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DEVELOPING COLLABORATION PRACTISES: MODELLING THE COMPONENTS OF INDUSTRIAL DESIGN NETWORK

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1. Introduction

In many respects Industrial design (ID) has been special knowledge externally contracted in the Finnish business-to-business engineering industry. Main reason to this situation is the fact that internal ID resources are inadequate. ID organisation can be too small to be able to carry all assignment addressed to ID or the competence can be too thin. Increasing global competition supports the outsourcing of specialized functions making it unlikely that companies will construct large inner ID organisations. And yet, in b-to-b sector, the need for finding a new competitive means and emerging tendency to change from the machine manufacture to the service producer is creating pressure to apply ID more effectively.

More than occasionally it seems to be that attempts to integrate the external ID work may result a sequence of try-outs in which the company fails to achieve a successful experience of using ID as a competative advantage. And the client is left with the experience that funds allocated to the ID just disappear into the "high-priced invoicing of design consultancy". It is often assumed that the sources of these miscarriages are caused only by incompetence of ID consultants or poor briefing. However, the latter can be also consequences rather than causes that are created by unsuitable mix of collaboration practises that are incompatible with internal capability and objectives.

Currently, the collaboration procedures with ID consultant and their clients consist in two motives: 1) cost efficiency (outsourcing to the market is more economical comparing to production in own hierarchy) and 2) compensation of capacity (outsourcing to the market if own hierarchy is overloaded). The cost efficiency collaboration mode, where working practises base on briefing, incidental meetings and cursory orientation, works well in simple transactions but when collaboration seeks such an objectives as new innovations, integration of special knowledge or mutual learning, collaboration modes approaching partnerships are needed. Partnership like collaboration modes also assist the effective utilisation of ID in the complex product development environment of engineering industry, where the products are developed in teams and the product requirements are often specified only by the design process itself [Haavisto 2002]. Very independent procedures may lead to the situation where the ID consultant operates too far from the client company to be able to participate into the solving of the emerging problems in the design process, carried by the inner developers inside the client's processes. The consultant's involvement is too casual and too late to be able to bring a new innovative perspective to the product development or to differentiate the product. Accordingly, the central challenge of utilising ID better is to improve collaboration practises (process) into the relevant level in relation to the objectives of ID in the product life cycle and the internal ID competencies.

The ability to create and sustain successful partnership is regarded as a corporate asset [Kanter 1994]. And yet, the companies seem to have very little hands-on experience and capacity how to bind contracted ID expertise to their own processes. This paper aims to model the components of collaboration between ID consultants and their clients in the environment of Finnish engineering industry. And to increase understanding about the status of the collaboration practices in order to utilise ID efficiently.

2. Method

This paper is part of the research project Proactive design (PROOMU) that is funded by Finnish Technology Agency (TEKES). It started in 2002 as collaboration between the University of Industrial Art and the University of Helsinki. The duration of this project is three years. This paper is based on documentary analyses and ethnographic studies conducted in four global Finnish engineering corporations in the business-to-business area. These companies are the producers of the paper making lines, mineral and rock processing equipment, elevators and escalators, steel products such as steel constructions, roofing and facade materials and wood processing equipments. The paper utilises interviews with both external and internal industrial designers and relevant employees at different levels of organisations within companies involved. The data includes the field notes as well as audio and video recordings of planning and working meetings between ID consultants and their clients.

3. The ID Contract Work Collaboration Model

The contract work collaboration model presented here has been developed on the basis of the data collected mainly in Proactive design project. This model is heuristic tool to study or enlighten the practises of collaboration in the network. It is not a ready-made technical instrument that could be directly applied to solve problems, since the very process of the contract work collaboration is always case specific and depends both on the aims of collaboration and collaboration environment. And yet, this model is an important help when developing collaboration relationship because it offers to the managers a map of various components that should be considered in networks.

