UNIVERSITY COLLEGE LONDON

Bartlett School of Graduate Studies

MSc Built Environment: Advanced Architectural Studies

BUILT ENVIRONMENT REPORT

DISCURSIVE AND NON-DISCURSIVE DESIGN PROCESSES

Kinda Al-Sayed

September 2007

Abstract:

This research study investigates the hypothesis that Space Syntax plays a role in enhancing architectural design as a knowledge-based process by bringing the non-discursive design process onto a discursive level, and by making explicit the logic of processing, evaluating, and reasoning about design. In order to establish an evidence-based argument for this hypothesis the study will scrutinize the performances and outcomes of architects solving a well-defined problem. The paper constructs the study on a literature background exploring the different theories which were concerned with the analysis and evaluation of design processes and outcomes. The analysis of design processes was investigated on micro and macro scales and the evaluation of solutions was considered in terms of spatial configurations and the social organization embodied in space. The research then goes on to apply some of these analytical studies to a set of design tasks made by architects who have a background in Space Syntax theory, and architects with other architectural backgrounds. The question then turns to the influence of Space Syntax theory on the strategies and cognitive actions of the design processes and the observational study will attempt to prove whether the knowledge of Space Syntax can have a positive effect on architects during their design process, taking into consideration that Space Syntax, as a morphic language, can render the non-discursive discursive of architecture. In the following step the design solutions are evaluated in terms of qualities regarding social organization, and in terms of quantities measuring the values of their spatial configurations. The analysis of the design processes and outcomes will show differences between the two groups of architects, in addition to some individual differences between the architects. Thus this research proves that the knowledge of space syntax may partially enhance the productivity of design process by making it more explicit.

ACKNOWLEDGEMENTS:

I express here my deep gratitude to Dr. Ruth Conroy Dalton and Dr. Christoph Hoelscher for all their insights and aid in the preparation of this thesis. In addition I would like to thank Dr. Laura Vaughan for her help during the MSc Course and to Alasdair Turner, Nick Dalton, Eral Shpuza, Pip Prewer, Christian Beros Contreras, and Space Syntax Ltd. for their useful support. I am very grateful for all the effort and time that the participants in my interviews have given, as their participation has played a significant role in conducting this research. Finally I express my special gratitude to my family and my husband Hussam for their support during my study.

TABLE OF CONTENTS:

ABSTRACT	i
ACKNOWLEDGEMENTS.....	ii
TABLE OF CONTENTS.....	iii
TABLES AND FIGURES.....	iv
Chapter 1.0	
INTRODUCTION	1
Chapter 2.0	
LITERATURE REVIEW	3
Chapter 3.0	
DESIGN PROCESS ANALYSIS.....	10
Chapter 4.0	
DESIGN OUTCOME ANALYSIS.....	30
Chapter 5.0	
FINDINGS	56
DISCUSSIONS	57
Chapter 6.0	
CONCLUSIONS	60
BIBLIOGRAPHY	62
APPENDIX 1	64
APPENDIX 2.....	65
APPENDIX 3	95
APPENDIX 4	101
APPENDIX 5	102

Tables

Table 1. Cognitive actions categorizations cited in Suwa et. al. (1998, pp. 460).	P. 11
Table 2. Participants experiences and interests.	P. 14
Table 3. Convex integration values for the different spaces produced by the participants.	P. 45
Table 4. The homogeneity of Integration and intelligibility values within the population.	P. 53

Figures

Figure 1. Design task layout.	P. 14
Figure 2. A model of segmenting cognitive actions from semantic expressions.	P. 15
Figure 3. Diagrammatic model of AH transcript representing the design actions.	P. 18
Figure 4. Diagrammatic model of LC transcript representing the design actions.	P. 19
Figure 5. Diagrammatic model of AB transcript representing the design actions.	P. 19
Figure 6. Diagrammatic model of KS transcript representing the design actions.	P. 20
Figure 7. Diagrammatic model of OO transcript representing the design actions.	P. 20
Figure 8. Diagrammatic model of JG transcript representing the design actions.	P. 21
Figure 9. Diagrammatic model of BC transcript representing the design actions.	P. 21
Figure 10. Diagrammatic model of PE transcript representing the design actions.	P. 22
Figure 11. Diagrammatic model of AN transcript representing the design actions.	P. 22
Figure 12. Diagrammatic model of CE transcript representing the design actions.	P. 23
Figure 13. Diagrammatic model of LM transcript representing the design actions.	P. 24
Figure 14. Diagrammatic model of CR transcript representing the design actions.	P. 24
Figure 15. Design tasks analysis for NSSX architects.	P. 25-26
Figure 16. Design tasks analysis for SSX architects.	P. 27-28
Figure 17. Total cognitive actions in the different design tasks	P. 29
Figure 18. Quantities of genotype and phenotype-related actions in the design tasks.	P. 29
Figure 19. Percentages of genotype-related functions	P. 29
Figure 20. Percentages of phenotype-related functions	P. 29
Figure 21. a. Duffy's diagrammatic example of design offices, b. organizational structure of design offices.	P. 31
Figure 22. Types of spatial relations in a justified graph cited in (Hillier1996, p. 249)	P. 33
Figure 23. NSSX design tasks in process	P. 36-39
Figure 24. SSX design tasks in process	P. 40-44
Figure 25. Percentage of revisited actions with certain preference from the brief or the general layout.	P. 45
Figure 26. Percentages and numbers of the four types of spaces in the J-graphs.	P. 45
Figure 27. J-graphs of design proposals, all starting from the public entrance.	P. 46
Figure 28. Convex integration maps.	P. 47-50
Figure 29. Global axial integration maps.	P. 51
Figure 30. Local axial integration R2 maps.	P. 52
Figure 31. Diagram showing integration and intelligibility values for the different proposals.	P. 53
Figure 32. Visual integration analysis.	P. 54
Figure 33. Reversed values of visual clustering coefficient analysis.	p. 55

Chapter 1.0

Introduction

Many empirical studies have been made in the last three decades within the frame of Space Syntax theory following Hillier and Hanson's first publication (1984). Their research aimed to make explicit the social logic of space. They were able to translate the topological and metric configurations of space to a morphic language¹ which may predict the social potentials of space. Space Syntax theory; as Hillier (1996) argues can achieve a better understanding of the real built environment. This understanding may enhance the design process by establishing designs on a reasonable ground of scientific research. Much research have been made to prove the correspondence between Space Syntax theory and reality², but less frequent approaches have been made to investigate the initial connection between Space Syntax as an architectural theory and the practice of architectural design. Therefore it will be important to investigate the capacity of Space Syntax language as an effective evaluative tool for thinking architectural design.

It might be suggested that the syntactic measures can contribute in the feedback part of the design process, thus assisting design decisions with a reasonable spatial knowledge that can predict the subject's behaviour within artefacts. Therefore, it might be suggested that the knowledge of Space Syntax can enhance design processes on urban and architectural scales depending on the models of partitioning and adjacency graphs. This might be relevant to the particular "generic function" studies which Hillier explains as the first filter in design.

"This filter governs the properties which all spatial arrangements must have in order to be usable and intelligible to human beings at all, that is, in order for human beings to be able to occupy space, to move about between spaces and to find buildings intelligible" (1996, p. 258).

The 'generic function' represents the simple logic of occupation and permeability in space. Its true state can turn the probable design solutions into possible ones and work together with the second cultural filter in specifying the possible genotype of an artefact. The third filter works successively on shaping the individual properties of the building. These filters play an important role during a design process by optimizing the field of possibilities in order to reach an adequate

¹ Kanekar has interpreted the expression of morphic language in Hillier and Hanson (1984) as the following: "Morphic language differ from both natural and mathematical language, in natural language there is a large lexicon which is combined through a simple syntax that is meaningful in a semantic referential sense while in mathematical language there is a smaller lexicon that undergoes complex permutations and combinations of syntax to create syntactic meaning. In contrast, morphic language is situated in between these two extremes. On one hand, it depends on a strong syntax to create structural meaning, while on the other hand allowing its constitutive elements to be individuated to allow for representative meaning". (2001)

² <http://www.spacesyntax.net/symposia/index.htm>

solution for the design problem. Thus it will be interesting to investigate later in this research how the knowledge of these three filters can influence architects in their design practice and how this maybe rendered in their design outcomes.

The aim of this study is to explore the efficiency of employing Space Syntax Knowledge into design processing and reasoning by making the logic of design thinking more explicit. For this reason the semantic transcripts of design performances will be analysed both on micro and macro scales, and the design outcomes will be evaluated with the syntactic tools. This analytical study of design process and outcomes will aim to depict differences between architects who have experience with Space Syntax and those who do not have such experience. The research will be supported with design tasks made by the two groups of architects, and a comparative reading of both groups performance will go in parallel with the different representations of their design processes and proposals.

Chapter 2.0

Literature review

This section will discuss some of the preceding research studies in the domain of design process. The theoretical research concerned with design process methodology embraces various contributions to this field of knowledge. Many attempts have been made to analyze the architectural design process, some of which will be reviewed and discussed in relation to the knowledge-based design process in general; and the influence of Space Syntax knowledge on modelling the genotypes of spatial solutions in particular. In order to construct an objective and scientific groundings for this research, it will be important to discuss the different categorizations of strategic and cognitive models of design performance. The most effective models of design methodology will be implied later to represent a set of design processes, and make them subject to comparison.

Many models have been introduced during the last four decades to represent the design process. Most of these studies were directed to understand the human intelligence during the creative process of design, in order to find implications in machine intelligence. Attempts have been made by architectural theorists, psychologists, and the disciplines of artificial intelligence, social, and cognitive sciences. Some studies have succeeded in introducing models of regularities in the process of design in spite of the sophistication of cognitive performance during design. The difficulties were raised then by abstracting the process of thinking to a logical procedure because of the complex nature of brain activity. This made it hard to segment the design actions into distinct phases and relate them to the cognitive awareness.

Some empirical research in the field of cognitive science may have some reflections on designer's behaviour. The findings of Tversky (2004) for example emphasize "The fact that order precedes perspective suggests that mental representations of the environments are perspective-free" (pp. 383). Tversky's experiments which were applied to subjects from the public might be also relevant to designers, which might suggest that architects perceive the order of spatial relations in the layout before thinking about the third dimension of space. The perception of spatial order may be relative to the experience of the architect and his/her collective knowledge, which may play role in the design process according to the design situation. The question whether design is knowledge-based was answered by Kavakli *et. al.* (2006) experiments which indicate that experienced architects perform better designs than novice ones, mainly because experience enhances memory. Hence memory in its short and long terms

can support the design evolution either by comparing the design situation with previous experiences or through synthesizing different experiences into one. Similarly Suwa and Tversky's experiments (1997, 2001) have shown that experts made more functional inferences from their sketches than novices. Specifically, experts were able to anticipate patterns of circulation and lighting from the sketched structure. It might be predicted that the kind of knowledge required in most of the design tasks is related to the spatial configurations in principle. It reproduces the logical connections between form and function; thus signifying the genotypic structure of space. Another variety of evaluative methods could be used to identify the formal envelope of space, shaping the phenotype. The knowledge required for assigning the genotype is an objective one, whereas the knowledge which maybe used to form the phenotype can be objective or subjective depending on the architect's idiosyncrasies and interests.

Much research has been conducted on genotype models and their configurations in Space Syntax theory. This research aimed to achieve a better understanding of existing artefacts and their influence on the social co-presence within space. Hillier (1996) suggests that a better understanding of our built environment may help in evolving more constructive designs. Hillier's research in design process was demonstrated in some early writings (1974). However, the later studies (1996) became more concerned with the applicability of space syntax morphic language. Hillier's synchronic view of space differs from other architectural theories which were more concerned with phenomenology. Space Syntax was able to expose the logic of spatial order and the meaning it reproduces in the social organization of space. It was able to "render the non-discursive discursive in architecture" (Hillier 1996, p. 288-p. 342).

The theoretical approaches which aimed to interpret design processes have changed in terms of interests and viewpoints dramatically during the last five decades. Generally the position of theorists seemed to be very vibrant considering the advances in information technologies and the rise of more efficient visualization and simulation techniques. The rational approach for design process was first introduced by Alexander (1964). His book "Notes on the synthesis of form" provides a mathematical configuration of design process; dividing a problem into subsets and synthesizing their corresponding solutions. The final design outcome may only be successful if it realizes the 'best fit' between form and function. This rational notion in architectural design was abandoned later by many theorists including Alexander himself (Cross 1984, p. 309-316). Alexander in another publication (1977) described common patterns of design problems, with guidance for possible solutions. The language which he uses this time is simplified and directed to the public, but it confirms in an indirect way that architectural design is a knowledge-based

practice, especially in the description of problem and solution. There seems to be certain logic of reasoning which is embedded in the text. Alexander's attempts in making the design process more explicit and subject to scientific evaluation might have been less appreciated in that period, but later on it proved its efficiency with the developments taking place in computer aided design. In a way the implementation of scientific reasoning in design process has helped enhancing more mature solutions based on rational groundings. Thus it can be possible to distinguish the factors which contribute in evolving designs by exposing the design process to the observers. This can assist in enhancing the design strategy and the evaluative tools to produce more productive solutions for architectural problems of an analogous nature.

Cross (1984) has included several approaches and theories aiming to identify the nature of design process. Many of them were against the systematic approach, stressing the necessity of intuition and conjecture procedures in architectural design. Others tried to make analogies and reveal the difference between scientific and intuitive procedures in problem solving. Alexander and Poyner (1984) were against the geometrical arbitrariness in design; aiming to establish an externalized objective body of design knowledge which may upgrade design to a "cumulative scientific effort" (p.133). They have substituted design 'requirements' with design 'tendencies' identifying "tendency as the operational version of a need" (p. 125). They considered design 'tendency' as a hypothesis which needs to be proven. They also suggest that a design problem can only happen when tendencies get into conflict. However, it seems to be hard to distinguish between a "well-structured problem" and an "ill-structured one", according to Simon (1984) who suggested that architects start with global specifications and has, from experience, "some over-all organization, or executive programme, for the design process itself" (p. 154). The problem is then decomposed hierarchically and transformed through memory from its 'ill-state' to a well-structured problem. Thus design process is composed of a general problem solver, plus a retrieval or recognition system. Simon has used a protocol method in decomposing design process activity which is similar to Akins's method (1984). Akin concentrates on 'intuitive design', distinguishing it from the systematic approach with which design is divided into three phases; 'analysis, synthesis, and evaluation'. During the design process each of the former phases is repeated regularly. Through an audio and video-taped protocol analysis of physical acts and semantic expressions, Akin identifies eight cognitive schemata used by the designer: "instantiation, generalization, enquiry, inference, representation, goal-definition, specification and integration" (p. 199-201). The difficulty with a precise definition of a design problem had an equivalent in the domain of design solution, since sub-solutions were not always possible to be combined in an overall optimum

solution. This difficulty was defined by Luckman as AIDA: “The analysis of interconnected decision areas” (1984, p. 88).

Hillier *et. al.* were concerned with filling the gap between design research and design application. They suggest that conjecture and problem specification precede decision making in design process. Conjecture according to them does not derive from analysis but from the designer’s “pre-existing cognitive capability” (1984, p. 257). In their opinion design research must be based on study of artefacts and their use in order to find the codes which link abstract functional requirements and instrumental sets. They define three levels of Design process: “Prestructures – Conjecture – Analysis” (p.258). A fourth procedure of evaluation was added by March (1984) who describes a cyclic ‘PDI’ model of rational design process as an iterative procedure of ‘production-deduction-induction’³. Analytic reasoning is embedded within the process of deduction, because with deduction the result of the process is predicted. Both induction and abduction engages the imaginative phase of design; Induction synthesizes ideas from phenomenological regularities, and abduction or ‘productive reasoning’ presumes the viability of a phenomena measuring on another.

Similar to the cyclic structure of problem solving proposed by March in his PDI model, Luckman has recognized the same kind of structure in house design, and Levin (1984) has identified hierarchical structure which is ‘tree-like’ in Urban design, in addition to the cyclic one ‘Loops’. A cursory examination of the protocol studies of Schön (1983) does also indicate to the dynamics of the hermeneutical circle in design process, proceeding by way of a dialogic exchange with the design situation. Later on; Snodgrass and Coyne (1997) have described the nature of design process as hermeneutical⁴ rather than epistemological. They interpret design as “the domain of dialogic question and answer” (pp. 93). It is composed of leaps which are related to the design situation, and to the parts and whole within a domain of interactions. But contrary to March (1984) the whole and the parts of the interpretive situation -in their opinion- are used neither deductively nor inductively, but as entities which confer understanding, as speakers in a dialogical oscillation between interpretation and assessment. Kavakli *et. al.* have also emphasized the cyclic nature of design process through their experiments (2006). The cognitive actions they introduce refer to a further detailed model of design process which goes more in depth than the former strategic models. They analysed the design process in terms of different categories of cognitive actions contributing with different frequencies in the process of

3 ‘Deduction proves that something must be; induction shows that something actually is operative; abduction merely suggests that something may be’ (p.268)

4 The hermeneutical circle has to do with the circular relation of the whole and its parts in any event of interpretation.

designing. This was first investigated in a study made by Suwa *et. al.* (1998). Their model is based on previous studies of protocol analysis, such as the model of 'Linkography' proposed by Goldschmidt (1992). In her scheme Goldschmidt segmented the protocol to a set of directed links standing for 'design moves'⁵. The design process can then be interpreted as a pattern of 'moves' associated in the graphical network of the 'Linkograph'. Goldschmidt identified two types of links: 'backlinks and forelinks'⁶. 'backlinks' are links of moves connecting to previous moves, while 'forelinks' connect to subsequent moves. Link index⁷ and critical moves were considered as indicators of design productivity. Most of the protocol analysis was focusing on problems solved intuitively to obtain models of intelligence which can help for psychological studies and artificial intelligence purposes.

Nonetheless, a well defined distinction between scientific and intuitive approaches in problem solving is originated in Lawson's experiment (1984). He compares cognitive strategies of fifth year science students and fifth year architecture students. Both categories achieved the same average of successful solutions but with different performances for 'conjunctive' and 'disjunctive' rules. In the former rule the architects did better and the case was reversed in the latter. The architects also made less planning errors but more structural errors compared to the science students. In a way the scientists were more 'problem-focused' and the architects were 'solution-focused'. Consequently Lawson suggests that scientific methodology does not apply necessarily to architecture since each derives from a different referential point in problem solving. Students with a scientific background tend to analyse and understand the problem thoroughly before starting to look for solutions; while the architecture students tend to solve problems using trial and error procedure, trying to prove their conjectures. Lawson agreed in one publication (1997) with the design process description made by Hillier *et. al.* (1984), whilst Lawson disagreed in another publication (2001) with the more abstract mathematical approach of configuration that Hillier suggests (1996). The question is then concerned with space syntax role in the design process. On the one hand it might be suggested that the basic ideas of space syntax can support intuitive design processes. Whether this is a true or false statement will be investigated in this study. On the other hand the capacity of Space Syntax evaluative tools aiding the computer-based design process might be observed in the genetic structures of the design solutions produced by Space Syntax Ltd.

5 Design move is: "an act of reasoning that presents a coherent proposition pertaining to an entity that is being designed"

6 "backlinks record the path that led to a move's generation, while forelinks bear evidence to its contribution to the production of further moves"

7 "Link index is the ratio between the number of links and the number of moves, and critical moves are design moves that are rich in links, they can be forelinks, backlinks, or both".

Apart from Space Syntax language which reads the morphological features of space, there were other contributions made by many academic institutes to support design language with different kinds of tools⁸; however they were more likely to be concerned with phenotype shaping rather than the spatial order. Such phenotype-related approaches are too diverse to be implemented as evaluative tools in this research study. Therefore it will be important to concentrate on the genotype evaluative tools and their role in design process. Space Syntax theory can be implemented with its synchronic reading of space in optimizing design solutions through evaluation and reasoning. Space Syntax as a quantitative architectural language has invested much in the genotype-related research of existing artificial environments than in generating future ones. Therefore it might be important to investigate the possibility of implementing such language in generating designs, but first it is important to inspect the influence of space syntax on architectural design.

A protocol analysis of architect's behaviour during design process may make it possible to measure the information processed by means of information theory (Shannon, 1948). However, it will be important to categorize design moves based on their purposes and motivations and to evaluate the design solutions separating between the genotype and phenotype of the designed space. The genotype which is referred to in this study is what Hillier identifies as the "genotype of the genotype" (1996, p. 60). It is mainly about the spatial configurations embedded in the logic of space and therefore, topological. In contrast the phenotype of the design outcome resulted from a variety of complex issues which can be environmental, formal, or technical, and other aspects that the design aims to satisfy. This is explained by Hillier; "We should properly see elements as genotypes, that is, systems of informational abstractions governing objects whose phenotypes are endlessly varied. It is only in this way that we can reconcile the idea of a well-formed element with the fact that such elements arise from and are given by configurational relations, not only those which generate their intrinsic form, but also those which define their embedding in the system as a whole" (1996, p. 256). The genotype of the design proposal will be the basic mean of evaluation during this study, whereas the phenotype will only be considered in the process segmentation.

