

**MEASURING WORKPLACE DESIGN  
PERFORMANCE**

By

**Essam A. Abdel-Aal**

A thesis submitted to the  
Faculty of Engineering at Cairo University  
In partial fulfilment of the  
Requirements for the degree of

**DOCTOR OF PHILOSOPHY**

**In**

**ARCHITECTURAL DESIGN**

**FACULTY OF ENGINEERING, CAIRO UNIVERSITY**

**GIZA, EGYPT**

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**Approved by the Examining Committee**

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**FACULTY OF ENGINEERING, CAIRO UNIVERSITY  
GIZA, EGYPT  
2006**

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## ABSTRACT

The workplace is temporally affected by a number of factors and motivators – the new ways of working, the evolution of Information Technology, the changing Real Estate business, and Life Styles – and in spite of this change, the office as a built environment is not on its way to extinction.

Organizations are now characterized of being flat, decentralized, and networked, and new emerging workplace design strategies are used to serve one or more business objective, introducing three trends in the real estate business; Opening up, Sharing, and Variety.

The office can directly affect the workplace productivity along with other factors - Business processes, People/Organization, and Technology – substantially leveraging financial performance leading to a better organizational performance. This indicates that the aim in designing offices is to accommodate organizational performance with its five criteria; effectiveness, efficiency, productivity, flexibility, and creativity. Since many factors work collectively to improve organizational performance, then the process of effectively designing workplaces is of a multidisciplinary approach and dependable on the feedback delivered to the architect regarding the corporate culture, organizational structure, organization’s message and aims, and the physical work form.

The problem is that there is still a lack of awareness by top management in recognizing the role played by the office in raising financial performance and the interdisciplinary role of the architect, isolating him from drawing a complete image of his client’s needs. This in turn led to the implication of unsuitable conventional office planning feared to be of less responsiveness to the needs of knowledge work and organizational performance accommodation.

Accordingly, the importance of measuring the workplace design performance is basically in **documenting** the strategic role of the physically designed environment

in accommodating organizational performance and the contribution to the company's profitability calculations. It also is important in efficiently directing investments in the workplace design.

Therefore, the aim of this research was to develop a measurement tool that would be able to measure workplace design performance in accommodating organizational performance. Productivity – one of the five performance criteria – was chosen as a parameter for this measurement process because it has the wider capability of maintaining the balance between both efficiency and effectiveness. To be more specific, the performance of the workplace design refers to the successful accommodation of productivity. This proposed tool measured the following points;

1. *Overall workplace design performance*
2. *Performance of the design attributes of the workplace*
3. *Levels of importance of these design attributes*

Workplace productivity – achieved by: people performance, business process, technology used, human resources, and the physically designed environment - is basically measured by worker satisfaction, customer satisfaction, and financial results. It was assumed by this research that worker satisfaction comes first in order before customer satisfaction and financial results. So, if the workplace design succeeds in satisfying the workers, then it is anticipated that the productivity of these workers will be levered, leading to both customer satisfaction and financial results.

Hence, it was concluded that worker satisfaction is the key to workplace productivity, and also the key to the measurement approach of this research. Significant because the design attributes of the workplace are evaluated by the users themselves, making each case of measurement independent from the other regardless the culture, the type of business, the awareness of workers, the location, or even the scale of company.

The measurement frame work of this tool was applied on a company called **Equant** working in the field of virtual private networks located in Cairo in the City Stars complex. The frame work was simply divided into the following two steps:



- Step 1: *Attitude survey*. To measure the overall worker satisfaction and satisfaction with the design attributes
- Step 2: Measuring the levels of *importance* of these design attributes

The results of the attitude survey produced eight subscales or factors that constitute a number of relative items concerning certain aspects. These results were statistically tested and proved valid and reliable. Validity tests included Content, Construct, and Discriminant validity. The eight factors or dimensions presented were;

**1- Personal Psychological factors**

**2- Appearance**

**3- Work Functionality & Efficiency**

**4- Environment**

**5- Physical Comfort & hygiene**

**6- Group Work activities**

**7- Knowledge Interaction & Transaction**

**8- Circulation & Movement**

Correlations were made between *performance* and *importance* levels of the items of each of the produced dimensions in order to present a number of design recommendations helpful for the architect in directing the company's investments in their workplace design. These design recommendations were also based on observations that helped in explaining a number of confusing issues that resulted either from the survey values or the replies of the open ended questions.

Finally, this research proved that workplace design performance is measurable where it presented a valid approach based on user satisfaction with a frame work that when practically applied proved to be valid and reliable. It also demonstrated how the results of this measurement tool were successfully capable of directing efficient investments in the workplace design.

## INTRODUCTION

**‘Organizational performance’** and the productivity of those who work in office environments is becoming a matter of greater focus for all enterprises. The great change that happened to the new economy – also known as the **‘Knowledge economy’** – introduced new trends in the real estate business and new workplace design strategies or models that are now used to serve business objectives.

The workplace design along with many other factors collectively work to improve organizational performance and this is why the aim in designing offices has now become to **‘accommodate’** this organizational performance. And since many factors and inputs rule the design process to fit, in a customizable way, the client’s needs it must also be realized that this design process is **‘interdisciplinary.’** It is dependable on the feedback delivered to the architect regarding the corporate culture, organizational structure, organization’s message and aims, and also the physical work forms of his client.

### *Problem definition*

If the top management of any organization fail to recognize the interdisciplinary role of the architect and also the role of the physically designed environment in leveraging organizational performance, then this might create an isolating barrier between the architect and the complete image of his client’s needs. This in turn will lead to the implication of unsuitable conventional office planning feared to be of less responsiveness to the needs of knowledge work, accordingly affecting the role of the workplace in accommodating organizational performance.

Those who are responsible for the delivery of effective workplace design - in today’s competitive business, where all costs not directly involved in creating customer value are carefully scrutinized - are pressed to show how it is contributing value to the corporation, and workplace planners and managers are obliged to justify their case. Share holders must also be convinced that spending extra money on

redesigning the workplace will somehow have an effect on the organizational performance and workplace productivity, thus achieving higher business results.

They are also pressed to efficiently direct the investments in the physically designed environments in order to accommodate organizational performance and promoting productivity.

In other words they are pressed to 'Manage the workplace design' in order to contribute value to the profitability calculations of their organizations.

### ***Research aim and objective***

An old business adage says '*What can't be measured can't be managed.*' The only way to manage investments in the physically designed environment and relating it to better business results is by **MEASURING** the '**Workplace design Performance**' – the research aim. It would never be realized how much successful the workplace design is, unless this success could be measured and documented.

With the rising complexity in the process of workplace design, subjective measurements are becoming more important than ever. But approaches to measure workplace design performance are relatively very little in number because venturing into this area is very confusing and problematic. This is because other factors than the workplace design could also lead to better business results. Also Productivity is comparatively easy to understand and measure in a manufacturing economy (quantitative measurements), but as the economies have migrated from manufacturing to service and on to knowledge-based, the whole issue of assessing productivity has become less clear (qualitative measurements).

Therefore, the objective of this research is to introduce a ***measurement framework***; statistically tested for its validity and reliability in evaluating those (qualitative) design variables that relate to increased productivity. It should also neutralize factors like the location, business type, culture, and scale in order to make the focus of the framework wider, and be used universally.

### ***Research hypotheses***

This thesis is based upon three main hypotheses shown as follows:

- **Workplace design performance can be quantitatively measured**
- **Worker satisfaction is a reliable approach to measure workplace design performance**
- **Measuring workplace design performance CAN direct investments in the workplace design**

### ***Research scope and limitations***

The scope of research will include the following issues:

- The term ‘Workplace design performance’ will refer to the progressive accommodation of organizational performance in this research.
- To minimize the scope of research, productivity – as one of the 5 criteria of performance – will be the centre of focus of this research.
- Productivity is measured by:
  - Worker satisfaction
  - Customer satisfaction
  - Financial results

But this research will only focus on *worker satisfaction* as an approach to measure workplace design performance.

- The focus of interest for the case study will be for the organizations that are characterized of being with a flat, star-shape networked organizational structures. This type of organizations hosts a very fast growing mode of work which is the ‘Transactional Knowledge Work.’ According to Duffy<sup>1</sup>, this mode of work is in continuous growth and needs provision.

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<sup>1</sup> Tanis, J. Duffy, F. **A Vision of the New Workplace Revisited**. A paper published in The International Development Research Council’s journal, *Industrial Development*, 1999.

- According to Bernard<sup>2</sup>, the minimum sample size for applying the proposed measurement framework will be no less than 200 workers.

### ***Research significance***

This research is significant by many means:

1. Measuring workplace design performance will enable facilities managers manage their workplace designs in order to manage the investments in the physically designed environment and relate it to organizational performance
2. It presents a validly tested framework, able to promote productivity by measuring worker satisfaction with the design items that compose the workplace as a physically designed environment.
3. This framework also measures the magnitude of these design items in order to correlate satisfaction with importance and direct investments in the workplace design.
4. Measuring Worker satisfaction (attitude surveys) reflects values like Relativity and Past experience<sup>3</sup>, making this approach to measure the workplace design performance significant by being generic.

### ***Research objectives***

The objectives of this research can be simply stated in the following points:

1. Defining the change in ***workplace***
2. Defining ***design performance***
3. Exploring different attempts to ***measure workplace design performance***
4. Developing a ***framework*** to measure workplace design performance
5. ***Validating*** the proposed framework

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<sup>2</sup> Bernard, H., **Research methods in anthropology. Qualitative and Quantitative approaches.** 2<sup>nd</sup> edition, Walnut Creek, London, New Delhi, Alta Mira Press, 1995

<sup>3</sup> James Pinder, **A method for evaluating workplace utility**, The College of estate management, Reading, UK.

### ***Research methodology***

The research methodology is built upon three clear steps shown as follows:

#### **1. Literature review**

The proposed measurement framework in this research is formulated upon the review of three different yet relative topics:

##### ***1. Workplace design and measurement***

A review of the change that happened to the workplace trends, the factors that caused that change, and the design principles. Also a review of all the previous attempts regarding measuring the performance of office buildings.

##### ***2. Organizational performance***

A review of all the factors that affect financial results, and strategic performance in organizations, and worker productivity.

##### ***3. Marketing research***

A review of all the research methods that relate to collecting data on the behaviour and attitude of workers.

#### **2. Analytical study**

This part of the methodology analyses the previous topics in order to help deduct the framework to measure workplace design performance.

#### **3. Framework development**

In this part of the research an approach to measure workplace design performance is introduced and the framework is proposed.

#### **4. Empirical study**

In this study, the previously proposed framework is tested for its validity and reliability.

### ***Research structure***

The previous methodology is presented in the following structure which is divided into three parts as shown:

## 1. Part One: LITERATURE REVIEW

### **Chapter One: The workplace in change**

This chapter works as an introductory shedding light on the '*modern workplace design.*' It will aim to define the term '*workplace*' and track the change that occurred in its design concepts. It will also shed some light on the new ways of working and how the real estate business was challenged. It will show how the design process is multidisciplinary, and that briefing the architect with the exact data is crucial. It will demonstrate the steps that should be followed in order to effectively design workplaces in a way that responds to the client's actual needs.

### **Chapter Two: Measuring office building performance**

This chapter will drop the light upon the role of the workplace in leveraging organizational performance and increasing worker productivity. If being ignorant about this fact, the top management unintentionally will affect the interdisciplinary role of the planning process, through the implication of conventional models that no longer suit the needs of their workers. Tackling this issue made it possible to identify the *problem nature*, the *problem decision*, and the *research problem* here in this chapter.

### **Chapter Three: Different attempts to measure office design performance**

There have been a number of approaches in the area of measuring office buildings performance that were found valuable and helped in creating the goals of this study. It was found necessary to demonstrate them before venturing into the process of building a measurement framework. Therefore, A thorough review of these different approaches that either tried to setup a measurement methodology, strategy, or even a technique, will be the aim of this chapter.

## **2. Part Two: A FRAMEWORK FOR MEASURING WORKER SATISFACTION**

### **Chapter Four: Worker satisfaction as an approach to measure workplace design performance**

This chapter explores Productivity as one of the five criteria that affect organizational performance. Then it focuses on the worker satisfaction as one of three methods used in measuring productivity. Accordingly, this chapter aims to develop an approach that focuses on measuring worker satisfaction so that it can be widely used and is able to direct investments in the workplace design by promoting productivity.

### **Chapter Five: A framework to measure workplace design performance**

This chapter formulates a framework that will focus on worker satisfaction as an approach to measure workplace design performance. The framework is a two step procedure relying on an attitude survey and focus groups to measure both the satisfaction and the magnitude of the design items composing the workplace design. This framework will be also supported by observations. This chapter will demonstrate all the practical steps, including the statistical calculations that will help achieve this target.

## **3. Part Three: MEASURING WORKPLACE DESIGN PERFORMANCE**

### **Chapter Six: Empirical study**

In this chapter, the proposed framework will be applied on a case study, and will be statistically tested for its validity and reliability in producing results. It will also demonstrate the different incomplete attempts of other selected cases and what was concluded out of these attempts.

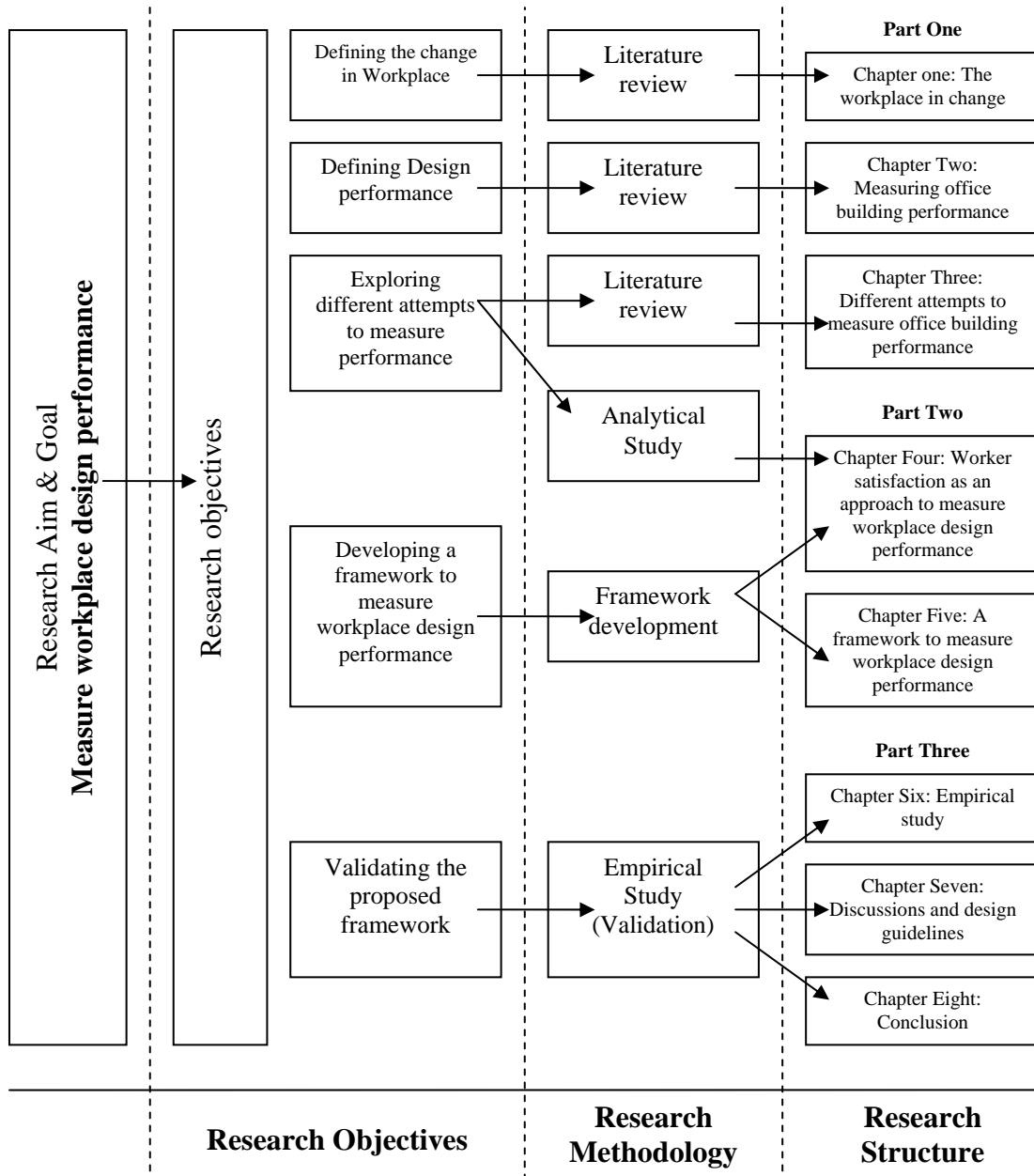


**Chapter Seven: Discussions and design guidelines**

After applying the measurement tool on the case study and producing valid and reliable results from the attitude survey, or from the level of importance measurement, these results are discussed in this chapter. This discussion is based also on the observations made by the author based on the fact that user perception should not always be taken for granted. This discussion will produce design guidelines that will facilitate for the architect or the decision maker to progressively direct investments in the design of the workplace environment. The discussion is supported by correlation plot graphs which help in directing investments in the office environment for each department separately.

