no 'generic' process to innovate);
- limits the development of more complex relationships such as 'obligational' relationships [Sako, 1992], and
- fosters an attitude of the 'uniqueness' of projects.

Because of the dominance of the project as the main organisational model (the industry being a population of projects [Boyd and Wild, 1999]:
- the formal organisations or 'businesses' are subservient to the task of delivering the 'project';
- business managers are drawn from project professionals (where experience is gained in management through the management of projects);
- the management of businesses is influenced by professional training which is technical/role/task focused; and
- reflects the craft tradition of production of an artefact.

The perspective of the project, as the organisational form which the construction professional is most familiar with, acts as a barrier to developing a process perspective within organisations.

The ICD Research Methodology

The ICD research has responded to this problem by creating an artificial and arbitrary split between Business Relationships/Processes and Project Relationships/Processes. The development of the SCM strategic framework within ICD is conscious effort to discriminate between business processes (generic/common processes across organisations) and project processes that are organisation/role specific. This is being done by introducing the concept of the 'supplier network (see Figure 1).
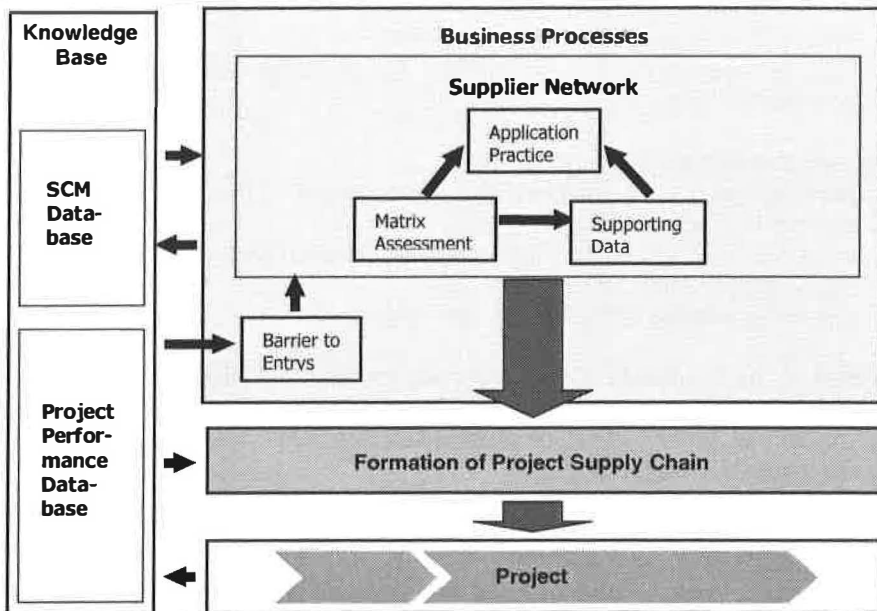
Figure 1: *The Supplier Network*

The supplier network can thus be seen as an attempt to engender cultural change by shifting the perspective away from project processes to wider business processes. It is proposed that such a change in perspective would facilitate relationships across businesses through which organisations are 'permanently' engaged i.e. development of status relationships/diffuse obligations which would exist outwith projects, rather than the current ad-hoc relationships where firms are temporarily engaged with each other through the project.

The introduction of SCM can thus be seen as an opportunity or a vehicle to undermine existing cultural barriers that exist between functional groupings within and between organisations as the perspective shifts from the narrow technically focused 'delivery of a project' to the business process of 'delivering projects'.

The Supplier Network as a Medium for Change

In attempting to develop inter-organisational relationships at a business to business level, there is a recognition that in order to have relevance, the network itself must represent a particular 'status within the DMC's supplier base. A prerequisite must be some ordering of suppliers into those that are

considered more important than others. Experience indicates that this always happens, that there is a natural order that develops through familiarity over projects although often this is at the level of individuals i.e. particular project managers develop favourite suppliers with whom they prefer to work. The concern is that this it is an ad-hoc unstructured arrangement. A system of tiers enables this to be put on a formalised setting. In the case of the DMC, there was an explicit intent to focus on suppliers who:

- were strategic suppliers;
- provide high value/high risk packages; and
- had a capability to provide high design input.

The tiers exist to provide barriers to entry into the select status of network members raising their status and allowing the development of the more diffuse obligational relationships between organisations that arise from status rather than contract relationships. It provides a mechanism and medium for communication across businesses to develop:

- an understanding of business relationships and processes;
- an understanding of each others organisations; and
- co-developments in relationships and processes.

Findings to Date

The attempt to develop this strategy towards supplier relationships within the operational context of a DMC organisation and its strategic suppliers has involved detail interviews with the companies concerned both at the business level and at the operational/site level on a number of projects. These have shown that there are significant differences between firms in terms of their organisational and operational cultures which are a product of their internal business processes and the need for these to be communicated amongst the firms that they interface with. Examples include:

- Industry subcultures which are a function of lines of business and so operate across organisations. These subcultures differentiate between building activities (which are geared to spatial perspectives) and service activities (viewed in terms of systems) which causes tensions in terms of design and construction programme management. Other sub-cultures distinguish between firms who see themselves as part of the construction industry and those who see themselves as suppliers to an industry. Those who see themselves as suppliers often have manufacturing backgrounds and exposure to other industries and tend to be process focused. In addition their level of development in terms of supply chain sophistication reflects the experiences of manufacturing generally and are reflected in

different languages i.e. supplier as opposed to sub-contractor [Root et al., 1999] and familiarity with many manufacturing concepts such as BPR, cell manufacture, lean production etc.

- Industry sub-cultures that are internal to organisations typically reflecting functional silos which are the product of a fragmented industry and represent the traditional structures of roles and technical/professional specialisms. Evidence to date supports their existence between design disciplines, site and office based personnel, design and construction activities and between contract management (project focused) staff and production (process focused) staff (though this is very much a characteristic of suppliers rather than contracting and/or design organisations).

In many cases, the existence of these industrial subcultures overshadows the broader organisational cultures/values in reflecting the historical development of the companies.

In doing so, the variety of cultures and of perspectives that interact with one another within the industry, shows the need for a common language or lingua franca that can apply not just within the immediate project team but across the organisations that contribute to that team. The attempt to shift away from purely technical project perspective by encouraging attention towards generic business processes is an explicit attempt to undermine the dominance of the existing technical subcultures by encouraging closer identification with the business rather than the project/task.

References

Austin S., A.Baldwin, B.Li and P.Waskett (1999) *"Analytical Design Planning Technique: A Model of the Detailed Building Design Process";* Design Studies; Vol. 20, No. 3. pp. 279-296

Boyd D. and A.Wild (1999) 'Construction projects as Organization Development' in *Proceedings of the 15th ARCOM Conference;* Vol. 1, pp. 221-229; Liverpool John Moores University; Liverpool

Chase R.B., N.J.Aquilano and F.R.Jacobs (1998) (8th Ed.) *Production and Operations Management: manufacturing and services;* Irwin/McGraw-Hill; ISBN 0 07 115222 9.