In general it will be interesting to observe the variety of routes that designers take when exposed to the same design situation. This will make it possible to record the commonalities between

⁸ Shape Grammar, for example, produced by the MIT computational group, was more applied in analyzing than in generating complex geometries. There were also many contributions in the computational design; such as the implication of Cellular Automata theory, Fractal architecture, L systems, genetic codes, and parametric design which are used in growing urban environments, besides the use of simulations in deforming structures according to different kinds of structural and environmental forces, such as lighting, ventilation, etc....

those routes and measure the productivity of their outputs. It will be also important to relate design decisions to their time span and to notice the continuity and loops in the process interpretations.

The research will test the hypothesis of Hillier that Space Syntax “renders the non-discursive discursive of architecture” (1996, p. 59 and p. 65-108)⁹. It will attempt to provide evidence that the discursive form of design process, which the knowledge of Space Syntax may partially promote can prove to be more efficient than the non-discursive one. The latter may be attributed to the architects with no Space Syntax knowledge particularly in terms of knowledge of generic spatial configurations and methods of maximizing and minimizing depth in space. The study will concentrate on the intuitive method with which architects solve genotype-related problems without being able to interpret the reasons behind their design decisions in words. It will depict differences, if any, between both categories of designers, whether in their strategic and cognitive process or in their design outcomes. The design performance will be examined in terms of controllers and filters used in the design process, and the spatial outcomes of design solutions reflect answers for the same design situation. Thus the research will render out the role that Space Syntax knowledge may play in the design process as well as in the design outcomes.

⁹ “an architectural theory is an attempt to render one or other of the non-discursive aspects of architecture discursive, by describing non-discursivity in concepts, words and numbers. We may say that an architectural theory seeks to create a ‘non-discursive technique’, that is, a technique for handling those matters of pattern and configuration of form and space that we find it hard to talk about. In research terms we could say that an architectural theory, at least in the ‘narrow’ aspects through which it describes and prescribes design decisions, is an attempt to control the architectural variable.”(Hillier 1996, p. 59)

Chapter 3.0

Design processes analysis

As has been reviewed from the literature, different approaches have been used to analyse the design process, which either concentrated on the strategy of design performance or on design contents. The methods of analysis which will be used in this research are the strategic model of March (1984), and the content-based one proposed by Suwa *et. al.* (1998). March introduced a cyclic PDI model of the design process as a macroscopic interpretation of the design procedure, which identifies three distinct phases “production, deduction, induction”; considering production as the act of creation, deduction as the act of prediction, and induction as the process of evaluation¹⁰. The model will be applied to the design processes in order to depict the different strategies used by architects during problem solving. The content-based analysis is the microscopic one introduced by Suwa *et. al.* who segmented the design process using protocol analysis of physical actions and semantic expressions. The semantic part will be considered in this research rather than the physical, since the latter is less related to the research interests. However; unlike Suwa *et. al.*’s experiment, the semantic expressions will be taken during the design process and the subjects will be asked to think aloud. The reason why semantic analysis is important during the design process goes back to the idea that the final design does not always represent the entire process of thinking, therefore it is important to consider the process as well as the final outcome because the purpose of this research is to make more explicit what is implicit in the design as a process of logical reasoning. The visualization of the cognitive levels in the design processes will make it possible to extract the differences between them. The consideration of semantics in design is emphasized by Coyne who regards the semantic content of a design description as “simply that which is not represented explicitly, but which can be inferred from the description and interpretive knowledge” (1988, P. 67). He differentiates between the explicit attributes of relationships and performances being part of the design description, and the implicit ones which represent the semantic content. The method used by Suwa *et. al.* was more adequate regarding the level of detail than the protocol analysis proposed by Goldschmidt, as the former has helped in producing a clear view of designer’s performance with reference to the cognitive level of the design actions during problem solving. Although the design segment, or the ‘Design Move’ as Goldschmidt describes, is considered as an action of certain preference, but the ‘forlinks’ and ‘backlinks’ were not applicable to the design tasks in this research because the ‘forlinks’ were rarely referred to vocally by designers, whereas

¹⁰ See chapter 2

‘backlinks’ were frequently used -for example- whenever designers needed to go back to the brief or to a previous depiction and study the requirements. In that case the interpretation of “new, continual, and revisited actions”, which was proposed by Suwa *et. al.* is more adequate, as it gives an idea about the important references which are frequently revisited by the architects. Such information can be useful if there is -for instance- a common positioning of a revisited function in the design proposals. The detailed model of categorizations by Suwa *et. al.* (1998) is made clear in Table 1 and provides in detail the categorization’s nature and criteria. Their description separates physical, perceptual, functional, and conceptual cognitive actions, and they provide detailed subcategories which belong to the former actions. It must be emphasized that their model of categorization was implied only partially in the research study due to the different scope of the research which deals with discursive thinking in architecture. Their scope was more concerned with proposing a meticulous level of labelling into design process analysis to depict the different cognitive actions within, and their regularities.

Category	Names	Description	Examples
Physical	D-action	Make depictions	Lines, circles, arrows, words
	*L-action	Look at previous depictions	–
	M-action	Other physical actions	Move a pen, move elements, gesture
Perceptual	*P-action	Attend to visual features of elements	Shapes, sizes, textures
		Attend to spatial relations among elements	Proximity, alignment, intersection
		Organise or compare elements	Grouping, similarity, contrast
Functional	*F-action	Explore the issues of interactions between artefacts and people/nature	Functions, circulation of people, views, lighting conditions
		Consider psychological reactions of people	Fascination, motivation, cheerfulness
Conceptual	*E-action	Make preferential and aesthetic evaluations	Like-dislike, good-bad, beautiful-ugly
	*G-action	Set up goals	–
	*K-action	Retrieve knowledge	–

Table 1 Cognitive actions categorizations cited in Suwa *et. al.* (1998, pp.460)

* Cognitive actions taken into consideration in this research study.

The only physical action which is taken into consideration is (L- action) which is similar to Goldschmidt's 'backlinks', representing the state when designers look at previous depictions and referring to that semantically. The perceptual, functional and conceptual actions will be fully considered as long as they are expressed in the architect's speech. Perceptual actions (P-Action) will be recorded whenever the architect refers to visual features or spatial relations. Functional actions (F-action) happen when the architect considers interactions between artefacts and people/nature, and think about the psychological reactions of people. Conceptual actions may occur during the process of knowledge retrieval (K-action), or whenever the architect makes preferential and aesthetical evaluations (E-action), or when the architect defines a goal (G-action). The goal might be similar to the 'forelinks' which Goldschmidt proposed if it is more specific to a certain reference. Figure 2 represents an example of the cognitive actions segmentation.

In order to investigate the influence of Space Syntax knowledge on designers in practice, a set of interviews was organised with 12 architects. Six architects had either academic or practical experience in Space Syntax. They are referred to as the SSX group. The remaining six architects had different design backgrounds, and had no knowledge of Space Syntax theory. They are referred to as the NSSX group. The first part of the interview started with some questions about the architect's experience and general design process strategy in terms of locating occupational spaces and defining circulation routes. In the second part of the interview each architect was asked to perform a design task for an architect's office floor plan. The second phase was supposed to last about 15 minutes, although most architects were found to override the specific time required for the experiment and took more time to understand the problem. The architect was asked to take into consideration the circulation and occupancy spaces; distributing them in the plan provided excluding the vertical circulation cores. A webcam recorded the drawing process and a microphone recorded the architect's voice while describing his/ her thoughts during the design process. Every architect was provided with a layout (fig. 1)¹¹ which contains structural columns and was asked to fulfil the requirements of a design brief, which constitutes together with the existing layout the first sets of constraints which may help to narrow the range of possible solutions. Later on the architect was free to invent his/ her own constraints if necessary.

¹¹ The layout is cited in Shpuza (2006,p.164, p.315-316) and it is an existing one and belongs to Weyerhaeuser Company SOM - Sidney Rodgers & Associates Tacoma, WA, USA. Further details are described in appendix 1

The proposed design for the architect's office had to incorporate the following requirements:

- Head office with its private secretary space
- Waiting area with small exhibition
- Two meeting rooms
- Management offices (number: 3-4).
- Telecommunication offices (number: 2).
- Three spaces for consultants
- Space for five project directors, each with two associates, and design team.
- Two IT offices
- Two technical studies units
- One construction expertise unit
- Two service areas with small kitchen, toilets, and lounge.

The architect was to interpret his/her ideas on the tracing paper, placing it over the original layout. The verbal comments were recorded during the experiments and were later transcribed¹² in order to subject them to a protocol analysis. The protocol analysis took into consideration all the semantic expressions. The sketching process and the final experiment outcomes are illustrated in figures 23 and 24. Only the final design outcomes were considered for a syntactic evaluation of the spatial and visual configuration of space as the study will show later. Four females and eight males have participated in these experiments with architectural experiences ranging between 10 years and 21 years. The participants belong to different nationalities. All the architects were right handed except for one (KS), who was left handed. Most of the architects in both groups stated that circulation is not a top issue in design, and comes as a result of allocating functions. The time taken to solve the design tasks ranged between 11 and 50 minutes.

¹² Please see Appendix 2

Fig. 1 Design task layout.

	Participants	Experience*	Experiment period	word counts	How architects think about the genotype of the building during their design process
NSSX group	AH	17	18m	1685	Circulation and occupation are different, but related, I always try to optimize circulation.
	LC	20	49m	5426	Thinking about the logic of how to go from one space to the other, adjacency and dependency for circulation and occupation. It happens quite hierarchically depending on the level of organization.
	AB	13	38m	3132	Depending on the scale, scope of the project, client demands, and how functions determine circulation. The designer has to think beyond the functions and circulation.
	KS	11	32m	1189	Connecting main spaces visually, circulation is a secondary issue in design.
	OO	21	38m	2673	On the basis of the client requirements, the context and the environment
	JG	11	11m	651	Depending on the design program
	BC	11	15m	1191	Circulation comes as a result of making connections between static spaces.
SSX group	PE	11	27m	2305	Organizing the structure of the organization and grouping functions.
	AN	11	18m30s	1118	Thinking about the client and the users of the space, and organizing functions.
	CE	10	30m30s	1374	Space, connections, circulation are basic layers of design process; the top layer is an ideal one.
	LM	13	16m30s	770	Depending on the functions.
	CR	19	15m	1819	—

* Academic and practical experience in architecture.

Table 2 Participants experiences and interests

Fig. 2, A model of segmenting cognitive actions from semantic expressions.

The verbal comments of the architects and their problem solving methods were similar to some extents. This can be noticed in the transcripts in appendix 2 and the summarized models of design processes in figures (3 to 14). Most of them have started calculating the space users, and were concerned about the spaces areas, the scale, and the structural system. They had different ideas about emphasizing and avoiding organizational hierarchy in space. The issue of visibility was raised very often by both groups. Most of them were designing circulation from the point of view of space users and their spatial experiences. They often started defining public and private access points, followed by allocating spaces accordingly. All the participants were occupied with the idea of Open plan layout, although some NSSX participants (AB and KS) have ended up limiting the visual qualities of their solutions by proposing opaque partitions, and two participants (JG and LC) allocated the enclosed meeting spaces in the central part of their layouts.

The segmentation model regards every segment according to a corresponding reference. For instance, talking about cores defines one segment, whilst talking about design teams defines another segment. The more detailed segmentations then refer to the different cognitive actions whether physical, perceptual, functional or conceptual. It was possible to obtain another model from the resulting string data¹³ representing the number of different design acts in 30 seconds units of time. Thus the resulting diagrams shown in figures 15 and 16 represent the frequencies of different (L, P, F, K, E, G) actions throughout the timeline of each design process. The number of occurrences of each cognitive action was counted within 30 seconds. The aggregate information formed trends. Thus the process of design thinking was visualised in relation to the

¹³ Please see appendix 3

timeline as the horizontal axes, and the number of actions in the vertical axes. The resulting diagrams represent the detailed model of cognitive actions; whereas more generic actions which underline the change in the general design strategies were recorded and rendered in the vertical text under the diagrams, from this generic model it was possible to optimize the strategic PDI model of the design processes.

The figures 15 and 16 present no regularities between all the participants. One obvious thing in all the design tasks is the fluctuating trends of functional and perceptual actions, whereas other sorts of physical and conceptual actions were not very present in the design processes. There seems to be no distinct regularities between architects with Space Syntax background and architects with other backgrounds. It seems like each design task is a single element which has little in common with the other design tasks. Some though are more fluctuating than others.

On the whole, the architects who have knowledge in Space Syntax took less time to understand and manage the problem and less time to solve the problem. On a macroscopic scale, the design strategies of the architects represent the cyclic nature of design activity, which is in general going through the process of:

Production → Deduction → Production → Induction → Production

The PDI models in figures 15 and 16 show more loops in some design processes of SSX group than in the other NSSX group, which only has one design task (OO) containing a loop.

On a microscopic scale, the trends of cognitive actions had less frequent peaks in the SSX group than the NSSX group. It is evident that LM and KS cognitive actions did not exceed 6 actions per 30 seconds. The value of perceptual actions appeared to become higher than the functional actions at the end of most design tasks in the NSSX group, whereas in the SSX group the values of functional actions have kept often above the perceptual ones. The exception was CR's case whose trend changed repeatedly in terms of perceptual and functional actions. The conceptual and physical actions seem to be less apparent in all the diagrams, although figure 17, which demonstrates the total number of cognitive actions, may imply that the conceptual and physical actions are relatively more present in the NSSX case than in the SSX case. The diagram also shows slight differences between both groups in terms of the balance between the total use of functional and perceptual actions in the design tasks.

In order to have a more detailed view of the design process as a whole, a view which is more specific to the design solution, a second level of segmentation was introduced regarding the

genotype and phenotype of the design solution. In that way it was possible to segment the design process into actions which relate to the “genetic function” of the building and contribute to the structuring of the genotype, and actions which relate to the phenotype of the design. The phenotype engages all the actions which shape the final solutions and control its dimensions and orientation. The segmentation of design processes for this purpose followed the same procedure used with cognitive actions. The actions were recorded¹⁴ according to their relation to the genotype of the design, *i.e.* everything that might indicate to integration, circulation, occupation, visibility, accessibility, and adjacency in the layout. In the same way everything relating to the phenotype of the design was noted; such as dimensions, lighting, technical, material, structure, environmental and aesthetical considerations.

The diagram of the total actions in figure 18 shows that the genotype related functions were higher than the phenotype-related ones in all the design tasks, although they seem to be higher in the SSX group than the NSSX group. This indicates that the NSSX group is more likely to be influenced by a variety of considerations regarding their designs, rather than being concentrated on permeability. In the more detailed diagram of genotype related actions (figure 19), there seems to be no difference between the two groups; they all seem to be more concerned with allocating functions. The circulation issue was less mentioned being a result of making connections between functions. The integration issue was even less interpreted within the design tasks, and seems to be more implicit in the context of speech. The phenotype-related model in figure 20 shows much variety between the different design tasks. Almost every architect has reflected his/her own interests in the design processes. The SSX group though was more concerned with the materials in general. The NSSX group had more variable interests ranging between lighting, aesthetical and technical considerations. In that respect PE seems to belong here more to the NSSX group. This might be reasoned by his short termed practical experience using Space Syntax tools.

¹⁴ Please see appendix 3

Fig.3 Diagrammatic model of AN transcript representing the design actions.

Fig.4 Diagrammatic model of PE transcript representing the design actions.

Fig.5 Diagrammatic model of BC transcript representing the design actions.

Fig.6 Diagrammatic model of JG transcript representing the design actions.

Fig.7 Diagrammatic model of OO transcript representing the design actions.

Fig.8 Diagrammatic model of KS transcript representing the design actions.

Fig.9 Diagrammatic model of AB transcript representing the design actions.

Fig.10 Diagrammatic model of LC transcript representing the design actions.

Fig.11 Diagrammatic model of AH transcript representing the design actions.

Fig.12 Diagrammatic model of CE transcript representing the design actions.

Fig.13 Diagrammatic model of LM transcript representing the design actions.

Fig.14 Diagrammatic model of CR transcript representing the design actions.

a,

Strategic Model: Production → Deduction → Production → Induction → Production

Strategic Model: Production → Deduction → Production → Induction → Production

Strategic Model: Production → Deduction → Production → Induction → Production

b,

Strategic Model: Production → Deduction → Production → Induction → Production

Strategic Model: Production → Deduction → Production → Induction ↔ Production

Strategic Model: Production → Deduction → Production

Fig. 15, a & b, Design tasks analysis for NSSX architects.

a,

Strategic Model: Production → Deduction → Production → Induction → Production

Strategic Model: Production → Deduction → Production → Induction → Production

Strategic Model: Production → Deduction ↔ Production → Induction → Production

b,

Strategic Model: Production → Deduction ↔ Production

Strategic Model: Production → Deduction → Production

Strategic Model: Production → Deduction → Production → Induction ↔ Production

Fig. 16 a & b, Design tasks analysis for SSX architects.

Fig. 17, Total cognitive actions in the different design tasks

Fig. 18, Quantities of genotype and phenotype-related actions in the design tasks.

Fig. 19, Percentages of genotype-related functions

Fig. 20, Percentages of phenotype-related functions

Chapter 4.0

Design outcomes analysis

The analysis of design process in the previous chapter did not distinguish many demarcations between the SSX architects, and the NSSX architects. Therefore this chapter will concentrate on evaluating the design outcomes (figures 23 and 24). The evaluation will consider first the quality of the designs in terms of social organization using Duffy's model (1974b). The second evaluation will consider the quantitative values of spatial and visual configurations of the proposals using Space Syntax tools. Such an evaluation of design outcomes is directed towards investigating the impact of Space Syntax knowledge on the designs themselves.

According to Duffy the structure of organizations is a determinant factor in explaining physical differences within a layout. Duffy identifies two basic concepts in describing organizations: bureaucracy and interaction. He suggests that bureaucracy can reflect differentiation, and interaction can explain levels of subdivision. Duffy proposed two hypotheses: first, that organizations marked as bureaucratic in office layouts take the shape of differentiated workplaces and second, that highly interactive organizations are likely to occupy layouts which have less physical subdivision (1974b). Duffy provided a special model for design offices (figure 21, a). Although his findings corresponded with the second hypothesis, his observations in the real working environments have reversed the first hypothesis (Shpuza, 2006). Surprisingly, Duffy also found that bureaucracy relates to interaction. In his observation results the bureaucratic variables correlated with the physical ones. This happened more on the individual level than on the level of the entire organization. He explained the results through the effect of status in organization. Interaction was found not to correlate with degrees of subdivision and differentiation in the layouts, but correlated with the organizations composed of low standing individuals. The organizations composed of high standing individuals tended to aggregate subdivision.

In the particular case of design offices, the model proposed by Duffy (1974b) is based on the hypothesis that spatial configurations promote less bureaucracy and interactions regarding the organization, and less subdivisions and differentiation regarding spatial configurations. His view considering design offices represents intensely project-based groups in loose touch with each other, serviced by normal support functions. Most spaces are accessible by visitors, and partners are well-connected. The work stations are concentrated with occasional confidentiality.

a.

b.

Fig. 21. a. Duffy's diagrammatic example of design offices, b. organizational structure of design offices.

The spatial allocation of functions reflects different views regarding the social organization within space. According to Duffy's model of organization all the SSX group proposals were in a landscaped pattern, which could be corresponding with the group identity and territorial definition and is flexible for possible rearrangements. It also allows easy access for visitors. In figures (23,24) three proposals from the NSSX group were similar to the SSX approach, while the other three produced more defined spaces (those spaces were occupied by different groups and linked with corridors). In a way their proposals might be more convenient for a design-based profession compared with the cellular offices, but still not ideal compared with the landscaped pattern which allows for an occasional need for privacy. This pattern of separating group spaces is witnessed in three designs; those of AB, JG, and KS.

The variable of interaction which Duffy did not configure spatially was represented as co-presence in Space Syntax theory and was configured according to the depth of space. Therefore Space Syntax measures will be employed in evaluating the final outcomes of design solutions. The analysis will consider the adjacency and permeability of the spaces, as well as their visual configurations. Space Syntax measures correspond up to 80% with reality (Hillier 1996, p. 200). They have proved effective in evaluating the potentials of social encounters. Space Syntax theory was influenced by Durkheim's configuration of society (1964). The community in Space Syntax theory relates to space in a spatial 'short model' way which represents the everyday life functionalities, and the transpatial 'long model' way where events resembling ritual ceremonies take place. These two models are respectively parallel to the organic and mechanic solidarities. The first is embodied spatially, and the second is transpatial. Both solidarities constitute

societies. As Markus (1993) has shown, powerful members of an organization occupy deeper spaces. Visitor's accessibility is controlled and shallow in the spatial structure of powerful institutions. Normally the tree-like structure of space reflects a controlled deep spatial structure and a hierarchy in the social organization, whereas more rings of movement provides choices of movement routes and may indicate a democratic working environment.