**Chapter Eight: Conclusion**

Finally, this chapter will present the list of conclusions and outcomes that this research has reached and would also propose future research work.



**Part One:**

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**LITERATURE REVIEW**

**Chapter One:**

**THE WORKPLACE IN CHANGE**

## 1.1 - INTRODUCTION

Workplace design concepts have changed dramatically; the workplace that was at a time observed as a '*paper factory*' (Fig. 1-1) is now seen as a '*Knowledge center*.' The image of the hi-rise custom-built office building of the seventies and eighties, no longer attract corporations, and large organizations. The workplace is now looked at as a hub or reservoir of knowledge exchange. (Fig. 1-2)

The continuous and rapid developments in the field of Communication and Information Technology are changing every thing related to the business world. Now the world economy has changed to become more of a '*Knowledge economy*.' The way work is done and Lifestyles also changed. These trends had its effect and implications on the real estate business, challenging planners to change their design concepts and models to fit the needs of this new economy.

The process of planning for the '*Knowledge Work*' is becoming more and more customizable, for what fits a certain client, doesn't necessarily fit the other, even though they work in the same field. A number of factors enter in the process, depending on the corporate culture, the business processes, and the work forms of each client. An effectively designed workplace is one that reflects the actual needs of the organization.

This chapter works as an introduction to shed some light on the '*modern workplace design*' and clarify the previous issues, define the term '*workplace*' and track the change that occurred in its design concepts. It will also shed some light on the new ways of working and how the real estate business was challenged. It will show how the design process is multidisciplinary, and that briefing the architect with the exact data is crucial.



Fig 1-1: 'The paper factory' an old model of office planning that no longer exists.

(Source: Duffy F. Cave C. Worthington J. Planning office space.1988)



Fig 1-2: The workplace is now looked at as a hub or reservoir of knowledge exchange.

(Source: Zelinsky, M., The Inspired Workspace: Interior Designs for Creativity & Productivity, Rockport Publishers, Inc. 2002)

## 1.2 - DEFINING THE TERM 'WORKPLACE'

Webster<sup>1</sup>, the online dictionary, defines the term '*workplace*' simply as: "*a place where work is done.*" This definition is too narrow and somewhat incomplete. There is a big change that happened to the economy and the parameters that control it, John Worthington<sup>2</sup> of DEG<sup>3</sup> writes;

**Today, we have already passed through the service economy, to embrace the knowledge economy. Information and communications technology have converged, providing through the web a seamless global network. Change has accelerated. Product life cycles have shrunk. The E-commerce year is commonly described as three months.**<sup>4</sup>

In such a changing economy that is increasingly dependant on "knowledge workers", work is done any time, and anywhere. (Fig.1-3 & 1-4) A definition of the modern workplace needs to recognize this reality.

Another approach to define the term is that, the office or the workplace is '*an idea factory*'. Strengthening this idea is the definition made by Neal Zimmerman<sup>5</sup>;

**A workplace is where ideas are developed, recorded, and communicated. In this sense a car or plane seat could serve as an office, and indeed they sometimes do.**<sup>6</sup>

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<sup>1</sup> Webster's online dictionary <http://www.websters-online-dictionary.org>

<sup>2</sup> Since co-founding DEG in 1973, John has pioneered methods of adapting urban and space planning techniques to meet the needs of emerging knowledge-based economies. He is particularly interested in how the changing needs of complex organisations are translated into a programme of practical action for design. From 1992-7, John was Director of the Institute of Advanced Architectural Studies and Professor of Architecture at the University of York. He is chairman of DEG's knowledge sharing group, Workplace Forum. He is Visiting Professor in Briefing and Building Performance at the University of Sheffield and Deputy Chairman of Regeneration through Heritage (a Business in the Community initiative).

<sup>3</sup> DEG is an international design consultancy committed to delivering strategy as well as practical design solutions. <http://www.degw.com/>

<sup>4</sup> Worthington, J., DEG. **Accommodating change - Emerging real estate strategies**. Paper Published at the Workplace Forum, November 2000. Workplace Forum is a research and learning network focused on global best practice in workplace design, technology, and management. <http://www.workplaceforum.com>

<sup>5</sup> Zimmerman, N., is principal of Zimmerman Architects in West Hartford, Connecticut. He's written numerous articles on residential and commercial office design.

But still, this definition sounds vague. In an attempt to search for a broader definition of the workplace, the one made by **PdK Consulting**<sup>7</sup> believe that the '*workplace*' should be defined as;

**The environment (as place, tools, social connections, physical well being) enabling work to be done.**

They also add that this broader definition, will lead workplace development to include the identification of:

- Where work will be done (*such as in an office, at home, in a plane or car, in an office, or at a conference, all of the above, etc*),
- what processes (*such as transaction processing, innovating, communicating, learning, etc*) will define the work to be done,
- How technology will enable those processes to be carried out (*such as data access, groupware, mobileware, etc*)
- What physical environment will support the work (*such as office design and layout, furniture, equipment, temperature, light, etc*)
- when and where people interact to exchange knowledge and information

In summary, the definitions reviewed for the term '*workplace*' were enormous, but seemingly what they had in common – as shown – was that they all led to the same meaning. The contributions presented previously only aimed to represent three levels of definitions – out of many – and to show that the only difference between them is the degree of description, and the determining of the parameters that shape the physically designed environment, serving that same meaning. But what's more important here isn't the description of that environment as much as noting that the workplace is temporally affected by a number of factors and motivators (*the new ways of working, the evolution of Information Technology, the changing Real Estate business, and Life Styles*)<sup>8</sup> that make those parameters in continuous change.

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<sup>6</sup> Zimmerman, N. **Home office design, everything you need to know about planning, organizing and furnishing your workspace.** Wiley Inc. 1996.

<sup>7</sup> **PdK Consulting**, a firm which focuses on Workplace performance optimization and on measuring the resulting performance improvements. <http://www.pdkconsulting.com>

<sup>8</sup> Zelinsky, M. **New workplaces for new workstyles**, Mc Graw-Hill, 1998.





Fig. 1-3: A plane seat can be perceived as a workplace.

(Source: [www.chawlatravel.com/airbusiness1.htm](http://www.chawlatravel.com/airbusiness1.htm))



Fig. 1-4: Limousines are now equipped to work as a mobile workplace.

(Source: May Bach automotive company <http://www.maybachusa.com/> )

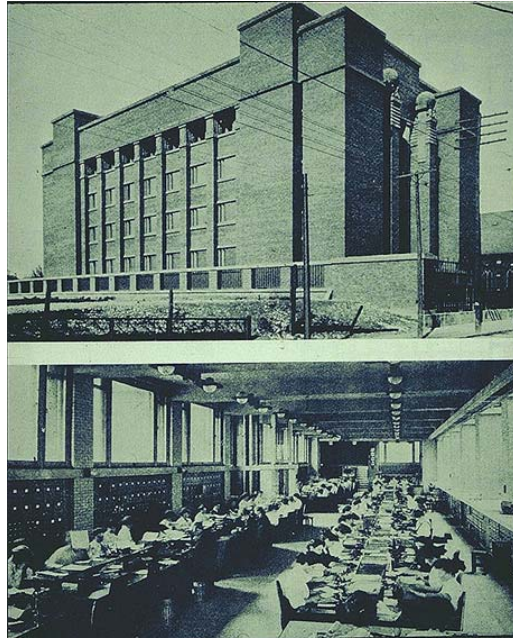


Fig. 1-5: The Larkin Building perceived as a 'paper factory' designed by Frank Lloyd Wright. 1896.

(Source: [http://www.prairiestyles.com/bock\\_comm.htm](http://www.prairiestyles.com/bock_comm.htm))



Fig. 1-6: Lloyds building, by Richard Rogers, London, UK. 1984

(Source: [www.stuart63.fsnet.co.uk/lloyds.htm](http://www.stuart63.fsnet.co.uk/lloyds.htm))

## 1.2 - THE WORKPLACE EVOLUTION

In an attempt to support the workplace definition, and in order to build up a clearer image of the continuous change happening to it, tracking the evolution of the workplace was found necessary. Basically, at the turn of the past century, offices were perceived as '*paper factories*,' best presented in Frank Lloyd's Larkin building built in 1896. (Fig.1-5) Technologies used at that time (*the telephone, type writer...etc*) contributed in this perception. It was always, the technological developments that used to shape the office building design.

Little change happened to the office design since that time until the seventies and eighties when developments in information technology evolved rapidly. Frank Duffy<sup>9</sup> wrote about the evolution of workplace design in his published paper '*forty years of office design*'<sup>10</sup> that in the seventies, the workplace was designed to broadcast corporate order. Thus, was characterized by the huge open plan, as well as the bold structure. While in the eighties, the increasing developments in the field of information technology, made it inevitable for the globalisation of Financial Services industry and the consequent deregulation of trading in securities and foreign exchange. As a result, a huge office stock had to be rebuilt in the Eighties to accommodate the new computers, with their cabling and their cooling loads. A good example of that period was Richard Rogers' building for Lloyd's of London (1986). (Fig.1-6)

As for the nineties, the Waterside building for British Airways near Heathrow (1998) (Fig1-7) is an urban contribution of a different kind and is a good example of the change that happened at that period. It is formed of six sub buildings that together create a landscaped, lively internal street, lined with coffee bars, meeting and training rooms, shops and restaurants. Again, what really made the building work are the developments made in the field of information technology, represented in cordless

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<sup>9</sup> Dr. Francis Duffy, founder of DEGW. Frank's career has been spent helping businesses use space more effectively over time. Currently he divides his time between DEGW's London and New York offices and is a Visiting Professor at MIT.

<sup>10</sup> Duffy, F., DEGW. **Forty Years of Office Design**. Paper Published at the Workplace Forum, November 2000. Workplace Forum is a research and learning network focused on global best practice in workplace design, technology, and management. <http://www.workplaceforum.com>

telephony which allows people to become much more mobile within – as well as outside the office – and to disengage themselves from fixed workplaces. The new building has been used quite deliberately and self consciously as a catalyst to create a new business culture.

By the turn of the century, Mobility continues to increase and the demands of increasingly powerful and discriminating end users couldn't be contained much longer in conventional office buildings. How unconventional the office is becoming is demonstrated by Clive Wilkinson's conversion of an industrial shed in Los Angeles for the advertising agency, Chiat Day. (Fig. 1-8) This example is one indication of the way workplace design is changing. All the design emphasis is on the short-term interior elements and the building itself is of little importance

This previous exhibition of projects was very important. In summary, It shows how fast and strong the magnitude of change has grown; from large hi-rise, custom-built office buildings in the seventies and eighties, to sub-urban remote locations, unnecessarily built to work as an office, but customized to serve an organization by utilizing the internal configuration. The catalyst for all this change is been foreseen basically in the developments of information technology.

### **1.3 - THE ROLE OF THE WORKPLACE**

The issue of telecommuting<sup>11</sup> (Fig. 1-9) and the enhancements given by Information Technology in the field of remote working strengthened the idea that '*Your office is where you are*'<sup>12</sup>, thus raising the question of the importance of building up offices. if work could be done remotely, like in the car, at home, or perhaps on a plane seat, have cross continent meetings, virtual workshops and teams, then why do we need to build up offices?

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<sup>11</sup> Futurist jack Nilles coined the term in 1973 to describe a strategy in which employees work at home. It's more of a policy, but it does have ramifications on space design. Telecommuters typically work from home one or more days a week on a consistent basis. This strategy is perhaps the most widely publicized of all alternative workplace programs.

<sup>12</sup> Philip J. Luchetti S, **Harvard business review**, article on '*Alternative officing*', March-April 1985.

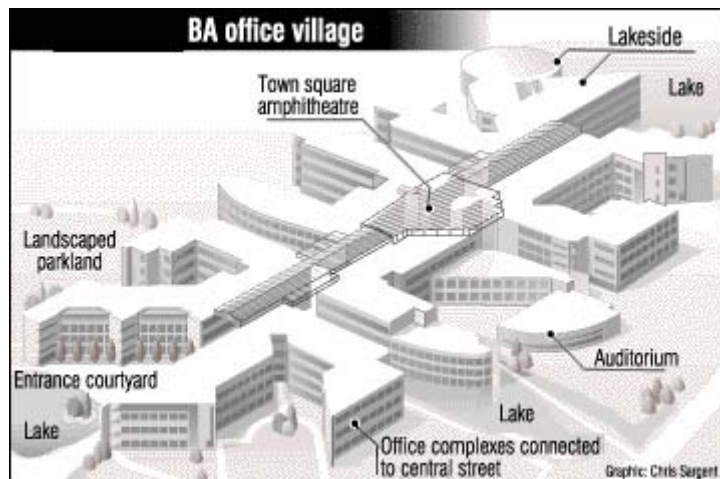


Fig. 1-7: the Waterside building for British Airways near Heathrow (1998).

(Source: <http://www.hughpearman.com/articles/cwa8.htm> )



Fig. 1-8: Chiat Day. Advertising agency, Los Angeles.

(Source: Raymond, S. Cunliffe, R. **Tomorrow's office, creating effective and humane interiors.** E & FN Spon. 2000.)