Davis T. (1993*) "Effective Supply Chain Management" Sloan Management Review;* Summer 1993; pp. 35 - 46.

DETR (1998) *Rethinking Construction;* Department of Environment Transport and the Regions.

Evans G.N., A.Bailey, M.Reed, M.M. Naim, D. Brown, D.R. Towill and M. Riley (1997) "Organising For Improved Construction Interfaces" in

Leeming; M.B. Topping, B.H.V. (Ed) Innovation in Civil and Construction Engineering; Civil-Comp Press; Edinburgh; Scotland; pp.207 – 212.

Fernie S., D.Root and T.Thorpe (2000) "Supply Chain Management – theoretical constructs for construction" in *Serpell, Alfredo (2000) Information and Communication in Construction Procurement, Proceedings of CIB W-92 Procurement System Symposium, Santiago;* Chile pp. 541-556.

Ford H. (1991*) Ford on Management: Harnessing the American Spirit;* Basil Blackwell (N.B. originally printed as "Henry Ford, My Life and Work").

Forrester J. (1961) *Industrial Dynamics;* The M.I.T. Press; Cambridge; Massachusetts. pp.138.

Kagioglou M., R.Cooper, G.Aouad, J.Hinks, M.Sexton and M.D.Sheath (1998) *A Generic Guide to the Design and Construction Process Protocol;* Published by the University of Salford; ISBN 0 902896 17 2.

Lamming R. (1996) "Squaring lean supply with supply chain management" *International Journal of Operations and Production Management;* Vol. 16, No. 2, pp. 183 - 196.

Latham M. (1994) *Constructing the Team: Joint Review of Procurement and Contractual Arrangements in the United Kingdom Construction Industry;* HMSO; London.

Male S., J.Kelly, S.Fernie, M.Gronqvist and G.Bowles (1998) *The Value Management Benchmark: a good practice framework for clients and practitioners;* Thomas Telford; London; ISBN 0 7277 2729 X.

Root D., S.Fernie and A.Baldwin (1999) The languages of product and service: barriers to the integration of construction and design in *the proceedings of the 15th ARCOM Conference at Liverpool John Moores University;* Liverpool; Vol.1 pp.181-190.

Sako (1992*) Prices, quality and trust* - Inter-firm relations in Britain and Japan; Cambridge University Press.

Spekman R.E., J.W.Kamauff Jr and N.Myhr (1998) *"An empirical investigation into supply chain management - A perspective on partnerships"* International Journal of Physical Distribution & Logistics Management; Vol. 28, No. 8, pp. 630 - 650.

Womack J.P., D.T.Jones, and D.Roos (1990*) The Machine That Changed The World;* MacMillan; New York; ISBN 0 89256 350 8.

David Root works at the Loughborough University at the department of Civil and Building Engineering.
e-mail: d.s.root@Lboro.ac.uk

Adress:

David Root
University of Loughborough
Department of Civil and Building Engineering
Leicestershire LE11 1JW
England

Differences in International Construction Process: some Dutch/German experiences

Wilco Tijhuis
He works at the University of Twente and at WT/Consult BV.

Introduction

In the period between 1993 and 1996 a partly-participative research project was been carried out in the field of international construction processes. Especially the comparison between Dutch and German construction-organisations and the behaviour of individuals in it have been analysed. Due to the partly-participative approach, there were open access to information and experiences, it was a very interesting and stimulating research [Spradley, 1980]. Especially the focus on critical incidents made it an interesting theme, leading to (cultural) differences. The main results have been published in several publications [e.g. Tijhuis, 1996, 1999], and are being used to develop further insight and experiences into international construction practice and its research.

the research project and its outcomes

Due to the fall of the Berlin wall in 1989, a large building market has arisen in the countries behind the former Iron Curtain. Various parties are particularly active in areas in former East Germany. Dutch enterprises are represented there too, as well as in several areas in former West Germany. Various investigations in the building branch have confirmed that it is necessary for Dutch building companies to enter into these markets to maintain a competitive position. However, entering into these markets is not always that simple, which is made very obvious by the fact that several foreign companies including Dutch ones are withdrawing. It would seem that operating on an international building market requires more than just working by different technical regulations or standards. This investigation was therefore primarily aimed at the situation and experiences of building companies and project developers that started activities in the new German provinces with their Dutch backgrounds. The preliminary research it turned out that these parties have quite some problems with the rather fragmented German building process, which they were not used to. In the Netherlands the common building process has a relatively integrated approach. The research was therefore especially oriented on differences between the Netherlands an German in the

organisation of the building process, in which special attention was paid to the possible backgrounds of these differences. To realise a number of matters, partially participative research was carried out within building companies and project developers. This was combined with the analysis of various theories, such as those of Hofstede, Mintzberg, and Sanders and Neuijen. Besides that, there was participation in other international research, where comparison were made between project organisations within building companies in France, Germany, the Netherlands, and Finland among others. These activities collectively contributed to the ascertaining of the fields of interest, in which differences and their possible backgrounds were brought to light. Mainly from in-depth interviews it appeared that the areas of *contact*, *contract* and *conflict* were of major importance. These prominent fields of attention have been depicted in figure 1 using causal relations against the background of the categories *culture*, *project organisation*, and *technology* respectively, which together served as a basis for a hypothesis.
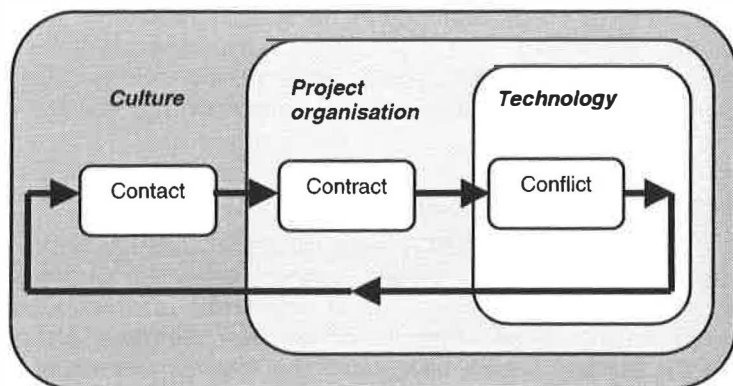
Figure 1: *Representation of prominent fields of attention and the categories involved*

Against the background of the categories involved the prominent fields of attention were incorporated in a hypothesis: *If Dutch builders in Germany have a conflict with the other parties involved during the building process, it is the consequence of incorrectly formulated contracts that are a result of misconceptions when contacts were made.*

This hypothesis was then tested by means of an analysis of the various case studies. The main goal was to determine where things went wrong during the building process. The results, which are portrayed as lessons for each case study, did not lean to the rejection of the hypothesis. After that, a validation of the lessons and the hypothesis was carried out. For this purpose, use was

made of a panel of experts, which consisted of experts with experience in the Dutch and German building trade. This validation provided us with the result that most of the lessons can generally be declared valid. The hypothesis was therefore declared to be generally valid within the context of the research. Finally, conclusions were drawn and certain recommendations were included too. These conclusions and recommendations have been placed in a so-called NEDU Matrix in the shape of key words. The matrix gives the conclusions and recommendations for the Dutch parties that were actively involved or wished to become active on the German building market. The principle focus was on building companies and project developers, and more especially the project organisations they or others used, or in which they participated. Following the vertical axis of this matrix, we can distinguish three prominent fields of attention, while the horizontal axis contains the three related background categories. Figure 2 represents this so called NEDU Matrix.