In order to manifest the spatial relations in a way which clearly represent the spatial relations between spaces themselves, it will be helpful to use the descriptive methods of justified graphs in Space Syntax (Hillier 1996, p. 71). Space Syntax technique starts with representing each convex space with a circle and each permeable link with a line. The depth¹⁵ might be shallow or deep and takes the behaviour of branching trees or looping rings. Spaces lying on the former have no alternative routes to them, whereas those lying on a ring are on at least two routes. The relation between spaces might be 'symmetrical' if its reverse is identical: A connects to B = B connects to A. If this is not realized then the relation is 'asymmetrical'. The total amount of asymmetry in a plan from any point relates to its mean depth¹⁶ from that point, measured by its 'relative asymmetry' (RA). Spaces that are, in sum, spatially closest to all spaces (low RA) are the most integrated. They characteristically have dense traffic through them. Those that are furthest (high RA) are the most segregated. Integration and segregation are global properties which relate one space to all the others. Building on the syntactic measures of integration, the convex integration map exemplifies the level of convex integration divided into five bands identifying the red as the most integrated. The more blue the space is the more segregated it is. Convex integration correlates with the inhabitant's behaviour in the building, whereas the axial integration visualizes the permeability of space. Convex spaces are spaces where one is visible from everywhere. Axial lines are lines of sight interpreting the local phenomena of being able to see and reach one point from another point. The axial map optimizes the fewest and longest axial lines and the convex map identifies the fewest and fattest convex spaces; the fewest to be prevailed. Both axial and convex maps are considered as networks, in which axial lines and convex spaces are elements, and the links between those elements represent either the lines intersections in the axial map, or the spatial connections in the convex map.

¹⁵ In order to observe the depth of a space from all other spaces, the resulting graphs was "justified" by placing spaces on series of lines according to their depth starting from the investigated space which locates on line 0, the ones immediately connected to it on line1, and so on.

¹⁶ For mathematical definitions see Appendix 4

Fig. 22, Types of spatial relations in a justified graph cited in Hillier (1996, p. 249)

Within the network of convex spaces there are different types of spaces; some spaces are definitely specified for occupational purposes, whereas some spaces are more likely to be for movement, and some contain dense movement depending on the position of space within the network of connections. Figure 22 shows a justified graph. In this graph Hillier differentiates between different types of spaces: a-types are dead-end spaces, whereas the omission of b-type leaves one or more spaces without connection to the graph. The c-type is positioned on one ring. D-type of spaces must be in a joint between two or more rings. The positioning of these types of spaces within the local and global configurations of the whole network can determine the depth maximizing and minimizing of the complex. The increase of a-type locally and d-type globally minimises depth creating an integrated system, while the increase of b-type globally and c-type locally maximises depth resulting with a segregated system.

Overall the tasks shown in figure 26 indicate that the numbers of d-type and a-type spaces are relatively higher in the SSX group than in the NSSX group. This means that the designs of the SSX group tended to minimize depth. In addition to that it can be noticed that a-type spaces exist in all the graphs in relatively high numbers. This might suggest that there are many spaces in all the proposals which are specified as dead-ends for the mere function of occupation. The d-type of spaces are more predominant in the SSX group and the c-type is more common in the NSSX group. In effect there are rings in both group's proposals, and the rings in the SSX group are more interconnected and give more choices for movement routes within the layout.

Although the design task is the same for both groups, the design outcomes were significantly different in terms of organizational structure. Most of the architects placed the design teams as the main function within the most integrated areas as shown in figure 28 and table 3. However, the NSSX group produced different patterns where the corridors are the most integrated spaces within the layout. It can be noticed from the justified graphs (figure 27) that the design teams were shallower to the main entrance; between one or two steps away, in the SSX group. In contrast the majority of NSSX proposals had the design teams deeper in the organization in relation to the main entrance. In all the proposals the design teams were of c or d-types, located on one or two rings. Only in one case (KS) were the design teams of an a-type. In both groups, most of the design proposals segregated the head office so that it was between two and five steps deep from the public access and was usually an a-type space. Exceptions to this are AB, JG and PE proposals. In general; it can be observed from figure 28 that the SSX group was able to integrate a larger area in the layout than the NSSX group, which means that the SSX group promoted more social co-presence and potential for interactions in their proposed working environments than the other group.

The average convex and intelligibility values in figure 31 imply that there is little difference between the two groups; however, it is important to note that these values (in addition to the mean axial integration) are the highest in the design outcome of CR, who has the longest experience in Space Syntax methodology compared with the other SSX participants. The globally integrated axial lines in figure 29 are the ones which connect the two cores together, passing by the design team's spaces in most of the cases. On the local scale which is determined by the two steps away formula, the integrated axial lines in figure 30 connect both cores as well (apart from OO and LM; who did not have locally integrated axial lines between the two cores). It can be observed on both local and global scales, that the SSX group were more successful in creating integrated rings of axial lines between the two cores than in the NSSX group, *i.e.* the SSX group were able to provide more choices for movement. In terms of intelligibility¹⁷, there seems to be little difference between the two groups, although it must be mentioned that intelligibility is not a very reliable measure in such a small organization. The SSX group did seem to generate more intelligible spaces than the other group, particularly in the case of CR where the intelligibility value is very close to 1 (reaching 0.95). The least intelligible solutions were made by KS and LM, whose values were 0.55 and 0.65 respectively.

¹⁷ Intelligibility is the correlation between Global axial integration and connectivity; the later is the number of connections for each space.

Overall the average values of convex, axial integration, and intelligibility shown in table 4 were higher in the SSX group than in the NSSX group. There was little variance¹⁸ within each group in terms of convex integration and intelligibility. In contrast the local and axial integration values witnessed many differences within each group. On one hand there seems to be a remarkable variance between the SSX members regarding the global scale of axial integration and more homogeneity in this regard in the NSSX group. On the other hand the NSSX participants produced heterogeneous results in terms of local axial integration (the SSX group had more similar results).

Developments in Space Syntax theory have shown that visual properties of space are not less important than permeability, but a good indicator of enhancing social potentials for interaction. It was possible using Depthmap software¹⁹ to reproduce integration variables, which were previously applied to networks of axial lines and convex spaces, and obtain similar formulas to calculate visual integration (considering the grid fragments as interconnected convex spaces). In the resulting visual graph, high values were represented in warm colours, thus; red represents the highest value and blue represents the least value. The visual clustering coefficient characterizes a local measure. “The clustering coefficient is potentially related to the decision-making process in way-finding and navigation and certainly marks out key decision points within complex configurations” (Turner *et. al.*, 2001, pp. 111). In terms of visual properties of space, it can be observed that the SSX group was more successful in creating visually integrated spaces than the NSSX group. The latter created more fragmented designs and more clustered spaces which have the potential to be merely occupational spaces (see figures 32 and 33). The SSX group produced greater potential for dynamic spaces, depending on the amount of space that can be seen from these spaces. Some of the spaces in the reversed clustering map (figure 33); which are highlighted with red, match the corridors and routes of movement in the original designs. This is extremely well-represented in AB’s proposal.

¹⁸ Please see appendix 5 for mathematical descriptions.

¹⁹ Turner, A., Depthmap Software.

a)

First sketch

Second sketch

Third sketch

Fourth sketch

Design outcome

b)

First sketch

Second sketch

Third sketch

Fourth sketch

Design outcome

c)

First sketch

Second sketch

LC

Design outcome

First sketch

KS

Design outcome

d)

First sketch

Second sketch

Third sketch

Design outcome

00

First sketch

Design outcome

JG

Fig. 23, (a, b, c, d), NSSX design tasks in process.

a)

First sketch

Second sketch

Third sketch

Design outcome

b)

First sketch

Second sketch

Third sketch

Fourth sketch

Design outcome

c)

First sketch

Second sketch

Design outcome

d)

First sketch

Second sketch

A hand-drawn floor plan of a house, likely a student's design. The plan includes a central hallway. To the left of the hallway is a large room labeled 'Living Room' with a fireplace and a television. To the right of the hallway is a 'Kitchen' with a sink, stove, and refrigerator. At the far right is a 'Bedroom' with a bed. At the bottom left is a 'Bathroom' with a toilet and sink. At the bottom right is another 'Bedroom' with a bed. The plan also shows a 'Dining Room' area and a 'Breakfast Room'. The drawing is done in pencil on a grid background.

A hand-drawn floor plan of a rectangular building. The plan features a central horizontal corridor with arrows indicating a flow from left to right. On the left side of the corridor, there are several rooms, including one with a cross symbol and another with a square symbol. On the right side, there are more rooms, some of which are shaded. The entire plan is enclosed in a rectangular border with small circles along the edges, possibly representing windows or doors. The drawing is done in black ink on a light background.

A horizontal number line with tick marks at 0, 10 m, and 30 m.

Kinda Al-Sayed / Discursive and Non-Discursive Design Processes / UCL / ADVANCED ARCHITECTURAL STUDIES 2007

Fig. 25, Percentage of revisited actions with certain preference from the brief or the general layout.

	NSSX						SSX					
	AH	LC	AB	KS	OO	JG	BC	PE	AN	CE	L M	CR
Design teams												
Reception+ Exhibition												
Meeting rooms												
services												
Technical studies												
Construction expertise												
Telecommunication												
IT												
Management												
Head office												
Consultants												

Table 3, Convex integration values for the different spaces produced by the participants.

Fig. 26, Percentages and numbers of the four types of spaces in the J-graphs.

Fig. 27, J-graphs of design proposals, all starting from the public entrance.

Min Convex Integration 0.77
 Mean Convex Integration 1.62
 Max Convex Integration 2.48

BC

Min Convex Integration 0.64
 Mean Convex Integration 1.46
 Max Convex Integration 2.29

PE

Min Convex Integration 0.65
 Mean Convex Integration 1.22
 Max Convex Integration 1.79

AN

a) SSX group

Min Convex Integration 0.85
 Mean Convex Integration 1.53
 Max Convex Integration 2.21

CE

Min Convex Integration 0.57
 Mean Convex Integration 1.07
 Max Convex Integration 1.58

LM

Min Convex Integration 0.90
 Mean Convex Integration 1.84
 Max Convex Integration 2.78

CR

b) SSX group

Min Convex Integration 0.929
 Mean Convex Integration 1.814
 Max Convex Integration 2.7

AH

Min Convex Integration 0.74
 Mean Convex Integration 1.11
 Max Convex Integration 1.48

LC

Min Convex Integration 0.47
 Mean Convex Integration 0.86
 Max Convex Integration 1.26

AB

c) NSSX group

KS

00

JG

d) NSSX group

Fig. 28 ; (a, b, c, d) Convex Integration maps.

NSSX Architects

Min axial Integration 1.71
Mean axial Integration 3.26
Max axial Integration 4.82

AH

Min axial Integration 1.33
Mean axial Integration 2.76
Max axial Integration 4.19

LC

Min axial Integration 0.84
Mean axial Integration 1.85
Max axial Integration 2.86

AB

Min axial Integration 0.82
Mean axial Integration 2.36
Max axial Integration 3.91

KS

Min axial Integration 1.07
Mean axial Integration 2.47
Max axial Integration 3.87

OO

Min axial Integration 1.30
Mean axial Integration 3.03
Max axial Integration 4.76

JG

0 10 m 30 m

SSX Architects

Min axial Integration 1.11
Mean axial Integration 3.33
Max axial Integration 5.55

BC

Min axial Integration 1.26
Mean axial Integration 2.92
Max axial Integration 4.59

PE

Min axial Integration 0.50
Mean axial Integration 2.47
Max axial Integration 4.44

AN

Min axial Integration 1.84
Mean axial Integration 4.29
Max axial Integration 6.75

CE

Min axial Integration 1.00
Mean axial Integration 1.23
Max axial Integration 3.46

LM

Min axial Integration 1.85
Mean axial Integration 5.68
Max axial Integration 9.51

CR

Fig. 29 Global Axial Integration maps.

NSSX Architects

Min axial Integration 2.01
Mean axial Integration 4.30
Max axial Integration 6.60

AH

Min axial Integration 1.14
Mean axial Integration 7.80
Max axial Integration 9.00

LC

Min axial Integration 0.50
Mean axial Integration 3.11
Max axial Integration 5.72

AB

Min axial Integration 0.70
Mean axial Integration 3.27
Max axial Integration 5.85

KS

Min axial Integration 1.26
Mean axial Integration 3.84
Max axial Integration 6.42

OO

Min axial Integration 1.26
Mean axial Integration 5.08
Max axial Integration 8.91

JG

0 10 m 30 m

SSX Architects

Min axial Integration 0.50
Mean axial Integration 3.91
Max axial Integration 7.33

BC

Min axial Integration 1.37
Mean axial Integration 5.46
Max axial Integration 9.20

PE

Min axial Integration 0.50
Mean axial Integration 3.73
Max axial Integration 6.97

AN

Min axial Integration 2.19
Mean axial Integration 4.95
Max axial Integration 7.72

CE

Min axial Integration 1.05
Mean axial Integration 4.55
Max axial Integration 8.06

LM

Min axial Integration 1.89
Mean axial Integration 6.22
Max axial Integration 10.55

CR

Fig. 30 Local Axial Integration R2 maps.

Fig. 31 Diagram showing integration and intelligibility values for the different proposals.

	NSSX Architects			SSX Architects		
	Standard Deviation	Variance	Average	Standard Deviation	Variance	Average
Mean Convex Integration	0.32	0.108	1.34	0.31	0.096	1.49
Mean Global Axial Integration	0.5	0.25	2.62	1.53	2.35	3.32
Mean Local Axial Integration R2	1.73	3.02	4.56	0.94	0.89	4.80
Intelligibility	0.132	0.017	0.78	0.116	0.013	0.82

Table 4. The homogeneity of integration and intelligibility values within the population.

Fig. 32. Visual Integration analysis²⁰.

²⁰ higher values of integration is marked with red colour, whereas lower values are marked with blue.

Fig. 33. The reversed value of Visual Clustering Coefficient analysis²¹.

21 higher values of clustering is marked with blue colour, whereas lower values are marked with red.

Chapter 5.0

Findings

The analysis enabled identification of a number of differences between the SSX and NSSX groups considering the limitations of the study. It was found that the functional and perceptual cognitive actions were in all cases more apparent than the conceptual ones. The SSX group took less time to perform the design experiment and had less fluctuating trends in terms of cognitive actions than the NSSX group. However the diachronic models of design processes do not really indicate remarkable regularities between the participants. The diagrams of KS and LM; which had lower trends of cognitive actions achieved the least intelligible solutions. By the end of most design tasks in the NSSX group the value of functional actions dropped lower than the value of perceptual actions, whereas in the SSX group the value of functional actions was often above the perceptual ones with the exception of CR who had more frequent exchange in her trends between the two values. The total numbers of conceptual and physical actions are slightly higher in the NSSX group, however, there seems to be a balance between the total use of functional and perceptual actions in the design tasks. The genotype-related actions were more frequent than the phenotype-related ones in all cases, with not much difference in the detailed pattern of different genotype-related actions. In contrast, greater variety is present in the phenotype-related model in the NSSX group and much less variety in the SSX group, which is concentrated mostly on material. The exception was PE who had practical but non-academic experience with Space Syntax. Nonetheless, in terms of design process strategy, the general sequence of actions in the design tasks can be summarized using the PDI model derived from March:

Production → Deduction → Production → Induction → Production

The designs of the SSX group were found to have a tendency to minimize depth, with their proposed spatial structures composed of interconnected rings. The NSSX proposals contained rings but their rings were less interconnected and more localized, although the overall nature of all the generated designs was more likely to be occupational than dynamic. Most of the solutions segregated the head office as the powerful member of the organization and regarded the design teams as the main functional unit, and placing them in the most integrated location. However, some NSSX solutions had the most integrated area as the corridor connecting the cores. In most of the proposals, the design teams were located on rings, although they were in a shallower position in the SSX group than in the NSSX group in relation to the main entrance. The total integrated areas were larger in the SSX proposals than the NSSX group. According to Duffy's

model of organization for the design offices, all the SSX group proposals were arranged in a more appropriate organization (landscaped pattern). Half of the NSSX proposals were similarly organized. The other half of the NSSX group arranged aggregated group spaces around the corridors.

The average values of convex integration and intelligibility indicate few differences between the two groups; however the total average of the SSX group in that regard is more than the total average of the NSSX group. The case is the same with the axial integration; in spite of the variant values within each group. On the one hand there seems to be a remarkable variability between the SSX members regarding the global scale of axial integration, contrasting the homogeneous integration values in the NSSX group. On the other hand, the NSSX participants produced heterogeneous results in terms of local axial integration compared with the SSX group. It is important to note the design outcome of CR, who achieved the highest values of all, as her experience with Space Syntax methodology was the greatest of all participants. The globally integrated axial lines connected both cores, and generally passed through the most integrated convex spaces. Apart from one proposal from each group, the locally integrated axial lines also connected both cores. In principle the SSX group seemed to create more integrated axial rings between the two cores than the other group. Regarding the visibility graph analysis there are more highlighted differences; as the SSX proposals seemed to be more visually integrated than the NSSX proposals, the latter were more fragmented and clustered. The spatial and visual properties rendered in figures 29, 30, and 33 may suggest that SSX proposals are more likely to encourage dynamic movement than the other occupational-like proposals of the NSSX group.

Discussion

In general there were some differences detected between the two groups of architects, considering the circumstances in which the experiments were conducted. The strategic PDI model identified the cyclic nature of all the design processes, with no remarkable differences between architects. The summarized processes structure comprises one loop in all design tasks between production and induction, and another loop between production and induction. In the detailed model of protocol analysis, the design processes were mainly dependent on a balance between the functional and perceptual actions. Compared to them the conceptual and physical actions were less apparent but more critical in terms of their connective nature with previous experiences and following conjectures. However, the short time of the design tasks made by SSX

group may promote for the idea that this group was more confident in solving the design problem than the NSSX group. The latter suffered generally from intensely erratic trends in terms of cognitive actions, and were more focused on the perceptual actions at the end of their processes. This might indicate that the SSX group was more confident in decision making, although it is not really possible to know if both groups were expressing their thoughts plainly; however the method used in semantic recording during the design tasks is still probably the best method in making these thoughts explicit during design actions. In spite of the difference in the architectural backgrounds all of the participants seemed to care to some extent about the genotype-related considerations more than the phenotype-related ones, despite a remarkable variety in phenotype considerations in the NSSX group compared with the other group. This may relate to the fact that the NSSX group were influenced by their different kinds of architectural backgrounds.

The verbal transcripts (appendix 2) and their summarizing diagrams in figures (3 to 14) highlight some similarities between the different design approaches. This is apparent to some extent in the reactions of the designers when faced with the design problem; most of them stressed their own vision for an open plan layout against the normative brief demands for individual spaces. Some of the architects designed opaque partitions which limited the visual qualities of space; (*i.e.* the proposals made by KS, AB, LC and JG in figure 23). Apart from KS who was more interested in satisfying lighting requirements, all the architects started their designs by understanding the organizational structure, sometimes emphasizing and sometimes avoiding the hierarchical structure of the organization, and this was rendered in their spatial solutions. The knowledge of Space Syntax emerged in the verbal comments of the SSX group, especially in PE's proposal who avoided creating large enclosed spaces in order not to 'block potential movement'. CE and LM talked about the directors being usually deep in the spatial structure. Similar comments came up in the NSSX group without their knowing the exact mathematical definitions that their expressions may imply, such as the segregation of directors in boxes that OO stressed in his design, or the visual experience of space that LC and AB have repeatedly referred to in their designs.

The synchronic analysis of the spatial design outcomes emphasized the idea that the SSX proposals were inclined to minimize depth and promote democratic atmospheres in the working environments, with equal lines of sight and well integrated spaces for teams working together. Thus providing for them flexible movement by locating them in intelligible spaces interconnected with rings of convex spaces as well as integrated axial rings between the cores.

The NSSX group has produced less interconnected rings if any, and more tree-like spaces organizing the space hierarchically from the entrances to the corridors. They then distributed them -in most of the cases- to clustered group spaces, which are less integrated visually and less appropriate compared with the ideal organizational structure for design offices proposed by Duffy. The latter being more reflected in the SSX proposals.

It is also important to highlight some individual differences. For example, LM (from the SSX group) and KS (from the NSSX group) both processed less values of cognitive actions in time and also achieved the least intelligible solutions. It was further noticed that PE who had a practical non-academic knowledge of Space Syntax, his status was in-between the two groups of architects in terms of the detailed model of phenotype-related actions. He took a variety of phenotype-related evaluative considerations, compared to the SSX group, and this may relate to his practical experience in Space Syntax. Another remarkable subject is CR who achieved the highest values of all, being the most experienced with Space Syntax methodology. In terms of the process analysis, CR had more frequent exchange between the two functional and perceptual values and the strategic model shows cyclic behaviour in her design decisions between production and deduction, as well as induction and production. In other words she was involved in a process of continuous evaluation in parallel with her design actions.

Chapter 6.0

Conclusion

The analysis of strategic and cognitive design processes, as well as the evaluations of spatial and visual qualities and quantities presented here, support Hillier's hypothesis that Space Syntax does influence positively architects during their design processes and outcomes through rendering the non-discursive discursive of architecture. Such a result was only possible through careful consideration of the circumstances of the design tasks, which were solved intuitively, and the method in which the experiments were exposed to models preparing them for evaluation and comparative reading. What architects think about and talk about plainly in the SSX group, is thought about and talked about in a more unconscious implicit way in the NSSX group (Appendix 2). The explicit knowledge of the SSX group about the generic function of space and the spatial configurations might have helped them in being more confident in their design processes, and allowed them to provide more efficient solutions. This is more obvious in the performances of CR, BC, and CE. Both groups considered the same issues of making spaces accessible and visually connected and therefore their outcomes reflect the optimization process they have gone through in order to approach an efficient solution. However, in the NSSX group there were more worries about privacy issues and confidentiality, resulting in more clustered-like designs. There were also more worries in their case about lighting issues, fire regulations, and other technical requirements. There are regularities in the designers considerations in general, as all of them seemed to think about genotype-related problems more than phenotype-related ones, but overall the design solutions reflect more integrated spatial structures and better qualities of space in the SSX proposals than in the NSSX designs. This result is very interesting because it may indicate to the idea that by exposing the spatial configurations of space to an explicit model of description it could be possible to enhance the design processes and outcomes of architects. This knowledge of space syntax, if employed in the evaluative process of reasoning during design, can leave a positive impact on the design solutions and reduce the time required for problem solving.