Building offices and maintaining them consumes a significant portion of the corporate cash flow<sup>13</sup>. The first beneficiary of the office diminish will be the organizations themselves – with all the savings they could gain out of it – but the true fact is contrary. Offices are built to host organizational performance, in a way that leads to better financial results. Supporting this fact is *'future work 2020'*<sup>14</sup> a paper published by the American society of interior designers, that aims to forecast what the workplace will look like in the future. It states that the Goals of integrated workplace strategies are identified as:

- Develop/maintain a strong organizational culture
- Reduce overhead spending while increasing productivity/profitability
- Foster creativity and innovation

Add to this the word organization itself, which means workers at all their levels and posts, and since the new economy realises that people are the main asset, then it sounds logical to fulfil their needs to get the best out of them. Looking at **Maslow's**<sup>15</sup> pyramid of human aspirations (Fig. 1-10), the office role rises in achieving self fulfilment, which is on the top of the pyramid. People need to get together for business and personal reasons. For business they need to share ideas, instructions and information, stimulate each other to become creative and energetic. For themselves they need to bond with their colleagues, and be valued by them. Hence, the role played by workplaces could be summed up in the following points<sup>16</sup>:

- Stimulating workers
- Working as a repository for information

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<sup>13</sup> Ouye, j., Ph.D. Principal FT/SYSTEMS. **Measuring workplace performance**. Paper presented at the World Workplace 97. <http://www.workplayce.com/news/press/meas.html>

<sup>14</sup> Vanecko, A., **Future Work 2020, presenting the future of the workplace**. Paper published by ASID (American society of Interior Designers) <http://www.asid.org>

<sup>15</sup> **Maslow, Abraham H.** 1908–70 American psychologist, b. Brooklyn, New York, Ph.D. Univ. of Wisconsin (1934). He taught at Brooklyn College from 1937, then became head of the psychology department at Brandeis Univ. (1951–69). A leader in the school of humanistic psychology, Maslow is best known for his theory of human motivation, which led to a therapeutic technique known as self-actualization. His influential works include *Motivation and Personality* (1954) and *Toward a Psychology of Being* (1964).

<sup>16</sup> Zelinsky M, **New workplaces for new workstyles**, Mc Graw-Hill, 1998.

- Promoting team working (getting people together, sharing ideas and instructions)
- Enhancing personal contacts
- Presenting a tangible corporate image

In addition to those roles, Accenture<sup>17</sup> also see the effectively designed workplace as one that would:

- Facilitate interaction and knowledge exchange
- Foster and support community
- Provide employee comfort and safety
- Respect local culture
- Respect work/life balance through remote work opportunity

The question is not whether to build or not to build offices, but it's a question of HOW to build these offices in a world that is changing, and that the new ways of working are manifesting itself into e-commerce (e-electronic) and m-commerce (m-mobile). Tele-mode work is increasing all over the world and most of the jobs will be in the so called TIME sector (telecommunication / information technology / media / entertainment). Traditional operational office work is becoming increasingly replaced through technology, i.e. automated. Work will change from hierarchically organised enterprises to enterprises organised like networks. Any corporation work will fall under production, marketing, or development activities. Globalization is increasing the chances to export office work in order to reduce expenses and invade new markets.<sup>18</sup>

As a conclusion, the effective design of the workplace must realize these facts – the factors that are driving the change – and as a result it will certainly lead to increased productivity, the quest of this research.

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<sup>17</sup> **Accenture** is a global management consulting, technology services and outsourcing company. Accenture collaborates with its clients to help them become high-performance businesses and governments. <http://www.accenture.com>

<sup>18</sup> **Arnold, T. Hascher, R. Jeska, S. Klauck, B.** *Office buildings, a design manual*. 2002. Birkhauser – Publishers for architecture, Switzerland.

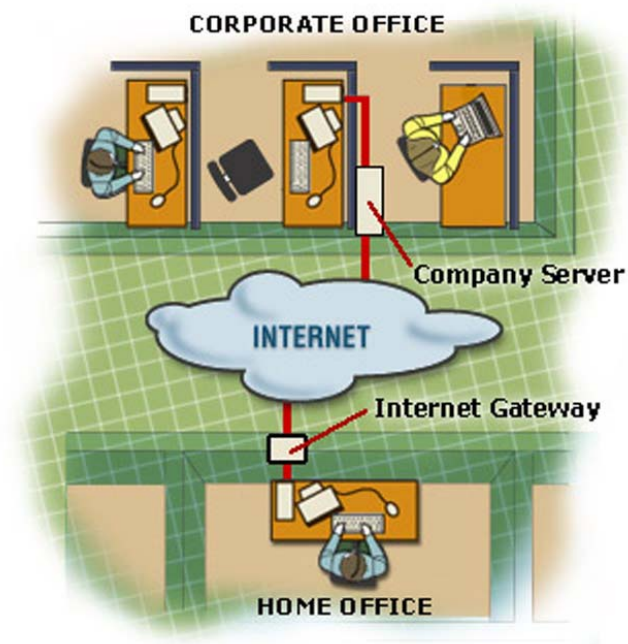


Fig. 1-9: A diagram showing the process of telecommuting

(source: <http://www1.sympatico.ca/help/local/bell/homenetworking/learning2.html> )



Fig. 1-10: Maslow's pyramid of human aspirations

(Source: researcher based on Maslow's Pyramid of aspirations)



## 1.4 - NEW WAYS OF WORKING

One of the most important factors that drove - and still is driving - the workplace design change is the new ways of working. About this change Worthington Wrote;

**Today, we have already passed through the service economy, to embrace the knowledge economy. Information and communications technology have converged, providing through the web a seamless global network. Change has accelerated. Product life cycles have shrunk. The E-commerce year is commonly described as three months.**<sup>19</sup>

Describing the characteristics of this knowledge economy, Kevin Kelly, in his book *“New Rules for the New Economy”*<sup>20</sup>, describes an economy that is founded on a set of rules that confound traditional expectations. The new technology has spawned an economy where:

- There is the minimum of hierarchy and decentralisation of control, power is with the swarm;
- Value is created by abundance not scarcity. One phone has very little value, whilst one million provide a rich range of contacts;
- Generosity begets wealth. Hardware is frequently given away to open up the market for valuable add-on services;
- Firms thrive on concentrating on the success of the network before the individual company;
- Corporations to succeed are prepared to change at the height of their success;
- Organisations are in continuous flux and change is the norm;
- Processes dominate the product, the experience adds value, many times greater than the base materials;

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<sup>19</sup> Worthington J, DEGW. **Accommodating change - Emerging real estate strategies**. Paper Published at the Workplace Forum, November 2000. Workplace Forum is a research and learning network focused on global best practice in workplace design, technology, and management. <http://www.workplaceforum.com>

<sup>20</sup> Kelly, K. **New Rules for the new economy**. Penguin Books (October 1999)

- Success is measured not by increased efficiency, but by the opening up of opportunity.

These characteristics impacted the ‘*office work modes*’ of the workplace, thus having a direct effect over the workplace configuration and evolution of its strategies. In order to understand this evolution, a comparison was made by Accenture to compare traditional, new, and evolving workplace strategies. [Table 1-1]

**[Table 1-1]  
Accenture vision of the evolving Work Characteristics**

Traditional Workplace Strategies	New Workplace Strategies	Flexible Workplace Strategies (Evolving)
Process Oriented	Project Oriented	Solutions Oriented
Isolated/Cellularised	Group / Interactive	Dynamic mobile teams with physical and virtual community support
Static Individuals	Community Based	Balancing physical / virtual work
Lack of flexibility	Increasing flexibility	
Fixed Workforce	Mobile Workforce (emerging)	

The knowledge economy, its characteristics, and the new workplace strategies, altogether participate in the change of the workplace design. About this impact Duffy wrote;

**Knowledge work is making the office the dominant workplace. Information technology, having already made the office grow enormously, is now offering ubiquitous and reliable electronic access in ways that are certain to transform not just the physical landscape of cities but also the entire landscape of our temporal lives. Perhaps 10% of the huge population of office workers is already experiencing virtuality, in forms such as home working and hotelling. Familiar Twentieth Century conventions of the use of time, such as the five day week and the eight hour day, may soon become anachronisms.<sup>21</sup>**

Since this change in the ways of working directly affects the workplace design, and since the evolution is directly proportional to that of the information technology, forecasting the future of work was the aim of the office of the future Consortium.<sup>22</sup> It started the development of the Future@Work<sup>23</sup> exhibit by creating

<sup>21</sup> Duffy F, DEG W. **Forty Years of Office Design**. Paper Published at the Workplace Forum, November 2000. Workplace Forum is a research and learning network focused on global best practice in workplace design, technology, and management. <http://www.workplaceforum.com>

<sup>22</sup> <http://www.callison.com>

<sup>23</sup> <http://www.futureatwork.com>

the following set of assumptions. What might the work a day world be like 10 years into the future:

- **Information technologies will continue to increase in power, speed, complexity, and offer an expanding variety of applications.**
- **Wireless technologies will release computing and communication technologies from fixed locations within or outside the office.**
- **Alternative environments outside the office will frequently support the working needs of people better than their current office environment.**
- **Focus on collaborative work will increase the demand for collaborative/group communication tools and environments. Collaborative tools will also be required outside the traditional office (home and other remote sites).**
- **As boundaries between work life and personal life blur, people will need new ways to cope with the overlapping demands of family, relationships, community responsibilities and work.**
- **Less space will be allocated to individual work.**
- **Symbols of status will need to be exchanged with alternative workplace, HR and IT benefits and solutions.**
- **“The bottom line” will continue to be of primary importance but will not remain the only indicator of success. (Others include ability to innovate, strength of corporate culture, management quality, market position, customer/employee satisfaction)**
- **Greater cultural and intellectual diversity in the workforce will require accommodation in work and workplace strategies and processes.**
- **What people accomplish will increasingly gain importance over who they are.**

In summary, the Knowledge economy has changed the ways of working, producing new workplace strategies and impacting the workplace design. The real challenge is to create a new real estate model, and procurement process that responds to and works in partnership with the needs and demands of these new ways of working and the new economy.

## **1.5 - CHANGE IN THE REAL ESTATE BUSINESS**

The main objective when building offices to the organizations of the eighties was to focus on efficiency by driving down costs. This objective has changed by time by focusing on ‘effectiveness’ besides ‘efficiency’. On this issue Worthington wrote;

**In the 1980’s, business was primarily focused on efficiency, the driving down of costs by increasing utilisation. The focus of real estate was on building performance. Organizations have recognised that business success is a balance between driving down costs (efficiency) and**

**improving people performance (effectiveness) through managing space, time, and staff expectations. The focus has shifted from property to processes, and the application of technology to support staff in achieving business objectives.**<sup>24</sup>

He also added that to ensure a greater sense of collaboration and creativity, three trends are now recognisable in the real estate business;

1. Opening up – with the linking of space to function rather than status
2. Sharing – by increasing the amount of shared space, that can be used by different staff over time
3. Variety – providing a wider and richer range of work settings that can support creative and collaborative work.

Hence, the real challenge for the real estate market, and facilities management professionals, now is to respond to:

- An organisational model that aims to support both individuality and team collaboration. Firms are moving towards a combination of personal and shared settings, managed across space and time.
- A business proposition, where the ownership of fixed assets are seen as a ‘millstone’ rather than a lifesaver for the organisation in the future.

In summary, those organisations that have embraced the new technology and accepted more flexible ways of working are experiencing a shift from a culture of hierarchical power and centralised control, to a structure that manages through culture, and functions by fostering a community of ideas. Such firms are establishing new structures and procedures to manage global networked mobile working, through the provision of safe and effective distributed working environments that foster community and culture. The real estate response is to move from the 1980’s model of the site and building being a long term investment, with tenants being a necessary

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<sup>24</sup> Worthington J, DEGW. **Accommodating change - Emerging real estate strategies**. Paper Published at the Workplace Forum, November 2000. Workplace Forum is a research and learning network focused on global best practice in workplace design, technology, and management. <http://www.workplaceforum.com>

irritant to today's model of real estate solution providers, who can deliver high value global services, to support the business, and where the building is incidental.

## 1.6 - ALTERNATIVE WORKPLACE STRATEGIES

Focusing more on the design process itself<sup>25</sup>, this change and evolution that happened to the workplace was deeply served by the increased use of the Alternative Workplace Strategies or (AWS) – Also called Alternative Workplace Environments, or (AWE) . The Environments Group<sup>26</sup> best describe AWS as;

**Alternative workplace strategies (or “AWS”) focus on problem solving and designing for the needs of knowledge workers and advanced technology.**

They also add that in order to develop successful AWS solutions, organizational objectives must be clearly defined. Depending on business needs, objectives may include;

1. Work process improvements,
2. Organizational effectiveness,
3. Occupancy cost controls, or
4. Human resource issues.

On the same issue Zelinsky wrote in her book *'New Workplaces for New Workstyles'*<sup>27</sup> that the alternative workplace design strategies are also used as tools for organizations to run their businesses. She adds that those tools are used to achieve four common business objectives: (Fig. 1-11)

1. Reducing real estate costs
2. Increasing sales and revenue

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<sup>25</sup> Literature review regarding the process of planning workplace design can be found in Appendix A.

<sup>26</sup> The Environments Group is a full-service design firm that specializes in the creation of effective workspace. Guided by the mission—*Design in Service to Business*—the firm offers facilities planning, interior design and management services. Based in Chicago, the firm serves clients throughout the United States. [www.envgroup.com](http://www.envgroup.com)

<sup>27</sup> Zelinsky M, *New Workplaces for New Workstyles*, McGraw-Hill. 1998. Page 34.

3. Increasing team interaction in order to reduce Research & Development cycle time
4. The need to use the office as a tool of talent recruitment and employee retention

However, Alternative Workplace Strategies (AWS) can have much broader business impact than mere economic efficiency and can be introduced to support any or all of the following change motives:

- **supporting new business strategy and marketplace repositioning**
- **sustaining organisational development and human relations initiatives**
- **attracting, nurturing and empowering human talent**
- **incubating business process reinvention and product innovation**
- **reinforcing technological systems re-engineering and operational efficiency**
- **stimulating information- and knowledge management systems**
- **catalysing culture shift and identity change.**<sup>28</sup>

Most AWS concepts can be aligned with a “space saving” or “space neutral” strategy. Space saving strategies improve densities and reduce occupancy costs. Space neutral strategies reallocate space to support new work processes.





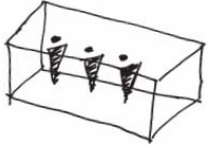

Best categorized by the Environments Group (Table 1-2), AWS are mutually exclusive. Nonetheless, they’re often used in conjunction with one another to match work patterns and processes with the most appropriate workplace designs. AWS are also described in relevance to the duration of occupancy, the ownership, counts of people in use of it, and space allocation. (Fig. 1-12)

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<sup>28</sup> Bradley S, **What’s working? Briefing and evaluating workplace performance**, a paper for the journal of corporate real estate, October 2001.