NEDU-Matrix	*Context* **Culture**	*Organisation* **Project organisation**	*Concequences* **Technology**
Contact	**(a)** **Avoiding uncercertainty** **Negotiating skills**	**(b)** **Orientation on the process** **Orientation on getting results**	**(c)** **Regulations** **Customs**
Contract	**(d)** **Reliability** **Balance of interests**	**(e)** **Integration** **Accountability**	**(f)** **Reach of the contract** **Experts**
Conflict	**(g)** **Orientation on claims** **Orientation on solutions**	**(h)** **Durability of the relationship** **Customer orientation**	**(i)** **Professional knowledge** **Complexity of regulations**

Figure 2: NEDU Matrix with conclusions and recommendations given as key words

The NEDU Matrix, in which the role of each of the respective background categories is given per prominent field of attention, summarised by the key words placed in the matrix fields.

The main line that can be drawn from the conclusions and recommendations is that the present national and international building trade will have to undergo a cultural revolution that is more customer friendly. Having some idea of what the costumer wants and especially how a customer will assess a particular achievement (e.g. in the shape of a building or building product) plays a vital role. This especially holds when conflicts arise as a result of flaws in the product or building. The prevention of such conflicts can mainly be achieved by a greater degree of trust between and reliability of all the parties involved. In addition, clearer communication on the other hand and proper information on the other, particularly in the shape of written professional knowledge and insight into unwritten customs are helpful. The reduction of the surplus regulations by the proper authorities may be one of the most important conditions for the creation of a good foundation for the realisation of these changes.

DISCUSSION

Doing research into 'real-life' situations creates interesting opportunities to collect information and experiences. It is more or less the need, while researching into 'culture-related' areas involves (many) people. And that is not strange while construction is a people's business.

However, it also introduces a risk: Researchers should train themselves every time to develop the capability 'put a step aside' when possible and/or needed. That is especially necessary while otherwise there could be growing an unwished involvement in the situation. Or the clear view of situation, problems, solutions and people and their behaviour cannot be analysed well anymore. So, for such partly participative research it is necessary to obtain an attitude of 'being a third culture man': Being inside but also outside an organisation [Sanders, 1995].

When researchers and practitioners use this attitude, it creates good chances for ongoing research into real practice: Understanding situations and behaviour better, keeping an open but trustful balance between the organisation and the observer. So that not only culture but also its research really becomes part of the deal!

REFERENCES

Hofstede G. (1980) *Culture's Consequences – International Differences in Work-related Values*; Vol.5, Cross-Cultural Research and Methodology Series; Sage Publications; Beverly Hills, London, New Delhi.

Mintzberg H. (1979) *The Structuring of Organizations*; Prentice Hall; Englewood Cliffs, New Jersey.

Sanders, G.J.E.M. (1995) Being "a third culture man"; article in: *'Cross Cultural Management: An International Journal'*; journal, Vol.2, Nr.1; pp.5-7; MCB University Press.

Sanders G.J.E.M and B.Neuijen (1987) *Bedrijfscultuur: Diagnose en Beinvloeding*; Van Gorcum; Assen, Maastricht.

Spradley, J.P. (1980) *Participant Observation;* Holt, Rinehart and Winston; New York, Chicago.

Tijhuis, W. (1996) *Bouwers aan de Slag of in de Slag? – Lessen uit Internationale Samenwerking: Onderzoek naar Nederlandse Ervaringen in het Duitse Bouwproces;* Ph.D.-Thesis; with English and German Summary: 'Contractors at Work or in Conflict? – Lessons from International Collaboration'; Eindhoven University of Technology, Eindhoven; Kondor Wessels Berlin GmbH, Berlin; WT/Consult BV; Rijssen.

Tijhuis, W. (1999) *Focussing at the Client's Wishes and Behaviour in Construction Management – (Re)Starting at the Front-end of Construction-process;* University of Twente, Enschede; WT/Consult BV; Rijssen; paper on conference: 'Customer Satisfaction: A Focus for Research & Practice in Construction'; proceedings; 5th-10th September; pp.148-156; Ed.: P.A.Bowen and R.D.Hindle; University of Cape Town, Cape Town.

Wilco Tijhuis works parttime as an Ass.Professor at the University of Twente in Enschede, The Netherlands, at the Faculty of Technology and Management and its Department of Construction Technology and Construction Process.
The other part of his time he is managing partner at the consulting firm WT/Consult BV in Rijssen, The Netherlands, which has its activities in international construction processes and developments.

Adress:

University of Twente
Faculty of Technology and Management
P.O.Box 217
NL 7500 AE Enschede
The Neherlands
Tel. +31-(0)53-4894254
Fax. +31-(0)53-4892511
www.sms.utwente.nl
e-mail: w.tijhuis@sms.utwente.nl

WT/Consult BV
International Construction Process & Development
P.O.Box 110
NL 7460 AC Rijssen
Tel. +31-(0)548-542888
Fax. +31-(0)548-542886
www.wtprojects.com
e-mail: tijhuis@wtprojects.com

Discussion and Outcomes

Starting with a number of presentations designed to provide the initial direction for discussions, the main themes were defined quite clearly. Especially the role of culture-research and its practice in research and industry led to interesting issues. Experiences from an academic viewpoint crossed and inter-linked with experiences from a business-consultancy viewpoint. This gave food for fruitful thoughts.

In that way, participants in construction industry should become aware of the importance of culture and its impact and influence on the process and product of construction business. But to stimulate such awareness, it is essential to put together specific multi-cultural teams for undertaking research in this field.

Besides this, the role of differences in culture, and especially the understanding or misunderstanding of differences in culture, often seems to be related to he role of 'trust' and 'distrust'.

For the theoretical part of doing desk-research it means, in a lot of cases, that the existing theoretical frameworks of research in this field (e.g. Hofstede) provides valuable starting-points, but it was agreed that 'the' framework does not exist. Therefore continuous improvements and adaptations are needed.

Added to that, the need for clear definitions was quite obvious, but internationally it was pointed at the fact that in that area certain progress is being made. The work of TG23 and e.g. workshop was really of added value to that aspect.

Interesting were also the problems raised, related to doing field-research in culture-issues. It needs good and realistic access to organisations. The approach of reporting from 'inside' gives the best guarantee for realistic viewpoints and outcomes. However, this way of working introduces the risk of 'becoming too close' (a so called 'third-culture-person').

And last but not least, when looking to 'a main' international common problem of research, the funding, it was agreed that having an international framework of research, this could improve the success of applications towards funding-schemes. By doing so, the progress into culture-research could also be stimulated.

