Case study: Old Mill, Turku, Finland

April 2004

CIB Taskgroup 51

USABILITY OF WORKPLACES

Case study: Old Mill
Final Report

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VTT
Turku Polytechnic

SUMMARY

The third European workshop of the CIB51 Task group – 'Usability of Workplaces', is arranged in Finland. The associated case study focuses on the elements of usability in a refurbished working environment of Old Mill Business Park. The Old Mill is located in Turku Science Park area and offers services as well as functional and interesting premises with an atmosphere of an old factory for ICT companies. The floor space is 15.100 sqm in four floors.

The case-report includes the illustration of the Old Mill in the context of creating a brand. The brand, in fundamental level, includes usability and it offers a way to describe the quality of the building. The aim of the case study has been to analyse the existing status of usability. The analysis is undertaken in two phases – 'Diagnose' and 'Discussion' - and the third phase – 'Dialogue' - is being proposed. The diagnosis phase consists of a **workplace survey** in the form of a questionnaire. The diagnosis indicated the areas of low usability. After this, the **'usability walk through'** was organised in order to get more information about the low usability as well as discuss about the ways to improve it. Third phase is under development – the intention is to set the information got collected through diagnosis and discussion to the context of future requirements of the building. The tool for this dialogue phase is software Ecoprop.

The status of usability Old Mill is quite high, but some areas of improvement have been identified. The aims include:
- customer orientation in the car parking area (serviceability),
- 'smarter' (multiple) use of the entrance hall - focus on different options and communication of these to the users in order to encourage them to use this space more efficiently (learnability)
- efficient use of the restaurant lunch buffet by improving the logic of the layout (functionality)
- Better guidance of the ways the meeting rooms are used. amount of information for the use of meeting rooms (functionality)

The learning points of the case study are
- the intangible character of brand is a relevant way to approach usability
- the dissatisfaction management is a good starting point to investigate where the usability can be increased
- the user experience has an emotional background: this fact of subject is important to keep in mind during the ways to gather information
- the results of the usability surveys has to be handle as a part of process, not only as frozen facts and figures

The case study focused mainly on the common areas in the Old Mill. The individual workstations were not considered in this phase. The future challenges include the use of EcoProp to create the usability profile in the shared facilities of Old Mill , but also in the occupying organisations -with their own brand and user requirements- within the Old Mill and the Science park.

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1 OPERATIONAL ENVIRONMENT OF OLD MILL - TURKU SCIENCE PARK AND ITS BRAND

Turku Science Park is the core of the innovative environment in Southwest Finland. The case study is made in Old Mill, which is located to the area of growing science park. The strengths of the region's trade and industry, universities and institutes of higher learning as well as infrastructure and human resources create the infrastructure of the science park The result is a truly innovative and interactive operational environment, which serves as an efficient basis for high-tech growth. The brand of Turku Science park is attractive.

Brand itself is an old innovation and they have been used mainly for marketing the tangible products. (Klein, 2000) The use of them i.e. in the service sector and in the real estate branch is relatively new. VTT has created a comparison method for different brands within a research about real estate brands. The research group benchmarked many real estates and real estate companies including some science parks from the viewpoint of brand (Riihimäki et al, 2003). They found four major elements.
1. Location
2. Functionality (includes usability)
3. Services
4. Associations and Image.