**[Table 1-2]  
Categories of the alternative workplace strategies**

(Source: The environments group)

<p>Private Office</p>  <p>An individual works independently in specific, dedicated work setting (workstation or office). While this traditional office approach is still used, the size and location of private offices have changed.</p> <p>Smaller “cockpit” offices use movable systems furniture and wall partitions for flexibility.</p> <p>Offices are moving to the interior - rather than the exterior window wall - to allow natural light to penetrate the open workplace.</p>	<p>Shared</p>  <p>Two or more individuals work in a specific, dedicated work setting either at the <b>same time</b> or at <b>different times</b> (as in shift work).</p>	<p>Non-territorial</p>  <p>An individual works in one of a pool of unassigned work settings.</p> <p>The space is allocated to the individual on a temporary basis. These work settings can be reserved through a formal process (<b>hoteling/just-in-time</b>) or on a first-come, first-served basis (<b>free address/touchdown</b> or <b>group address</b>).</p>
<p>Collaborative</p>  <p>A group of people are assigned to a flexible setting in an enclosed team room or an open area, such as pods or bullpens. These teaming areas can be assigned for short durations such as a week, or for longer durations such as years - depending on the requirements of the team. If unassigned, enclosed offices are located adjacent to an open team area, this is known as the <b>caves and commons</b> concept.</p>	<p>Unique Work Process</p>  <p>A group of people work in a dedicated setting that is designed specifically for their unique work Processes - such as a PC Configuration Work Room or a Report &amp; Graphic Processing Area. These areas typically house specialized equipment and furnishings.</p> <p>Because this is the primary Workspace for these groups, these people are not assigned other work settings.</p>	<p>Remote</p>  <p>An individual works at an off-site location but maintains electronic connectivity to the main office.</p> <p><b>Telecommuting</b> is location-static. It refers to remote officing from a fixed place, such as a person’s home.</p> <p><b>Virtual officing</b> is location-dynamic. It refers to remote officing from any location, such as a person’s car.</p> <p>Occasionally, companies have <b>satellite offices</b> (often located near an airport) for “drop-in” remote work by salespeople or consultants.</p>

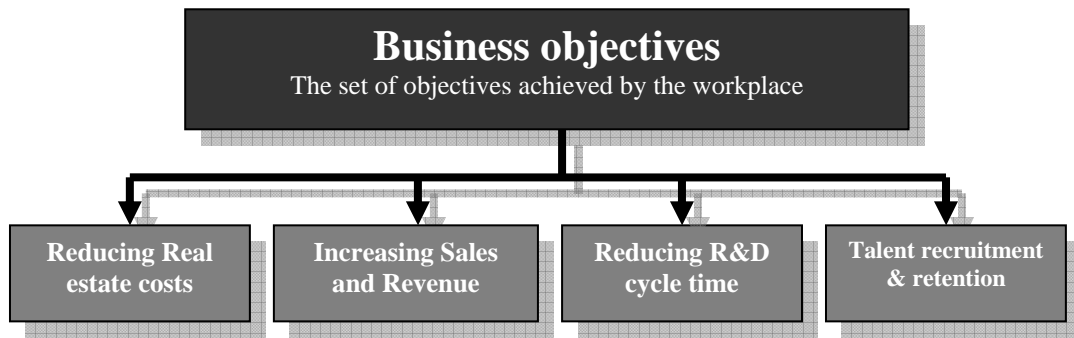


Fig 1-11: The main four business objectives the corporations need the workplace to achieve.

Source: Author, based on Zeleinsky M. *New Workplaces for New Workstyles*, by McGraw-Hill. 1998. Page 34.

		Duration		Ownership		People		Space	
		Temporary	Permanent	Assigned	Unassigned	Individual	Group	On Site	Off Site
Private Office			●	●		●		●	
Shared	Same Time	●	●	●			●	●	
	Different Times	●		●			●	●	
Non-territorial	Hoteling	●		●*		●		●	
	Free Address	●			●	●		●	
	Group Address		●	●			●	●	
Collaborative		●	●	●			●	●	
Unique Work Process			●	●		●	●	●	
Remote	Telecommuting	●	●	N/A		●			●
	Virtual Officing	●	●	N/A		●			●
	Satellite	●			●	●			●

\*On Reservation Basis

Fig. 1-12: In this figure AWS are described in relevance to the duration of occupancy, the ownership, counts of people in use of it, and space allocation.

(Source: [www.envgroup.com](http://www.envgroup.com))



## 1.7 - SUMMARY

The most comprehensive definition that could be found for the term '*Workplace*' was;

**The environment (*as place, tools, social connections, physical well being*) enabling work to be done.**

The only difference between definitions is the degree of description of the parameters that shape it. Noting that these parameters are in continuous change is very important. Factors that affect these parameters are four;

1. The evolution of Information Technology,
2. The new ways of working,
3. The changing Real Estate business, and
4. Life Styles

As an example for that change, offices grew from large hi-rise, custom-built office buildings in the seventies and eighties, to sub-urban remote locations, unnecessarily built to work as an office, but customized to serve an organization by utilizing the internal configuration. But still, this change doesn't mean that the office building is in extinction. Offices need to be built for;

- Stimulating workers
- Working as a repository for information
- Promoting team working (getting people together, sharing ideas and instructions)
- Enhancing personal contacts
- Presenting a tangible corporate image

The Knowledge economy changed the ways of working, producing new workplace strategies and impacting the workplace design. Now, organizations are experiencing a shift from a culture of hierarchical organizational structure and

centralised control, to a structure that is characterized by being flat, decentralized, and networked. As a result, three trends are now recognisable in the real estate business;

1. Opening up – with the linking of space to function rather than status
2. Sharing – by increasing the amount of shared space, that can be used by different staff over time
3. Variety – providing a wider and richer range of work settings that can support creative and collaborative work.

In order to support these trends, Alternative Workplace Strategies (AWS) were used as tools in the planning of new workplaces. These strategies could be categorized as;

1. Private office
2. Shared
3. Non-territorial
4. Collaborative
5. Unique work process
6. Remote

To use them properly, organizational objectives must be clearly defined. Depending on business needs, objectives may include;

1. Reducing real estate costs
2. Increasing sales and revenue
3. Increasing team interaction in order to reduce Research & Development cycle time.
4. The need to use the office as a tool of talent recruitment and employee retention.

Finally, the workplace design in this era is a process that needs a very serious attempt from the planner to comprehend the ever changing factors that shape its parameters. No specific model that was found successful for one organization could work as a repetitive prototype, even if it will serve an organization that works in the same field. The effective design of the Workplace depends on the feedback given to the planner, the more precise it was, and the more effective the design will be.

**Chapter Two:**

**MEASURING OFFICE BUILDING**  
**PERFORMANCE**

## 2.1 - INTRODUCTION

Work is no longer a place - it is an activity that can be conducted anywhere. Consequently, it is clear that the businesses requirements for the workplace are changing in terms of quantity, quality, location, diversity and functionality, all of which will place greater and more varied demands on those responsible for its provision and its management. To maintain an effective role in the organisation, facilities managers will need to innovate new solutions for new problems.

Organizational performance and the productivity of those who work in office environments is becoming a matter of greater focus for all enterprises. Productivity is comparatively easy to understand and measure in a manufacturing economy, but as the economies have migrated from manufacturing to service and on to knowledge-based, the whole issue of assessing productivity has become less clear.

This chapter will drop the light upon the role of the workplace in leveraging organizational performance and increasing worker productivity. If being ignorant about manipulating this fact, the top management, will un-intentionally affect the interdisciplinary role of the planning process, by implicating conventional models that no longer suit the needs of their workers.

Tackling this issue made it possible to identify the *problem nature*, the *problem decision*, and the *research problem* here in this chapter; the three main steps that form the problem formulation. Clearly formulating the problem, the outcomes of this research work can be fruitful and would significantly contribute to the larger framework of future office design.

## 2.2 - ACCOMODATING ORGANIZATIONAL PERFORMANCE

In his book Senge wrote;

**The challenge to business leaders seeking improvement is to find ways to change things effectively and, with the least amount of effort, find the leverage points in a system<sup>1</sup>.**

For most organizations, the physically designed environment is one of those leverage points. Small changes in the environment can effect big changes in behaviour and changing physical space can modify relationships. (Fig. 2-1)

This role of the physically designed environment, as well as management processes over time, in bringing about improved organisational performance in terms of management effectiveness and increased productivity, has been noted by several authors.<sup>2</sup> Mohr argues that;

**Office space is a tool that can be leveraged to improve business results and help achieve corporations' objectives.<sup>3</sup>**

It also has been hypothesized by Brill that;

**Improvements in the physical design of the workplace may result in a 5-10 per cent increase in productivity.<sup>4</sup>**

Robertson writes that;

**The notion that behaviour in organization can be shaped through alteration or design of work settings, such as the office, has important implications for businesses as well as scholars interested in planned organizational change.<sup>5</sup>**

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<sup>1</sup> Senge P, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 1994, Bantam Doubleday Dell Audio Publishing.

<sup>2</sup> Ilzor, Love, Trelor. **The impact of work settings on organizational performance measures in built facilities**. *Facilities*. Volume 20. Number 1/2. 2002. pp. 61-68

<sup>3</sup> Mohr, R. (1996), "Office space is a revenue enhancer, not an expense", *National real estate investor*; Vol. 38 No. 7, pp. 46-7

<sup>4</sup> Brill, M., "Workspace design and productivity", *Healthcare Forum*, Vol. 35 No. 5, September-October. 1994.

<sup>5</sup> Robertson, P.J., "The relationship between work setting and employee behavior", *Journal of Organizational Change Management*, Vol. 7 No. 3, 1994, pp. 22-43.

The American Society of Interior designers note that;

**Using the workplace as a leverage point, organizations can better facilitate structural realignment; implement new technology, redesign business processes, and reinforce the organization's values, culture and image.<sup>6</sup> (Fig. 2-2)**

This means that the workplace is one of four key factors that drive organizational performance & better business results. These factors simply are:

1. Business processes
2. People/Organization
3. Technology
4. Workplace (Fig. 2-3)

Also add that efforts in all these four areas must be integrated, balanced, and measured. If an organization seeks radical change in a key business result – such as doubling revenues – the organization must integrate radical steps on all four platforms to achieve that result. Hence, developments in the workplace environment are considered strategic, and it should be promoted through an interdisciplinary approach.

For example, adding a global network but failing to integrate it with adequate training, appropriate processes, and ample network connections will restrict the use and value of the new system. (Fig. 2-4) Similarly, the organization must balance investments on each platform to optimise results. The investment in technology must leave adequate sources available for training, administration, and connections. Finally, business leaders must measure costs and benefits of any investment—whether in personnel, technology, process, or workplace improvements.

If an organization is guided by profitability, the transformation process of input and output should be effective as well as efficient at the same time. If this is the case then the process is productive. In order to anticipate possible future changes, the process should also be flexible. Finding the right balance between the mentioned criteria asks for certain creativity.

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<sup>6</sup> [www.asid.org](http://www.asid.org)



Fig. 2-1: Small changes in the environment can effect big changes in behaviour and changing physical space can modify relationships

(Source: Steelcase)

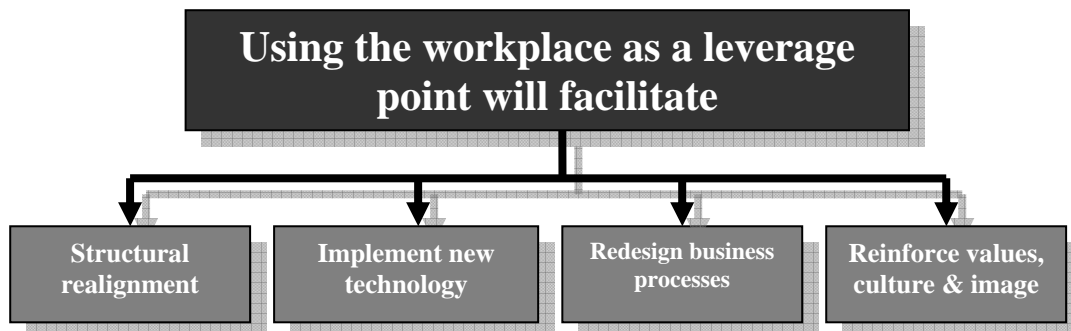


Fig. 2-2: Using the workplace as a leverage point, organizations can better facilitate structural realignment; implement new technology, redesign business processes, and reinforce the organization's values, culture and image.

(Source: Author based on the American Society of Interior Designers)

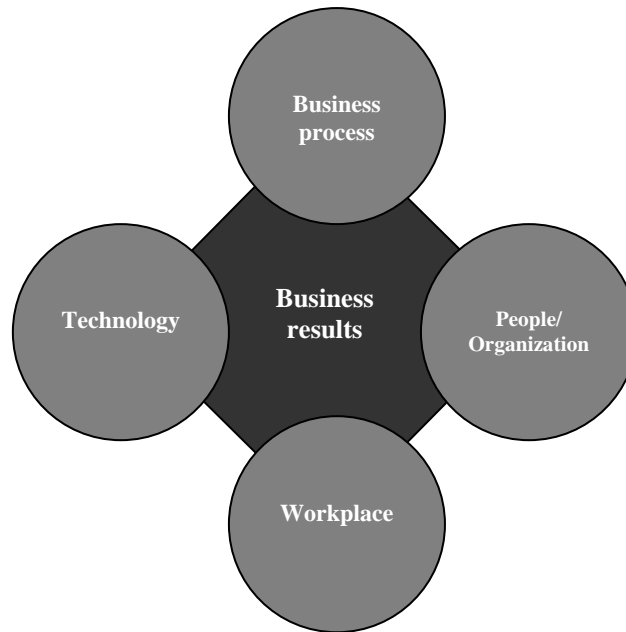


Fig. 2-3: The workplace is one of four key factors that drive business results.

(Source: Author based on the American Society of Interior Designers)



Fig. 2-4: Adding a global network but failing to integrate it with adequate training, appropriate processes, and ample network connections will restrict the use and value of the new system.

(Source: Steelcase)



Accommodation, a substantial part of the resources used within an organization has a significant impact on the profitability or performance of an organization. It depends to a great extent on meeting the generic performance criteria: effectiveness, efficiency, productivity, flexibility, and creativity. In order to really contribute to profitability, an organization should strive to simultaneously meet and accommodate all mentioned criteria sufficiently. [Table 2-1] Two of which are most important are Effectiveness and Efficiency. Ree writes;

**Nowadays, there are two important approaches that contribute to organizational performance:**

- 1. Achieving greater efficiency by reducing the occupancy costs by reducing the amount of space per employee; and**
- 2. Achieving greater effectiveness by improving the productivity of the employees by providing comfortable and satisfying working environment.<sup>7</sup>**

He also adds that the biggest contribution to the organizational performance can be reached if a reduction in occupancy costs leads to increased productivity of the employees. Increased efficiency, however, often has a negative impact on the effectiveness and vice versa. By providing insight into the impact of one approach on the other this can be prevented.

Given the fact that the costs relating to human labour are much higher than occupancy costs, the most intelligent way to contribute to the organizational performance through accommodation is to support the productivity of the employees by reducing the occupancy cost. The fear is that organizations are mostly focused on cost reductions (efficient accommodation); therefore more attention should be drawn on (effective accommodation).

### **[Table 2-1] Accommodating organizational performance**

#### **Effective accommodation**

$$\frac{\text{actual contribution to individual productivity}}{\text{aimed contribution to individual productivity}}$$

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<sup>7</sup> Ree H. The added value of office accommodation to organizational performance. Work Study. Vol. 51. No. 7. 2002. pp. 357-363

Provide a varying working environment  
Provide interactive-stimulating areas in the office layout  
Apply collective, supporting elements  
Provide informal spaces

#### Efficient accommodation

$$\frac{\text{aimed occupancy cost}}{\text{actual occupancy cost}}$$

Establish a favourable gross/net ratio within an office building  
Try to prevent churn by providing uniform workplaces  
Reduce the amount of space per person  
Reduce the number of workspaces

#### Productive accommodation

$$\frac{\text{actual contribution to individual productivity}}{\text{actual occupancy cost}}$$

Look for opportunities to apply both approaches above at the same time equally  
Find the right balance between both approaches through cost-benefit calculations

#### Flexible accommodation

Realize possibilities for extending or downsizing  
Look for possibilities to divide, reassign and rearrange spaces  
Provide uniformity of furnishing and communication tools

#### Creative accommodation

Pay attention to interior design  
Pay attention to furnishing, dressing and colour

## 2.3 - OFFICE DESIGN & BUSINESS PROCESS RE-ENGINEERING

Recently, when office design was thought of, what usually came to mind was wall and carpet colour, style of furniture, and wall pictures. Cost containment, as previously explained, was and still is a concern. The CEO would inhabit the largest suite on the top floor and the lowest-level employee would have the smallest office on a low level.