Chapter 3: Culture's Role in the CIB

Introduction

During the discussions on day 2 about the role of culture in theory and practice, it gradually focussed towards the challenges it put in front: How to look at 'culture' in the near future. And then especially into the present and coming schemes of construction research. This gave interesting 'food for thought' and resulted into structuring discussions.

After these discussions, the CIB's secretary-general gave the vision of CIB on the issue of 'culture' into her research-schemes. His paper is presented in this chapter.

Culture in a (changing) Construction Research Environment and Changing Culture in CIB

Wim Bakens
He is Secretary General of CIB.

CIB Past and Present

CIB was established in 1953 with the support of the United Nations, as an association whose objectives were to stimulate and facilitate international collaboration and information exchange between governmental research institutes in the building and construction sector. At that time an implicit objective also was to help rebuild the European infrastructure for building and construction research following the ravages of the second World War.

At the start 43 research institutes were members of CIB and by far the majority of these were European. And just as in the programmes of these institutes at that time, so in the CIB programme there was a strong emphasis on technical topics.

For selected topics CIB Commissions were established to which member organisations appointed experts from their staff to participate.

Along with all types of less visible activities, this collective participation resulted in many important international symposia and congresses and in a large number of publications acknowledged as of global standing. Indeed many of these formed the factual basis for developing international standards or were themselves used as such. Others were international state-of-the-art reports

that for a long time provided an indispensable input to programming new research by the participating institutes and countries.

However, CIB has come a long way since 1953.

At present about 500 organisations are members of CIB from whom about 5000 individual experts participate in over 50 CIB Commissions. These extend over the whole area of building and construction research and innovation.

Amongst the CIB member organisations we can now find almost all the major national building research institutes in the world, as well as many other types of organisations in the building and construction sector who have joined us since. And although within the CIB programme considerable attention is still given to technical topics, there are now also activities focused on topics like organisation and management, economics of building, legal and procurement practices, architecture, urban planning and human aspects.

It is no exaggeration to say that at present CIB is the world's foremost platform for international co-operation and information exchange in the area of building and construction research and innovation. And we continue to increase our membership, to expand our scope, to initiate new activities while constantly striving to improve the quality of our products and services.

CIB's Mission Statement

The **purpose** of CIB is to provide a global network for international exchange and co-operation in research and innovation in building and construction in support of an improved building process and of improved performance of the built environment.

The **scope** of CIB covers the technical, economic, environmental, organisational and other aspects of the built environment during all stages of its life cycle, addressing all steps in the process of basic and applied research, documentation and transfer of the research results, and the implementation and actual application of them.

The **objectives** of CIB are to be: a relevant source of information concerning research and innovation worldwide in the field of building and construction; a reliable and effective access point to the global research community and a forum for achieving a meaningful exchange between the entire spectrum of building and construction interests and the global research community.

In achieving its objectives CIB shall promote for international benefit appropriate collaboration with other international and national organisations.

CIB can act as a platform for every person active in the field of building and construction research and innovation who is looking for possibilities to improve his or her own performance through international co-operation and information exchange.

It makes no difference whether such a person is employed by a research institute, a construction company, a university, a governmental agency or by any other type of organisation, as long as that organisation is in some way involved in building and construction research and innovation and provided the person concerned is interested in international co-operation and information exchange.

Although most members of CIB are organisations, within the CIB community there is a strong emphasis on the interests of individual persons. And in line with this another way of characterising CIB is as follows:

CIB is a worldwide network of building and construction experts who improve their day to day performance through international co-operation and information exchange with their peers.

Wim Bakens is Secretary General of CIB.
e-mail: wim.bakens@cibworld.nl
see also: www.cibworld.nl

Adress:

The CIB General Secretariat is located at:
Postbox 1837
3000 BV Rotterdam
The Netherlands

Discussion and Outcomes

It is obvious that the CIB's facilitating role is a prominent one into modern daily construction research and practice. As CIB's activities are globalising and expanding, other and/or more different cultures from especially developing regions will enter the research-community and its networks, which should be continuously encouraged. Together with this development, the need for solving problems in these developing regions, related to construction and its aspects, becomes more prominent.

When taking into account this multi-cultural dimensions into the several raised problem-areas of international construction-business, the need for understanding the cultural impact on these items will be growing. This can be seen already, when looking towards several international research-programmes.

Creating and maintaining an international 'platform' of understanding, of exchange of knowledge and experiences worldwide, can start by creating a clear understanding of each other's culture. Without having a good and common research-framework for it, this will still stay very difficult. The use of the present CIB-world 'market-place' could be a good and sound start for it to improve these efforts.

Chapter 4: Conclusions and recommendations

Conclusions

During the presentation-sessions and following discussions it became clear that the outcomes could be grouped into some key-issues, which have to be taken into account when working on 'culture' in construction, from an academic viewpoint as well as from a viewpoint for practical use. These key-issues of the conclusions were especially:

(a) Awareness:

1. Participants in construction industry should become aware of the importance of culture and its impact and influence on the process and product of construction business;
2. To stimulate such awareness, it is essential to put together multi-cultural teams for undertaking research in this field.

(b) Trust and understanding:

3. The role of 'trust' (and 'distrust') was discussed, especially in the field of possible reasons for understanding (or misunderstanding) differences in culture;

(c) Theoretical framework:

4. Doing desk-research means, in a lot of cases, that the existing frameworks of research in this field (e.g. Hofstede) provide valuable starting-points. Nevertheless, it was agreed that 'the' framework does not exist - continuous improvements and adaptations are needed.
5. The need for clear definitions was quite obvious, and certain progress is being made.

(d) Methodology:

6. Doing field-research in culture-issues needs good and realistic access to organisations; reporting from 'inside' gives the best guarantee for realistic viewpoints and outcomes.
7. However, reporting from inside organisations introduces the risk of 'becoming too close' (a so called 'third-culture-man').
8. One very specific aspect of 'the field' was discussed, as it is possible to apply for (international) funding schemes and research-programmes; such frameworks should stimulate progress in research.

Recommendations

The discussions were interesting, especially when it came to understanding how executing research into culture in the construction industry can be quite different from doing research in other subject areas and in other industries. The main recommendations were as follows:

1. We should look to other branches of industry, as not only as we can learn from experiences there, but also and especially while cultures are multi-dimensional and operate at a variety of 'levels' in societies.
2. No longer should it be acceptable for culture to be used as a 'black box excuse' for effects that have not been explained in an investigation.
3. Exchange of information worldwide becomes easier, more rapid and ubiquitous due to modern media, but the cultural differences seem to remain. This awareness about existing differences and its cultural dimensions therefore should become an integrated part of research in construction industry.

Chapter 5: Future of TG 23

Introduction

During the workshop the future of TG23 has been discussed, especially looking at its research agenda. As the outcome of this discussions already point at, the role of culture-research in construction has been recognised of a great importance for present and future activities into the international research-community.