These four elements can be described as the basics of the real estate brand. These are the main points to concentrate on when evaluating any real estate, building, facility or premises (figure 1).
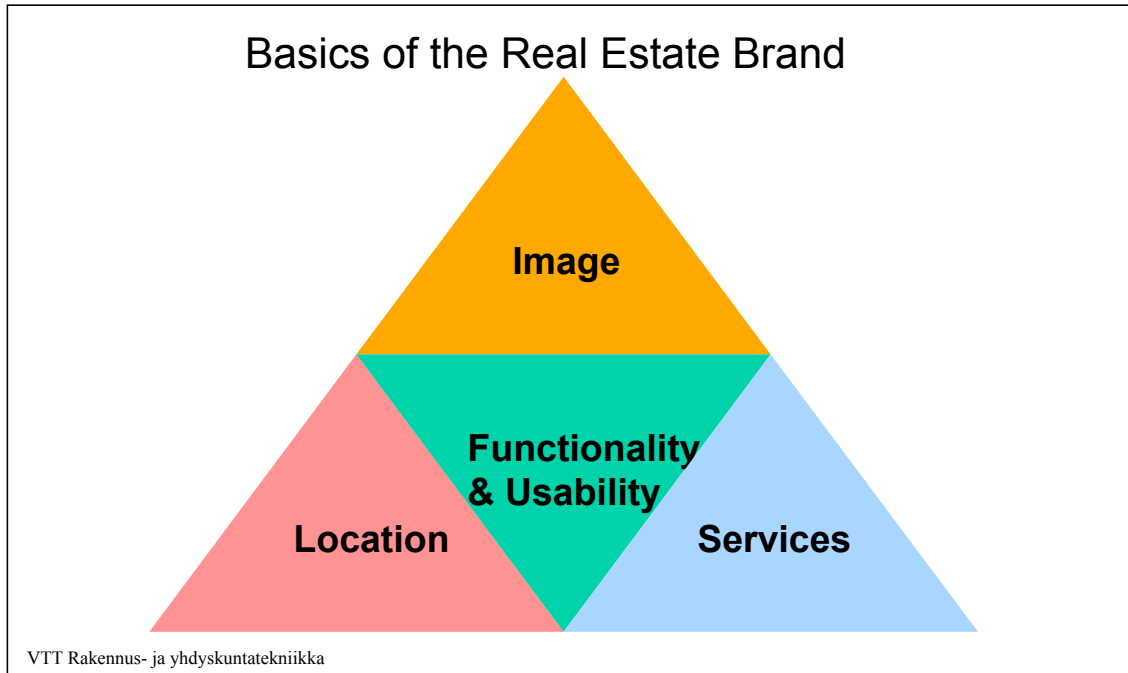
Basics of the Real Estate Brand

Image

Functionality & Usability

Location

Services

VTT Rakennus- ja yhdyskuntatekniikka

Figure 1. The basics of the real estate brand. Source: VTT Building and Transport.

What is the Turku Science Park brand like? How does it show up? What kind of operational environment does the Turku Science Park offer?

According to the comparison method Turku Science Park brand is anlaysed. In coparison with several science park brands the following conclusions can be made (*figure 2*):

In Total

Legend: Location/accessability ■ Premises and services ■ Some key brand elements&general associations □
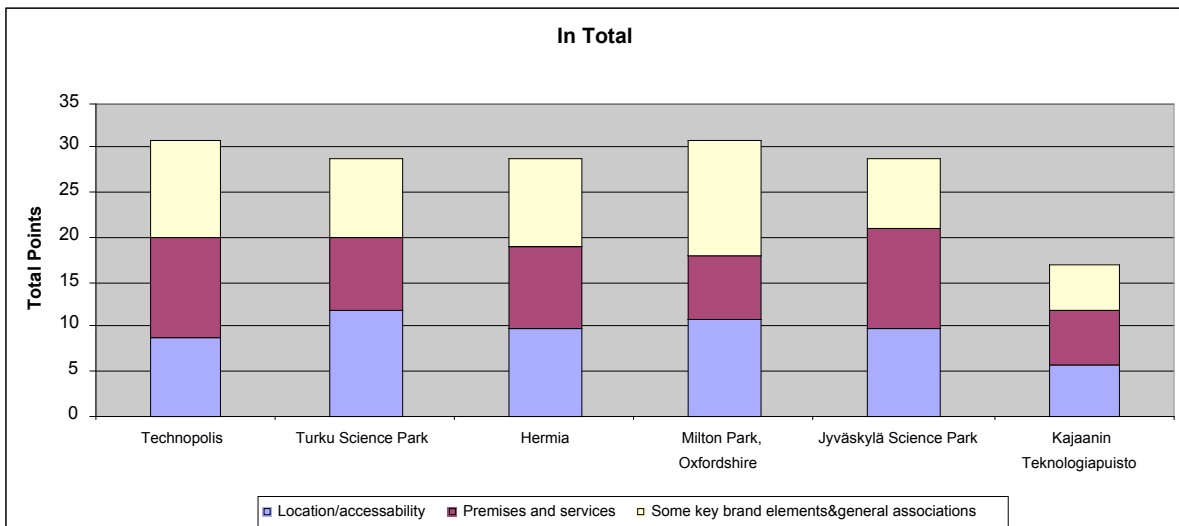
Figure 2. Science Park Brand benchmark. Total points. Systematics: VTT Building and Transport.

In brief the Old Mill is located to the Science Park with following characteristics.

- Location of Turku Science Park seems to be excellent.
- Premises and services seem to be on average level.
- Turku Science Park does not utilize every key brand element fully. However, the general associations and impressions are positive.
- In total Turku Science Park brand gets some points less than Technopolis, Espoo but stays on the same level than Hermia, Tampere and Jyväskylä Science Park.
- More detailed description of the benchmark is shown in *Appendix 1*.