Today, however, the trend is towards basing office design on employee needs, in order to maximize employee productivity and satisfaction. The work environment can either accommodate or frustrate those needs.

Looking at one of the primary motivators of this change is the advances in Information Technology which, as described earlier, led to new ways of working and rethinking of office processes. But many organizations were dissatisfied with their return on investment in IT and began to invest in Business Process Re-engineering (BPR).<sup>8</sup> The introduction of BPR, along with other factors, resulted in that many of the organizational structures changed from being '*hierarchically organized enterprises*' to '*Flat, Star-shape networked enterprises.*' (Fig. 2-5) Decision making changed from passing vertically through several different levels of the hierarchy ladder, to flat networks of workers who have the authority to make decisions. (Fig. 2-6) This new form of organizational structures is characterized by the following:<sup>9</sup>

- Flat hierarchies
- Decentralized, Polycentric decision making
- Organised in interdisciplinary teams (Project teams) Characterised by being:
  - Task based
  - Process oriented
  - Result oriented
  - Empowered to make decisions
  - React directly to problems and customer requirements without having to waste time going through functionaries higher up in the hierarchy
- Routine work is Automated
- A corporate culture that is open to:
  - Innovation
  - Promoting communication between workers
  - No fear of making mistakes or taking risks
- Non-Authoritarian management that develops and establishes common goals with worker participation – supports creative thinking

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<sup>8</sup> Tanis J, Duffy F. **A Vision of the New Workplace Revisited.** A paper published in The International Development Research Council's journal, Industrial Development, 1999.

<sup>9</sup> Arnold, T. Hascher, R. Jeska, S. Klauck, B. **Office buildings, a design manual.** 2002. Birkhauser – Publishers for architecture, Switzerland.

- The boss is no longer an authority, but a Team Leader/Moderator of the group process
- Worker capabilities are:
  - Social competence
  - Ability to communicate
  - Initiative
  - Flexible
- The worker decides for himself, in certain cases, the time and place of work
- Result oriented remuneration or computer supported control systems
- The use of outsourcing

It is still believed that BPR has helped organizations become more competitive, although recent reviews have drawn attention to the high failure rate in BPR experienced by many businesses often pointing to rejection by the very people upon whom the success of business processes depends. This is because in many cases there was a significant breakdown in trust, perhaps because the most obvious commercial reality that resulted was the elimination of jobs.

The robust economy of the late Nineties has put most of these skilled knowledge workers back into the work force. Some of those workers have had to acquire new skills before becoming reemployed. Today, of course, the major focus of most organizations is to attract and retain the best and the brightest people into their organizations. In other words, there is a shortage of skilled human capital in many economies. Peter F. Drucker<sup>10</sup> has described a fundamental shift in the structure of the knowledge work force;

**Every existing society, even the most individualistic one, takes two things for granted, if only subconsciously: that organizations outlive workers, and that most people stay put. But today the opposite is true. Knowledge workers outlive organizations, and they are mobile. The need to manage oneself is therefore creating a revolution in human affairs.**<sup>11</sup>

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<sup>10</sup> Peter F. Drucker--writer, management consultant and university professor-- was born in Vienna, Austria in November 1909. After receiving his doctorate in Public and International Law from Frankfurt University in Frankfurt, Germany, he worked as an economist and journalist in London before moving to the United States in 1937. Experts in the worlds of business and academia regard Peter Drucker as the founding father of the study of management.

<sup>11</sup>Peter F. Drucker. **“Managing Oneself,”** (Harvard Business Review, March-April 1999).

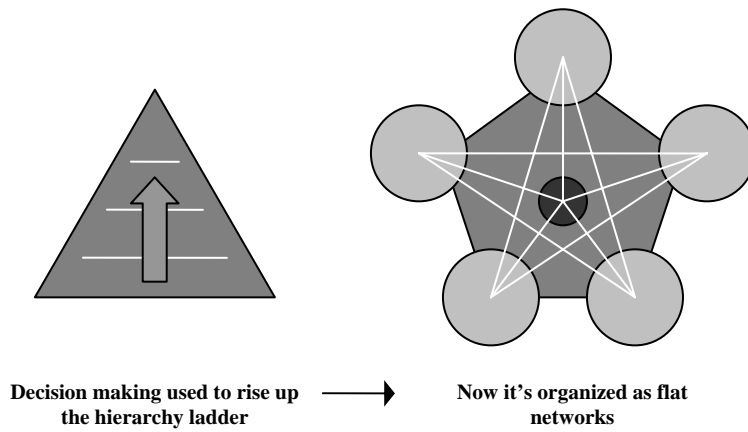


Fig. 2-5: Decision making changed from passing vertically through several different levels of the hierarchy ladder, to flat networks of workers who have the authority to make decisions.

(Source: author)

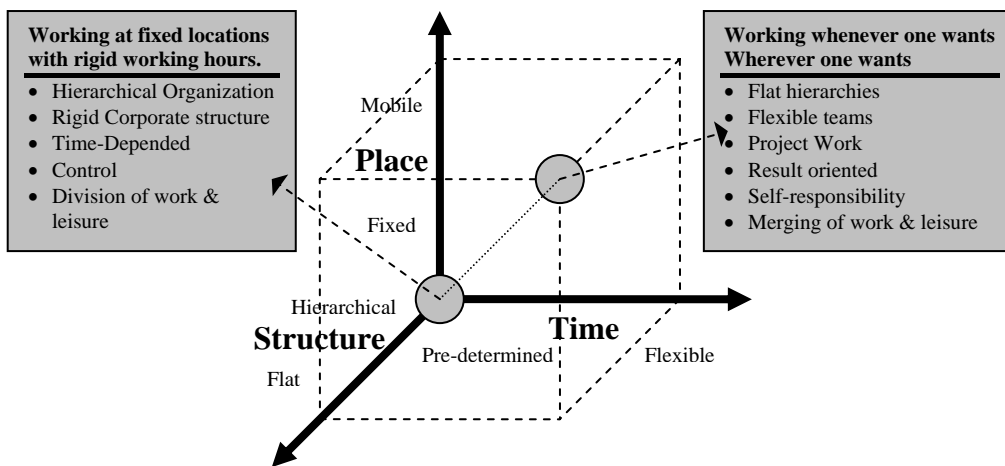


Fig. 2-6: Structure, Time, and place coordinates

(Source: author)



Fig. 2-7: One might look at this image and wonder if these workers are productive in the eyes of their organizations.

(Source: Zelinsky, M. *The Inspired Workspace: Interior Designs for Creativity & Productivity*, Rockport Publishers, Inc. 2002)



Fig. 2-8: The workplace can have a huge impact on the quality and pace of the knowledge workers.

(Source: Zelinsky, M. *The Inspired Workspace: Interior Designs for Creativity & Productivity*, Rockport Publishers, Inc. 2002)

If BPR really has contributed to a breakdown of trust within organizations, what will be necessary to rebuild that trust? Drucker's answer was that;

**The first secret of effective working relationships is to understand the people you are working with. The second part . . . is taking responsibility for communication.**

So, it's quite clear now that conventional office planning is a major part of the problem because, with all its bureaucratic connotations, it is inextricably implicated in management by force. New forms of planning office space must do the opposite. They must help businesses build trust. The corollary to this proposition is that effective office design must enable organizations to achieve better and more dynamic communications.

From here, it can be concluded that with all this change in business processes and with the increased interest in reducing costs by promoting efficient accommodation, there is still a lack of awareness in top management of the role that can be played by the effective accommodation of the workplace environment in increasing worker productivity by responding to their needs in adding more dynamic communications. In other words, by this enforced implication of the conventional office planning, the top management un-intentionally keeps the architect in isolation from its very own true needs.

The task is to progress beyond the mechanistic and inhuman assumptions that lurk beneath the surface of the apparent rationality of BPR in its cruder forms, it continues to be to make office design relevant to modern business in all its dynamism and diversity. This can only happen, if the interdisciplinary role of the workplace planner in accommodating organizational performance is recognized by management.

Mapping the physical work forms of the knowledge work is a very thorough exercise. It depends mainly on the different methods of gathering qualitative data of the knowledge work of that very specific client. Like, for example, you might find a manager taking a nap in his office, or a programmer downloading a fantasy game from the internet, and wonder, if they are really working or being productive in the eyes of their organizations. Peter F. Drucker says that; (Fig. 2-7)

**Knowledge worker productivity is THE only real competitive advantage in a global economy<sup>12</sup>**

Knowledge workers often depend on the ability to collaborate with other workers to produce results. They may need to analyse problems and create original solutions. They may require mobility and flexibility to accomplish a wide variety of tasks. Again, given these environment-based needs, the workplace can have a huge impact on the quality and pace of their work. (Fig. 2-8)

## **2.4 - PROBLEM FORMULATION**

As earlier explained the continuous exercise of business process re-engineering BPR, moved by external factors such as globalization and the evolution of IT resulted in a significant change in corporate structures and work patterns. Considered one of four factors that can lever business results of an organization, it was shown how the workplace environment is feared not to be coping with this change, which in some organizations could be very strong in magnitude.

It is also because of the implication of conventional office planning by the management, and the increased interest in promoting the efficient accommodation over effectiveness, the architects and workplace planners work in complete isolation from the true needs of their clients.

It is now very obvious that the *problem nature* of this research can be identified as;

**‘The fear that existing workplace environments might be of less responsiveness to knowledge work and does not support the productive accommodation of organizational performance’**

Signs that introduced this fear can be summarized in the following observations that were made by the author while participating in designing a number

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<sup>12</sup> Drucker P, “**Knowledge-worker productivity: The biggest challenge,**” California Management Review, Vol. 41, No. 2 (Winter 1999): 79-94.



of office buildings<sup>13</sup> (Fig. 2-9) and when interviewing some individuals working in the top managements of some enterprises working in Egypt;

User oriented design is ignored and architects are isolated;

- There is a complete ignorance of the worker needs whether it be physical or psychosocial
- Architects aren't able to exercise any focus groups, or any other sort of feedback process, with workers due to managerial barriers
- Most probably, the only user needs served is that of the top management alone

Corporate culture;

- Office designs emphasize only on the image of the organization in the eyes of its customers, neglecting parameters like promoting communication and innovation between workers for example

Business objectives;

- Most designs promote efficient accommodation; decreasing the costs of real estate, neglecting the effective or the productive accommodation of the organizational performance.
- Increasing worker productivity and worker retention are completely ignored

All these were signs that urged the introduction of the *problem decision* which was to;

**‘Measuring the workplace design performance in achieving a productive accommodation of organizational performance in the New Economy’**

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<sup>13</sup> The author participated in designing a number of office buildings, some of which are: The Head quarters of ELNG: Egyptian Liquefied Natural Gas Company in Edko, Alexandria. The Head quarters of the Gulf Cooperation Council Accounting and Auditing organization in Riyadh, Saudi Arabia.

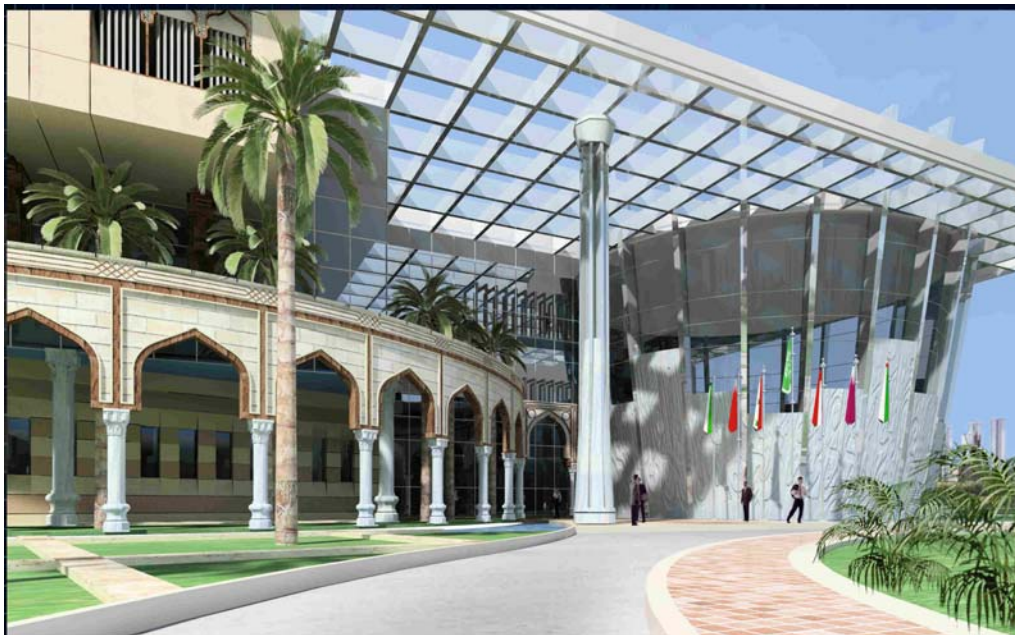


Fig. 2-9: Projects designed by the author

Above: The Head quarters of ELNG: Egyptian Liquefied Natural Gas Company in Edko, Alexandria, Egypt.

Below: The Head quarters of the Gulf Cooperation Council Accounting and Auditing organization in Riyadh, Saudi Arabia.