The Research-Agenda

The research-agenda of TG23 should therefore focus on the following:

(1) Developing a structurised and especially internationally harmonised approach into research-methodology;

(2) Improving and completing the present theoretical framework of culture-related issues; not only 'stand-alone' but more related towards organisation-issues, fitted for use in construction-industry;

(3) Stimulating the active use, exchange and collecting of data from local case-studies, described and analysed in a harmonised way. Especially in culture-research the local 'facts of life' play an important role. Collecting these data internationally creates the possibility of a structurised comparison of experiences, resulting into better understanding and awareness of culture's impact on daily construction-life.

(4) Harmonising and stimulating the applications for international funding-schemes to improve the quality-level of research-output. Combining international parties into specific project-groups (thus creating 'market-power') gives better changes for success into the several funding-schemes.

And not to forget:

(5) As the Task Group TG23 has proved already to be in the centre of the 'culture-related' research-topics in construction (which seems to be more and more now the 'top of the iceberg'), the effort of transforming TG23 towards an official CIB-Working commission should be undertaken.

Resume

The assumptions made in the previous part of this chapter are not only from an academic viewpoint, but also represented the main viewpoint of the practitioners. Especially the comparison with the 'top of the iceberg', related to the influence of culture-related issues in construction-industry, seemed also to

the practitioners to become more often part of the daily problems during present construction-business.

And the expectations are that these influences will increase, while construction-industry is globalising. It therefore introduces a lot of new developments at one hand, but also involves a lot of new groups of people at the other hand. This was also stated by CIB by means of its secretary-general, which made globalisation and involvement of new/other groups of people and its cultures part of CIB's strategy.

So therefore...

...As construction is still a peoples' business, and will stay so, 'culture' should become an essential part of the deal!

Dr. Richard Fellows and Dr. David Seymour
(Joint co-ordinators of TG23)

Dr.ir. Wilco Tijhuis
(organizer of the TG23 workshop)

Chapter 6: References

Austin, S., A.Baldwin, B.Li and P.Waskett (1999*) "Analytical Design Planning Technique: A Model of the Detailed Building Design Process"*; Design Studies; Vol. 20, No. 3. pp. 279-296.

Benedict R. (1934) *Patterns of Culture*; London; Routledge & Kegan Paul.

Boyd, D. and A.Wild (1999) 'Construction projects as Organization Development' in *Proceedings of the 15th ARCOM Conference;* Vol. 1, pp. 221-229; Liverpool John Moores University; Liverpool.

Calori, R. (1994*) The diversity of management sytsems;* Calori R. and P. de Woot, A European Management Model beyond diversity; Prentice Hall; pp.11-30.

Chase, R.B., N.J.Aquilano and F.R.Jacobs (1998) (8th Ed.*); Production and Operations Management: manufacturing and services;* Irwin/McGraw-Hill; ISBN 0 07 115222 9.

Davis, T. (1993) *"Effective Supply Chain Management" Sloan Management Review;* Summer 1993; pp. 35 - 46.

DETR (1998) *Rethinking Construction;* Department of Environment Transport and the Regions.

EFQM (1999) *The EFQM Excellence Model; European Foundation for Quality Management;* EFQM & The British Quality Foundation; 32-34 Great Peter St.; London; SW1P 2QX.

Evans, G.N. A.Bailey, M.Reed, M.M.Naim, D.Brown, D.R.Towill and M.Riley (1997) "Organising For Improved Construction Interfaces" in *Leeming;* M.B. Topping; B.H.V. (Ed) Innovation in Civil and Construction Engineering; Civil-Comp Press; Edinburgh; Scotland; pp.207 – 212.

Fernie, S., D.Root and T.Thorpe (2000) "Supply Chain Management – theoretical constructs for construction" in *Serpell, Alfredo (2000) Information and Communication in Construction Procurement, Proceedings of CIB W-92 Procurement System Symposium;* Santiago; Chile pp. 541-556.

Ford, H. (1991) *Ford on Management: Harnessing the American Spirit;* Basil Blackwell (N.B. originally printed as "Henry Ford, My Life and Work")

Forrester, J. (1961) *Industrial Dynamics;* The M.I.T. Press; Cambridge; Massachusetts; pp.138.

Garfinkel, H. (1984) *Studies in Ethnomethodology;* Polity Press; Cambridge.

Gopalan, S. and R.Dixon (1996) *An Exploratory Investigation of Organizational Values in the United States and India;* Journal of Transitional Management Development; Vol. 2 (2).

Handy, C. (1978) *Gods of Management;* Souvenir Press; London.

Hofstede G. (1980) *Culture's Consequences – International Differences in Work-related Values;* Vol.5; Cross-Cultural Research and Methodology Series; Sage Publications; Beverly Hills; London; New Delhi.

Hofstede, G. (1988) *Cultural dimensions in management and planning;* Asia Pacific Journal of Management; January; pp. 88.

Hofstede,G. (1991) *Cultures and Organizations,* software of the mind.

Kagioglou, M.C., R.A.Ghassan. J.Hinks, M.Sexton and M.D.Sheath (1998) *A Generic Guide to the Design and Construction Process Protocol;* Published by the University of Salford; ISBN 0 902896 17 2.

Karsten, L. and K.van Veen (1999) *Managementconcepten in beweging, tussen feit en vluchtigheid;* Assen: Van Gorcum.

Lamming, R. (1996) *"Squaring lean supply with supply chain management";* International Journal of Operations and Production Management; Vol. 16; No. 2; pp. 183 - 196.

Lansley, P. 1994 'Analysing Construction Organizations'; *in Construction Management and Economics;* 12:337-348.

Latham, M. (1994) *Constructing the Team: Joint Review of Procurement and practitionersContractual Arrangements in the United Kingdom Construction Industry;* HMSO; London.

Male, S., J.Kelly, S.Fernie, M.Gronqvist and G.Bowles (1998) *The Value Management Benchmark: a good practice framework for clients and;* Thomas Telford; London; ISBN 0 7277 2729 X.

McCabe, S., J.Rooke, D.Seymour and P.Brown (1998) 'Quality Managers, Authority and Leadership' in *Construction Management and Economics,* 16; 447-457.

Mintzberg H. (1979) *The Structuring of Organizations;* Prentice Hall; Englewood Cliffs; New Jersey.

Neuijen, J.A. (1992) *Diagnosing organizational cultures: Patterns of continuance and change;* Ph.D.-thesis; Groningen: Wolters-Noordhoff.

Root, D., S.Fernie and A.Baldwin (1999) The languages of product and service: barriers to the integration of construction and design *in the proceedings of the 15th ARCOM Conference at Liverpool John Moores University;* Liverpool; Vol.1 pp.181-190.

Sako, (1992) *Prices, quality and trust* - Inter-firm relations in Britain and Japan; Cambridge University Press

Sanders, G.J.E.M. (1995) Being "a third culture man"; article in: *'Cross Cultural Management: An International Journal';* journal, Vol.2, Nr.1; pp.5-7; MCB University Press.

Sanders G.J.E.M and B.Neuijen (1987*) Bedrijfscultuur: Diagnose en Beinvloeding;* Van Gorcum; Assen, Maastricht.