It is important to emphasize that this result is only viable in terms of generic function considerations, as the experiment's solutions were merely evaluated in terms of genotype-related structure. A phenotype-related evaluation would have required more time than the research allows because of the complexity and variability of phenotype considerations, and because so far there is no comprehensive integrated model to read the language of phenotype evaluation. This might go back to the fact that the evaluative tools which shape the phenotype can have a

tendency to conflict between each other. In other words it is sometimes hard to find a compromise solution which satisfies the different requirements of design. Such cases can happen for example; if the design emphasis is on maximum exposure to natural lighting, and the enhancement of visual qualities in space may contrast with the safety standards of buildings. Issues such as this could be accommodated by extending the current study to include an integrated model of evaluation, and the development of computer-aided applications to enhance design qualities and productivity. It might be also important to present some modifications in the brief and enlarge the population of participants in the upcoming studies in order to obtain more consistent results.

Bibliography:

1. Akin O.(1984), 'An Exploration of the Design Process' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
2. Akin, O. (1986). Psychology of Architectural Design. London, Pion Ltd.
3. Alexander, C. (1964). Notes on the Synthesis of Form, Harvard University Press, Cambridge, MA.
4. Alexander, C. (1977). A pattern Language: Towns, Buildings, Construction, Oxford University Press, New York.
5. Alexander C. and Poyner B.(1984), 'The Atoms of Environmental Structure' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
6. Christopher Jones J. (1981), design methods: seeds of human futures, John Wiley and Sons, New York and Chichester.
7. Coyne, R. (1988), Logic Models of Design, Pitman, London
8. Hillier B., Musgrove J., and O'Sullivan P.(1984), 'Knowledge and Design' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
9. Duffy F, (1974)a, Office design and organizations: 1. theoretical basis, Environment and Planning, B 1, 105-118
10. Duffy F. (1974)b, Office design and organizations: 2. the testing of a hypothetical model, Environment and Planning B 1, 217-235
11. Duffy, F. (1974)c, Office Interiors and Organizations: a Comparative Study of the Relation between Organizational Structure and the Use of Interior Space in Sixteen Organizations PhD thesis, Princeton University, Princeton NJ
12. Durkheim, E. (1964), The Division of Labour in Society, Free Press.
13. Hillier, B. and Hanson, J. (1984). The social logic of space, Cambridge University Press, Cambridge.
14. Hillier, B. and Leaman, A., January (1974), How is Design Possible?
15. Hillier, B. (1996). Space is The Machine, Cambridge University Press, Cambridge.
16. Hillier, B. (1998). A Note on The Intuiting of Form: Three Issues in The Theory of Design, Environment and Planning B: Planning and Design anniversary issue, pages 37 – 40.
17. Goldschmidt, G. (1995), The designer as a team of one, Design Studies Vol 16 No 2 April 1995
18. Kanekar A. (2001), Metaphor in Morphic Language, Proceedings, 3rd International Space Syntax Symposium Atlanta 2001.
19. Kavakli M., Suwa M., Gero J. and Purcell T. (2006). Sketching Interpretation in Novice and Expert Designers. Key Centre of Design Computing and Cognition Department of Architectural and Design Science
20. University of Sydney NSW 2006 Australia.
21. Lakoff, G. and Johnson, M. (1999). Philosophy In The Flesh: The embodied Mind and its Challenge to Western Thought.
22. Lawson B. (1984), 'Cognitive Strategies in Architectural Design' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
1. Lawson, B. (1997), How Designers Think: The Design Process Demystified. Architectural Press, Oxford.
2. Lawson, B. (2001). The Language of Space. Architectural Press, Oxford.
3. Levin P. H. (1984), 'Decision-Making in Urban Design' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
4. Luckman J.(1984), 'An Approach to The Management of Design' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
5. March L. (1984), 'The Logic of Design' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
6. Markus, T. A., (1993), Buildings & power: freedom and control in the origin of modern building types, London: Routledge.
7. Rosenman M. and Gero J. (1999). Evolving Designs by Generating Useful Complex Gene Structures. In Peter Bentley edition Evolutionary design by Computers, San Francisco: Morgan Kaufmann.
8. Schön, DA: 1983, The Reflective Practitioner: How Professionals Think in Action, Harper Collins, New York.
9. Shannon, C. E., (1948). A mathematical theory of communication. Bell Syst.Tech. J.
10. Shpuza, E. (2006), Floorplate Shapes and Office Layouts: A Model of the Effect of Floorplate Shape on Circulation Integration, Doctorate dissertation in Architecture, Georgia Institute of Technology.
11. Simon H. A.(1984), 'The Structure of Ill-structured Problems' In N. Cross ed. (1984).Developments in Design Methodology, Wiley, Chichester.
12. Snodgrass A. and Coyne R. (1997) Is Designing Hermeneutical? Architectural Theory Review, Journal of the Department of Architecture, The University of Sydney, Vol. 1, No. 1, pp 65-97.

13. Suwa, M., & Tversky, B. (1997). What architects and students perceive in their sketches: A protocol analysis. *Design Studies*, 18, 385-403.
14. Suwa, M., & Tversky, B. (2001a). How do designers shift their focus of attention in their own sketches? In Anderson, M., Meyer, B., & Olivier, P. (Eds.), *Diagrammatic Reasoning and Representation*. Pp. 241-260. Berlin: Springer.
15. Suwa M., Purcell T. and Gero J., (1998), Macroscopic analysis of design processes based on a scheme for coding designers' cognitive actions, *Design Studies* Vol 19 No 4 October 1998.
16. Turner, A, Doxa, M, O'Sullivan, D, Penn, A, 2001, "From Isovists to Visibility graphs: a methodology for the analysis of architectural space" *Environment and Planning B: Planning and Design* 28(1) 103–121
17. Tversky B. (2004). Narratives of Space, Time, and Life. *Mind and Language*, 19, 380-392.

Alasdair Turner, "UCL Depthmap: Spatial Network Analysis Software", version 6.0818b (London: University College London, VR Centre of the Built Environment, 2006)

<http://www.spacesyntax.net/symposia/index.htm>

Appendices

Appendix 1:

The description of the existing layout which was used in the design tasks:

Client Weyerhaeuser Company

Building name / location: Tacoma, WA shell

Architects / year: Skidmore, Owings & Merrill / 1974

Layout architects / year: Sidney Rodgers Associates / 1974

Floor area in sq ft - gross | net 45,950 | 41,750

Source (Pile, 1976), (Canty, 1977)

The floor plate has a rectangular form, and its proportions are 438 ft by 195 ft (figure 1). It contains two cores near two opposite corners; each core is composed of three blocks, which contain the lifts and some risers. The structural system is reflected in two grids of columns; which are set in two different angles; one is orthogonal and has 15 ft spacing, and the other has a 30 degrees angle and has a 20 ft span. The existing open-plan layout is one of the largest projects in the US to employ the landscape concept.

Appendix 2:

Transcripts of Design tasks:

NSSX group:

AH transcript:

Unit is working unit; I have just to allocate all these things, these spaces inside this layout, ok. Here you have two service areas with small kitchen toilets and lounge, I can use some of these areas for that, and then the other thing that you have here is, this a, it is an office, it is an architect office; and in architects office you have, you have scale, perfect. I am just thinking about the two services that I am going to use the one you have, because I guess here you already have the lifts and stairs and everything, so these are the connectors of the building, so I want to use these two ones.

Then I am just trying to think about the rooms that you are asking me, we have 2 meeting rooms so I am just thinking where to put these two rooms, and I guess what I want I am going to do first, I want to just write here, just to make general layout, so have these 2 service areas, then meeting areas I think a good position for them, although you have all those pillars I don't like it so much; but I think a good place for these meeting rooms is in this place, I am just trying to divide this, so meeting rooms, service rooms.

Then you have the head office which I think I am going just to chose one of this two final I think I am going to use also, here in some place here, near the meeting rooms maybe one of the head offices just lets say head office; then waiting area with small exhibition I think a good position for that should be here, because you have this. I think, because it is an architectural office it is good to show how the people work, I am just thinking that these area huge big area are clean plan; I don't know how to say this, open plan, so I want to put all of these, management office, telecommunication, - no telecommunication maybe not - 3 consultants, five project directors each with 2 associates and a design team, 2 IT offices, 2 technical studies unit, one construction expertise.

So I think I am going to divide this in, these ones, for sure the five project directors with 2 associates and one design team I think it is going to be in this area, then I don't know head office, yeah, then three consultants, management office, 2 meeting rooms, waiting area with small exhibition, small exhibition maybe in this area. I am just thinking that maybe, maybe, the 2 IT offices I am going to put in this area, ok, 2 IT offices, and then we have 2 technical studies units, it is quite a lot of space, telecommunication.

I am just thinking also on circulation how to communicate this two areas, so for this reason what I am thinking is maybe a good option is to have waiting area with small exhibition maybe on this part of the office, so when you arrive. I am just thinking that this is going to be the main entrance, and this is going to be the second entrance of the building, so maybe here you will have the waiting area, and from this waiting area you can move to this another point maybe there ok just in the middle. So I want to divide this into I don't know, it is an open plan, so from this corridor you can go to the offices, and then here obviously you are going to have something like, another hole from where you can go from the meeting room directly to the toilets and to the rest of the technician that is going to be at the end.

And here I am going to put the three consultants, although the 3 consultants are part of, maybe the telecommunication offices, but the thing is I don't know which is the, if I am designing obviously I need to know. I am going to write, obviously, you have the head and then you have the services or not services but at the end you have, it I like in a tree you have different categories in this office, and there are people who need to be more connected with the head of the department, because at the end I guess the design team if they had any request they have to talk with the associates or maybe the director and the director is going to be with the head of the office; so in someway these people, that gives you an idea which is the spine of the office, so before I need to know that before I start to design.

This is what I should do, put in order the circulation of the offices, I think now what I should do now as I just told you these two are my services. I am going just to decide which one of these two is going to be my entrance' I am going to say, ok, this one. Then I am going to have a corridor in the middle of these two; also because I am trying to have the desk the hard desk in this area, where you can have more light or sun or everything, so I guess this point is the one that has less light - natural light - so for this reason I

am doing also this. And I think it is easier just to go from this corridor, so if you are in any part of this place you just take the main corridor this is what I think I should do.

And then according to this tree that I have shown you before I think I will start to design the offices according to which is the relation between the three consultants with the head of the office or the 3 consultants with the design teams. I have the impression that obviously the 3 consultants are going to be in a day by day, they are going to have a relationship more close with the design teams than with the head of the office, but also I have the impression that the five project directors are going to have in some way some relation with the head of the office.

The two meeting rooms, I am designing two meeting rooms in this areas, one near the head of the office which I think it will be the main meeting or an external room where you can receive people from outside and show your projects, and the other one is going to be the internal meeting room for the architects for the people there they can have informal meetings day by day; but this one is more where you can book, someone is coming from the government and is gonna show some project and is gonna show there near to the waiting area and exhibition area, which also could be part of this meeting room, you know what I mean.

As you can see also, what I am trying to do is to put all the circulation in, I think because if you see here, you have some of the offices here, something here, and looks like you have the lift there, and the lift there, and also some lift there that I think; so I think what I should do is to try to use this as a circulation - main circulation - maybe something like that, I am not sure about that, but, between this, so this maybe is going to be my main circulation area. Although this is an open plan obviously you have secondary circulation area.

But I think just to start, this is going to be my main proposal for this, this is going to be the main number 1 , 2, 3 this is going to be open , 100% open, this is going to be 70% open, this is going to be 70% open also, when I say open I mean I want to have internal divisions. So what I can do I can put here technicians and people who need certain, for example the 2 IT offices - I think they will have plenty of computers some kind of lockers and this kind of things - so maybe they need a space something here at the end that is close; you don't need light because obviously directly with an internet connection cables and this kind of things. What else, the technician, one construction expertise unit, when you say unit this is one person or this is a group of people, for example one construction expertise unit, 4 management offices, it means one person per office, in a design team how many people?

What else, I think this is, yeah, and then in term of how I am going to allocate the computers and the hot desks is going to be directly related to which is the orientation - which could sound strange - but obviously if this is south - here in England - I am going to have the sun in this position, I'll consider the north is to the upper level, so in this case if you see you are not going to have direct sun light on this façade so maybe what you can do here, maybe computer facing - maybe you have to study this kind of things- the windows but in this case when you have sun directly to this façade, obviously you cant put computer, because you'll have all the reflection; so obviously this will obviously tell me something about the internal circulation that I am going to do, and maybe I am going to have this is the first one A, and then I am going to have something like B which is the second the ones that connect to more specific, and maybe I am going to have between this desk and the other desk, I will have a third one which is less important, something like that.

LC transcript:

Head office, Private secretary, waiting area 3 meeting rooms, manage office, telecom office, 3 consultants, 5 project director, + 2 associates each, and a design teams: do you mean just under point which ever it is, 5 project director ... when you say a design team each of the project directors has one team or one big project team for the five project directors. Each director has his own project team.

2 ... offices, 2 technical studies unites. A 2 technical a study unites are they just a group of people or just spaces you want assigned. So these are people.

One construction expertise unite I take that is the same thing people as well just for that. 2 service areas, small kitchen, toilets, lounge. Ok

Anything about this particular architect's office, I mean the kind of questions I'd ask is... First thing I would ask how much they want to spend. It is ok all is flexible.

Alright it is more about the culture of the architect's practice; it is I mean the idea that they have a head office with it private secretary suggests there might be hierarchal kind of company. I mean are they corporate do they employ lots of young people. Those are the sort of questions I want to know.

I mean it makes it easy but I am going to invent constraint then, because what I would really want to know is this brief almost suggests that they have already had an architect involved or had a management consultant, god forbade, involved and this is what they want to put together on the floor plan and just sort of arrange spaces. But if this is about them wanting to have a culture that they want he building and it's designed to foster..., if they want to be successful they got to make their people work productively and the rest of it, and it is not just about meeting technical restraints. You know really to understand the brief you got to understand the organization. To have a brief then to develop it, and to give them something that they buy into, and they understand why it is the way it is. Otherwise it is sort of, you know, it feels like putting the desks in that pattern and/or that other pattern; and then the first thing I will do is rearrange it. So you know those would be the kinds of questions, if it were a real project.

I will take into consideration long before thinking about (net the floor) because of all these rooms and things that they want to put in the space. Don't make any assumption about this floor plan here; what sort of scale are we talking about. 30 meters across, is this an actual floor plan or this one...? So there are walls, top and bottom, and glazing. All glazed, gosh, I was going to say that is good, otherwise it would be very deep floor plan, glazed all the way around, great; ok.

So these are service corridors which are already there, I take that the sort of rooms around the service corridors are fixed. Any assignments for them already or they are just there?

So the dots are the, they are unusual column grid if it is a column grid. It is a column grid! Gosh. Right Where is the main entrance, is it on the ground floor on the front of the building ... Right.

Well, if it so that they can come from either one of the main corridors that makes handling visitors awkward, because you really in an organization, well I mean it has been my experience working for a corporate company is that you will not want point of contact. You want your visitor to be take care of, and not have to wait and be seen by the right person immediately, whether they are early on time or late. So your shop front for your corporate organization is your front door and you should only have one. And then when you get repeat business and the same person comes again they are seen by the same person and are treated in the same way then get to feel that they have been handled, because they paying for this thing to happen so it is important that they are looked after. And that is architecture as a practice is a service industry it is not an Avangrade show

So my first thought would be they should rationalize their entry to one place. So of these to corridors they need, somehow, to manage the vertical circulation so at the bottom of the sky scraper all visitors are directed to one entrance. That would be my first suggestion. And that would fix I would suggest.

Reception is not really held up here is it? Sure I saw reception somewhere.

Head office room... Waiting area with small exhibition, ok. I'll treat that as meaning reception, point 2. and a client 30 seconds in an organization is the beginning, middle and end of their impression almost no mater what happen afterwards. So that exhibition is to hit them first. If they have to wait they need to be entertained by seeing what their prospective time spend... This organization might yield. And they need

to look good and should be the first thing that they see. So I would say of your 2 entrances here a and b gear the people to come through from a and see ... meet them in comfortable chair surrounded by some eye candy, and that where you put the host, receptionist I always thought is a terrible job description to give to somebody and they are hosts they are there to look after people as they come in, so that would be the first face to face port of call I would say. And if it is possible to organize the flow so that they get view or partial view of the world inside so it is not kind of sterile reception. Where they have no idea what is happening beyond it, and but not actually so they can walk in that direction. That would probably be by second thought.

And how I would like to see or organize the circulation for b, entrance b, is that is the way people work here and staff enter, and only that way. And that is not to domain any one; just to make your VIP really a VIP. So I would say that separation circulation at the base of this sky scraper you have a staff entrance and you have a customer entrance, or a consultant entrance.

The idea of having a head office with its private secretary is a ... to me but if that is what they want what kind of organization are you we dealing with. I worked for a corporate company and everyone sat at, there were no desk assignments, everyone's desk with the managing director or chairman or some one who joins the company from collage is the same. So the same kind of computer you have the same desk; you have the same chair end of story. It is not quit egalitarian as it sounds in practice, but visually for people coming in I think it is very important that the status of people working environment is equal, it may not state where they are in the company in terms of seniority, but the access to the tools they need to do their job should be the same. That is not to say that everyone is doing the same job. So the idea of having a head office actually I find, again I am not designing a company here I am just designing the space they are using. I will try to engineer it so that they would have equal lines of sight to everyone in the space, and equal line of sight to you as an individual from everyone else. And also equal lines of access, so you can walk there is no real distinction between a separated part of the company through potting a big cabin through the space, because cabins end up not being crossed if they are big enough. And so people cannot have informal conversations across desks like now. For instant, I am not saying this is an informal, but having lines of sight is important in that regard to promote communication where it might not exist.

I could tell you stories about a company that had a floor plane that is not that dissimilar from this, although it was a race track, so you had all the cores in the central of the building; it is actually not that different from this plane. And there was a group working on one team on the other side of the core and a group working on similar part of the project but effectively for a different client on the other side. And the job was discontinued; the client said we do not want to do it anymore. But they only told one of the teams they went for 3 months with the other team not realising that the job was not on anymore, and they where within 15 meters of each other. They never talked to each other, this is before email so it kind of lines of sight, lines of being able to walk up to someone's desk are lines of communications, so obvious though it sounds and it sounds obvious. I will try to organise the desks in such a way where you could promote that. So if you want to have 5 teams I would not make hierarchy about the relationship of the directors, their 2 associates and their design team built around them. And I would almost loosely say here is a zone of one team, here is zone of another team. These are quite big zones aren't they.

What is the column spacing? 5 meters, on grid, it is about 5 meters The bitch between columns looks about 5 meters... still quite big isn't it? Gosh it is a big space.

My god it is starting to look like a wiring plane!!

Very very roughly, meetings of they are successful people almost already know what they want to and need to say, and so the idea that meeting space is enclosed does not necessarily have views out, and is not necessarily something that people are looking in to, I do not think detract from usefulness of the desire of the meeting spaces. So I would actually tend to put in the middle of the building, preserving views out if there are views out and if it is a sky scraper as you say this building is one would expect that there where ..., I have the idea that the design teams and the day to day working spaces is having, kind of being on the periphery and having views out on the preferably away from the deep plane. And the meeting areas are probably drown very very large here.

Team meeting rooms, gosh I think I made baskets ball court out of them. 10 meters!! .. may be it needs to be..., so I guess meeting room 1 unfortunately with a colon in the centre of it ... something like that.

Meeting room 1, what you do not want is to have any dividing lines in the meeting room, like drawing battle lines. Meeting room 2 I would say something like that. Is it ok that they are inward looking? Because you hoping that the people all looking at each other and out on the window in disgust about what the people are saying.

Now interestingly there is almost a politics about who sits where in a meeting room. And the ordering in which people decide to sit down as they come in, I always thought this is quite amusing to watch. You know when you arrive early you sort of looking at the company hierarchy. So you know who is the big person sitting... "Ah I am going to set there"... You know... "I am going to be fussy about who I am going to sit next to" and. I cannot really; I never really thought you could engineer ways around that. The only thing that I have notices: it is a meeting room where you able to come in from 2 different sides to the room at the same time, does tend to shake that up, especially if the entrances are at the opposite sides of the room. Once I worked in a place which was like this; it was not particularly a large meeting room, but you do notice this sort of jostling for, and people obviously eyeing up the room to see who they going to sit next to, who they do not want to sit next to.