(Source: Author)

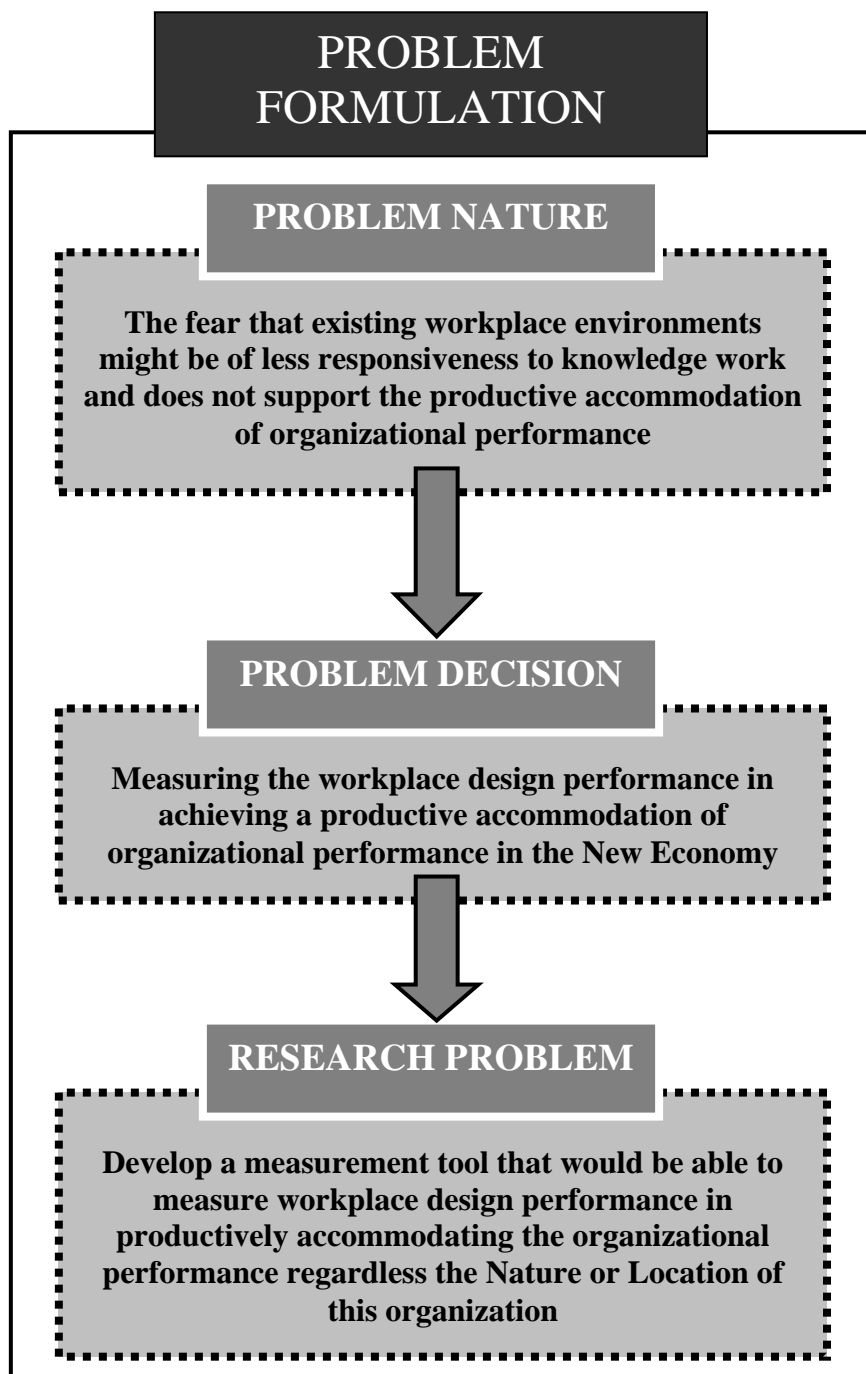


Fig. 2-10: The problem formulation

(Source: Author)

Clearly identifying the problem decision consequently made it simpler to translate it into the *research problem* in a more specific and precise fashion. It was identified as to;

**‘Develop a measurement tool that would be able to measure workplace design performance in productively accommodating the organizational performance regardless the Nature or Location of this organization’  
(Fig. 2-10)**

## **2.5 - SIGIFICANCE OF THE STUDY**

Measurement is one of the fundamental elements of success, and an old business concept for an old business adage says that *‘whatever cannot be measured cannot be managed.’* You can never know if you are successful or not if you cannot measure success. While measuring business results is the key for business leaders to improve worker performance, guide corporate efforts, and reach organizational goal, measuring the performance of knowledge workers gives the ability to better manage them, thus foster their loyalty, creativity, and productivity. (Fig. 2-11)

Measures of performance of buildings in relation to tenant demand are developing rapidly. Impatience with conventional office space and willingness to innovate will become the predominant characteristic of more office users. The technology, the organizational structures and the culture of tenant organizations are becoming ever more volatile. A more rigorous framework for the evaluation of the office performance in relation to changing user demands is needed.

Properly designed and implemented measurement systems focus the management and company resources to areas that can most benefit from change. But metrics that fail to measure all outcomes may portray an inaccurate picture of what really happens within the organization.

But the challenge for businesses is to monitor and measure all outcomes – both the intended results and the unintended consequences – of any given change.

- A move to cut real estate costs may save money in rent, and also have the unintended consequence of costing more money in increased turnover and absenteeism.
- A shift to a more egalitarian environment may save money in reconfiguration costs, and also have the unintended benefit of speeding product development time.

By developing and implementing a systemic approach to workplace measurement, businesses can better track and assess both the anticipated and unanticipated results of change.

Hence, the key rationale for developing new and more effective measurement strategies for today's office workplace is the value of documenting the contribution the workplace itself can make to business success. Employing this process adds performance responsibility to the other responsibilities of the design team and assures the client that there are clear expectations and minimum performance levels. This helps the design team understand which of their decisions will affect building performance and which will not.

Effective Workplace Performance Measurements help track the role that the workplace plays in:

- Enabling new ways for people in organizations to work
- Valuing the individual
- Implementing new technology
- Shifting or reinforcing culture and image
- Leveraging real estate
- Facilitating simpler, faster change
- Achieving financial objectives

If workplace productivity can be accurately measured, then that same workplace can be leveraged for enhancement and increased performance. Measurement strategies enable a company to chart a continuous improvement

direction. It allows the level of performance to be measured and monitored over time to establish whether it is stagnating, declining, or improving. (Fig. 2-12)

The question is what to measure, is it efficiency or effectiveness? The point is that efficiency and effectiveness, in different ways, are both critically and closely related to business success. From a business point of view there is a fundamental difference between measures of efficiency and effectiveness. Measures of increased efficiency in the provision and use of office space are always direct. It is immediately clear whether or not greater efficiency has been achieved. If an improvement is achieved, the benefits are always quantifiable, not least in terms of the financial savings that the adoption of each particular design solution achieves.

Measures of effectiveness may be more important, but they are never so direct. The basic reason why office design has been so peripheral to corporate strategy for so long is that matters of efficiency, which are easily translatable into cost reductions arguments, have attracted far too much attention compared with the open ended, value laden and judgmental issues embedded in the debate about effectiveness.

In a time of such rapid change as the present, the reverse has to be the case. If office design is considered a major agent of change, then effectiveness in all its many forms is central to business success. Tanis and Duffy wrote;

**Companies spend less than 10 percent of their operating expenses on occupancy costs. A massive 30 percent reduction in real estate costs would reduce annual operating expenses by 3 percent. If the cost of such savings is to de-motivate highly qualified staff, to throttle interaction and to scare away newly qualified knowledge workers, then the price is far too high. No business can afford to take the risk. The less certain but highly probable gains that office space designed to increase the probability of interaction, greater transparency, more stimulus, higher staff retention cost are well worth paying for.**<sup>14</sup>

Productivity is the balance between efficiency and effectiveness. Measuring the workplace design performance in accommodating productivity is significant, for it concentrates on translating qualitative values of the design attributes to easily negotiable quantitative values with respect to occupancy costs.

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<sup>14</sup> Tanis J, Duffy F. **A Vision of the New Workplace Revisited.** A paper published in The International Development Research Council's journal, *Industrial Development*, 1999.



Fig. 2-11: Measuring the performance of knowledge workers gives the ability to better manage them, thus foster their loyalty, creativity, and productivity

(Source: Author)



Fig. 2-12: Measurement strategies allow the level of performance to be measured and monitored over time to establish whether it is stagnating, declining, or improving.

(Source: Steelcase)

## 2.6 - SUMMARY

It has been proven that the physically designed environment of the workplace directly relates to the organizational behaviour and productivity of the workers. By increasing the productivity of knowledge workers, the designed environment can work as a corner stone in leveraging the organizational performance along with the other three key factors; Business processes, People/Organization, and Technology. And since developments in organizational performance are strategic, then the process of effectively designing workplaces is of a multidisciplinary approach.

The task then is to design workplaces that would accommodate organizational performance by meeting the generic performance criteria; effectiveness, efficiency, productivity, flexibility, and creativity. The biggest contribution to the organizational performance can be reached if a reduction in occupancy costs (efficient accommodation) leads to increased productivity of the employees (effective accommodation). But the fear is that organizations are mostly focused to cost reductions therefore more attention should be drawn on the effective accommodation. The accommodation of productivity is the focus of this research because it balances between efficiency and effectiveness.

Organizations invested in Business Process Re-engineering or BPR which in turn introduced new demands that the physically designed environment should meet, especially the assistance in managing the knowledge workers by:

1. Providing healthful physical support for individuals.
2. Establishing a culture of trust that gives people autonomy.
3. Creating vital workplaces.

In turn, the ability to better manage knowledge workers opens the door to new ways of fostering their loyalty, their creativity, and their productivity, hence adding value to the organizational performance. But, there is still lack of awareness by top management about this fact, un-recognizing the interdisciplinary role of the workplace planner, thus isolating the planner from translating the true needs of the tenant, which in turn led to the implication of unsuitable conventional office planning.



From the previous review, the *problem nature* of this research can be identified as;

**‘The fear that existing workplace environments might be of less responsiveness to knowledge work and does not support the productive accommodation of organizational performance’**

Leading to the *problem decision* which was to;

**‘Measuring the workplace design performance in achieving a productive accommodation of organizational performance in the New Economy’**

This *research problem* was precisely identified as to;

**‘Develop a measurement tool that would be able to measure workplace design performance in productively accommodating the organizational performance regardless the Nature or Location of this organization’**

The significance in such a tool is in helping it track the role that the workplace plays in:

- Enabling new ways for people in organizations to work
- Valuing the individual
- Implementing new technology
- Shifting or reinforcing culture and image
- Leveraging real estate
- Facilitating simpler, faster change
- Achieving financial objectives

It also works on translating the qualitative values of the design attributes to easily negotiable quantitative values and helping decision makers by directing investments in the workplace design.

**Chapter Three:**

**DIFFERENT ATTEMPTS TO MEASURE OFFICE  
DESIGN PERFORMANCE**

### 3.1 - INTRODUCTION

In today's competitive business where all costs not directly involved in creating customer value are carefully scrutinized, managers of the workplace are pressed to show how it is contributing value to the corporation, and workplace planners and managers are obliged to justify their case. Share holders must also be convinced that spending extra money on redesigning the workplace will somehow have an effect on the organizational performance and workplace productivity, thus achieving higher business results.

As explained earlier, it is only by measuring the '*Workplace Performance*' will those managers be able to relate investments in the physically designed environment to achievements of better business results. But venturing into this area is very confusing and problematic, because other factors than the workplace design could also lead to better business results. What is needed is a carefully designed measurement methodology capable of evaluating those design attributes that relate to increased worker productivity.

There have been a number of approaches in this area that were found valuable and helped in creating the goals of this study. It was found necessary to demonstrate them before venturing into the process of building a measurement framework. Therefore, A thorough review of these different approaches that either tried to setup a measurement methodology, strategy, or even a technique, will be the aim of this chapter.

## **3.2 - MEASURING ORGANIZATIONAL EFFECTIVENESS & EFFICIENCY**

The Research and business development team at Steelcase<sup>1</sup> believe in ASID's assumption – explained earlier – that in most companies the effective design of the workplace is one of four leverage points that will raise business results, and that small changes in the environment can effect big changes in behaviour.

They looked into Dr. Scott Sink's<sup>2</sup> identification of the seven-measure system (Effectiveness, Efficiency, Quality, Profitability, Productivity, Quality of Work Life, and Innovation) for assessing organizational performance. (Fig. 3-1) Considering it a comprehensive model which covers virtually every facet of performance, they used it in a trial to develop a systemic measurement approach.

Focusing on two of these seven metrics – effectiveness and efficiency – they produced a simple but useful measurement model. (Fig. 3-2 & 3-3)

They believe that in developing a plan and tracking results, three sets of questions must be addressed;

- **What do we want to accomplish? How will we measure our success?**
- **How are we going to accomplish it? How will we assess our process?**
- **How can space help? How will we measure its impact?**

They also introduced a four-phase process which can help ensure that the measurement system will gather meaningful data and produce meaningful information. It will also help ensure that all relevant results are measured, on both sides of a cost/benefit equation. (Fig. 3-4)

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<sup>1</sup> Steelcase began in 1912 as The Metal Office Furniture Company in Grand Rapids, Michigan. Today, their portfolio of solutions addresses the three core elements of an office environment: interior architecture, furniture and technology. They changed their name to Steelcase in 1954 and became a publicly held company in 1998. URL: [www.steelcase.com](http://www.steelcase.com)

<sup>2</sup> President of **The World Confederation of Productivity Science** <http://www.wcps.info/>

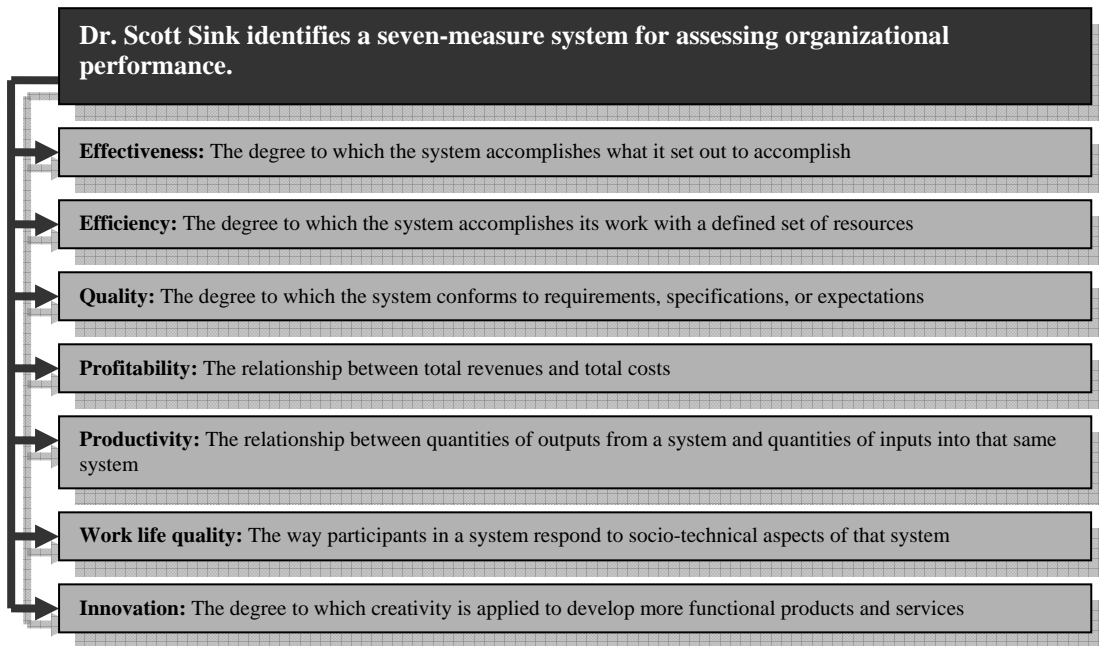


Fig. 3-1: The system suggested by Scott Sink for assessing organizational performance

(Source: Author after Sink)

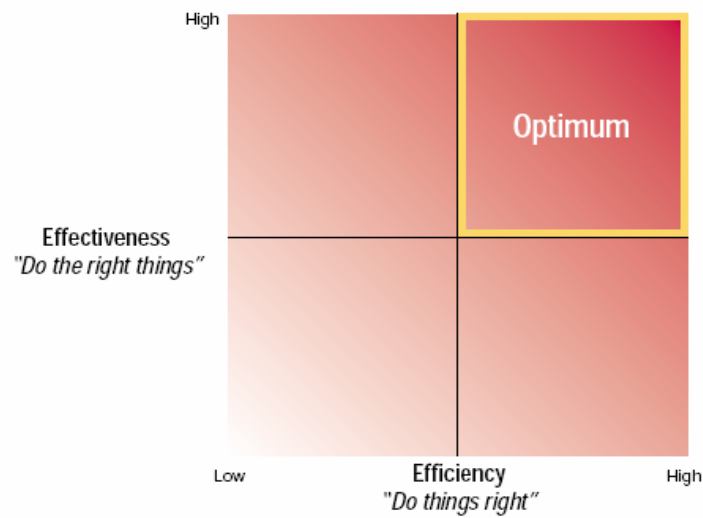


Fig. 3-2: Steelcase focused on two of the seven metrics - effectiveness and efficiency - to produce a measurement model.