In this case the results are highly subjective, but on the other hand the brand can be evaluated in this way. Brand is more a mindset, intangible concept than the pure fact, This comparison is made using the public image Turku Science park is giving i.e. in www-pages. The comparison includes only some of the key factors that usually effects on the brand. Every factor is valuated from 1 to 4 where 4 mean the best level. When calculating the total points every single factor has the same weight.

2. THE OLD MILL

The Old Mill is located in the Kupittaa area of Turku close to three universities and the polytechnic. The building itself is an old ceramic factory renovated for the use of ICT-companies. Turku wanted to raise its profile as an important center for ICT-business. Consequently, the decision was taken to renovate the old factory as a modern center for ICT-companies The interior of the building has been left exposed in the renovation giving the estate its unique feeling combining modern technology with the building's historical features.

The Old Mill includes a number of additional services alongside its functional and interesting office space. The building is equipped with latest data network connections to provide the best setting possible for the ICT-companies in the estate. Tenants also have access to a number of meeting rooms as well as an auditorium for their use. Sodexho manages a restaurant in the building providing the perfect setting for business as well as private functions. Petrasol Business Centre oversees the running of the Old Mill's reception area, switchboard, as well as the building's Intranet.

The building of the Old Mill presents the imago and brand in a similar way as the name , slogans or logo. The Old Mill has its own profile and identity which differs from the surroundings and manages to provide something unique for the companies. The slogans in www-pages **From a ceramic factory to a technology center – a glance into Old Mill's history** and **New technology in an old factory** make the brand exciting, unique, valuing tradition

3 SPACE UTILISATION IN THE OLD MILL

It is well known that the costs of office environment constitute only a small part of the total costs of a typical office work organization. However, the importance of working environment quality is essential for any organization due to several reasons, for instance:

- High quality working environment enables the office workers – the most important resource of the know-how organization - to do their best every working day and every working hour.
- The business challenge of today is simple: Do more, faster and better, with less.
- For any company a high quality working environment is an important advantage when competing for the best workers.

In Old Mill 84% of total floor space is leased for the tenants. The share of actual office space (including support space, internal corridors etc.) is 69%. This means that there is about 23 m2 of office space per worker in Old Mill (table 1).

	m2	share	workers	m2/worker
Office space	10 478	69 %	453	23,1
Printing house	491	3 %	6	81,8
Laboratories	525	3 %	6	87,5
Photo studio	247	2 %	2	123,5
Restaurant	374	2 %	8	46,8
Film studio	585	4 %	5	117,0
Leased total	**12 700**	**84 %**	**480**	**26,5**
Auditorium (joint use)	180	1 %		
Classroom (joint use)	40	0 %		
Meeting rooms (joint use)	170	1 %		
Other space (joint use)	2010	13 %		
Total	**15 100**	**100 %**		**31,5**

Table 1. Space distribution and space per worker in Old Mill.

According to the research (Nissinen, 2003) the space use of Finnish offices can be described spacious. The average space utilization in Finnish offices is about 25 m2/worker (excluding the joint use space). The office space utilization in Old Mill is below the national average but it is still quite high when comparing to the international values (figure3).
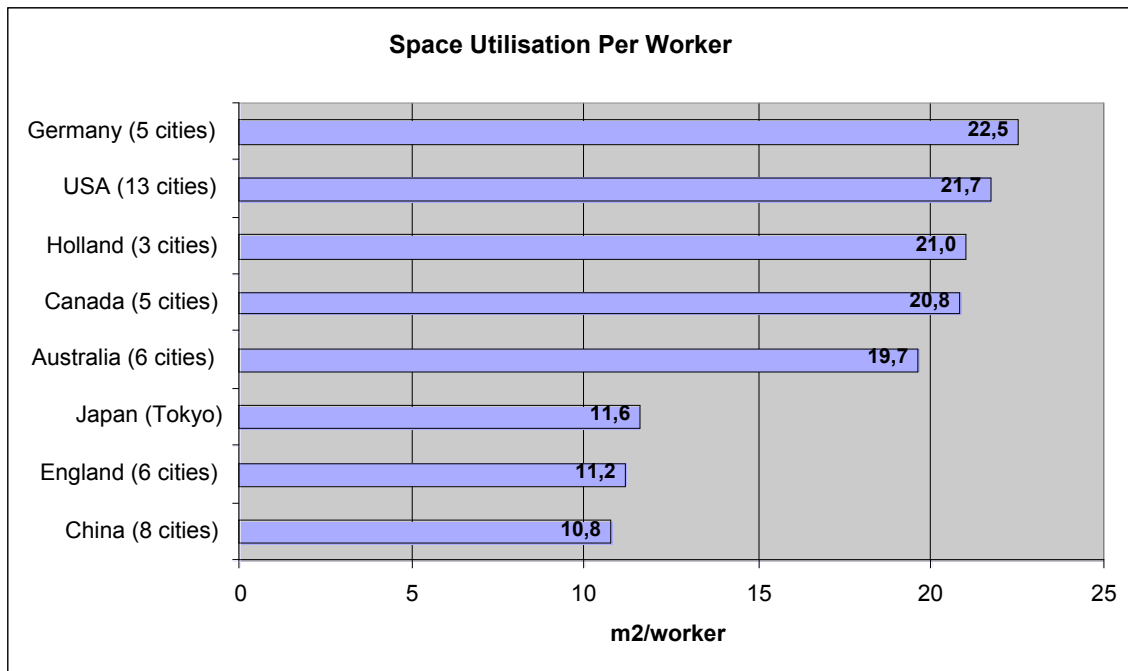
Figure 4. International office space utilization comparison. Net usable area that is used by the organization divided by the number of workers. Big cities, Central Business District Locations. Source: DTZ Debenham Tie Leung International Property Advisors Space Utilization Standard.