Table 1. The Maturity Model of ID Contract Work Collaboration in Finnish Engineering Industry

Components of collaboration	"no harm, no benefit" Level 1	"still missing the final proof.." Level 2	"part of the development team" Level 3	"works holistic self-leading way" Level 4
Selection	"Telephone catalogue"	"By word of mouth"	Assure capability Structured review	Mutual sustain of capability
Resource and orientation/learning	Incidental trials Limited orientation	Continual change of partners Orientation perform repeatedly	Regular partners	Partners comparable to the internal resources
Contracting	"How much one meter of bar counter will cost?"	Tight offer based contract that pre-determines the budget and schedule	Flexible contracting based on short term plans	Contracting based on long term plans Shared equity?
Communication	"I will send you an e-mail later…"	Through internal co-ordinator	Continual interaction with other product developers	Interaction in all levels of organisation
Product development process	No formal process	Process existing but no guideline for industrial design	Industrial design is part of process and it is used	Constant improvement of process
Leadership and organisational structure	"Who should take care of it?	Continual change of co-ordinators and thin internal competence of industrial design	Concentrated to the regular actors Sufficient internal resource and competence	Valid balance and task partitioning between internal and external resources
Collaboration evaluation and adjusting	No mutual evaluations Decisions based on intuition	Occasional mutual evaluation of collaboration process causes rarely development actions	Regular mutual evaluation causes now and then development actions	Mutual structured evaluation causes operations of development

Trust and partnership grows

The model should been seen as an open tool that can be constantly developed further. Its task is to help to analyse and evaluate the process of contract work by mapping the challenges of collaboration.

It can also have an important role in mutual evaluation since it helps to open up and structure the discussion about the collaboration between the client and the consultant.

This paper identifies the key components forming the collaboration model between ID consultants and their clients. These are 1) Selection 2) Resource and orientation/learning, 3) Contracting, 4) Communication, 5) Product development process, 6) Collaboration evaluation and adjusting, 7) Leadership and organisational structure. Together these components define those circumstances and the mode of collaboration that outline the application of ID in the network.

In the levels 1 and 2 the practises do not support the integration or efficient use of ID entirely. The practises in the level 3 allow an external consultant to act closely with the internal product development team. In a level 4 the type of organisation, ID consultant is able to work inside the company in a holistic self-leading way. The trust and partnership grows equally when converging to level 4.

3.1 Selection

The product development strategy (or ID strategy) of a company has vital role when searching for a design consultancy. The motive and objective to collaborate ID should be in line with that. In lower levels of the collaboration model the identifying and evaluating the ID consultant seems to be quite random. Often companies learn about the ID consultancies by word of mouth. After preliminary contact the collaboration and contract is set. The selection is more often based on intuition than on structured evaluation methods; good reputation, cost and scheduling seem to be central decision-making motives. And yet, the important issue is to assure that the consultancy has a technical, social and cultural capability to act according the R&D strategy that the company requires.

3.2 Resource and Orientation

Resource, orientation and learning are firmly tied together for the simple reason that, according to my data, all regular and significant ID partners of different companies have developed through 1) long and solid working relationship or/and 2) the consultants had worked fixed period as an internal designer. Where as the continually changing consultants received very limited orientation from the companies.

For FOREST, the company that manufactures paper making lines, the orientation was a key element in selecting partners with the technical, cultural and social capabilities demanded by the product development strategy. The senior ID manager was hiring the assistants from design consultancies or they were recently graduated young designers, but they all worked as temporary employees during an internal "rooming-in" period as the senior ID manger calls that practise. Some of those assistants later founded own firms and become regular partners.

The idea behind this practise was one of the FOREST's strategic focuses - improving profitability. This strategic principle also forms the cornerstone of the industrial design in FOREST. ID concentrates on easing production and is intended to lead to significant cost-savings, justifying the presence of ID in the paper machine industry. To be able to reach that objective the ID consultants have to know the production method well. As the senior design manager explains in a following quote.