(Source: Steelcase)

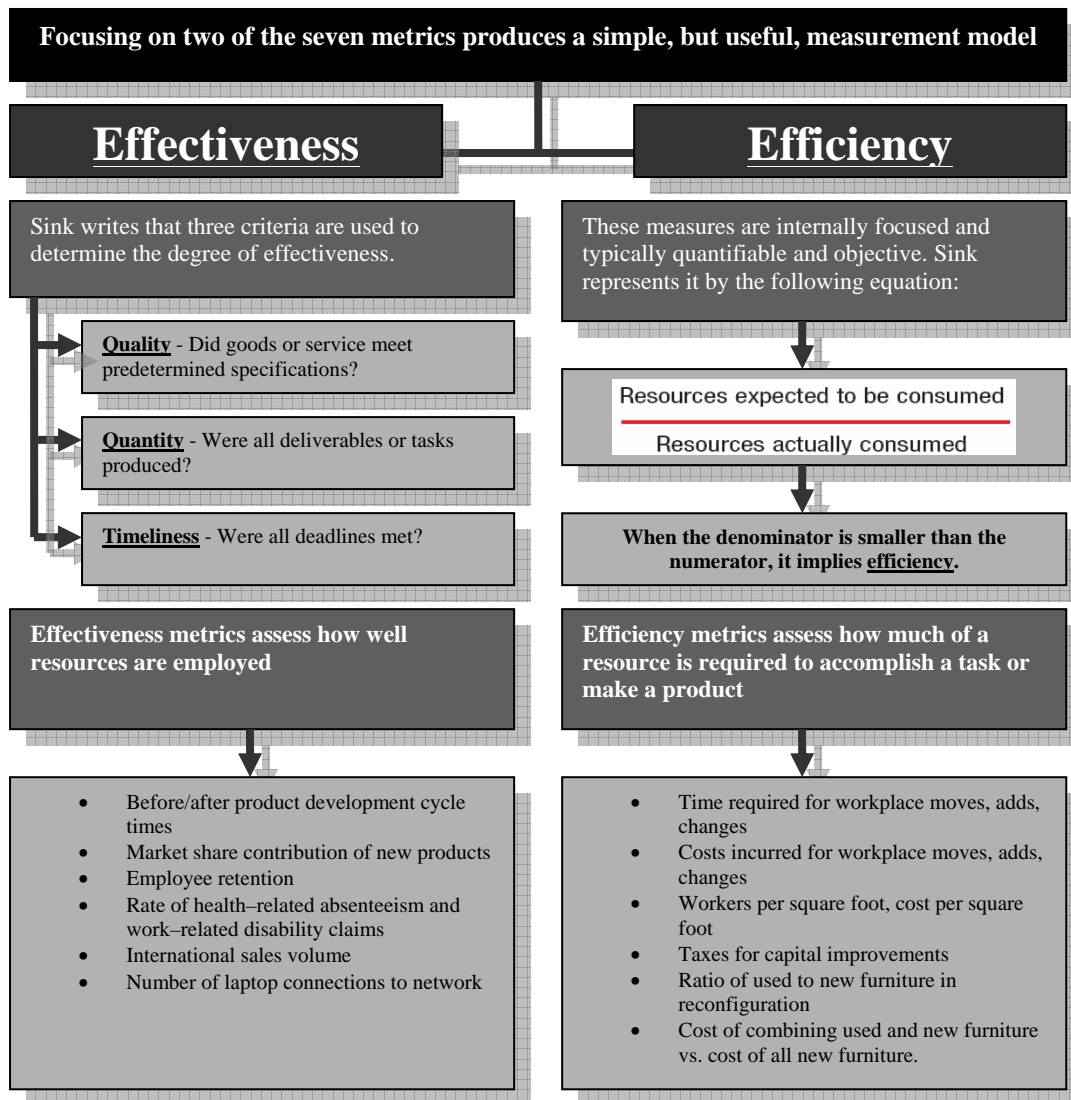


Fig. 3-3: Steelcase model to measure Effectiveness and Efficiency of the workplace  
(Source: Author after Steelcase)

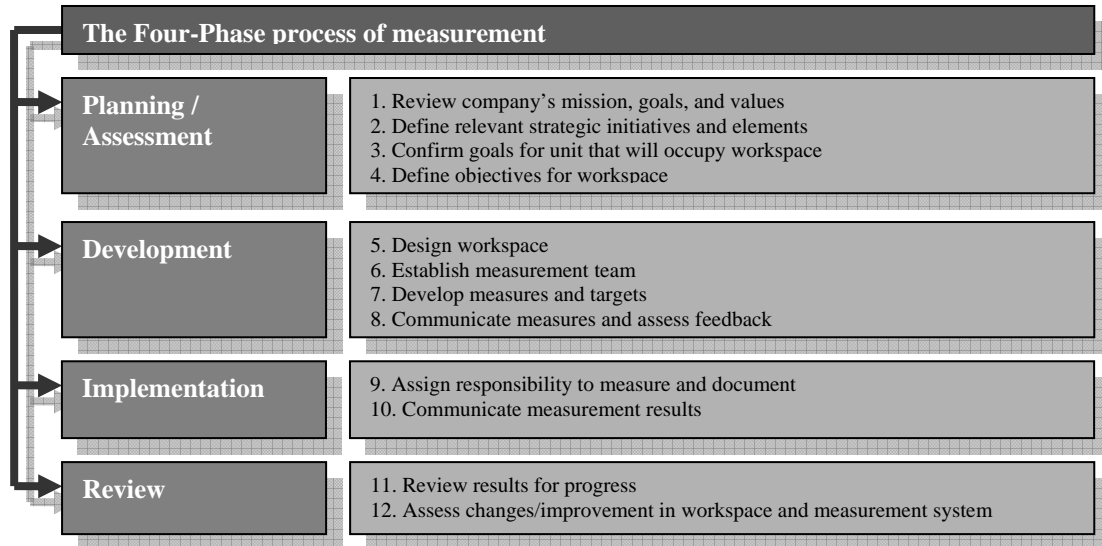


Fig. 3-4: Steelcase four-phase process of measurement

(Source: Author after Steelcase)

The following examples were drawn from a combination of actual Steelcase customer experiences. Each of the following examples starts with a clearly defined objective: [Table 3-1]

<b>Table 3-1: Three workplace examples of the measurement model</b>		
<b>Objective</b>	<b>Effectiveness</b>	<b>Efficiency</b>
<b>Workplace A</b> Worker Interaction Workplace Flexibility	Co-locate workers who are on the same team; provide integrated team space in their “neighbourhood” work setting to facilitate interaction and communication.	Design workspace with fixed panels, freestanding furniture, and mobile files to accommodate frequent moves without incurring excessive costs.
	<i>Metric: product development cycle time</i>	<i>Metric: cost of adds, moves, changes</i>
<b>Workplace B</b> Worker Safety Workplace Costs	Provide adequate levels of adjustability and user control to ensure that increased density does not hamper employee retention	Compress workspace footprints to accommodate more workers without increasing real estate costs.
	<i>Metric: productivity levels before and after workplace change</i>	<i>Metric: number of workers per square foot</i>
<b>Workplace C</b> Implementing Technology Improving the Balance Sheet	Reconfigure workplace to support new, global communications network with ample plug-and-play connections	Use existing furniture in workplace reconfiguration to save money.
	<i>Metric: rate of networks use before and after workplace change.</i>	<i>Metric: cost of reuse vs. all new furniture.</i>



### 3.3 - MEASURING WORKER PRODUCTIVITY

Measuring the performance of workplace design by relating it to measurements of the knowledge worker productivity allows an organization to guide and direct its valuable human capital toward the goals it has identified.

Richard Florida in his book says;

**Anyone whose work creates “meaningful new forms” is vital to the success of an organization.<sup>3</sup>**

However, gauging the contribution of knowledge workers to overall organizational effectiveness poses several challenges because no single measure is likely to capture the outcomes.

Productivity, which has been a human concern for centuries, has a direct effect on Organizational effectiveness. A unit of production per hour is a direct measurement, easily obtained for routine processing jobs or work that has little variation. Likewise, profit margin, cycle time, and cost of sales are all tangible & quantifiable measurements, easily attainable with good record keeping and accounting. If methods are sound, results are clear.

The case is with many other intangible workplace variables that are indirect, highly qualified, much more difficult to measure, and may not be as readily understood. For example, adding more people and equipment may result in increased absenteeism and less worker productivity, while it may improve the bottom line for real estate costs.

In many cases, the factors affecting tangible and intangible conditions overlap, creating a zone of influence. Evaluation techniques for both tangible and intangible forces need to be employed, and it may be necessary to measure multiple variables with one technique, or use multiple techniques to measure one variable.

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<sup>3</sup> Florida R, **Rise of the Creative Class: And How It’s Transforming Work, Leisure, Community and Everyday Life** (New York: Perseus Books Group, 2002).

In his book about managing and measuring knowledge-based assets, Karl Erik Sveiby presents a model to classify intangible assets. He organizes intangibles into three categories; (Fig. 3-5)

1. Competence,
2. Internal structure, and
3. External structure.

He notes;

**As in all measurement systems, it is the comparisons that are interesting. A measurement tells nothing at all unless it is compared against a yardstick of some kind: another company, a previous year, or a budget, for example. When we measure intangible assets, we must therefore be prepared to keep doing so for at least three measurement cycles before attempting to evaluate the results. Ideally, measurements should be repeated yearly.**<sup>4</sup>

In the workplace, this holds true. The value of assessments is realized when multiple variables are measured over time.

Susan Cantrell<sup>5</sup>, a Research fellow of the Accenture Institute for strategic change<sup>6</sup>, notes that;

**Knowledge workers resist being measured, both because they have no history of being measured and because they believe it might take the ‘magic’ out of their work. Most high-end knowledge workers tend to work on unique, one-off, highly specialized problems, making it impossible to have one measure for all such knowledge workers. Moreover, many knowledge workers work interdependently, making it difficult to isolate one knowledge worker’s contribution from another’s. And, because the work performed is generally unobservable, a knowledge worker could be working for months, or sometimes even years, before an output is tangibly realized.**<sup>7</sup> (Fig. 3-6)

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<sup>4</sup> Sveiby K E, *The New Organizational Wealth*, Berrett-Koehler Publishers, INC. 1997

<sup>5</sup> Susan Cantrell is a senior research fellow at the Accenture Institute for High Performance Business and a senior manager based in Wellesley, Massachusetts. She specializes in research on human performance and is a frequent speaker on improving knowledge worker performance and managing and measuring human capital.

<sup>6</sup> <http://www.accenture.com/xd/xd.asp?it=enweb&xd=index.xml>

<sup>7</sup> Cantrell S, “Challenges and Best Practices in Measuring High-End Knowledge Work,” *Accenture Institute for Strategic Change*, Art of Work, Issue Six, 15 May 2001.

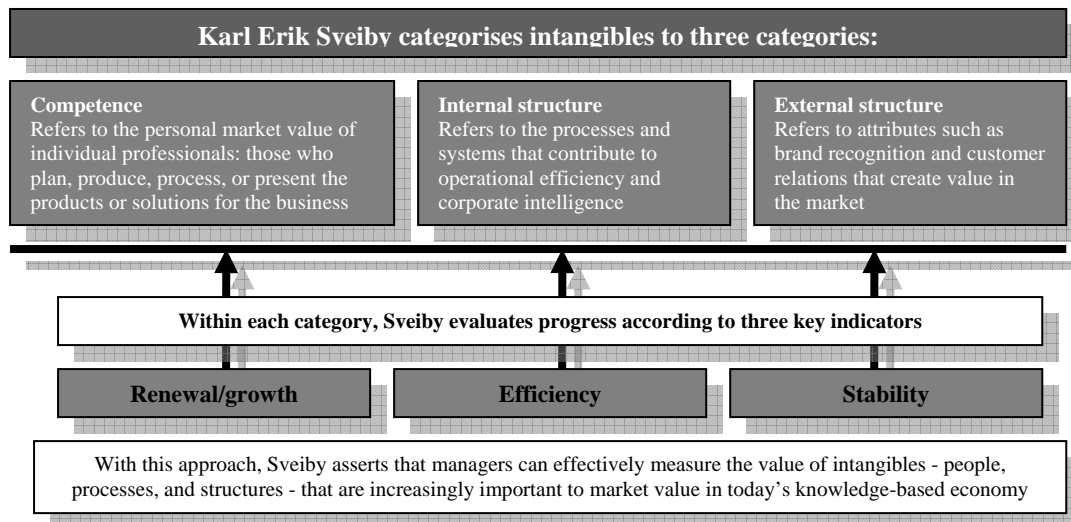


Fig. 3-5: Karl Erik Sveiby's model of intangible assets

(Source: author after Sveiby)

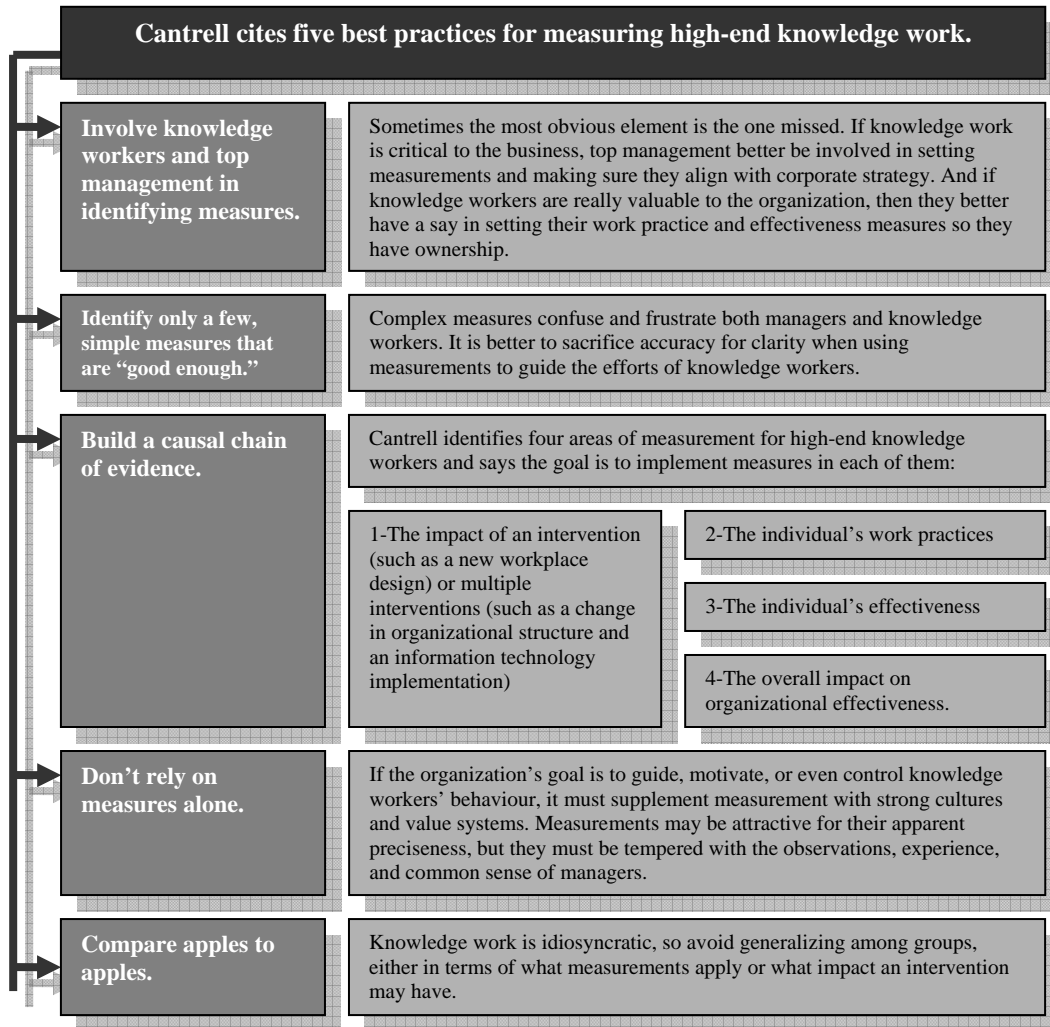


Fig. 3-6: five best practices for measuring high-end knowledge work by Susan Cantrell

(Source: author after Cantrell)

As an example of Cantrell's "casual chain of evidence," O'Neill<sup>8</sup> conducted a research to identify a "casual model" that shows the logical relationships between organizational, workplace, and technology design features, and subsequent effects on employee behaviour and business outcomes. (Fig. 3-7) This model was empirically tested as part of a long-term research project with a company in the shipping industry.<sup>9</sup> The company wanted to examine the impact on collaboration and efficiency of business processes of a major consolidation of employees from four locations into one.