So the idea of not being able to see into the meeting room and having to make that decision as you open the door, I think is something not necessarily, from that you can design with a conscious end intend. I quit like to see if there is any empirical studies about that kind of how... where you choose to sit and why? So having 2 entrances into the meeting room, those are enormous doors sorry!! It might very well be double doors. That would be the sort of logic behind that I would suggest. Anyway 2 meeting rooms, vast meeting rooms, I do not know they do not sort specify, I would say sort of 10 meters by 10 meters. Gosh, that would be quit big; it would be bigger than this room I think. No actually this probably, may be slightly bigger. It does not say how big this company is? Anyway; it is all right so... like the idea of that looking in. And really the project space is looking out I think this is way generous the way I drawn this plane, so I would need to think about those a bit longer. May be that one is not a bit like that it is a bit like that. But the main frost of the logic being that you have views out, but you also have views between teams, this is like team 1, team 2, 3, 4, 5, something like that.

Yes 2 technical studies unites, this corporate office that I was describing which has got the race track, they were such people and to go and talk to them you had to go down to the basement, because they lived in the basement with all their hundreds of samples. And defiantly I would not want to see this ever happen again. So I would put them almost like a kind of recourse, where they are almost seen by everyone if possible line of sightwise, which is a little bit difficult to do in this plane. I guess it is slightly arbitrary I would tend to group them so you got your technical studies people over here. That is pretty big space may be technical studies... I suppose the consideration I would have is that, thinking about that, is actually you want to separate them; I mean one idea is that may be you put them on the other side of the floor plate. Technical studies one and TS2 are actually separated.

The other thing about IT offices, IT support, the idea of them being centralised, I guess there will be one dimension to this where the IT offices would probably be near the services stake because I guess they will be hooked in to the infrastructure through the whole of the rest of building. So it would make for since to them to be near one or the other of the rises, I am not sure which is a rising here, I am assuming it is the one through the cross their, the one you cannot occupy . So I suppose depending upon which is which; which is the IT service riser for the rest of the building. You would obviously want to locate your telecommunication office. Not quite sure what a telecommunication office is. So the two IT office I am assuming they are things like server room, and sort of technical support and full of manuals. So I guess on one level you only need certain amount of access to them. If they are staffed by people who are available and walking around the building again this depends on the culture of the company, how they view these. I tend to not to try and centralise them, if there is one support role, i.e. helping people with PCs deployed in the office, and a different support role which is looking after the network, dealing with back up and dealing with, if it is an architect office I am assuming that they will do all their own plotting, which is not a trivial as the logistics. Unless it is completely paper free office which always struggle with the idea but this has nothing to do with circulation, or is it, it all depends on where you put the plotter if you are not a paperless office.

Do the 2 IT offices include printing? Printing is not accounted for here, are you assuming this is a paper free office? ... They will take care of it but what about the printer? I mean it is usually a non trivial thing designers want to review drawings that they can look at. And actually cutting a path to the plotter, I

remember the office, they were, all the plotters where in one location, also they had like photocopier and it was an excuse to go and walk around the office, you go and print something to the printer that was as far away from the desk as possible just so to get up “ah I will go to the printer over there”, and go wander around, say hey to people who you like talking to and then get your bit of paper and go back to your desk. Lines of sight to that and efficient circulation were not trivial. It was on a different floor you had to go to a different part of the building to pick up your print. So depending upon what the teams where like and how the office operated and what kind of policy they had towards paper. Some offices try to be completely paper-free, in which case, obviously I do not know how an architect office thinks they’re going to be paper-free, anyway. Cutting a path to the plotter it ought to be quit a centralized place. So I guess your circulation routs would want to have a zone where you can get to your plotter. So may be printing happens in one place, and there is an obvious routing to that one place from anywhere in the building. So the IT I guess one would have a tendency to put them in two different places, otherwise they will just sit there all day and talk to each other you have to be careful. And logistically one tide to the infrastructure of the building and the other one is a bit more flexible.

Well if you going to have a head office with its own private secretary you better make it, if the chairman is going to be happy in the most prestigious location with the best view and if you really want your company to fail and with the least amount of access from absolutely everybody other than the VIPs so you put it here. Corners of sky scrapers are always the bullet end place to be, so here is your head office, vast space so the chairman can play golf, he can have his little potting green from that corner. His secretary gets this little bit here, that is for the secretary. I am being facetious. That is how to make a company alienate its work force, and how chairman so rubbish like. I know one make this office paperless that would be easy. No, what would you really do? Apart from the idea of abolishing the head office, I guess that is actually what you do put it in the corner of the building. The VIPs can go straight there, and I would even suggest that head office sacrifice a bit of potting green to have a reception area that is personally hosted by the private secretary; and a clear line of sight between that secretary and the host for the company. Probably more detail than one could go into on the plan, but that would be the rational for that I think.

I have always felt that an office being seen to not be doing something at any particular time by guests is a rely bad idea, so lines of sight past the host to anything that looks like you having to do much fun is probably not great for your profile. But it is important that your staff do feel like have a place to hide away a little bit even, this egalitarian open plan office that I am trying to suggest this architect office too. The 2 service areas, obviously from a services point of view again they need to be hooked in fairly close to the vertical services in the building; so it is daft to take the WC and the kitchen to far away from the 2 cores. So I guess you put the services, kitchenette, and WCs here in some arrangements, and you put the other ones here behind where the VIPs can see more important to do that then to look after the printing in being in centralised a place that is flexible so long it is centralised, whereas routing service too far away from the cores is not very economic usually. So I would say loose kitchenette there serving this side, loose kitchenette there serving that side. And that might make natural break out area as the lounge, one would need to be careful about VIPs seeing that though, especially on their way to the head office, or in fact if they waiting in the reception. And I think the idea of the lounge looking out of the building, especially at the corner of a sky scraper is not a trivial consideration. That is a vast lounge it is almost 10 meter by 10 meters. I do not know it could be big company it does not say how many people they are. If they are big enough to support 2 IT offices, 2 technical studies unites, and one construction expertise unite, I would not expect them to be particularly small, 5 project directors 2 associates each so that is 10 associates, it could be 70-100 people. Yeah so putting the lounge too far away from the kitchen is daft, so may be that needs to be moved a little bit, may be the lounge needs to be a little bit closer.

Preserving that these are out, it would almost seems to make sense if possible, I know I am not a big fan of narrow oblong spaces. I do not want these services to look a lot bigger than, yeah that looks vast actually. But defiantly would want to preserve all the logistical connections between there and there, and the same goes for this side here.

There is also a strange bit of politics I think about who is in the kitchenette, you know who you do not want to stand next to the water cooler, who you do not want to, if they are lunching there as well, actually it does not say ..., but some people make their own lunches and put their stuff in the fridge, so similar to the idea your circulation rout and lines of visibility for judging where to do your printing - not judging –

where to collect your printing, similar idea about who is in the kitchenette. And I think it would probably promote more open use if you could see into the kitchenette quite clearly. And I do not mean that from a hierarchal point of view it the manger who always being able to see who is taking the most coffee breaks, but just to see who is around, which I think is quite social for a company. So the idea of that, and it might be that there would be a focus of both sets of teams being able to do that in different ways, obviously separate from the privacy of the WC area, yeah.

Telecommunications offices are for administration you said? I would probably revise that one thinking about it. I would probably significantly revise that idea. Because, because usually when someone comes and visits whilst on one hand it might be a personal call out they more than likely coming for a meeting. So actually lines of sight and your route from reception probably should be the most directly to the meeting room, if you are not going to see the person who is sitting at the head office. So actually, no I was not ... in the first time was I? You probably would want to put your meeting room here actually. Yeah, I guess you have got your VIP here, they come in and I think that actually you would end up putting some of the management offices there, I think the idea of the WC/kitchenette thing may be the WC here and the kitchenette there, and still possible the idea of the lounge there, I think the opposite on the other side of the building. You try and put your, that is going to be a vast lounge isn't it? These are not walls really that I am drawing these are just zones, just so. So I do not know is that, I guess she more or less... area here. That is actually vast isn't it; maybe it would be more realistic...

Same sort of story but the... clear witch is... I mean I am taking it these are the lifts but it does really be too explicit here about whether it is a vertical dry or a wet riser. So I will make an assumption that the WC have to be there because that looks like a lift, it looks like a goods lift, not sure, not enough info. Kitchenette/WC thing was not a bad idea having that there. Lounges!! So the reception idea is still holds which would be here, and so the exhibition area sort of entrance hosts, exhibition area, and then I will start putting the teams along here. So for a loosely bounded, three teams on that side, to other teams on that side. Gosh that does not look there is enough room it needs to be bigger. 2 teams, 3 teams, 2 teams!!!

Same idea about the head office bit. The core of the building, VIP waiting area, and I guess, yeah, actually thinking about it again, yeah, I guess that, it is ok, so that would be the main reception, this would be the waiting area and the exhibition, and so there will be a natural barrier here to the rest of the space but it might be you could still see, while you waiting, the exhibition or you worker bees in the three of the 5 teams. And then the other host, it would be very important that the guest in any way confused about which way to go. So it might be that there is a route that they can get taken blindly, so they can only see one main reception then they can be taken discreetly of to the VIP waiting area and head office. And it might be that the private secretary is kind of adjunct to this so there is a little VIP wait and then private secretary. And I would say that these become admin areas, sorry telecommunication offices, 1, 2. Immediately adjacent to that, and then the lounge area still in the corner of the building, I mean I might get the scale of it, it is very very wrong, I am suggesting that. I always see corners of the building, especially sky scrapers, is where you would like to be in, sort of there is obviously a link there between that and the kitchen. And I think the same idea if possible at the other corner of the building, linked to the kitchen at least by line of sight if not if not actually some.

So team 1, 2, 3, 4, 5. Meeting spaces 1, 2. So there is a straight route from the VIP waiting and all the regular waiting to the meeting room. So you do not have to think too far that way, and then you just draw people form the teams as needed to the meeting spaces. Meeting spaces kind of in the core of the building and away from, so there is the idea that they are inward looking. So these might actually be real walls. On another reflection you would want to centralise the IT the idea of breaking out of his daft, because if it is not a support role out in the floor space, then probably it is best if it is centralised here all the recourses in one place. So you probably would depend on where there is dependency of the building for the vertical cabling if there is cabling, if it is not all wired whatever. Then centralizing the IT despite the fact that the 2 offices, which I would have thought meant that you have them in 2 parts of the building, centralizing that in one place seems to make sense.

And it might be actually that thinking behind the expertise that you do centralise it, because you are kind of going there for little consultation. It is may be the idea that there is a logic of going to the central core of recourse, sort of specially articulated. I would suggest that this were open, and these were closed. Quit apart from the fact that if you did close these the only way for these to be fairly dreary naturally

artificially lit corridors, I mean there will be some artificial lighting doubtless, anyway but something along that route.

2 design teams 2 IT Offices 2 tech offices, so all kind of expertise, so your construction, your Technical and your consultants might actually be a very different animal. And depending on what they were about you might want, depending on whether they were scientific teams or not, you might want to block them in a group here and then may be with the same logic block them in a group in another part of the building, depending on how many where there, 3 consultants and those are pretty vast rooms. So I do not know may be something like that, depending on what is they are about. I mean are they attached to the teams are they consultant to the head office, so they consult not clear what, or they are sort of hot disking areas so people from out side the company can come in for 2 days a week or. I ll suggest or assume, it is a dangerous thing, that they are related to the teams so they are supporting the teams.

And that leaves the management offices, which might very will be blocked here with the IT, although the logic suggests that actually they are much more closely aliened to administration in head office. So it might be organisationally wiser that they are here.

Special person arrives, reception take him to meeting room, meeting room supported by design teams. Internally the logic is that design teams supported by meeting rooms as they are needed from either side of the space. Make most use of natural light where you need it; which where you spend most of the time. Not be so fuzzy about either external view or natural light by intensive meetings where you should be looking at each other and not windows. Logic of the VIP being taken straight to the head office, head office supported by Administration and private secretary, both areas offering an option, or both kind of design team and practice administration supported by lounges at either end of the building. Lounges supported by the logic of being near the WCs and kitchenette, and offering the best kind of views out.

AB transcript:

I think the brief is very clear, and it somehow concludes what normally architects in this age of information technology needs, and their architectural firms; but I believe you need some specification regarding the areas, and how much area you need for each function, because this will indicate how many persons will be using each space, at the same time, how this will affect the future of this firm, because you are not mentioning anything regarding the future use of the space, this is my note for the brief.

On the other hand there is no clear boundary for the design outlook, or for the design position. There is no strategic layout for the main entrance, for the relationship between the office and the outside, the neighbourhood, the relationship between the vertical spaces in the same building, is it alone? Is it inside a city or inside a village?, where is the place, because this will affect the type, or the design itself, (LOOKING AT THE LAYOUT), now it is much better.

So regarding the office plan layout, it is a rectangular shape, two main cores, a lot of columns, I have two main elevations left and right, I am not quite sure about this area here, is it just for the shape of the building from outside,? Or is it not? What about this columns here, is there any neighbourhoods here, can I open the side, can I have open views, I need like to think about this things, regarding the inside. There is a clear network for the columns, which will affect the divisions of this functions, but I need to understand first how can I reach the functions according to the main points which will affect the circulation around the cores; and how this two cores will be working together, because I am designing something for one team or for one firm, this is in general the first impression about what I can see now.

Now I guess I need to study first the areas, because I believe that this is about 30 meters width and maybe 90 or 80 length for the space - I wish I can know the height of the space - because I need to understand if I can design this space as a multilevel space, ok I will consider it as a flat one floor. I think according to the new theory for the working environments I guess it will be great if I can design an open space for the work, because this will create a friendly environment for the architects, and this will affect the impression for any client who will be visiting the office; because if I am a client and I need to see what is happening inside the office, this will be great to have partitions in an area or another, but I can be in touch visually with the people who are working inside, and in the same time I can use the corners or the areas around the cores. To put the functions which don't need this kind of connectivity between the people who are in and the people who are out, or the people who are working in the middle of the space, so I think I need, normally I prefer to draw the outline or the boundary of the plan, because I can feel the dimensions, because now the area is almost, 30 meters multiplied by 90 so it is 2700 m².

I think I will start designing the major zones which reflect the brief.. Let's say that I need to do that step by step or the design should be step by step, because I have for example zone here, and I have a zone here , a zone here, a zone here - it is quite big - a final zone here, I have this main zones, according to the brief I will look first to the main area where the architects work, because this is the main body of the project, and I think I need to design open space with open views, and with easy access to the lefts and to the toilets and to the rooms of services and this stuff. And this will occupy, waiting area, I think I need first of all this is on the first level, on the second level; I need to find a way to connect this core with this core, then this zone will be divided into two zones c1 and c2, then again I need to go back to the brief and look for the functions because I started to manage the plan. Maybe I will design if I consider the first entrance will be from this area to this area here, this is the main entrance, with a waiting area, and this waiting area will connect with back of house for people who are working here; and this will take me to the head office with a private secretary as you asked; then from this area here or from this boundary I should visually connect with the people who are working here.

It might be a nice idea, to have here an interactive wall so this interactive wall I can use it as an exhibition for the firm for the office, and in the same time it is flexible boundary between the area before and after, because before you get inside the firm you have an impression and after you come inside you have another impression, because this will affect the way of working; because I believe according to my personal experience from my work in the office, we have two personalities before getting inside the office, and after getting inside the office, so I prefer to be more flexible inside this space, to work more relax, in a comfortable way, rather than staying with the secretary or the offices here or the IT or the technicians, or those people who are working in this part or in this zone. So I think, lets say on the same time I need to use some kind of new shapes for the design because I will not forget that I am designing an

office for an architect, and this will affect the shape of the space; because, especially now, architects prefer strange shapes maybe, so maybe I prefer. What I need to design here is another enclosure to have a new shape because the circle in general gives you the impression of going out. So this is the main core here, yeah it is additional wall, which will be on the edge of your current core, so I can use this spaces as storages or something but I will have a new wall or a new boundary; this will give us an impression of continuity in the space, at the same time I can start to understand the first point in the plan that I need to start from here.

Then I need to get inside the working space, from here I need, maybe this will be just a common area, maybe reception or something will be here, so when I get inside I can see this person here, and say hi to you, and he is welcoming me; then he will orient my movement, if I am working in the office I will get in, if I am a visitor I need to go somewhere here to check this with the people working in this area here, and in the same time I can use this wall as an exhibition for me, so it is an open exhibition around the core, if this is like concrete core whatever it is made of, I can put here screens along the way of the core and this will represent the work of the office, so the visitor will enjoy his trip around the core and he can start with point and finish with point a again. So the information or the security people will understand his movement or her movement before giving a decision whether he is a visitor or he is a client, or whatever he wants to do in the office.

Here I guess this will depend on the usage of the space, how many rooms, maybe I can leave something for the future maybe I will use the corner for the head office, with secretary. This will be connected with a meeting room here, this will be connected with special services, or maybe I should think about services not on the edges, I might put them somewhere here, this will be in a later step, but I prefer to go back and think about the working space itself.

Now I believe I will design another circle here around this core, because in this way I can use it as a sculpture element inside the space just to give some modern touch to the working environment, and then I will use the coordinator point of this circle, this one, to divide zones. So I have this zone here, this zone here, this zone here, maybe I will use this corner here, to make it like seating area or relaxing area for the architects who are working, maybe with a connection, good connection to the working environment around there. Then, according to the brief, I need to find five directors each with two associates and a design team, maybe if I can use this circle here, so this line will be here, so this circle will have an edge here, so then I will use. I will divide it into one, two, three, four and five, five main areas, and I have a main corridor, or a main, it is an open space, but still I need a clear circulation path to connect these two cores together; I need to understand the grammar of the shape here, because I have a circle here, I have another circle here, I am trying to create another circle here, I need to think about this circle in the Z axes + how can I connect this shape together visually.

Then I believe because these 2 centres they will affect the shapes of orienting spaces and functions, maybe I need somehow, because if I need to do an offset for this line here, I can still use these two spaces plus I can design this part for competitions or something, yeah it might be a good idea for the office, because clients can get inside the office just to see the way of working. But still I need a private place for competitions, for private meetings or something for the work, I think I will say four teams with four project directors, I will address them here, plus I have a competition working area here for competitions and maybe a private meetings there, and in this case the main corridor it will be here, which actually connects the two centres together. So this is like the main interaction area between these 4 teams, because I believe this team should be alone, yeah I think it is much better.

Maybe I need to design a door or a relationship between this part and the working area; this part is the head office with private secretary, meeting rooms. They might be I guess here, or there, maybe here is fine, meeting rooms, meeting rooms with a connection with this part because I can remove the seating area to this corner, three consultants they will be there, telecommunication offices, I believe they are enough. Also, here 2 technical studies units maybe I can design them close to the core somewhere here and there. One construction expertise unit, yeah I think it should be again in this zone, because I still have this part and this part as a major area; but I feel myself thinking too much about the shapes maybe I need to go back and think about the functions more, and the relationships between functions plus areas, how much area we need for each space?

Lets try, ok, lets go back now, head office with private secretary, waiting area with small exhibition it is here, 2 meeting rooms they are there, management offices between 3 and 4, I can put them here, three consultants I can design them maybe in this part with other functions, five project directors are here, 2 IT offices they should be close to the working area, two service areas with small kitchen, toilet and lounge, yeah, ok. I need to think about how can I create this space and how can I create maybe a branded space, because this firm or this architectural firm, it might be, it depends actually on their type of work or their type of contract they get, they are designing they are, what kinds of design they prefer to do, lets say I need to think about details, maybe more details, to give another value to the space because it is not a space to sit and work, but maybe I need to give extra values to the space, extra values regarding the impression the feelings. But anyway I like to be formalistic a little bit, so regarding now the scale this was 30 so I am using here around 6 meters, so I can use here, so till now I have this shapes, the head office, the head office with its private secretary are here' then and I have a meeting room here in the other part, then maybe a small shape for waiting area here, again the main reception will be there. I need to think about the finishing, the details, materials inside the space, the colours, maybe the colour code which I need to use. The interactive wall is here and another one here just to have somehow concave and convex inside the space, so they are like very straight, very simple, because I need to understand the maximum usage of space; actually I can waste a little bit of space here, just to give the impression that that's a good office, because I am using this space as a gallery, with a lot of glass here, so it is actually it is an open space here visually.

From inside here - as I said - this is the first team here, second third and fourth, it is an open space I need to go back now, and make zoom in to study the way of this architects they will sit inside this working area, but still, maybe I need to go back here - yeah okay - so I can use this space here, so actually this is the main route which connects this core with this core, plus I am still using this spaces as storages and services maybe kitchenette or something. This here another glass wall, this will give me another functions I can put them here. I can use also this space in the back maybe for services, so I can still use all the boundaries for the sun light here I can use it, the natural light I can save it I can spare energies, and this areas here the dead areas for services, toilets, and kitchens.

I need to go inside this area now, again I am using the grammar of the shape just to understand the module which I need to use, I will not forget that there are a lot of columns there, I need to match now between the columns and the spaces I am using, but I am a little bit flexible in that because it is in general it is an open space plan. So this is like the main area, actually there are two ways to design this spaces, either I need to have an enclosed area completely closed, so there is no connection between this team and this team, or I can use small height partitions, so people cannot see each other but still it is an open space which looks better.