Selmer, J. and de C.Leon (1996) Parent cultural control through organizational acculturation; *Journal of organizational behaviour;* vol. 17; pp. 557-572.

Seymour, D. and J.Rooke (1995) 'The culture of the industry and culture of research', in *Construction Management and Economics;* 13:511-523.

Spekman, R. E., J.W.Kamauff Jr., and N.Myhr (1998) *"An empirical investigation into supply chain management - A perspective on partnerships"* International Journal of Physical Distribution & Logistics Management; Vol. 28; No. 8; pp. 630 - 650.

Spradley, J.P. (1980) *Participant Observation;* Holt, Rinehart and Winston; New York, Chicago.

Tijhuis, W. (1996) *Bouwers aan de Slag of in de Slag?* – Lessen uit Internationale Samenwerking: Onderzoek naar Nederlandse Ervaringen in het Duitse Bouwproces; Ph.D.-Thesis; with English and German Summary: 'Contractors at Work or in Conflict? – Lessons from International Collaboration'; Eindhoven University of Technology; Eindhoven; Kondor Wessels Berlin GmbH; Berlin; WT/Consult BV; Rijssen.

Tijhuis, W. (1999*) Focussing at the Client's Wishes and Behaviour in Construction Management (Re)Starting at the Front-end of Construction-process,* University of Twente; Enschede; WT/Consult BV; Rijssen; paper on conference: 'Customer Satisfaction: A Focus for Research & Practice in Construction'; proceedings; 5th-10th September; pp.148-156; Ed.: P.A.Bowen and R.D.Hindle; University of Cape Town; Cape Town.

Womack, J.P., D.T.Jones and D.Roos (1990) *The Machine That Changed The World;* MacMillan; New York; ISBN 0 89256 350 8.

APPENDICES

Appendix A: Transparencies of D. Root's presentation

Aspects of Culture and Supply Chain Management – using SCM as a 'tool' for cultural change

Transparency 1:
Integrated Collaborative Design
Aspects of Culture
David Root – Loughborough University

Transparency 2:
Summary of the presentation
- The ICD research project
    - collaboration between a DMC and 11 of its suppliers/specialist contractors
- Using Supply Chain Management as a 'tool' for cultural change
- Aspects of culture relating to the research
    - the lines of business
    - professional culture and the management of businesses

Transparency 3:
Integrated Collaborative Design
- Integration of design
    - Primary Designers / Specialists Suppliers / Designers
- Value Engineering within the Supply Chain
- Strategic Frameworks for Supply Chain
- Cultural changes within Supply Chain

Transparency 4:
Supply Chain Management
- Implicit generic characteristics
    - Holistic (requires a view beyond a single organisation)
    - Relationships (within and between organisations
    - Networks (combining the organisations)
- 'Chains' implying links within and between
    - Resources / Competencies
    - based upon relationships / processes

77

Transparency 5:
Origins of Supply Chain Management
- Lies in manufacturing industries
  - focused on the production process of goods through the control of material flows
- Current interest has arisen due to the achievements of the automobile industry
  - Large efficiency gains achieved through managing interfaces between organisations
- Reflects a fundamentally different perspective to the construction industry craft and professional traditions

Transparency 6:
Construction Industry Relationships
- Project relationships are short term and have defined start and end points
  - currently informal / ad-hoc
  - focused on projects not business
- Relationships between competencies vary between projects
- Lack of continuity prevents
  - process innovation and improvement
  - developing more complex relationships

Transparency 7:
The 'Culture of the Project'
- The project as main organisation model
  - 'business' are subservient to the task
- Business Managers drawn from project professionals
- Business management influenced by professional training
  - technical / role / task focused
  - 'uniqueness' of projects
  - reflects the craft tradition of production of an artefact
  - acts as a barrier to the process perspective

Transparency 8:
Business and Project Relationships / Processes
- ICD research concentrates on Business relationship / processes
  - Encourage a business process perspective
  - To develop stable relationships outside of projects (status / OCR)
  - Currently relationships are a product of project relationships (contract / ACR)
  - Need to recognise opportunities that exist across projects

Transparency 9:

SCM as a 'tool' for changing culture

- A mechanism to encourage a process perspective
  - shift away from the 'delivery of a project'
  - shift towards a view of the business of 'delivering projects'
- An opportunity to attempt to undermine existing cultural barriers

Transparency 10:

SCM as a 'tool' for changing culture

- An attempt to distinguish between
  - business processes
    - generetic / common across organisations, though which organisations are 'permanently' engaged i.e. development of status relationships / diffuse obligations
  - project processes
    - organisation / role specific where firms are temporarily engaged with each other through the project

Transparency 11:

Concept of the supplier network
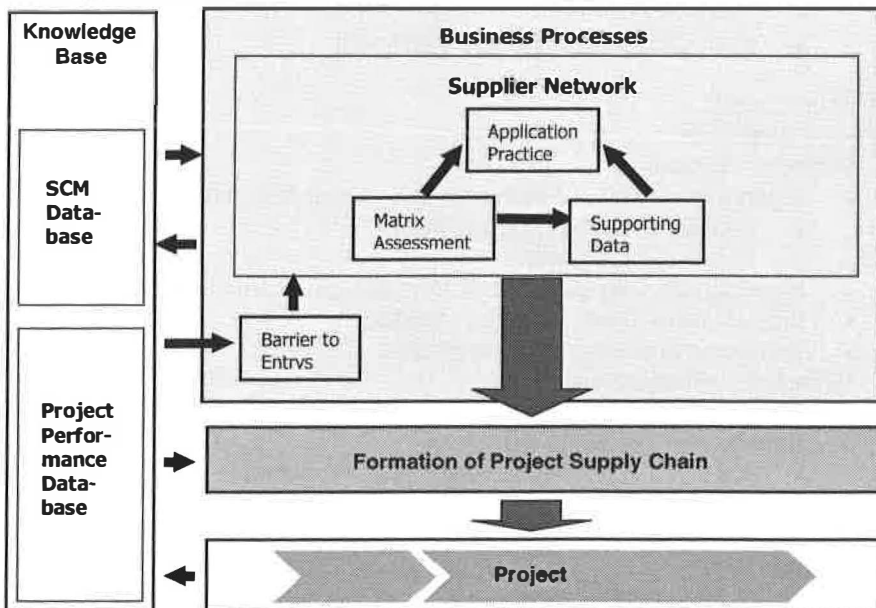
Transparency 12:
Intention of the supplier Network
- Focusing on small number of strategic suppliers
  - High value / high risk / high design input
- Providing a forum and mechanism to develop
  - an understanding of business relationships and processes
  - an understanding of each others organisations
  - co-developments in relationships and processes
- Create formal barriers to entry (tiered suppliers) – depersonalisation of selection

Transparency 13:
Findings to Date
- Range of cultural issues
  - Between organisations
    - lines of business (M & E, Ductwork etc.)
    - services & building (n.b. spatial and system perspectives)
    - internal to organisations
    - existing functional silos
    - design and construction
    - office and site
    - design disciplines
    - production and contract management