4 USABILITY CASE STUDY

The focus in the case study was to find out how to gather information about the status of usability. The source of information for usability is in users daily experiences: they feel the satisfaction, the effectiveness and efficiency of their work environment.

The case study used three ways to gather data
1. the questionnaire
2. the usability walk through
3. the application of Ecoprop software

The questionnaire was a telephone interview with yes/no questions about the Old Mill environment. The basic structure of questionnaire was based on the classification of real estate made by Brand(1993) and applied by Blackstat (2001) in figure 4.
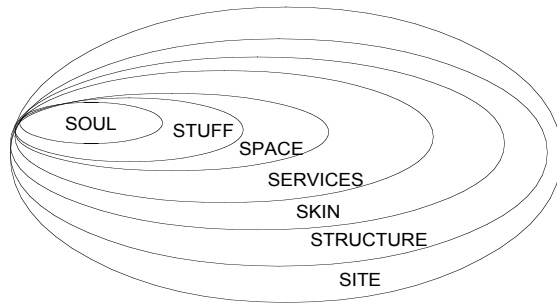
Figure 4 The seven s-model by Brand and Blakstadt

Brand´s model included six s and Blakstadt added the seventh s, soul. The soul in this case study of usability presents the main actor, the user. The source of data is user´s experience.

The other classification used as a framework for questionnaire was the definition of usability according to ISO 13407:1999: Usability is the "effectiveness, efficiency and satisfaction with which a specified set of users can achieve a specified set of tasks in a particular environment."

The questions were not only asking if people were satisfied for different components of work environment but also if there were enough of them and if they were easy and efficient to use.

In summary the results can be presented in a table 2.

	Low usability	High usability
SITE	Lack of parking places – specially for customers	Nice imago
STRUCTURE	Not enough signs – specially for customers	Secure infrastructure and structure as such
SKIN		Security services are good
SERVICES	The slow catering services – specially lunch time	The helpdesk services are high quality and functional
SPACE	The emptiness and of entrance hall	The meeting rooms are nice, comfortable.
STUFF	The use of lightning and air-conditioning is difficult	The possibilities for ICT work are good.

Table 2 High and low usability according to user´s experiences in the Old Mill

4.2 Usability walkthrough

In walk through evaluation, the end users, on various levels, evaluate the focus area diagnosed as high or low usability in the diagnosis -phase. The technique is suggested as a tool to evaluate the workplaces, identify the gaps between the original design concepts and the current use, and to provide a platform for different parties to communicate.

The balance of the participants is important. The team for usability walk through included
- the architect of the present structure in Old Mill
- the service provider of help desk services
- the service provider of catering services
- the facility manager
- the end user
- the usability researchers (3)

The route for usability walkthrough was identified by using the former data from the diagnosis phase. The results were described briefly and the participants have had the chance to prepare. They got some guiding questions beforehand.