Ok, so lets see, till now I am happy with this, the fifth work team I think it will be here, I need to go here to have corridor, maybe I can use this shape here, maybe the edge of the circle, then I can use this, meeting rooms; I can use this as consultants or maybe 2 IT offices I can put them here, maybe the seating area I can put after this, I can go here to the sitting area, construction expertise unit, maybe I can put it there because I believe it will take, I guess this looks ok.

Maybe I need to go back now to the columns just to see what happening, maybe it might be better to use colours with designing, so I can look at this as layers, so I can put the walls on a layer, columns on a layer, cores on a layer, and then I can draw the circulation on the plan, but as a test, a column is there, a column is there, a column is there, a column is there, a column is there, a column is there, a column is there, so logically I need to move this partition to be here which is fine. I need to study a little bit the diameter of this circle just to understand the relationship between the column and the circle and how can this affect other areas; for example this one is fine it is coming here, for the open space again I need to understand where is the position of this partitions maybe it is worthy to have a deeper view, or maybe I can just test the three dimensional, but in general it looks ok; maybe I need to think about just the space itself is this like a walking area, because I need in each unit, I need project directors each with two associates and a design team, so lets say I will forget about others now, I have this space, I need to go inside, I need to think about furniture, I need to come, I need to put my personal stuff maybe here; and then I will have an open space I will divide it into two, this for the team to work on computers and this stuff, but I can have like this area here for the two associates, and maybe this area here for the project director, but I can mirror this and flip it here, to have the same here the same there the same there. So I

can think about manufacturing the furniture, so I can save a lot of money, a lot of time for the client, the same I can do for the rooms here.

KS transcript:

It looks systematic by this diagonal, ok, and then it has this kind of layout with columns, diagonally rather than straight, it is strange, regarding how many numbers of programs I am going to put here, (counting).

Now I am thinking how large each room, I am thinking how large is the floor plan, one hundred meters this way, and 60 meters this way, it is actually a very big room. I want to put, now I am thinking each room should be around the wall so it can happen in day light and each one can be put inside, maybe these rooms put inside don't need day light it can be toilets or, I just don't know.

Technical studies unit can be inside, because maybe they can be lit by artificial lighting, so it dose not need day light this one, so the technical studies area can be inside. And the meeting rooms around the wall, so I want to give them some exterior view and day lighting, meeting room. Head office also should be ahead of the wall because the boss technically likes room with the view to outside contrary to inside. It quite looks like the construction expertise units can be inside I think, should I put this inside, I think I should, according to my knowledge they don't need day light in summer so I will put them as well inside this room.

So now I divide other offices, maybe could all around the exterior wall, because they waste time, most of their day time in this building most of the day time, so they need day light and outside view. I think the IT, technician, and construction expertise they don't need outside view rather they can be in the basement, so I also put the other consultants outside this building. Waiting area with small exhibition I think they might be outside by the waiting that one, and kept inside, this one, this one.

Now I kind of categorization of two types of rooms, first one on the wall so that it has exterior view then that one would be inside, it is very symmetric so I assume that they have some kind of smoking outside sometime.

I ll start to put the head office at the back of this building, the direction of the north to the upper side of the page, this are about ten meters, this rooms with this columns, I'll try to keep those arrangements diagonal, invisible wall, so that I can..., for example for my grid, it would be very weird if I make a wall this way than this. This room has a column in the middle of the room, if I put wall this way is it better. Now I am figuring out how many spaces should be around the exterior wall.

Now I realized that maybe I have to connect two cores with the corridor, because they should be used for escaping way in case of emergency, so I think this way will be with a kind of long corridor, like this, three meters exit efficient width, maybe I want some kind of day lighting in case of emergency it can be out of power day lighting. And then, I am not sure this is kind of upper level or down level, so it is an upper level, you have to leave the facade, only as kind of emergency this way, maybe they all have blizzard rooms so I am going to put activity here. I don't like this, because it has corridor, this way too and then, maybe it could be more economical approach it conserve every space on either side of the corridor, and then it connects two cores as well and it has escaping width.

Now I find that I am designing the layout just contrary to what I have said to you; because I put the space first and then the circulation. In this case I put my circulation first because the layout is fixed here so I can not change it; the layout is fixed and has walls in there. Now this room this and this parts can make place for this room so now I have to figure out which one here is, oh I should put this. I decided to put head office here because it is close to the core and it also has out view, I am not sure how big it is, it is too large, but then, the problem is, I think it could be close to the core because of the service, I will put here next to the core rather than. So head office needs its private secretary I prefer to put the office there to have this space, and then the people coming so they have to have this one first and then it could make, meeting room here, head office here. I think I will put the other meeting room here because they have office; this is the secretary office, so one could go to the head office like this.

And then I think I put the management office there, I think they don't need daylight so I put them here; I think they don't need large spaces. I will put telecommunication offices here. So then I put five project directors this way, so that this way they can have private office spaces; I would move one room this way, so one project director room. I will put consultants here; I think about divide them for project directors here.

Now I am thinking about the depth of the space; one construction expertise unit, this in this design I don't know how large this room could be, it is a big layout and then I don't know. The service should be in this space, in this area, because it has it can be here next to the core and has day light, and I am not sure.

IT, I don't know where IT office, one could be there, so I will put them here, and these are the services, I think this corridor - I think - waiting area, the problem in this where is the reception, so it has reception inside the waiting area and exhibition area. I think I will put construction expertise here because they need day lighting, I think. And technical studies here, because I cant, this one core waiting area because in this building they can wait and then present the project maybe here, so and then they would somewhere here and here, this would be; now I have kind of circulation inside, because this is existing core, it is not very creative. Head office here, including this private secretary side and waiting room; meeting room one here, and management office, one here, two there, other consultants here, and five project directors around here, and then two IT offices there, there, and IT could be here, it is office, so this is corridor, this part is the corridor and this part, and those are all partitions you can not see through, there is a corridor within each space.

OO transcript:

Well my understanding of the brief, (reading the brief); head office with its private secretary..., 2 meeting rooms, management offices, 2 technical studies unit....; so it sounds to me like a design for medium scale architectural firm maybe with about 15 members of the staff, something like that, a bit more maybe, ok. It looks to me like a bigger size office than I thought initially looking at the scale that you've got in there, it looks to me about 30 meters by about 100 meters, so we are looking for about 2000 square meters of office space, 2 cores areas. It looks like you've got glazing on either side so you have got light coming in from the east and west based on my orientation. I just presumed that this double lines from the left and right are glazing.

It looks to me that it is going to be like a big office although 2000 square meters is quite a good size, and obviously as you have said it is the head of the firm so there is got to be a waiting area. The 2 core areas for this in total, there is probably service areas, conveniences located within those core areas as well, ok. Baring in mind you've got five project directors, and 2 associates each, and a design team; if I presume that a design team is about 10 in each team, say for example, headed by one project directors, looking at a bigger office than I initially thought; 2 IT offices maybe about 10 members of staff; and a construction expertise unit five members of staff, so initially I like to make a note of the occupiers, and just making a note of the members of the staff, and the key areas that need to be created. These numbers written in telecommunication offices, they are more administrative, this number is referring to the number of staff, ok, (counting), numbers of the spaces, (counting), ok, I got two core areas and I see there is a requirement for two service areas with small kitchen toilet and lounge, so I would tend to adjoin this service areas with the core areas which we have at the moment in terms of, I presume that these service areas will include the toilets and the conveniences.

I would have the toilets, the lounge, and the kitchen facilities, what I will tend to do obviously is create because I can see, I presume these circular bits are the structural, so they are columns, are not they? Because of the layout of the columns I would obviously bare that in mind in terms of axes and requirements, also the way I am aligning my spaces to suit; but I have to bare in mind the location of the column in terms of, I presume what we want is an open plan layout, maybe some open plan with some offices presumably the directors offices and the consultant offices, and meeting rooms segregated to create private spaces. Also, what we tend to do is obviously the entrance area will be the waiting area and also the exhibition area; and the receptionist area will be that area as well.

I am not sure what is the role of the private secretary is, but I assuming that she is the private secretary to of the managing directors, so she might have her own private office adjoining the director's office. The waiting area would have the receptionist desk and obviously, adjoining that area could also be the meeting rooms, with as I said the management offices located nearby as well, I'll do a sketch on that, what I tend to do is... . You have got a the scale here, it is 10 meters, it is quite big actually, because of the orientation of the grid one could be limited in terms of, 10 meters by ten meters, so central point, ok. Waiting areas with 2 meeting rooms, ok, 10 meters, 5 it is quite big spaces actually. Ok I got to get an axes to my conveniences, what do the 3 consultants do, just assist the firm in terms of what they do, so they are not job specific research.

I suppose they would have a good size management team you would have accountants, you would have pay role, you would have human resources as well, wont you? Because they are about 100 staff from my numbers, from what I have calculated so far, working about 3000 square meters; what I probably tend to do in this is to zone the different areas initially, and start working out in terms of how much an area they would require; but I would tend to do maybe do a bubble diagram, in terms of zoning the spaces baring in mind that based on this grid I have got in between the columns I've got about diagonally 6 meters, and running across on there is about 10 meters isn't it? I would do the zoning of different areas as such.

What I am trying to do here is the main entrance reception area here, oh the main entrance is from the core, I'll change my axes, ok, so coming into a core area there, and then I would have sort of like the offices, the initial offices sort of like the meeting rooms and other areas around that area as well. So I have got 2 meeting rooms that I need to provide for, so I could have one core, the entrance waiting area, and I've got meeting room one meeting room 2 in that area there. What I would tend to do then is to enter into an open plan area, but I've got 5 teams which I have got to separate in various areas. Ideally each team wants to sit in an area adjoining the associates area as well so I would want to have, I have got my

conveniences in this core area I presume I think that would be conveniences for that area, and each area then could have an area for each team, I have got five teams that I have to provide spaces for, so if I dotted five teams in there all seated in that region, and they had sort of the directors box so to speak within there in there nearby somewhere which could be either enclosed or segregated in some sort of fashion in there.

And then had the consultants, there are three consultants who could either be consulting on each project or consulting generally by each segment, so my consultants three of them could go in there, and my directors are there, and there and there, and these are my teams, team one, team 2 team 3 team 4 team5, these are the major numbers. All the other staff are sort of support staff who could be in various areas, the expertise unit and the construction unit, and the IT, well IT offices could be one on the side and one on the back of this core area here, adjoining this core area. Also, we could either Have ideally like you said we've got the one entrance area here you have got an administrative stuff team here as well that could be here in the back, IT, IT, and I was speaking in terms of the areas that I've got in here.

Then, I just got to insure, I believe with this area I have got in here I am looking about an area, based on my, I am looking at quite a big area here which is about 300 square meters for each team here, which I think would be sufficient for about a dozen of staff with tables in there that would be more than sufficient for staff and tables the computing units, and the circulation spaces as well. Ideally what I want to do is maybe to design an area that would be ideal for each team and see how this would work with the spaces that we have, I think we have got quite good spaces anyway, because based on the numbers that we have we have got about a 120 stuff, and 300 square meters of floor space which is quite generous in this percentage, and there is room for expansion as well.

I have got meeting rooms in this area here, and I have got admin staff, and I have got another area here for more work or management offices, which could be upper management, which could be the managing director private secretary office, could be here as well adjoining previously my entrance area. So I have got private secretary managing director office in off a bit in track and away from the hassle and bustle, but still having a clear view of the rest of the office, so it could; I could imagine him having a private office with glazed screen here, having the view to see the different teams working, and quite close to one of the teams here, team 5. So we have got major management offices, here we could have more admin staff, here as well, adjoining the IT section as well, and they could have access through this core coming through the building, so the main entrance doesn't have to be always there but this could be the public entrance you know for clients and other visitors coming to the firm or the practice, whereas this could be a more restricted access for other members of the staff to reduce the pressure on that circulation on that area there.

Also, I have created areas for the directors, I have created areas for the consultants, I have created areas for the IT, and I think we need an area for the technical studies, which could be like a library area, well the library area could be either central, whereby all teams could have access to it, in a central location, an informal location, or could be restricted segregated to be more informal, sorry more formal, this could be informal as impact of the open plan area, or more formal and quite space, talk to you in the corner, but I could like the idea of the library being there; could also be an area where seminars could be held and different organizations to present things to the firm as a whole, so you could have what we call the libraries and technical studies unit in there.

I think all the different areas are taken care of, that library could also be in the entrance area we have got the exhibition space and the waiting area as well, I think all the different areas are taken care of in terms of distributing the spaces within this core area, obviously once we have done the investigation of the firm and the different requirement and the different projects they are working on different teams on different project they have different space requirements; some teams are bigger than others because they are working on bigger jobs than others so they might need a bigger area than others, so the different thing, more information required for us to satisfy a brief of a firm employing a 100 of stuff, and obviously that would then help to determine what we can do within the scope of the area we have.

I think the circulation spaces for me would kind of go in line with the, will follow should we say the line of the circle in here so the spaces goes like that; so this is basically a circulation space here going through, and that a circulation space as well going through, circulation spaces are related between those spaces I have shown and then the same thing goes across like that, but then I have created more of an area in the

central that it could expand into, depending on the size of the teams really, it could, because I've got the central space more as a general space it is used as a library area or as a open plan area as well.

I would think that the directors room here could be enclosed, the meeting room will be enclosed in here, but there is also an area here where you could actually meet in the central area that is not enclosed, in terms of enclosure that would be enclosed, that would be enclosed, that would be enclosed, that would be enclosed, the other possibilities the consultants room could be enclosed as well depending on what services they are rendering, or they might just be flexible to deal with the different teams in terms depending on what they are doing, so they are serving the different teams depending on the jobs they are doing, to define how this team unit will work in itself, I guess it depends on how many members are in each team, it could be 10, so one of them will be. I will do the desk layout, the space itself, well I suppose because architectural offices nowadays everybody works in different ways, lets assume we have a space like that and we have got a team of 10, and I have got director office in the corner there, and I have got 2 associates here, and I have got 10 other members of staff, because we all working with computers nowadays, there is nobody with drawing board anymore. I am thinking in terms of defining the spaces for 10 people you would have, so I have got here, so typically so I am just looking at how the spaces will work now, this is a PC unit, this a seat, this is a PC unit, this a seat, this is a PC unit, this a seat, this is a PC unit, a seat, because nowadays you have to think how they work out their services as well, a screen, a screen, a screen, a screen, and each person is sitting that way, that way and that way, and the circulation is going like that; so that's a typical 8 person unit, so you got (counting 1 to 8), depending on one level there as well. Because within a team you have got technicians, architects and you have got associates as well, so I could imagine technicians working in a core like that, and then you have got architects at the end requiring some more space, I call this like wall units around there, some sort of some wall unit in there, so then you've got circulation spaces there, and then I am thinking the associates could be there and possibly there. And then you've got the directors office there as well; and then you've got some sort of central core for each person there; and then that thing does reproduce does go along, so you find, the technician are using smaller spaces, because possibly they are being given information they are chunking it out. You then have more like the architects around them, and you have got some storage unit for shelves for paper work, there is always a lot of paper work, associates office in there, the corner is more admin spaces, so that get filled up, all that area there got filled up because I suppose with administration you have got HR, you have got the accountants, you have got, I mean an office with a hundred you got couple of people doing the pay role, people doing the HR, people doing the paper work, yes I think in terms of the administration for example, that would be, the whole area would be enclosed so to speak, but when you go in, it will be actually open plan, but the whole area would be enclosed, because you require some form of security because of maybe private personal documents in there, the IT offices will be enclosed as well because you will have all the servers in there, expensive equipment in there I presume.

JG transcript:

Ok, in head office with its private secretary I imagine those spaces; they should be at the end of the project, or at the end of the space, so it is private. Waiting area with small exhibition we will put it by the entrance in like a door by a door, with a separate space as well the small exhibition. Two meeting rooms they should follow the waiting area so you just go to the meeting rooms. Management offices just before organised by the head office; telecommunication office can be anywhere but not by the exhibition and waiting area. Three consultants sometimes you don't have them in the office but here they could be by the management offices, this five project directors each with two associates and a design team, they should be, ok. This 5 project directors can be, they are in the same floor in the waiting area, with the technical studies unit and the construction expertise unit, and by the waiting area you should have the toilet and lounge; and by the very end the areas with small kitchen, where is the entrance here, it is from the cores, and this are two entries in a one floor plan, ok, ok.

I am dividing the grid because there is no grid, so everything is more organised, so when you come from the lifts you want to have in the back the toilets, so you go here you come out this is a service area, this is a service area too, so the cores are the same, they are equal; this is storage, and this storage. These two are the lifts, when you come out reception is in here, here is reception with, yeah this is reception here, and this is all reception and the waiting area, waiting area which is the more public part of the studio ok. Then here is the, here is it is going here so these two are connected somehow, here is the reception, here is one construction expertise.

Ok, so I am dividing the program by public and private spaces; the more public are reception waiting lounge and exhibition the small exhibition. The two meeting rooms are going to be in the middle, so you could access from both of them, meeting rooms from both cores, here you have both meeting rooms, and here you are going to have the private spaces' lets say the head office with its private secretary, and on the other side you will have other important people, which is five directors, with here you are going to have construction, IT, and there is one missing, the three consultants. So in here you have in the middle the two meeting rooms served by the two cores, the head office is here at the back so when you come here to work you don't see the IT, or the consultants, or the construction; and here you have the same the reception the WC and the waiting lounge, yeah I think that's it.

I organised this office around the meeting rooms so you come from both cores, and you have either side the reception the lounge the small exhibition; so you come here, the circulation you come here you have here the meeting rooms here, you come here to the three consultants, the IT, and construction, so they don't meet it is different spaces. With the architects on the other side of this floor plan, or if you come from here you are the head office so you have a different access and the 5 directors, so you don't meet with other people. So the program was organised to separate the activities, these are all partitions, so it is an open plan, this is the core, here is the architect team directors, and here is the head office, and here is the construction IT and consultants, so I have separated them.

SSX group:

BC transcript:

Reading the brief...

CB: it is quite a big office - complete reading the brief - okay so I suppose that these two are the lifts, okay, this is the main boundary, so I suppose that this one is a wall and this one too, it is all windows, it is all windows, this thing should be like services and other kinds of stuff, isn't it? It has a load of pillars, so waiting area with small exhibition, and is there any preference in which one is the first, or both, or it is the same thing.

I am starting to think how to distribute the program, okay, so you have one core here and have another core there, okay, so you have two cores here. This is the half of the office, you have all this space as an empty area, and all these rows here will be more related with service areas. So first thing I think about is a grid for the office, where the cores are, and how the cores are related with services; what is the empty space or the useful space in all this area, then maybe, what are the private areas that we need to put in this building, and which ones are the common area?

You are saying here asking for a waiting area with a small exhibition, so that's going to depend on which one is the main core, and it doesn't really matter, so we can pick this one as the main core, and we could say that this one is just like fire exits and whatever. So the main reception of the office, yeah, I think that you can close this space here, so people don't need to go to this area and you can leave all this spaces segregated for the technical part.

So let's say the two IT offices could be here in the back, so this could be IT one, IT two, so the client can come from this lift turn right, and then the reception area can be here in the middle of the office; so you can have the waiting areas, the two secretary are facing to the lift. You are talking about some small exhibition area, so all that exhibition area could be like in the front of office here so all of these could be the reception and show rooms, so maybe the management office also need to be more segregated in this case, so you could put all the management in one the corner here, like management. And if you need a head office with private secretary that thing can be also here, like head office, so then you have two private area, head office, management, and IT, that is more about equipment, and working area for IT guys.

You have your reception here, you can have some sofas and that stuff, sofas around, and space for hanging things, then I think all the main space, all the empty space should be related to the five directors and the design teams, so you can distribute freely the design teams around this space. Again you can separate in the next core all what is about construction, so you could group all these two guys here, you can group technical studies, construction in one thing here. The service area with a small kitchen they already defined with the core, so they are both going to be related to the core.

This area here there is the construction unit and the technical unit could be in this part here, so you have area A that is the technical studies and the construction expertise here. About the meeting rooms, I'll try to put the meeting rooms close to the head office, and close to the main studio, so meeting rooms should be like at the left of where the secretaries, so client could come here talk with the reception and go to the meeting room that should be here, meeting room.

Well the three consultants are related with the five directors as well, so let's call this area B, so all of this is B, and you could distribute that randomly, some way the consultants like a consultant box in some part, and the project directors, what else, management offices, yeah we say the management offices are going to be here, this is going to be like the show room, this is going to be their main studio, with teams separated in directors, associates, and architects let's say for the team. Again IT offices, technical studies areas, and construction expertise in all of these places, and maybe you could use all this thing in the back for printing, and all the warehouse area.

The tricky thing is that you don't, well at least, I don't define circulation as the first idea, so when I just start thinking about the layout design is more about distributing these areas, and thinking about how this people are going to communicate, or how people are going to work? But talking about circulation, you want to have one core here and one core there, personally I don't like corridors, or circulation spaces, defined as circulation spaces. I prefer the open plan scheme, where you could define everything either

with furniture or with screens or whatever; so I would say that you have a screen here, and you have some furniture like defining the space, so well the show areas could be different screens here around, and the only places that should be closed is the head office that could be there.