Transparency 14:
Lines of Business
- Distinction between
  - organisations who see themselves as part of the construction industry
    - traditional construction activities
    - very project focused
  - organisations who sell to / buy from the construction industry
  - typically have manufacturing capabilities
  - tend to be business / process focused
- Reflected in different languages
  - supplier v. sub-contractor / designer
  - terminology (i.e. SCM concepts)
    - e.g. Lean Construction versus Lean Production

Transparency 15:
Functional Silos
- Product of fragmented industry

- traditional roles
- technical specialisms (professional roles)
- process / project perspective reflected within organisations
- Industrial subcultures overshadowing organisational cultures / values
  - example of a DCM organisation
  - reflect history of companies

Transparency 16:
Observed Trends
- Designer / contractor as systems integrators
  - bringing organisations together
  - 'virtual' organisations
  - requires common language / outlook
- Development of organisational values
- beginning to undermine the dominance of technical cultures
- encourage development of organisational cultures
- values do currently exist but are relatively week
- requires identification with the business rather than the project / task

Appendix B: Transparencies of J. Rooke's presentation

Developing a Culture of Quality in the British Construction Industry: a report on research in progress

What is Culture?
"Culture is learned, not inherited. It derives from one's social environment, not from one's genes. Culture should be distinguished from human nature on one side, and from an individual's personality on the other, although exactly where the borders lie between human nature and culture, and between culture and personality, is a matter of discussion among social scientists." (G. Hofstede, 1991, Cultures and Organisations, Harper Collins, London)

So what is it?
"That complex whole which includes knowledge, belief, art, morals, laws, custom, and any other capabilities and habits acquired by man as a member of society." (E.B. Tylor, 1871, Primitive Culture, John Murray, London)

Or is it?
- However, other writers, like Parson (1951, The Social System, Routledge and Kegan Paul, London) and Hofstede favour narrower definitions, which distinguish between culture and behaviour.
This would facilitate the use of the concept to construct causal models.

A Methodological Decision
- However, attempts to construct causal models have met with little success. We argue that such attempts are misconceived: the concept of culture is an invitation to interpretive understanding, rather than the description of a discrete object or event, which could play a causal role.

Why Culture?
- Globalisation: more business with people from different national and ethnic backgrounds. Knowing these backgrounds leads to better business relationships.
- Competition: pressure to change not only the way we do things, but the way we think. But what to change and how to change it?

83

Globalisation
- While Hofstede presents a global overview of cultural differences, more practical guides can be found in ethnographies that focus on one or two particular cultures.

Competition
- Over the past two decades, considerable effort has been made to change the culture of British industry and o take more advantage of new production philosophies. More recently, the construction industry has been a major focus of this effort. Perceived problems in the industry include: adversarial attitudes; lack of effective planning; incomplete, unrealistic, or uneconomic design; claims conscious contracting; late delivery; and overemphasis on price competition.

Some ways of denoting cultural differences
- Nationality
- Ethnicity
- Organisation
- Occupation

Some ways of researching culture
- Survey methods
- Critical thinking
- Participant observation
- Ethnomethodology

Survey methods
Survey methods inevitably suffer from the ambiguity of the abstract categories they use. How is it, for instance, that Japan scores higher than Britain on Hofstede's Power Distance Index, yet seems more able to promote worker empowerment? Resolving this paradox requires interpretive methods of investigation.

Critical thinking
Critical thinkers consciously bring value judgements to bear in their analyses and often stand in opposition to attempts at cultural change. A drawback with research from a critical perspective is that it tends to emphasise the researcher's point of view over that of the people who are being researched.

Participant observation

We take the view that the most effective way to learn a culture is the way that members of that culture learned it themselves: by talking to them; witnessing the way they live their lives and even joining in! Problems of this method include gaining access, maintaining rapport and finally, withdrawing from the field.

Ethnomethodology (EM)

People create their culture on a moment to moment basis through their everyday activities. EM focuses on this mundane local production of work and meaning. EM is a specialised field of study whose applications in management are only beginning to be explored. Our research is intended to make a contribution to this enterprise.

Previous projects at Birmingham

- Lean construction
- The engineering and construction contract
- Quality management
- Site safety

Lean construction

- Lean construction thinkers have developed techniques of process improvement that address the particular problems of construction
- However, organisational resistance to change has proved to be a major problem.
- This study examines reasons given for the failure to achieve the specified cover in concrete structures.

The engineering and construction contract (NEC)

- The NEC sets out ground rules for less adversarial relationships, emphasising planning, communication and fair distribution of risk.
- However, many problems arise not from the rules themselves, but from how they are interpreted.
- This study focuses on sources of conflict in the industry.

Quality assurance management

- Most major contractors in the UK have certified quality assurance systems.
- However, these systems are often felt to be overly bureaucratic and unhelpful to the construction process.
- This study focuses on attempts by quality managers both to implement and to transcend their quality systems.

85

Site safety

- Systematic planning and training for safety can dramatically reduce accidents.
- However, the non-routine nature of construction processes makes the use of conventional risk analysis difficult.
- This study focuses on the methods and understandings of those most at risk.

Appendix C: Some Impressions

During the workshop several good discussions in a formal as well as informal way took place. These contacts between academics and industry pointed out a very fruitful 'confrontation', searching for several ways to get more 'grip' on the issue 'culture'. The enclosed photographs try to give an impression of the pleasant atmosphere during these two days. Not only at the "formal' moments, but also at the accompanying 'informal' moments.
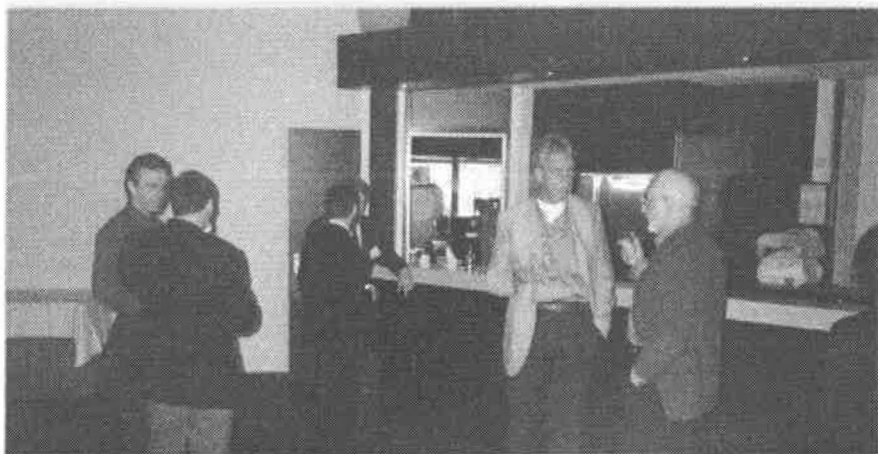

Map with Enschede related to Europe

Famous clocktower of UT Campus Estate of Drienerlo

Workshop impression

Informal discussions afterwards

Appendix D: The University of Twente

Introduction

The University of Twente is a university that offers both technological and social study programmes. We characterise ourselves as an entrepreneurial university, adapting our research efforts to the benefit of society in general. The entrepreneurial attitude permeates the university: from our students to our professors. It is a state of mind, a mental approach to science and society, which allows us to respond rapidly to new ideas and challenges. We believe that this approach is forged through the nature of our study programmes, in the qualities we seek in appointing new members of staff, and in our research and funding policies. The university has approximately 6000 students.