Participants were encouraged to reflect their views on the facilities and open-ended questions asked to prompt. Topics were recorded. During the walk through, the participants observed the facilities and began to discuss the causes and effects of use of spaces. Participants speculated on four milestones:
- The entrance space
- The restaurant
- The meeting room
- The parking area

VIEW	FACT	RECOMMENDATION AND FINDINGS
The entrance space	The entrance space is large and the reception/ help desk is located on the other end of it. As the desk is relatively distant from the entrance itself, it is not immediately noticeable when you enter the building. This sometimes causes confusion for visitors. *"We often need to catch visitors attention, because they don't notice us"* - reception	Make the help desk service visible. Hospitality (of reception staff) increases usability – service is an intangible attractor.
	It is assumed that visitors approach the help-desk/reception first in order to provide security (limited access to offices). Therefore there is a limited amount of signs and guidance.	People should be encouraged to **learn** to use the help desk. Host should inform the visitor about norms.
	The "lobby-area" is in low use *"People are not familiar with using such a open entrance spaces"* - architect People are not utilising this space for other purposes (multi-use), such as meeting, displaying products, events etc. *"People don't want to be seen to sit in a lobby as this means you are lazy"* - FM "	To provide information about multiuse possibilities The attractors: vending machines and touchdown desks The furniture solution - Encourage for communication and interaction (greeting and informal meeting) - Should the space be divided to provide more privacy? - Focal point to the entrance (

	The design of the space creates a "wow"-effect. *"I chose to work here because I was impressed with the design of the building"* - user	A lively and dynamic atmosphere should be created to sustain the positive 'wow' impression. (from the first impression to the total experience – "wow, here is a pulse"-effect) Maintaining the 'wow' effect throughout the building -
The restaurant	*"The layout of the lunch buffet is illogical - wrong way round"* – service provider	Use the towards the clockwise Arrangements Change the location of the cashier
	The lack of information about "traffic" rules	Signs
	Limited use of two meeting rooms after the restaurant closing time	Information Room booking arrangements
	On-peak time queuing is time consuming and frustrating "I sometimes turn back when I see the queue and come back later" - user	Encouraging people to have their lunch on off-peak times – rewards (free coffee and dessert etc.)
The meeting room	The light and ventilation switches are illogical: Red light indicates that the ventilation is switched on – confusing message (red = danger) To control the level of light you need to press rather than turn the switch – Delay in the change of the level of light - difficult to achieve desired level. *"It is embarrassing when the lights turn off in the middle of a important customer meeting"* - user	Guidance for, and information about, efficient use.
	As a consequence after combining two smaller meeting rooms, the light and ventilation switches are not next to the new main door (having to find the switches in the dark)	Investigate new solutions (Remote control etc.)
	It is difficult to serve food and beverages in the two small meeting rooms.	Consideration of furniture solutions
	The need for larger meeting spaces has increased – more training sessions	Use of entrance space?
	ICT system and security – the same phone line for two rooms. *"We need an absolute confidentiality also during the tele-meetings"* - user	Under assessment.

The Parking area	Not enough parking space for customers. *"I sometimes have to go and re-park our customers' cars because the allowed parking time is only 2 hours – less than most of the meetings. "* – user	Help desk service can be developed

Table 3 Usability walkthrough

The status of usability Old Mill is quite high, but some areas of improvement have been identified. The aims include:
- Customer orientation in the car parking area (serviceability),
- 'Smarter' (multiple) use of the entrance hall - focus on different options and communication of these to the users in order to encourage them to use this space more efficiently (learnability)
- Efficient use of the restaurant lunch buffet by improving the logic of the layout (functionality)
- Better guidance of the ways the meeting rooms are used. Amount of information for the use of meeting rooms (functionality)

4.3 Ecoprop

EcoProP is a software tool for the systematic management of building project requirements. The EcoProP software helps to fulfil customer requirements and expectations by describing the properties of the final product using a hierarchy of performance requirements and different performance 'levels'. The technical solutions can then be designed based on the specified performance requirements. EcoProP can also estimate life-cycle costs associated with different scenarios, based on the environmental 'costs' which result from the construction and operation of the building. EcoProP has been used in various projects including office buildings, schools, nurseries, residential developments and shopping centres. The intention is to use the software in the usability case study in two ways:
- to develop the hierarchy of performance requirements for usability and different performance levels for it in order to develop a usability profile
- to develop the dialogue between hard data from the building and soft data from the user in order to combine two perspectives in an effective way.

Flexible content – wide applicability

EcoProP comprises a database of performance requirements and an easy-to-use interface to the database. There are a number of requirement definition sets, which correspond to the possible requirements of different building project types. The application has been primarily designed for the building and construction domain but it can also be used also in other domains by adding new requirement definition sets. The user can select from one to five pre-set performance levels for each requirement and then add their own comments. EcoProP can be used to manage performance requirements for new building projects, and can also be used to some extent for evaluating the performance levels of existing buildings.