What else to say the meeting rooms that could be here, maybe let's say that this is service, and I'll use this like a waiting area for the meeting room, so this is going to be meeting room one, meeting room two, and then you could have here for example the secretary, and the head office here. So again you don't have circulation, but you have open space where you go inside this areas, and then you have management here and maybe all of this are management offices, and IT rooms here in the back. So again there are no corridors but empty space to get there. In all of this, I won't define any wall or any circulation, just thinking about how to get there, from here to there, how to get from this point to this point there. I'll try to setup the different teams here more in the middle, to be more quite and maybe more work spaces in the corners, or meeting areas like small meeting rooms to work. Again full of furniture every where, then I'll consider all the technical and construction areas, like a separate unit, that can be in some way communicated also through some private space that could be small for this people meeting areas. And then a couple of studios for the technical stuff, so that would be technical unit one for example, technical unit two and let's say that this one is construction expertise, and all of this for the typical services of plotting printers and all this stuff.

PE transcript:

Okay, well I have just got to the design brief for the architect's office. The other thing I think from the way that the brief described, I think that already starts to imply certain things that would start to lead in a certain way, things like head office with private secretary I would think would immediately begin to describe that as a separate space from everything else. Again two meeting rooms; I think it is maybe implied from the brief that they would be as separate spaces, whereas that might not necessarily be the case. And again the same thing with the offices kind of implies a separate define and probably enclosed space. Project directors each with two associates and a design team, 2 IT offices, ok.

The first thing from looking at the brief, the first picture that I would have in my mind would be is that what this is describing is quite compartmentalized; it is talking about lots of spaces that are separated from each other. I think that the thing which comes to me from the way it is described, and I think probably is quite descriptive, maybe to get something which is different and to be less implied from the brief; it would be to be more specific about the conditions that you're trying to kind of create, but, that's okay, okay.

So this is everything that we have to fit in, this is the floor plan here, ok, well the first thing I think is that a lot of this spaces can be sorted into different kinds of space. One of them is to do with service areas like the kitchen toilet and lounge, I think one is to do with kind of general or production or shared space, and the other type is to deal with spaces that I would imagine to be separate maybe things like meeting rooms, maybe the management offices, something separate, you can begin to put these into kind of categories, one of them is service areas one of them is meeting rooms and I think this comes from spaces which need to exist, activities which can exist or happen in enclosed space.

The other interesting thing would be my assumption that all of this things that would work best in an open, in a much less enclosed space, I don't know why, that is coming from if it is having to work in places where that is a more pleasant place to work, or if it is a current kind of thing, this is service areas, this is separate spaces, these are offices, so that head office, ok.

So I guess the waiting area you would try to keep separate from the main service area, meeting rooms also that category, management offices could be that or could be undefined, and I'll put it undefined at the moment; telecommunication also undefined, consultants undefined. Project directors I think they could almost be if you are talking about a design team, consisting of design as associates and directors they could be defined as elements within this kind of undefined space, so I put design team here, and that's directors and associates and design teams, and this is 5 of this. 2 IT offices also fit here with technical studies, and construction and the lots of them got the service area up here.

The next thing, having sorted this out, I think you can draw second or more relationships between them and I think the design team you'll have close to the technical studies and construction expertise, IT offices. What are the consultants are they related to the design team or the management offices? so I am going to put the consultants in the same, I think how this is working now there is a kind of organization to the spaces, or there is relationship between spaces which are relates to the organization of the company, this service area which is a kind of their own area; meeting rooms and waiting area are also their own kind of thing. Head office and secretary I am gonna move from that to be with this, so now this is a group of kind of priority management of the company and the premises. This is the design staff, these are people that support the design stuff, the consultants running the link between the consultants and the actual design team.

So I think that having worked out the relationships between each of those people you could begin to translate that into spatial relationships. Ok, if I start that again, this is kind of refined thing again, so one is the design teams and everything that goes with them, there is a kind of support staff which are the technical people and construction expertise, consultants which relate to the design teams, and they relate to the management, so that's one set of relationships, service areas I think, they've got the same relationship to everybody can be, everybody needs to go to the kitchen, use toilets and stuff like that, so that can be kind of independent at the moment. Meeting rooms, waiting areas, I guess also be, I think if you use meeting room either you will be coming in from outside the company to talk with either someone of the management or someone of the design team, to talk about something, or the design team will use it; so I think meeting room have a separate relationship to people coming in from outside, which would

mean also waiting areas and exhibition have a certain relationship to the meeting room that they wouldn't have to other spaces, so I think that is the next step.

So is there anything like an entrance already given from this, it is just a typical floor, probably people are going to come from the left, so one of them is gonna be the main entrance and one of them is gonna be for the staff entrance, as they look same, this one is slightly different. I am gonna say that this is the main entrance, so you can then kind of start to see this diagram working with that, so if you imagine one of this routes is going to be for visitors, and you need less space for visitors, and one of these routes is gonna be for the staff. So to begin with, very roughly begin to put this spaces on, this would be a kind of entrance waiting room, exhibition space, I guess this would kind of split into two, so if you go one way you would have two meeting rooms so maybe your meeting rooms organized something like that, so this I guess this side is more public kind of people from outside, this side is more private to people within the company.

The other thing which I have not considered from looking at how this things related to each other is whereas the hierarchy of the company is reflected in the organization of it, for the moment I had saw it is not because there is no time to think about it, so the next thing is then beginning to plan this onto here; so I suppose the main space that you come into is probably gonna be dominated by the design teams and their support stuff, so design teams and support so the things like technical studies, construction expertise, moving further this way I think probably one of this would be the kind of management area. And somewhere the consultants need to come in between the design teams and the support staff put them there to begin with.

The other thing is the service areas, and I think there is normally kind of technical constrains system where you can have like things like rises and the technicality of it; so to begin with it, the service areas is around one of these cores, so the visitors can use them equally to everybody else. There is another core over here, ok, so this getting everything, maybe this sizes is wrong, and that instead of, maybe that all gonna be design, that could be all taken by the design people, this could be support, and maybe this could be kind of management, so they are linked through the consultants, probably through all three of them. Also they could have their own service core, beginning to get into an issue of hierarchy which maybe it shouldn't do, but that kind of a quick way in which I could see this diagram working on that plan, ok.

I think moving on again that's a core ok, I think there is, this could probably get more efficient, so this is just a diagram rather than a kind of plan, ok, so that's the main entrance. I think probably the meeting rooms need to be enclosed and private, so I am gonna say that the first bit of space which is defined as definitely not being movement. Next thing is the service space which it is going to be around here somehow, I am not sure whether I should enclose quite a large area, if doing that could begins to block potential movement, I think probably one thing that you really have to consider is the relationship between these two cores being able to get from one to the other, one of the first things is to define a way of getting from one to the other, which is -to begin with- is along here; this is still reception area, and you could either go around this way, or that way.

It is important, that if you gonna have workstations, to have them against the edges of the building because they are more likely to have windows, but then working by computers, is assuming if they are doing a lot of work by the computers, I don't know if being next to the window is necessarily a good thing, not for your eyes anyway, maybe for ventilation it is, maybe stick to the assumption that the design team located close to the edge of the building and the opportunity to get light in and ventilation, if you could get service area somewhere around here, possible routes around the core here. Meeting rooms in these two corners, probably, the reception here but I am not 100% sure about that.

I think I am gonna change what I've said before, or am I? Ok, so this is design team, design team, design team. I see this as an open space nothing apart from the columns separating people, the other thing you would have kind of doors or something because of fire regulations, but apart from that no further division of space. But then that's becoming a little bit cut off, which I prefer not to, then, ok I think the technical support is going into this corner, and this is going to be the consultants in here and the management in here.

I think as well probably, actually I am gonna change this into support and consultants, which means that, probably support and the management, I am going to spread them around as well, so that management is closer to design teams, and support is not so close, probably because I think this would be individual

spaces again, and probably the people concerned about the support and running of the building wouldn't need to be part of the team, that the design team, management are going to be part of.

Again that would be separated, that's the other core, ok, now, I'd probably would change this slightly, the thing which I don't like about the last one, what I am doing now is to try to link this down here, and try to fit these blobs in a kind of design teams slightly differently, so that you can move through the centre of them everybody is a kind of equally spaced, then this management, support. I am gonna change this another time so you've got the core is here, I think this could be defined along this space, this is gonna be support people that look after the building and the company here, this is management close to the support, but also quite close to the design, this is consultants who are the link between the management and the design teams, these are design teams.

There is a separate core up here, ok I am just wondering if there is a different way of rearranging these meeting rooms so that it is a little bit easier to get from this space into here, I suppose it doesn't matter, so this is service space. I think if you can move this way to get in towards the lifts, as well as this way, this is kind of service area here, these are the two meeting rooms, which are individually defined spaces, and this here is reception and waiting, so if you are visiting for the first time come out of the lift, see across the design team people working, but it also will be the first thing that you could see the reception, you could wait somewhere around here, then you could go to your meeting, then you could see a design person or the management, if you are working you could turn up everyday, and just as easily come straight to your desk.

I think probably there are things which I have not considered like fire regulations, kind of escape distances, how big a space you could have what need to be certainly defined and what doesn't, I think purely in spatial terms I would end up with something like that, if that ok. I guess probably there would be divisions between these, but I think I would keep them as transparent as possible.

AN transcript:

(Reading the brief),

You might categorize them.

The offices', waiting area, and meeting rooms could be something related to each other. The management offices, we have two offices telecommunication, three ones, the fourth one with three consultants, two other offices, we have one, two, three. Two technical studies and consultants.

Office plan layout, it is about, so this is the core, you mean, these two parts are the core, and there is the structural system; so I could have two entrances. By the way what is the exterior, what outside the building? It is glass, so it is transparent I could see outside, is there any visual attraction from outside? No, ok. private secretary, waiting area with small exhibition, two meeting rooms, telecommunication. So let's see where are the waiting area with small exhibition and two meeting rooms, where are these going to be, are they going to be in the central part or to one of these corners, I prefer to put them in the central part somewhere here, okay.

So the head office with its private secretary and the management office could be near each other and could take one of the corner themselves, near one of the entrances and could be somewhere here, doesn't contain any areas, just, okay, right. And then we are going to have two meeting rooms it might be also this meeting room with open area, so it might be near this the meeting room, some sort of a central part, and here is the private secretary, and here the head office. And here is, waiting area with small exhibition, this part could be the small exhibition, and this part also could be waiting area, waiting area, yes.

Two meeting rooms, management offices, telecommunication, three consultants, and two.... The three consultants might be here on the other side, that's a tricky part, the three consultants might be here, the size of the room doesn't mean anything to you here, I don't have the size of the rooms, ok, here; I am going maybe to have three, two, three consultants, project directors, design teams, maybe here; five project directors, two IT offices, might be here, 2 IT offices, two technical studies unit, it might be here; technical one, technical two, one construction, might be inside the consultants; one construction expertise, 2 service area with small kitchen, might be here, here the service.

So we have spaces, spaces are going to be here, this is for the head office, this is the meeting room, here is the waiting area for them, and maybe the securities, waiting area, small exhibition. And here the IT and this part could be here, IT, so actually that's an open space, and also the director is also going to be, so it is around the core itself, and that is our one core with service, another core with the other service.

I want to define the negative space, or the open space, that is going to be open spaces, that's gonna be the circulation here, so we have circulation here, surrounded by this one and stopped here; and we have inner circulation from that part and this side could be added; and we have circulation surrounding this one; also there might be some sort of another circulation here and here.

The problem with this design is that it doesn't have some connection between this part and that part, so we might do some arcades here, and exclude that part there, to make some sort of private connection between this part and that part, so actually it is semi opened space.

So let us check again the program, it has office here it is checked; waiting area with small exhibition, it is checked; it has two meeting rooms, one big meeting room could be divided, so it is been checked; management offices, 3 to 4, management offices here are management offices; this ones, telecommunication offices, two, we have two telecommunication here, telecommunication one, telecommunication two, it is been checked; three consultants, we can have our three consultants here, oh I could change my mind, oh that's ok, 1,2,3; five project directors each with two associates and a design team that could be in this place; that is our project directors, five project directors; two IT offices, yes I have designed that, that's our IT one, IT two; and two technical studies offices, yes we have two technical studies unit, and here is the other technical; one construction expertise unit, which is this one; and two services areas, that's one service areas, and another service area here.

I think it is finished so far, office, meeting room, waiting area in this part, that's a bit odd, I am just trying to locate which are the openings, where are the entrances? How I am going to get here? so I am just looking at the openings, this part is going to be, so I am going to switch, so I am going just to relocate the location of the kitchen here with the meeting room, I am going to change it a little bit to face the entrance

itself. Meeting room, which I have designed as an open space, it could be divided into two or could be used as one huge single one, and also to face the main entrance of the space itself, so it could control it a little bit. And I do have here the waiting area and could have a passage, or just space to go to the other part which is a little bit private company, it is also open, it is semi close one.

So I am just locating the lines to clarify the entrances, by the way, in this company where it is located, its location, because it is funny thing, in some sort, towards the north orientation, yes technology can, you can control everything, but I mean the openings, so I'll consider the north going upwards. So it is an open space here, that's a small exhibition, that's the waiting area, which has its security, and also it has its service, and you could get out without being seen. And also as well, by the way, there is something here, its partitions it is not walls, I mean I am using here partitions, the wall thing I could just give it some thickness, so you could understand that it is walls, it is not partitions.

Okay I am almost finished by the way, yes I am finished, the waiting area for the staff themselves, or for someone coming out side from the company. Where is the gathering point for people inside the company, the employees, or I just design for them together.

CE transcript:

I should design a plan for architects office, and then I should consider circulation and occupancy spaces, should it be divided by walls or it can be open plan, so it can be either.

so first I would count how many people are going to use this space, one head office + one secretary, waiting areas, two meeting rooms, management offices - so this means three or four people are going to use that space - telecommunication offices, for the managements, so two secretaries for management offices, two consultants, five project directors, each with two associates, each with design teams, five project directors - every director is for one design teams - so the design team could be any number of people.

I'll draw diagram, this is design department, you have, one, two, three, four, five teams, and there are directors for each, there could be four people for each team, so like this for design team, then, so in total it is thirty. IT offices, so it is two people, two technical studies unit, one construction expert unit, two service areas, ok, I think that total people – counting - so let's say, total six people. Then you should consider these rooms, that room I should consider, ok. I think service areas should go around the core, this building has two cores, is this elevator? What is the case? Which one is the stairs? What is this? it looks like it is toilet, it looks like some kind of service area, so maybe I would use; and then is this window, this one as well, two windows, all of this is glasses, this is kind of, these are kind of columns, north is to the upper side of the paper, this is north, so I guess I'll, ok, it is a little bit tricky because it has two cores, here and here, and the direction to approach this cores could be this way and this way, and I think may not approach this direction.

If I divided this space with walls, then, well I will decide to use one core for public circulation and one core for more private circulation. I am trying to decide, this is towards south, if I set it properly, then I could use this space for public purposes, now I have to decide which area should go more with public function, I want to go with more open plan layout, but for certain rooms I think it should have some kind of walls, I will give it with the glass wall.

So let's say, such as two meeting rooms, and construction, two meeting rooms, three consultants, waiting area, I will make only this room with glass, and that room could be used for public purposes, so let's say, so now I am starting to design from the point of view of public approach. So I decided this core as a public circulation, so I'll start from this point and decide to place the public area; then I could use this as a toilet, woman and man, I don't like this approach when someone look directly to the wall of the toilet, but then they could come out, if they come this way they could see this space, if they come they wont see the room. Well I will put the - is there space for the reception? - waiting area is for the reception, so I'll put this amount of place for the reception and exhibition, and so when people come they should go to this space, that means you should put something here, reception desk, and then they could, maybe around this area, they should go to meeting rooms; and then waiting area with exhibition, ok. Then this bit should go for the design team, because I think design team is the main part for the architectural office, so I'll put them in the centre of the layout, and they could use this as their own circulation. So for the service two service areas with small, I'll put service area around here so they could connect behind them, because sometimes when guests come they would need to serve them, so they should have some service area here; I don't want to put service area in the middle of a large space, so I want to put them at the corner, near the core, so this should be service one, and service two, because this is south direction.

I want to put let's say, head office, what I need, this area should go more specific offices, like head office, management office, 3 to 4 management offices, and two telecommunication offices - I am not sure if it would fit here - three consultants, and 2 IT offices, maybe IT office could go in this area. What I need is also is meeting rooms, reception, maybe they could go this way, and this can be meeting rooms, two meeting rooms. Now I am trying to categorize two groups, in the centre I put, and in two kinds of edges I want to put head office and management offices, there are a bit different parts like IT offices and technical studies, so two IT offices and two technical study, construction expertise - I think construction should go here - three consultants. And should I also layout which location the director could sit? so this is where they have.

And then now, then the main circulation could be for the public they would approach like this, there should be a reception here if they want to go to the meeting room they should go like this, so I will put the meeting room around here, two meeting room, this is glass wall, so they should go like this - I don't see

the column - but they should go like this. 2 IT offices, for me because I want to do open layout, 2 IT offices, and 2 technical studies should go like this, and they can move around here if they want, if they want to go to meeting room, and I think it is better if they have, they can use this way, so maybe I just close it here this way, to go to the service area, and they can use this approach to go to the service area.

And then reception and exhibition, maybe here they can put waiting, maybe the reception should go like this and here it is waiting and exhibition. Then the main circulation route can be, this route can be used as the main route, and each office I can exit as this and this way, and this part is another service area, they can use this as well.

I am going to put design teams, it is 5 design teams so well I want to just roughly divide it into 5 areas, but I want to give this area a little bit of space, and I want to put in this area maybe head offices. Here I have to decide if I should put the projects directors closer to the main route or far from the route, normally what they do is the project director tend to be in deeper place, but here I want to reverse way, because I think they need more communication with the other parts like management offices and telecommunication parts; so I'll put project directors closer to the main route, and two secretaries and other design teams like this, this is design team.

Then I will put Maybe head office should go deeper plus the other keepers, and this should be all open plan, telecommunication, management, and here, 1, 2, 3, 4 management offices, this means administrations, so I think reception area it kind of related but I'll put it closer, then I'll put two telecommunication, one construction and three consultants. So in this layout I created like this route, main route, and then the service area is more for the private use, they can access either way or through this as well, they can use this corridor as the main corridor, and they can access like this, and this service area is more for the public use; and then this is IT offices and technical services part.

LM transcript:

So the head office with the private secretary means that they'll be together; telecommunication office is like secretary. Number two is two offices or two desks? Because it is rarely to see a separate secretary office in an architectural practice, unless it is like an accountant. Three consultants means architects I suppose, IT offices like server rooms.

So this is core, what are those given things, so they are given, so for example when you say small kitchen with toilet and lounge could be used in, so between column and column you have like ten meters, right?

It is just that it is shifted, the scale, so the entrance can be anywhere, so is this a ground floor, so you come up either here or here, so you come up both then? Okay.

The first thing I will do is I will put the IT offices separate from every thing, like it doesn't matter if they are close to the creative people; and the same thing probably for construction units, because people will go and find them anyway.

So you are right when you need to have the role of the reception desk, telecommunications, and the meeting rooms, so if we have, I am thinking, that if you are coming either one or the other end, which I don't think that it is ideal, I think you should have one point of access to the practice, I would maybe close one, and have only access for staff with keys or something. About visitors they should access one ideally, and on the one you should access, you'll have your desks, or secretary or something somehow to welcome you. Is there a stair anywhere, on both sides, so you come out here?

so I would say that you come in somehow you have a hall way, I don't know if this is a core, then you have a hall way, then you can have a waiting area, a reception, and then here, well this is windows, you want your meeting rooms with windows, so quite shallow, I don't know how many, many meeting rooms, two meeting rooms. I will have a head office somewhere here in the corner, and then this all becomes working, but I probably would leave, from here you'll have sort of partition, or have this open plan with all this creative people, and I would mix them.

The directors will probably have the windows, so you could have your desk space or something like that, with some, probably, sharing the same space, but you have the directors on this side, or like project leaders, and then you have your associates and your design teams all mixed anyway, I won't split them; so this guy, the directors will have direct access to this area, and here you could have some sort of bar for kitchen so that you could serve the meeting rooms.

What do I need? exhibition space, well you can have your exhibition here along this wall, just outside meeting rooms, so you have meeting room, meeting room, then you have, so you'll fit I don't know how many, five, six, seven, you can always take this space. Then on this side you'll have server room, which could go against the core, you don't need much visibility or anything, and you can have consultants here, you can have another management office, meeting room, well management office will have to be there, keep the toilets, so you can have all this for management; you could have one here, space here, and then your management here, so your visitors come here, this can be become like the exhibition space, or something like that. And here you have your consultants; they are sort of separate but close together to all this crowd.

And then you could have your technical study unit, and library whatever, I guess it is sort of research, isn't it? So you gonna have nice corner office, oh this would be probably open it wont be all closed, and then you gonna have meeting rooms, waiting area, head office, telecommunication, consultants, IT, oh IT you can squeeze them anyway, can't you? you want this, the IT here, oh not here, here, some where here, technical studies and IT, that's it, you can have, (2 IT offices, kitchen, service area with small kitchen); so this becomes your other service area, the service area and it got the lift and stuff for staff if you want, and you can have sort of like the kitchenette and you can have sort of the communal kitchen area facing the other way.