See also the home page: *www.utwente.nl*

About Civil Engineering & Management

Oversee, analyse and predict

The high-speed train, the Betuwe line, dike improvement, Manhattan on the Meuse. But also: your corner roundabout, the development of the local industrial site, the recovery if a water abundant nature reserve. These are all technologically feasible projects. After all, the Netherlands can boast of a long tradition and considerable expertise in the field of civil engineering and construction. But it is not only the technology that determines the result. Political policy, participation and permission procedures, land expropriation, environmental impact studies, costing, budgeting and price control, logistic efficiency and safety. These, as well as many aspects, have to be taken into consideration early on in the design phase. That in turn, requires technologists who can do more than design, construct and calculate. It requires engineers who have mastered the process. Engineers, who can oversee, analyse and predict all aspects of the design and execution.

The study programme in Civil Engineering & Management at the University of Twente delivers such engineers. Men and women with a solid basis in civil engineering who also possess considerable business knowledge and administrative skills. The balance between these two fields of expertise is approximately 2:1. A combination that makes this study programme unique in the Netherlands. The programme takes five years and consists of a basic training, a specialisation phase, a practical training (internship) and a master thesis.

Basic training

CE&M starts with a thorough basic training in Civil Engineering in the fields of:
- Construction Technology and Construction Process
- Traffic & Transportation
- Water Resources & Environment

In addition, the students attend subjects in business and management science, which are of importance in starting off and executing civil engineering projects. For example, organisation knowledge, policy processes, law and managerial business economy.

Specialisation

In the second year, students choose their specialisation: Traffic & Transportation Management, Water Resources Management or Construction Management. The core of the first two specialisations is based on the functioning of civil engineering infrastructure. Attention is focused on problem identification and generating possible solutions. Mathematical models are often used for analysing and determining technological and socio-economic effects. The specialisation in Construction Management focuses on the design and construction process of civil engineering works. Design, execution, management, maintenance and demolition are dealt with from a technological, economic, organisational and an environmental point of view.

Construction Technology & Construction Process

In the current construction practice, the end product is more or less produced in a specific and unique manner. It has an individual location, a specific design as well as its own organisation. The product is developed step by step through various phases. Once completed, its product organisation will break up since the need for such an organisation no longer exists. Because of its nature, construction has very strong, dynamic characteristics due to the involvement of many organisations and disciplines throughout the development process.

The diversity of the large number of participants involved, as well as existence of the various stages in the development process, makes fine-tuning problems and sub-optimal solutions unavoidable. The section Construction Technology & Construction Process aims to improve insight into the construction process by means of an integral approach and contributing to the improvement of both the construction processes as well as the constructed object.

Vision and approach

The vision and approach of Construction Technology & Construction Process can be characterised as follows:

- process approach (professorships in the areas of design processes, construction processes and innovation processes);
- designing attitude (search trough problem analysis for tangible solutions);
- integral approach (in order to understand practise, it is vital to approach this subject in the context of the interrelationships between the various project phases and the coherence between the construction process and the construction company's organisation and management)
- technological awareness (construction processes cannot be understood without understanding the technology involved).

Related questions

The following research questions could be raised in connection with the vision sketched above:

- What do new contract forms mean with regard to the role and the functioning of the participants involved in the construction process?
- Which adjustments have to be made to production philosophies from other industries before they can be successfully implemented in the construction process (lean production, partnering, co-makership). What would that mean for the construction process, the construction process organisation and the participants concerned?
- How can the design and work execution process be directed and optimised from a logistical point of view?
- Which tools can be used to stimulate sustainable construction? What is the effectiveness of these tools?
- Which strategies are suitable for design based on 'constructability' and, subsequently improving the design by using the experience gained from construction?
- In which manner can the prevention of building waste and the application of building remains be stimulated in construction?

Examples of ongoing research

The research of the section Construction Technology & Construction Process must provide a contribution to the optimisation of the construction process. Some examples are:

- Research into the suitability of the 'Design for X-concepts' (DFX) for the benefit of the design process of civil engineering structures, starting out from the concurrent engineering approach. The implementation of the DFX

concepts serve to improve the effectiveness, efficiency and productivity in the design process and is particularly directed towards the aspect of 'constructability'.

- Research into Public-Private Partnership (PPP) in urban revitalisation. The goal here is to analyse and interpret the bottlenecks that exist within such partnerships.
- Research into finding instruments for managers and organisations who are involved in sustainable building of housing projects.
- Research into performance contracts. The general question of this research is; how do project managers increase the effectiveness of co-operation between the various participants in the construction process? In addition to the hierarchical perspective on project management, the pluralistic management perspective is being introduced.
- Geotechnical research into soil behaviour as a factor of uncertainty in the design and construction of foundations, underground and pavement structures. In addition to the theoretical aspects such as statistical and mechanical modelling, the research also involves field and laboratory testing

Co-operation

In the field of research and education, the section Construction Management co-operates with the following institutes:

- Delft and Eindhoven Universities of Technology;
- Construction Research School (Onderzoekschool Waterbouw);
- Construction Knowledge Transfer Institution (Stichting Kennistransfer Bouw);
- Various governmental organisations (for example the Department of Public Works, the Ministry of Housing and Construction);
- Engineering and Consultancy firms;
- Construction Contractors.

Contacts

For further information about the section Construction Technology & Construction Process, please look at the following websites:

www.utwente.nl or *www.sms.utwente.nl*

Appendix E: The CIB

Name

CIB is the acronym of the abbreviated French (former) name: "Conseil International du Bâtiment" (in English this is: International Council for Building). In the course of 1998, the abbreviation has been kept but the full name changed into:

INTERNATIONAL COUNCIL FOR RESEARCH AND INNOVATION IN BUILDING AND CONSTRUCTION

Background

CIB was established in 1953 as an Association whose objectives were to stimulate and facilitate international co-operation and information exchange between governmental research institutes in the building and construction sector, with an emphasis on those institutes engaged in technical fields of research.

CIB has since developed into a world wide network of over 5000 experts from about 500 member organisations active in the research community, in industry or in education, who co-operate and exchange information in over 50 CIB Commissions covering all fields in building and construction related research and innovation.

Members

CIB Members are institutes, companies and other types of organisations involved in research or in the transfer or application of research results. Member organisations appoint experts to participate in CIB Commissions. An individual also can be a member and participate in a Commission.

Activities and publications

CIB Commissions initiate projects for R&D and information exchange, organise meetings and produce publications. These meetings can be Commission meetings for members only or international symposia and congresses open to all. Publications can be proceedings, scientific or technical analyses and international state of the art reports.

Contacts

More detailed information is available at the website: *www.cibworld.nl*

Appendix F: Sponsor

cib