Functionality

Based on the specified performance requirements, the user can print out a project brief in HTML or Word format. The reports can be customized for relevant stakeholders. For example, only part of the requirements is relevant for the electrical engineer so there is an option to print out only the relevant requirements separately. It is possible to also have a report only on certain performance properties (such as adaptability) or a thematic re-port such as 'health related' requirements.

The application provides estimates the life cycle costs of the building. This analysis is based on the cost factors associated with different performance levels and the baseline information of the project. The user can use NPV and Annuity methods in the calculation and the discount rate and time-frame can be changed. Additionally the environmental 'costs' due to the operational energy consumption can be estimated.

The first step for setting requirements in EcoProP is to start a new project. The user then selects the right requirement definition set (e.g. office building or apartment building) and then adds the baseline information on the project, e.g. investment cost, operational cost, energy unit cost, size of the building etc. It is also possible to add different scenarios for each project. The user then selects the appropriate performance level for each relevant requirement. The requirements are listed in the left hand side of the window. The information on the requirement can be found on the right hand side: name, description, validation, and place for own comments and one to five pre-set levels.

A requirement profile can then be created based on the average of the normalised performance levels for each requirement. The user can compare different scenarios and get a quick understanding of the project performance requirement levels.

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MANAGING THE REQUIREMENTS
EcoProP

REQUIREMENTS
A conformity
- A1 LOCATION
- A2 SPATIAL SYSTEMS
- A3 SERVICES

B performance
- B1 INDOOR CONDITIONS
- B2 SERVICE LIFE
- B3 ADAPTABILITY
- B4 SAFETY
- B5 COMFORT
- B6 ACCESSIBILITY
- B7 USABILITY

C life cycle costs and environmental pressure
- C1 LIFE CYCLE COSTS
- C2 ENVIRONMENTA PRESSURE

owner user society

DESIGN CONSTRUCTION

ENVIRONMENTAL PRESSURE

PERFORMANCE

USE AND MAINTENANCE

COSTS

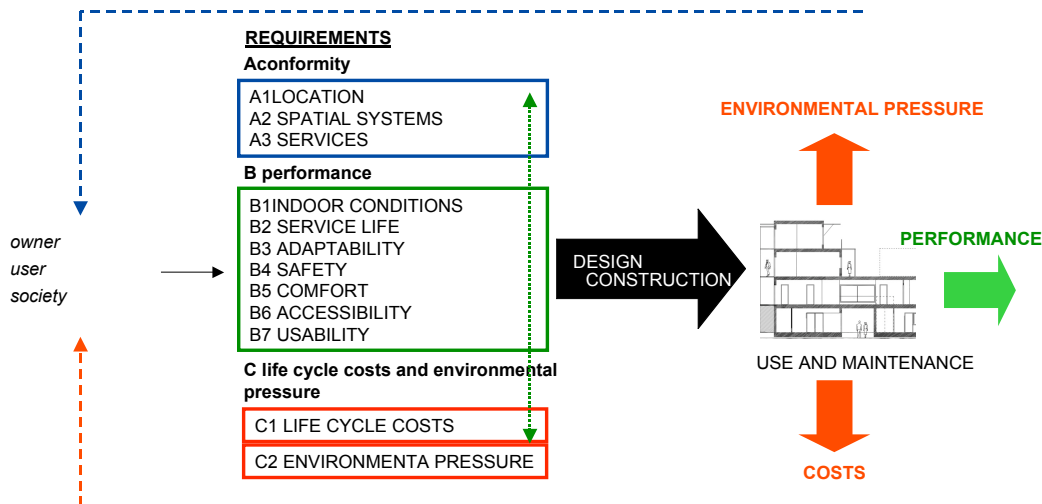15/04/04   16   VTT

Figure 5 Ecoprop in brief

4.THEORETICAL CONSIDERATIONS

The intangible nature of brand includes the usability. The five star usability can be developed as a part of the brand building process. The brand can also used as a framework for classifying the usability – the brand is a concept, a mindset, which have tangible artefacts like logo, slogans, buildings etc. The usability has intangible elements as well: not only satisfaction but also the productivity and efficiency aspects.

To structure the complex variety of subjective expressions of experiences the model of evaluation space of usablity attributes is interesting framework. Keinonen (1998, 159-161) writes: "The different domains in the evaluation space have a character of their own. In the personal domain the influence of feelings is considerable. In the task corner the attributes related directly to the task for which the product is meant are emphasised. In the product corner the qualities of the representation are in focus." The domains are presented in the figure.