" To be able to know how to pass through the tunnel of production you have to know that tube. No mobile phone designer is able to know the methods of heavy industry." (Interview 21102003)

Vice versa an ID consultant who worked with FOREST without an internal orientation period describes the project from the designer's point of view as very obscure.

"To put it mildly, it was a confusing project...I felt that we never finished it or something...you got in to that world or actually to the jungle and there were no guidelines or support...it was a clear role but if the world is unfamiliar and you have never done anything like that it just takes some time before you can actually be effective..." (Interview 21112002).

The strong inner view and the unsuccessful try-outs with designers who were not familiar with the industry created a vision to FOREST that there is no "ready made" ID partner but that it is possible to generate one by putting them through an intensive learning period. This kind of intense orientation requires massive amount of internal resources and ID competence, although later it reduces the time required to co-ordinate external work.

3.3 Contracting

The contracts that define the responsibilities and performance of the parties are tools for controlling collaboration. Besides, the wider contract frames, which define for instance the secrecy obligations, companies often use also contracts that are tied to certain projects. These project-based *one-off agreements* can sometimes turn out to be obstacles for operative actions. For example, if the consultants have to make an offer to get a project, it means that they have to plan and schedule the whole project to be able to define the final costs on the basis of the client's first frail idea considering a new product. The budget and schedule included in the final contract pre-determine the course of the project and also the contribution of ID. At the worst, design consultants are not able to react flexibly to the changes that most product development projects unavoidably carry. A tight contract works in simple transactions but they may not be applicable in the complex product development environment. Contracting can also be flexible and proactive if it tries to foresee gaps and problems arising during collaboration and is able to react to the chancing environment.

FOREST has solved the challenge of contracting by developing so-called yearly contract. This means that FOREST buys yearly 40 % of all the working hours of the design consultancy at an agreed price. The work is not based on offers in separate projects. The following quotes are comments made by the design manager of FOREST and an external ID consultant on their custom of contracting.

"We do not ask for offers concerning different projects so our design work is not based on the offers, but we have a yearly contract where we say that from that design consultancy we buy 3500 hours give or take 10 % of design work for the price of x. After that we start working and invoicing work and somewhere towards the end of the year we start to check if the hours are filled…" (Interview 11102002)

"With the yearly agreement we are able to work in peace and we are treated well. We can be sure that we get everything done." (Interview 12112002)

The advantages of the yearly contract are abundant. 1) The contract is flexible. 2) It eases both purchasing and performing the design work. 3) This committed share of workload is also the way of managing risks for both parties. The approach guarantees to FOREST that the consultancy has other clients as well and through those altered projects the new knowledge is transmitted to FOREST. To the consultancy this 40 % working for FOREST ensures independence from only one client.

3.4 Communication

In theories the network economy is usually presented in a very ideal light. It is supposed that the ideas, knowledge and profits flow between partners easily. However, in reality well-working network demands multiple actions and human resources, mainly because the generative communication seems to happen locally between singular actors. It has to be remembered that design is a social process and the longer the communication chain is, the more difficult it is to collaborate in product development.

In the case of ECON (leading producer of elevators and escalators) the product development is decentralised in several different countries. Its Italian product development unit created a successful new product in collaboration with a local ID consultancy. The same consultancy was connected to the new project but in this time the primary development was made in Finland and the inner team was different. Here, communication was based on few meetings, e-mails and telephone calls through inner co-ordinator or project manager. During a previous collaboration project the ID consultancy had not influence only to the visual appearance of the product but also to the areas of manufacture, technical applications and customer/user needs. In the current project the utilisation of ID has been moved solely to the direction of the visual "face design", because the collaboration mode does not consider the effects of the changes in geographical locations and interpersonal relationships.

Instead, FOREST has a clear practise concerning the chain of communication when they start a new project involving an external industrial designer. First, the project manager contacts the senior ID manager who negotiates with the internal industrial designers whether the assignment will be carried out with internal resources. If this is not the case, the ID manager contacts the ID consultant and then again the project manager. After that, the ID consultant works partly in the same space with the other product developers which demands that the consultants invest to the mobile workstations in order to be able to work in both FOREST's and their own premises. This assures that ID consultant receives

enough knowledge to be able to react flexibly to the changes, which may happen in the product development.