CR transcript:

I am just having look through the brief here, so I got a head office, secretary, waiting area, two meeting rooms, and management offices, communication offices, consultants, so already I am noticing that there is quite a lot of individual offices, and potentially I don't see any requirements here for open plan accommodation, but I assume that there will be a... that the rest of it is open plan, there is at least one, two, three four, five six seven eight, the consultants offices are 15, and the rest of it is 18, 20, I am potentially looking for at least 20 individual offices here, so beginning to look.

So looking back here, it appears that this grid spacing, the thing which I am noticing is that very bizarre offset column grid, which I have never, I don't know if I have ever seen before, so that is worrying me a bit, and I am immediately wondering if I can actually fit corridors in between them, and I am looking at the scale as well, let's see, mmm, and it is actually quite large so if we are talking about a corridor being about 1.5 meters then, that's ten meters, ok so that sort of corridor width, so I am gonna fit one between the columns. I can't see any stairs here, but that looks like lifts and that look like lifts, obviously gonna have to have the main corridor coming off these, and if I were to have some offices around the edge, I am probably looking to have, about 10 meters, that's actually a large office, this is actually an enormous space. So I mean if you had your average office size is about –I am guessing – even 5 meters you are looking at sort of, coming out about here, so even you were to wrap offices around the space you got a massive space in the middle, the scale of this somehow doesn't quite seem, something about the scale doesn't quite seem that, but one obvious thing to do would be actually to obviously take this line along here like this and do the same here as primary circulation will continue this, and bring it to this, I am assuming I got the correct width here, and, so let's see, so probably you are going to want, I mean you got quite some senior people, you've got sort of head office -I presume that is the main guy-, management offices, so I mean traditionally if you want to give people prestigious offices you begin to sort of put those in the corner, it is very interesting that there is some very natural sort of corner spaces arising here, that is obviously much larger than a whole office, but there is a very obvious region here, so I'll be very inclined to sort of make that self contained, so for example, you might have all the management offices, you know you've got a whole cluster of management, so I'll be tempted sort of put this together, and either have that, potentially open plan but if you were to sort of break this up, and extend this out, but I might be inclined to do, so sort of to keep this as a region for sort of management, and then maybe to sort of subdivide, now have some three to four, so maybe have the sort of circulation extending through to here, so you have got entrance to there, so maybe this is a sort of general on ancillary -you know- for this region, so this becomes a sort of self possibly another office there, this might be storage for the archive, so that -sort of- becomes the management region, equally, anything else that could be usefully bundled here, I'll be tempted possibly to put the head office here, and again sort of mirroring that, so you are extending the, the sort of arm of the corridor down here, and give master head block big generous office at the end, some room for his secretary, hopefully be here whereas they got three here, you would have master head block here, and his secretary here, and again a small ancillary perhaps a small waiting area here. So again it becomes sort of fairly self contained for the head here, and going back, now let's see waiting area with small exhibition, I was wondering what to do with this central space, because -I mean- obviously you got the worst lighting here, but equally as you come out of the lift this sort of first area you come in to, and in fact this exhibition space is very interesting, so I'll be tempted to do is sort of have a sort of fluffily designated seating area as sort of outside each lift and again mirror that here more seen to the rotation of symmetry today, so again I'd have sort of you know comfortable multiple seats here and begin to have –maybe- some informal meeting rooms, I mean not meeting rooms but just sort of tables for people to just sort of informally... Foster's offices had a lot of this you know you didn't need to book you just sort of have sort of rose, and I am sure this is way out of scale but never mind, and then you could have you know sort of exhibition space in the middle, and this is all open you know sort of quit sort of fluffy fuzzy stuff going on here, so that sort of head office waiting area and exhibition, the meeting rooms you probably got rooms separate meeting rooms but that's sort of wrapped up in there, telecommunication project directors, I think, now I am not too sure what this is, I am assuming that we do have glazing all the way around but this clearly something different, some kind of fenestration going on here, maybe this is louvers or something, but I suspect that I'd you got project directors and things, I think probably I would be inclined to continue the sort of cellular office down, I mean literary just chunk it down each side, and so you've definitely got rooms for the sort of the project directors offices, and just sort of mirror that here, so you've got all your people that would need to be in the sort of private offices

here, and then again keep this quit open so you know you've got... so the rest of it is just open plan, so this will be sort of telecommunication, maybe some here, I don't know split them up, project directors, project director and then have this more or less as an open plan, and what you might want to do is to take primary, so I don't know maybe have half high partitions every other grid, so this are not going all the way up, and again is probably the way those sort of not on, they are not quite, no hang on, no no they do align up, ok, so something like this, then you got your main circulation coming in, and what you might want to do is actually have sort of -you know- rough teams working within each of those modules so, your standard desk -I don't know- might be something like this, so actually try to have a sort of and actually keep as much as a sort of window side as free as possible so that you know you don't get that much of a hierarchy between the window people and the non window people, so this is would be sort of typical -I don't know- layout, something like that, these all sort of individual desks you know, so this might be one sort of typical team you know with may be little team meeting space here, a lot of meeting spaces, so this is sort of be one unit and obviously repeat it, I think there are probably adequate meeting rooms in here, but if we did need another meeting room and possibly the other logical place would be to put a large meeting, it is a pity that it got a column right in the middle of it, I mean my initial thought is to have a big round table but then they would be looking around the column so it is certainly bizarre having a... if that column wasn't there it would be very good to have that as a sort of big meeting room there, and mirror there but that's a bit peculiar so maybe don't do that, got the head office, got the waiting, meeting room, telecommunication offices, the consultants yeah let's put the consultants here they can cope with the column, so give a big consultants room here that's just again a bit of a separate thing, that's consultants, consultants, so directors around the edges, mmm a T for a technical and communication, a sort of a T is telecommunication around there so service area with a kitchen, now I presume that I can't actually use any of these, I assume that everything here is allocated, so where would be the office place, I mean actually what I would be, I kind of be tempted with this kind of fuzzy open plan bit in the middle is may be just have a sort of open bar thing with facilities along here, and I would actually mirror that here, so sort of actually have an enclosed kitchen you sort of had bar with sort of tea making facilities along here, and then if you are actually meeting in this informal meeting rooms you could just go along and just grab a cup of tea or coffee in there, and presumably within this core you have toilets, and services, and things so you kind of get a riser going up around there anyway, so I am sure you wouldn't have things sink and odd things in there, so this is a slight, by making it so exposed you run the risk of having bars of dirty wash in front of the visitors, but hopefully they put trained people to be tidy, then you normally get with work in kitchens by having it all displayed, but I think it's quite good I could imagine a fancy coffee machine, and also if you had an exhibition, I don't know what this exhibition for, but if you have members of the public coming in, turn this into a sort of wine bar and wine all along the sides so that's the kitchen, toilets I assume I am again somewhere in here, I hadn't actually read that properly the toilets were actually required there, I'd assume they are in one of these areas already given, and the lounge, there is enough fluffy area there to include the lounge, so generate lounge in this as well.

Appendix 3

This section will describe the transcripts as sets of string data. It will include three parts; the first one represents the narrative progression of cognitive actions. The second part is specific to the genotype-related actions, whereas the third part involves the phenotype-related actions.

Cognitive actions

This part includes string data for the cognitive actions performed in the design tasks. The string data is obtained from the semantic transcripts of the design processes.

Legend

Physical: L- Action: Looking at previous depictions.

Perceptual: P-Action: Attend to visual features, spatial relations, or organise or compare elements

Functional: F-Action: consider interactions between artefacts and people/nature, and consider psychological reactions of people

Conceptual:

- K-Action: Knowledge retrieval
- G-Action: Set up goals
- E-action: Make preferential and aesthetic evaluations, i.e. Like-dislike, good-bad, beautiful-ugly

NSSX group

Protocol analysis of AH cognitive actions

FGPFPPPPFLFPFPPFFPELFLPLFPPPFEPEFPFPFPFPFPFPFLFPLFPLFFFFPLFPLFPPLFFPEFP
FPFPFPFFFFFPFKFPFPFFFFPLFPFPFPFPFPFPFLPFPFPFPFPFPFPFPFPPLPPPFPFPFP
PPPPFPFPFPKPKFPFPFPFPFKFPFPKFPFP

Protocol analysis of LC cognitive actions

FFFKFFFFGFFPGFPFPPFFFPGPPPPPEPPEFPFPPFKPFFFPKFFFKFFFFKGFLFPFFFKPFFFPFPFLF
PPFKFFPFLPFFPFFFPFEFPKPFLFPGFPPFFPPFKFPFKPPFGPFFFPFPPLPPPPFFPFPPLFPGF
PFPLFPLFPPPPPPPPFKFFFPKFFKPFFFLFPKFPPGFPPPPPEEFLFPFGPFPFPPPPPFKPEPFLPE
PFPGPFPFPFPFPFPKPFPFLFKFPFPFFPFFFFKFFFPFKFPFKPFFFKFFKPFPPFFFFFPFPFLFPF
FFFEPPEFFPKFPFPFKFPFPFFFPFPFKFEFEFPFPFPFPFLFPFPKFPFPFFFPFKEPPLFPFPFLFPFEP
PEFPFPFKFFFFFFFFFFFFLFLPLPKFPFPFPFPFLFPFPPPPPFFLFPPFFEPFLFPFGFPFPPLFLFLPP
FPFPFFFPFPFPFPFPKPFPFPFLFPFPFPFPFPKFPLEFPFPPLFPKPFPFLFFFFFPFPFPFPPLFP
KPPFPFPFFFFFFFPFPFPF

Protocol analysis of AB cognitive actions

[illegible]

Protocol analysis of KS cognitive actions

FPPPELFPFPPPPGFPFPFPPFFFPFFFPFPFFFPFFPKFPPPPFFFFFPFPFPFFFPFFPFLFPFPFGPPPEPP
PEFPFPFKFFPPKFFKFPFPKFGFPEFKFFFPFLFPPPPPFLGFPFPFPFFFPFLFPLFPLFPFLFPFFFPF
FPFPFPFPFLFPLFPLFPPLFPFPFPFFFPPLFPLFFFFPLFPFLFPFPFFFLFPELFPFPFPLFPLFPPLFPLF
PLFPPLFFFFPFF

Protocol analysis of OO cognitive actions

FFFPPPPPPFFKPPPEFFFFLFFFFPFFLFPFFFLFPFPFPFFFFGPPPGFPFPFFFFFPFFFFFPFFLFFFP
FFPGPPPPPPFPFPFFFEFFFFLFGFPFPFPFPFPFGFFGFFPPLFLFLFPFGFLFPFPFPFPLPPF
PPPLFFFFPLFPFPFPFPPLFFPLFFLFFPPPPPEFPFPFGFPFPELFFPEKPFLLFPFPFFFPFF
PFPFPFPFLFPFPFLFPFPFFFLPFLPFLFPFFFPFPFFFPFFFPFFFPFFLFFFPFLFPFFFLFFPFF
PFFGFPFPFPFFFPFPFPFFFLFPFPFPFFFPFFFPFFFPFFFPFFFPFFFPFFFPFFFPFFFPFFFPFF
PPPPPPFPFPFFFP

Protocol analysis of JG cognitive actions

FPPFP
PPFLFP
FP

SSX group

Protocol analysis of BC cognitive actions

FKFPFPFPFLFPPLPFLPKFPLPPPLPPLFPFPGLFPFLKFLPFFLKFFFPKFPFFLFPFPKFPFPK
FPLPLFLFLFPLFPPLPKFPFPFPFPFLFP
FPFLFPFPFPFLFP

Protocol analysis of PE cognitive actions

FFFP
FFFP
FFPLFKFP
PFPFLFFFFFP

Protocol analysis of AN cognitive actions

GFFFFFP
PFP
FFFFFP

Protocol analysis of CE cognitive actions

GFFPGFP
FEFFFFGFP
LFFFFFP
LFFFFPGFP

Protocol analysis of LM cognitive actions

FFFFFFFFPFFFFPKFFFFFFFPPFFPFFPFLFLPFFFPFLFLPFPFFLFFPKFLFFFFFFF

Protocol analysis of CR cognitive actions

FFFFFFFFPFFGFLPKFPPPPGPPFFGPPPPPPPPPPGPPFFPLFFFKPPPPFFPFFPPPPFFFFF
PPFFFPFFFPFFFPFFFPFFFPFFFPFFFEPPPPPPFPFKLPFPFFLFFFPPLFFPPPPFGPPFPFPFP
PFFLFLPGPGPPPPFPFFKPPFPFPPLFPFPFEPEFPPELFFFFFFFFFPFFLFPFPFPFPFPFPFP
FPPPPFFFPFFFKFFEFFFFPFLFPFLFPFPFP

Genotype-related actions

This part includes string data for the actions related to genotype determination. The string data is obtained from the semantic transcripts of the design processes.

Legend

V: VISIBILITY
X: ACCESSIBILITY
A: ADJACENCY
C: CIRCULATION
O: OCCUPATION
I: INTEGRATION

NSSX group

Protocol analysis of AH genotype-related actions

OOOCCOOOOOOAOVVOOOOCOXXOCVCXCIOAIOIAAACCOXXCOCCIAAAAAOAOXOXX
AOCOCCCCCVCOOVVVVXOOIOOOCCCO

Protocol analysis of LC genotype-related actions

AOVVVCOOXXXVVXXVXCXOCVVVXXVOOVCVVCXOXXCXXVVAXVVXXVVVVVOVAO
OXVVOVOAVVOXVOVVVVVOXVXVXVXXVVVVVOOOOOVAOAOAOAOAOAOAOAOOXC
AOCOOCVCOOXCOOCOVAOAVXXAAOOOAVAXOVOVVVVAAOVOACXOAOAOVCO
VAOAACCVOCVVAVVVCVCCCOOXOOOOOXOOCOOOOOOXAOCOOCOOXVCCCVV
AOOOOAOAVAOCOVXOCCAIVXIAIOAOAIOOIICXXXVVCAXIAOXAOAAOXAXOIAAC
VCAVVVVVCACXAXAV

Protocol analysis of AB genotype-related actions

OOOCOAXVOXCCOVVXVOIOACOOOOOOOOOXXVCCCOCOOOOXAXOCCAVOOXOAOOOC
AOVXOOVVCCOVVAOAVCCVVVOOAOAOAAAOAVOOOAOOCXOCVCVVOOCVVOOOO
CCCVCOOCAOAOAOOOOOOOOOOAAOOOAOVVVOOOOVVOOOVOCOOOVOAOVVVO
OOXVOOXOVXOCAOOOACOCXXXCOCOCVVOOOOOO

Protocol analysis of KS genotype-related actions

OAAAAVAVAAOAVVOAAOAVAOIVXACCCVCOCCXCCXOOAVAAACOOOAOXOOOXX
OOOOOAVOOOCOOOCCCOOOOOOOOOOCCCXVC

Protocol analysis of OO genotype-related actions

OCVCOAOC AOOOOOXOAVVIII OOOOOOOOOOAOOAXOOOOOXXOAXOOOXVOIAOOOOOAI
OAOOOOOOOOOOAAA OOOOOC OOOOOOOOAXOAVOVVAOOOACXXXCOOOOOAIXIAIOIA
OVOAOOOOXOOOOOCCCCCCCCOAOIOVXXAXXXOXOXO OOOOAOOOAOOOOOOOOOOOC
OAAAAAACOOOAOOAOOAOOAOOOOXXVXXOO

Protocol analysis of JG genotype-related actions

IIAIAXAAAAAAAIXCXCVCOOCOCCOXXCOOXXOXXOXXCOXOAOOOOXXCOACVV
VOOOACCCCOCOOOVXACXVVOXVOOOOOOV

SSX group

Protocol analysis of BC genotype-related actions

CVOXCCCOAAXXAXXXCIAOCOVOOIAOAXOOOAAIOXA OOA AOOOACA OOOOOOCCCC
CVXOOAOOCVOOCXCCCOOAXXOOO

Protocol analysis of PE genotype-related actions

IIIIIXIXOIOOAAO OAAAAAAAAAAAAAAAAAOOOOAAAXXXAXXXXCCOOCXXXO OAXOOO
CAXOVOO OCCCCOCCAAOC OOOVXXVXOOOOOAAAAOAAOCCOOOAOOAAOAOOXOXXO
OVOXVVXVXVXXOXV

Protocol analysis of AN genotype-related actions

ACCXVVVAAAAOAAO OOOO OAO OOOO OOOO OOOO OVOAOOVCCCCCXCXVXOOOOOXX
AAVAVVOCCXXIVOOAVXVXCX

Protocol analysis of CE genotype-related actions

CCOXVACCOVVVCXXXCCXXVXVVOOOOVXXCXOVVVOCCCOICOCXAAA OOOOOOOOOO
OOOAAO CXOVCCOCCXC OOOCCOIXOACAAA OOI AVAOOCXXCXXO

Protocol analysis of LM genotype-related actions

AAXCOCXXOIIXXXXXCCCCCOOVVAOOXVAVIXOAOAOAVOOOOOCO OOI AOAVOOXA

Protocol analysis of CR genotype-related actions

OOOCCCCOCCOOOOOOCXOOOOO COIOOOOOC OOOOOVVVOOAOXVOOVVXCOAVOAOO
OOVVOOVVOAO OOOOOOCAAVVVC OAO

Phenotype-related actions

This part includes string data for the actions related to phenotype determination. The string data is obtained from the semantic transcripts of the design processes.

Legend

L: LIGHTING
E: ENVIRONMENTAL
S: STRUCTURAL
D: DIMENSIONS
E: ECONOMICAL
A: AETHETICAL
M: MATERIAL
T: TECHNICAL
C: CULTURAL

NSSX group

Protocol analysis of AH phenotype-related actions

DSDDLMLTEEEELML

Protocol analysis of LC phenotype-related actions

EEEDDDMMSSSEAMDDDDDDDAADDADTTTTTTTTDDTEADDADDMDTMDMTLLD
LALA

Protocol analysis of AB phenotype-related actions

DDSMMSMASDDDDMDDDDDDMMAAAAAMMAAAAAAADAAAAAADDEAAAAAD
DADAMMMMMMAAAEEAMMLEASSMAAAMSSSSSSDDDDMAEEE

Protocol analysis of KS phenotype-related actions

ASADDDDLALLALELAAEDSAAAAATDLTTAETDADDLDDDDL

Protocol analysis of OO phenotype-related actions

DDDDMLEDDSSASDDDDADDDDDDDDDDDDMDMDMT

Protocol analysis of JG phenotype-related actions

AM

SSX group

Protocol analysis of BC phenotype-related actions

DMMMSDDMMMMM

Protocol analysis of PE phenotype-related actions

DDLLELESTDDTM

Protocol analysis of AN phenotype-related actions

SMAMMADDAETEEMM

Protocol analysis of CE phenotype-related actions

MMMSEEMMMEMSD

Protocol analysis of LM phenotype-related actions

DDMMMMM

Protocol analysis of CR phenotype-related actions

DSDDDDDDSDDDDDDDDDDLADAMMMMDAAADAMTAAD

Appendix 4

This section will provide description of the Mathematical definitions of Mean Depth, Relative Asymmetry, Real Relative Asymmetry, and integration. These definitions are part of the spatial configurations suggested by Space Syntax theory.

A complex C is represented as a graph of k points and connecting lines.

The depth between two points a, b of a complex C is noted as D (a,b) and is equal to the minimum number of connections that must be used to reach from a to b.

The mean depth of a point a in a complex C is defined by the expression:

$$MD(a, C) = \frac{\sum_{b_i \in C} D(a, b_i)}{k - 1}$$

k is the number of points in C

The relative asymmetry of a point a in a complex C is defined by the expression:

$$RA(a, C) = \frac{2[MD(a, C) - 1]}{k - 2}$$

For all a, C $0 \leq RA(a, C) \leq 1$

The real relative asymmetry of a point a in a complex C is defined by the expression:

$$RRA(a, C) = \frac{RA(a, C)}{RA_D(k)}$$

k is the number of points

$$RA_D(k) = \frac{6.644k * \log_{10}(k + 2) - 5.17k + 2}{k^2 - 3k + 2}$$

RA gives an approximation to the empirically found average RA(a,C) for complexes of size k. Values of RRA vary about 1 so that values above 1 indicate deeper than average complexes and values below 1 indicate shallower than average complexes.

The mean depth, relative asymmetry and real relative asymmetry of a complex C taken as a whole is given by the averages:

$$MD(C) = \frac{\sum_{a \in C} D(a, C)}{k}$$

$$RA(C) = \frac{\sum_{a \in C} RA(a, C)}{k}$$

$$RRA(C) = \frac{\sum_{a \in C} RRA(a, C)}{k}$$

$$Integration(C) = \frac{1}{RRA(C)}$$

Appendix 5

Standard deviation:

Estimates standard deviation based on a sample. The standard deviation is a measure of how widely values are dispersed from the average value (the mean).

STDEV uses the following formula:

$$\sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}}$$

Where $\bar{x}$ is the sample mean AVERAGE (number1, number2,...) and n is the sample size.

** Variance: Estimates variance based on a sample.

VAR uses the following formula:

$$\frac{\sum (x - \bar{x})^2}{(n-1)}$$

Where $\bar{x}$ is the sample mean AVERAGE (number1, number2,...) and n is the sample size.