Figure 6 Evaluation space of usability attributes

Accordig to Keinänen (1998, 159-161) the personal domain is characterised by affective criteria (AFF), the product domain by presentation (PRE), and the task domain by functionality (FNC). The relationship between the personal domain and task domain is described by usefulness (USE), between the personal domain and product domain by ease-of-use (EoU), and between the product domain and personal domain by logic (LOG). This classification can be useful to work further with the concept of functionality as a close concept for usability.During the case studies in work group CIB TG51 the discussion around the concepts of usability and functionality have been relevant. In notes from England following structure was presented with the remark that usability need to include all levels.
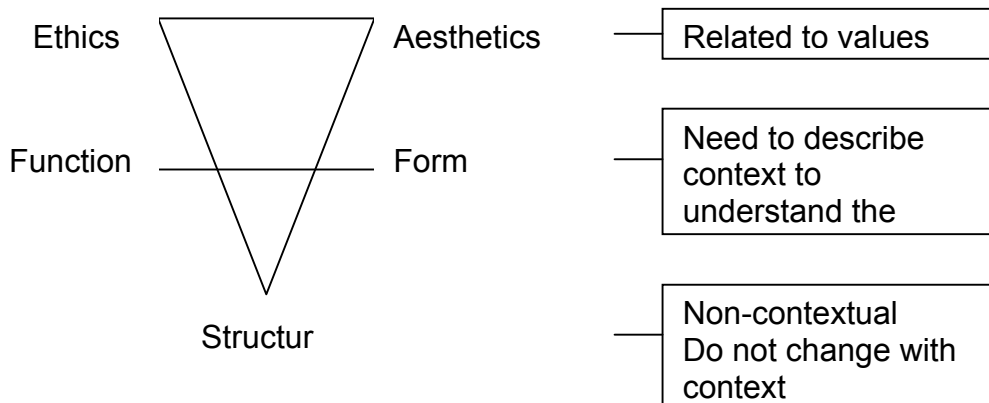
Figure 8 Different levels and dimensions

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The combination of these two triangles might help the further work within the taskgroup to position usability and functionality in a clearer way.

**PERSONAL DOMAIN
- USER**

ETHICS   **AESTHETICS**

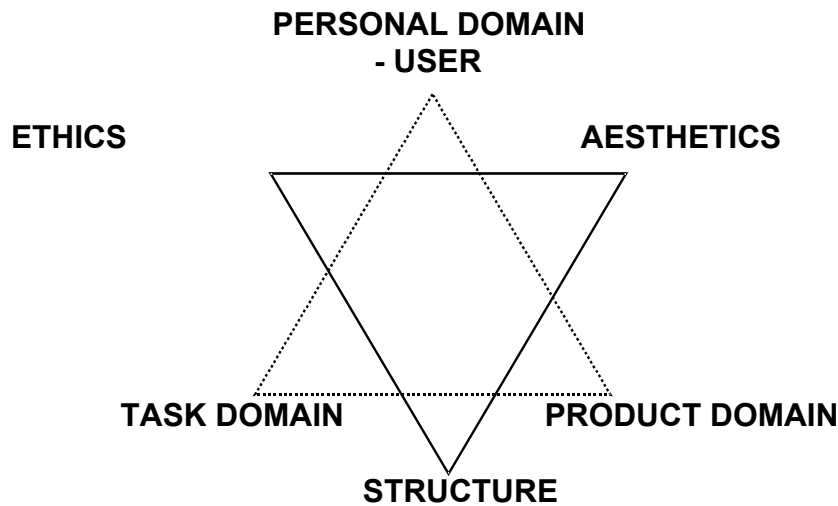**TASK DOMAIN**   **PRODUCT DOMAIN**

STRUCTURE

Figure 8. User - Structure

The usability discussion can be user-led or structure-led. Both approaches are relevant. The user with emotions, senses and needs is the main acto. The structure, functions and products are the cornerstones for another approach which has its significance in