3.5 Product development process

None of the companies in my research do yet have a formal process for industrial design linking it to the general form of product development process, such as for example stage-gate process model, even some companies apply similar models with other disciplines. The lack of ID process model creates a situation where the challenges addressed to the ID are based entirely on the knowledge that project managers happened to have. In case of ECON, those managers change in every project, and the project documentation of ID is missing. In this way good practises do not accumulate and the knowledge does not transform.

The industrial design manager of FOREST has substituted the lack of ID process model by working as a "missionary" being present when the ID consultants co-operate with a new project team which are not used to collaborate with ID. The drawbacks of this practise are the limited resources of one actor, in this case the ID manager. Also, having all the central functions concentrated into one person is a risk. To lower that risk FOREST has lately appointed another ID manager and the organisational ground for ID is getting wider. Also few new internal designers have been hired to the hands-on design work to relief senior designers to operate in a managerial level.

3.6 Collaboration evaluation and adjusting

When the partnership works well or the objectives are reached, the orientation of collaboration and working methods are re-evaluated in co-operation. The relationships are either brought to an end or reorganised. Both partners have learned in the collaboration process and those valuable experiences should focus to develop the further conditions of collaboration. Nevertheless it is acceptable that conditions may change or unexpected complications appear or collaboration is accomplished. There can be several reasons to end the partnership; it has either reached the objectives or it has not progressed well enough. The aims of the partners may have also changed in a way that no longer supports the present relationship. Again, the company's design strategy may change and the ID partner may no longer be able to implement it. The design consultancy may also prioritise the needs of other clients or simply another company may offer more interesting and challenging task environment.

However, it seems that consultants rarely have an opportunity to discuss and solve difficulties of collaboration. FOREST arrange discussions for all consultants together but these events were experienced as a rather complicated because of the competition factor between different consultancies and because of client-principal relationship. Often the collaborations perish silently even if partners had a clear opinion of the reasons to discontinue it.

3.7 Leadership and organisational structure

The companies with an internal structured practising ID unit seems to be able to utilise externally contracted ID work better than companies with thin ID competence. The existence of active internal unit indicates that many components of collaboration are relative mature. In lower levels of collaboration model the external design function is often 1) of low priority or 2) it is a part of other tasks of actors responsible of collaboration or 3) those actors have not enough ID competence or product development process knowledge. Some companies hire industrial designer as an expert to co-ordinate ID tasks. It is a big challenge for a single designer inside a company to substitute the lack of the process. Such a position limits the use of ID in ECON. ECON employees also a few internal industrial designers (employed 2000 and 2002) but operative ID work is contracted. The role of the internal ID designers is to aid the project managers concerning ID. Those internal designers have not solid hands-on experience of product development process and ID work. And their responsibilities have been unclear, as the internal designer explains:
"...in a way my role was very fuzzy, just hang around there, because there were on the other hand very strong designers and in the end I or project manager haven't had very clear understanding what I was actually doing there." (Interview 10022003). The main task of FOREST's senior design manager

(employed 1974) is to educate other designers and co-ordinate their operative work. This task has heavily burden the resources of the senior design manager but in addition of five internal designers, FOREST is able to apply work from nine different domestic ID consultancies.

4. Conclusions

It seems, considering the collaboration model and data that, in fact, efficient utilising ID network requires a process with internal resources and ID competence within the client company. This means that minor internal competence needs to be compensated by implying even stronger mutual and open procedures approaching partnership. The collaboration is productive if the inner ID competence, objectives, collaboration motives and practises support each other. Also it seems that ID is able to influence more comprehensively to the product life cycle in higher levels of collaboration model. Therefore the central question in contract work collaboration is to find out the right balance between collaboration practise, the expertise of ID located in, out and between of the organisations and the aim of ID in product development strategy.

Acknowledgement

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