6.CONCLUSIONS

The third workshop is meant to add the understanding of the user experience as a starting point to develop usability. The main issue is not to measure because of the results but to investigate in order to improve the usability. The way to express the process used for getting the information can be illustrated in following way (figure 9)
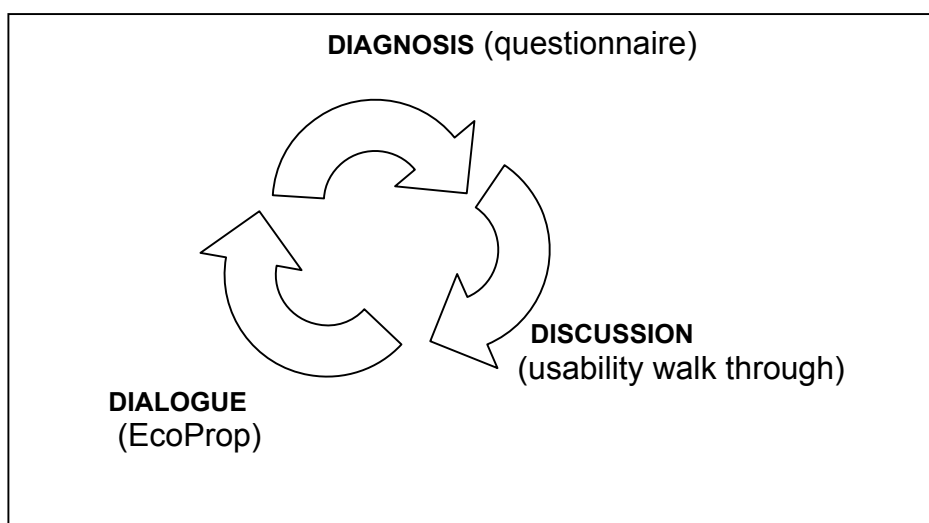
DIAGNOSIS (questionnaire)

DISCUSSION
(usability walk through)

DIALOGUE
(EcoProp)

Figure 9   3DI -model

I The diagnosis phase investigate the weakest points in usability and the outcome of this phase is a general picture of the status of usability according the user's experience. The questionnaire can be used as a method. The result is quantitative and informative.

II The discussion phase provides closer and in-depth investigation offering also the possibility to gather different point of views to the defined target area with low usability. The usability walk through can be used as a method. The result is a qualitative data based on group interview and observations.

III The dialogue phase is a interaction between the technical data about the building and the user experience data about the usability – the outcome of the dialogue is a usability profile, an illustration to be used in brand building as well as on going improving of the high-performance in a real estate.

The 3 DI-analyse models is a way to find solutions to the usability of workplaces. The intention is to develop usability of workplaces in a way, which provides the concentrations to essential issues in an effective way. The question which needs to be worked further in 3 DI-analyse model is if the usability improvement process can be started from whatever DI.

To summarise the learning points of the case study following list is relevant:
-    The intangible character of brand is a relevant way to approach usability
-    The dissatisfaction management is a good starting point to investigate where the usability can be increased
-    The user experience has a emotional background: this fact of subject is important to keep in mind during the ways to gather information
-    The results of the usability surveys has to be handled as a part of process, not only as frozen facts and figures
-    The product domain, the task domain and the personal domain are important to recognise as well as the perspective of the user or the structure in usability discussions

The case study concentrated purely to the common areas in the Old Mill. The individual workstation was left out in this phase. The future challenges are in developing the use of EcoProp for creating the usability profile in Old Mill as such but also in organisations with their own brand, with their own user requirements within the Old Mill and the Science park.

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APPENDIX 1: Science Park Brand Benchmark

1 Location/accessability

		Technopolis	Turku Science Park	Hermia	Milton Park, Oxforshire	Jyväskylä Science Park	Kajaanin Teknologiapuisto
1.1	City/district	Oulu: dynamic, significantly growing district centre	City with great history, growing district centre	Significantly growing district centre	Oxforshire, Thames Valley ("Sounds very good")	Growing district centre	Not-growing district centre
	* points	3	3	3	3	2	1
1.2	Premises: How far away from the city centre?	Most of the premises about 6 km away from the centre of Oulu	Most of the premises about 2-3 km away from the centre of Turku	Premises about 10 km away from the centre of Tampere	About 12 miles from Oxford	Most of the premises comfortably at the centre of Jyväskylä	Premises standing less than 5 km away from the centre of Kajaani
	* points	2	3	2	1	3	2
1.3	Premises: How far away from the international airpot ?	n. 600 km	n. 200 km	n. 200 km	n. 45 miles	n. 300 km	n. 600 km
	* points	1	2	2	3	2	1
1.4	The availability of well-educatied workforce, interaction with educational institutions	University next door, Polytechnics at the City Centre	2 Universities, School of Economics and Polytechnics inside the same "trade mark"	Technical University next door, University and Polytechnics at the same city	World-famous academic society nearby	University and Polytechnics at the same city	Polytechnics and some "away"- units of Oulu University at the same city
	* points	3	4	3	4	3	2
	* Total points	9	12	10	11	10	6