The research showed that as a result of the design interventions, the time required for "business project approvals" (involving interaction between four departments) decreased by about 20%. Cross-departmental ratings on quality of "responsiveness" to needs for information between departments increased by 32%, this change eventually led to cost savings. These results, demonstrate the importance of understanding an organization's high-level business strategies and then creating measures that determine whether the contributions of knowledge workers are achieving the desired goals.

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<sup>8</sup> Dr. O'Neill leads the Workplace Performance Metrics Practice Area within Herman Miller's Services group. He is a Board Certified Professional Ergonomist with a Ph.D. in Architecture (Environment-Behaviour Studies), Master of Architecture, and BA in Psychology. He has 18 years experience in conducting research projects examining the impact of work environment design on behavioural and business outcomes. A Certified Six Sigma Master Black Belt, he also specializes in quality measures related to the workplace, and workplace management.

<sup>9</sup> Herman Miller, Inc., "Case Study: Effects of Workplace Redesign and Consolidation on Business Processes and Effectiveness," *Workplace Strategy News* (Spring 2002): 7.

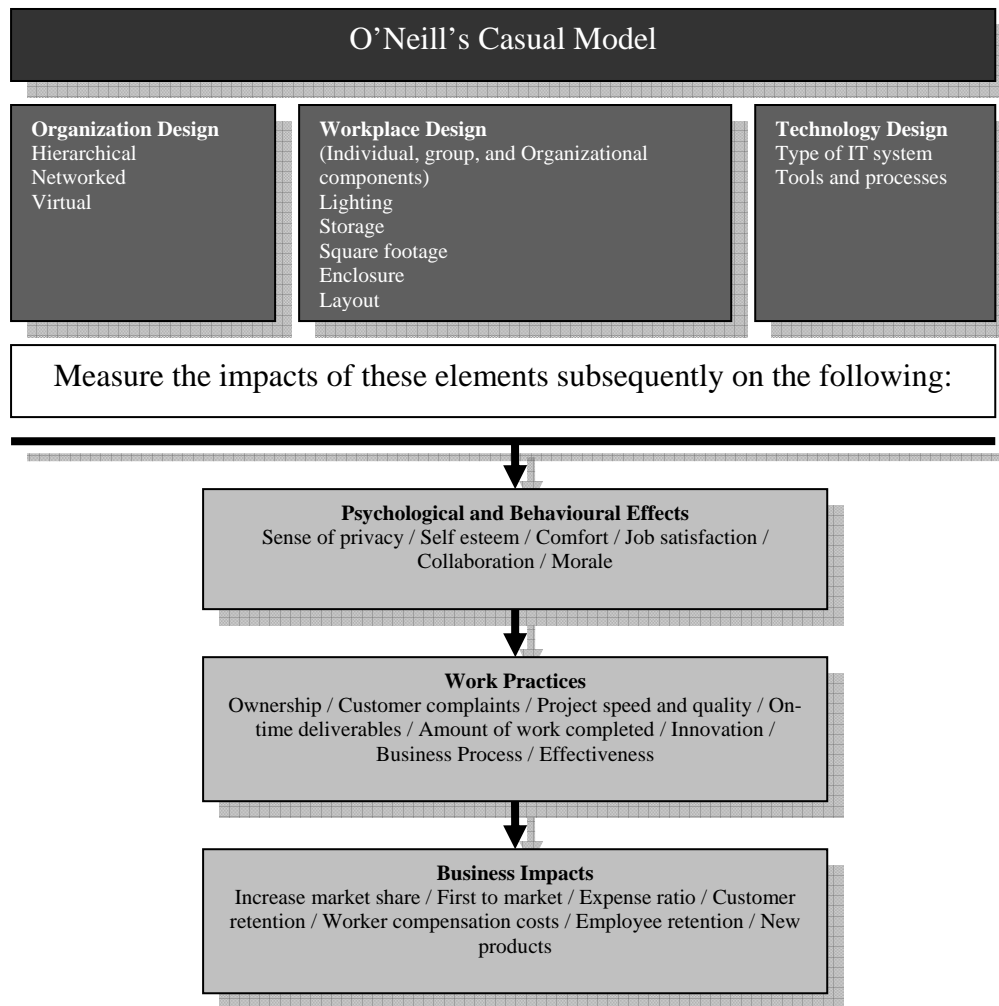


Fig. 3-7: O'Neill's 'Casual Model' based on Cantrell's 'Casual chain of evidence'

(Source: author after Cantrell)

### 3.4 - THE BALANCED SCORECARD

As previously mentioned, measuring performance of knowledge work is fundamentally different to measuring the manufacture of goods, the simplistic and purely objective measurement of input and output is inappropriate; because there are too many system variables.

It is because of that reason many private and public sector organisations are now using Kaplan and Norton's '*Balanced Scorecard*'<sup>10</sup> techniques to monitor their overall business performance. This offers much value in complex systems where simple cause and effect cannot readily be isolated.

The Balanced Scorecard has developed as a new framework for measuring organizational performance. It was originally proposed to overcome the limitations of managing only with financial measures. Financial measures reported on outcomes, lagging indicators, but did not communicate the drivers of future performance, the indicators of how to create new value through investments in customers, suppliers, employees, technology, and innovation. The Balanced Scorecard provided a framework to look at the strategy used for value creation from four different perspectives; (Fig. 3-8)

1. **Financial.** The strategy for growth, profitability, and risk viewed from the perspective of the shareholder
2. **Customer.** The strategy for creating value and differentiation from the perspective of the customer.
3. **Internal business processes.** The strategic priorities for various business processes, which create customer, and shareholder satisfaction.
4. **Organizational development.** The priorities to create a climate that supports organizational change, innovation, and growth.

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<sup>10</sup> Kaplan and Norton introduced the "Balanced Scorecard" first in 1992 with an article in Harvard Business Review – presenting a management system which does not rely only on financial information but also on non-financial key performance indicators (KPIs). Robert S. Kaplan is the Marvin Bower Professor of Leadership Development at Harvard Business School, and David P. Norton is a Management Consultant and President of the Balanced Scorecard Collaborative, Inc.

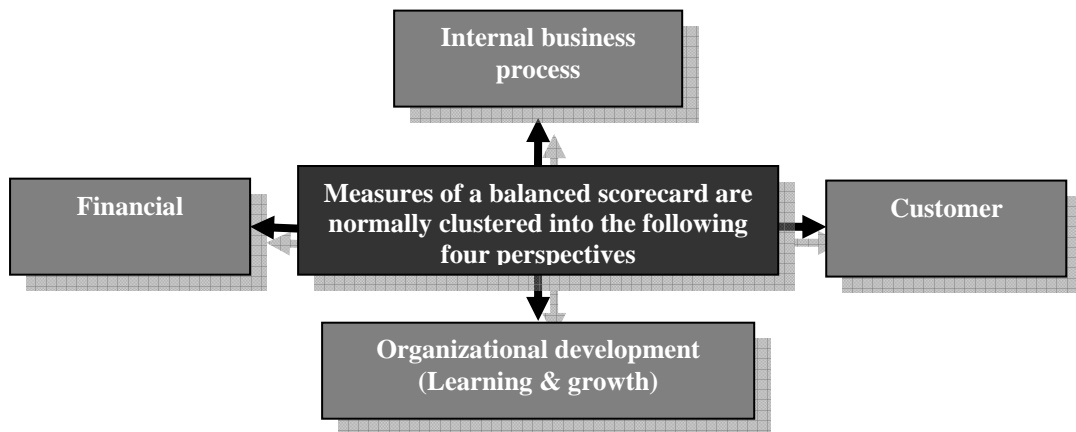


Fig. 3-8: the four perspectives of the Balanced Scorecard

(Source: author after Norton & Kaplan's Balanced Scorecard)

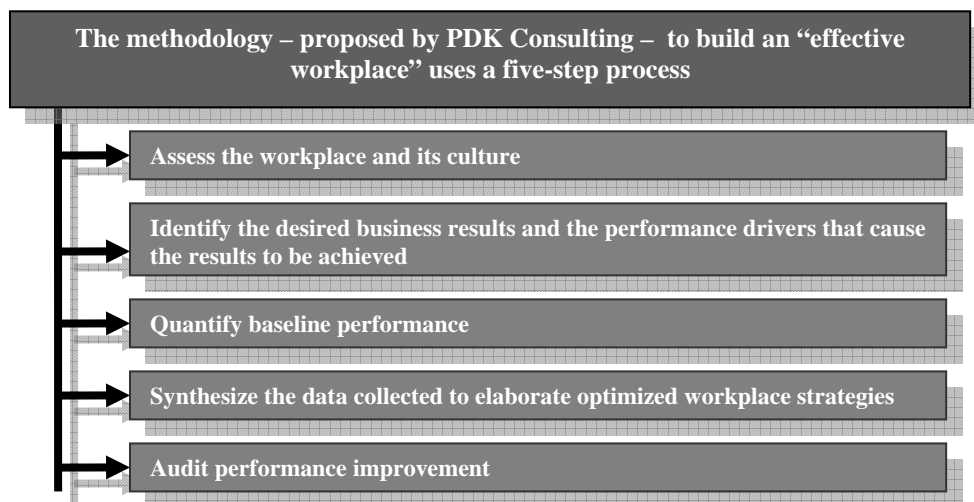


Fig. 3-9: Based on Norton and Kaplan's Balanced Scorecard, PDK Consulting proposed a measurement methodology that uses a five-step process.

(Source: author after PDK Consulting)



Based on the Balanced Scorecard approach developed by Norton & Kaplan at Harvard, PDK Consulting proposed a measurement methodology that uses a five-step process. (Fig. 3-9) Focusing on the first step of the methodology set by PDK Consulting, this methodology is a consultative process aimed at establishing the existing broad business objectives and strategies that the new workplace needs to stimulate in order to maximize productivity improvements. The consultants identify the firm's corporate objectives, its corporate culture, and its corporate vision, mission and values. The identified outcomes cover the four perspectives of the Balanced Scorecard as shown below:

**Financial** - measured by ROI (Return on Investment) and Economic Value-Added (EVA)

**Customer** - measured by satisfaction, retention, market, and account share

**Internal Process** - measured by quality, response time, cost, new introduction

**Learning and Growth** - measured by employee satisfaction and information systems availability

Through a series of interviews with key members of selected workgroups, the consultant validates the alignment of the workgroup objectives with the previously identified corporate goals and strategies. This top-down, bottom-up approach leads to the development of a deep understanding of the workgroups operational strategies through observations of;

- workplace usage and occupancy,
- work processes,
- technology employment,
- Organizational structures.

Finally, the use of the balanced scorecard is equally applicable to not-for-profit and governmental organisations as to commercial organisations. The scorecard is always organisation specific in its detail. It is another approach that effectively enables evaluating the effectiveness of the workplace in a holistic manner.

### 3.5 - STRATEGIC PERFORMANCE MEASUREMENT

In “World Workplace 97,”<sup>11</sup> Joe Akinori Ouye<sup>12</sup> presented a paper on measuring the workplace performance, where he had this viewpoint that it is best understood in terms of the following perspectives: (Fig. 3-10)

- **Strategic Performance:** the way workplace is supporting the mission, goals and objectives of the business
- **Worker performance:** How well are the workers who use the workplace performing their functions
- **Workplace effectiveness:** How effectively does the workplace support the performance of those workers

Strategic Performance measures for the workplace are ideally developed in the context of overall corporate performance measures, as in the Balanced Scorecard approach, it depends on the exact mission, goals and objectives of the particular company. It generally covers the types of measurements that parallel those of the balanced scorecard mentioned previously.

Akinori assumes that of these strategic performance measurements, the measurement of worker performance and workplace effectiveness – subsets of the strategic performance – are of the most interest to workplace managers and planners. It is in the expectation of improved worker performance that companies invest in the re-planning and re-design of workplaces to improve their effectiveness.

Worker Performance measures the outputs and capabilities of individuals and groups, which is considered a challenge because everyone defines outputs differently, especially for the knowledge worker. Factors that affect the performance of the knowledge worker also vary. (Fig. 3-11) Performance must be defined in terms of the goals and objectives of the specific group versus the individual.

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<sup>11</sup> IFMA, World Workplace '97, Conference Proceedings, 1997, International Facility Management Association (IFMA).

<sup>12</sup> <http://www.workplayce.com/integrat.html>

Workplace Effectiveness measures how well the workplace supports the performance of the workers. The workplace can include any aspect which is of interest but more focus must target those aspects which may have been problematic before and were hopefully addressed by the re-design.

In the same paper, Akinori displays all the possible measurement application in the four perspectives of the strategic performance. (Fig. 3-12) He adds that correlating the different measurements of workplace performance is difficult. If there is an improvement in workplace effectiveness, it is not clear that improvement of worker performance results. And certainly the same is true for strategic performance.

To address whether workplace effectiveness infers improved worker performance or strategic performance requires a well designed and rigorous experimental or analytical approach which Akinori says must confirm the following conditions:

1. Improved workplace effectiveness and improved worker performance vary together in a consistent and predictable fashion
2. Improved worker performance occurred after improved workplace effectiveness
3. Improved worker performance is not due to other factors

Since Akinori started with the viewpoint that worker performance is the resultant of the interplay of many factors, perhaps the point is to see how and if performance was improved as a result of all those factors, instead of just trying to understand the impact of isolated factors. He developed a workplace performance measurement methodology that insures that the measurement process is a part of an overall planning/design process for the development of a workplace. The information developed in the process of planning naturally feeds into the following steps of this process;

1. **Orientation:** Meet with leaders and representatives of the business unit to review project goals and objectives, corporate context, vision, goals and objectives of their business unit, and performance objectives. These results are

the basis of discussing possible Strategic Performance measures of the workplace. This and following meetings should be kept small, numbering no more than eight or ten so as to encourage interaction. Leaders of the company may be interviewed as well so that the team is informed of the overall corporate vision, strategies, goals, objectives, and performance measurements. Leaders of the business group and most certainly the company may prefer to be interviewed prior to the orientation meeting.

2. **Strategic Performance Measurements:** Prepare draft strategic performance measurements and review with representatives of the business group.
3. **Work Process Review:** Meet with focus group of business unit to review the business visions, goals and objectives, understand their organizational structure, analyze their business processes (by mapping them), identify obstacles to better group performance, discuss possible Group Performance measures, and begin to explore workplace strategies
4. **Group Performance and Workplace Effectiveness Measurements:** Develop Group Performance and Workplace Effectiveness measurements based on the results of the Work Process Review and review with the focus group
5. **Workplace Strategies:** Review workplace strategies with a focus group and revise as required. Workplace strategies are best developed beforehand, by the planning team, based on the results of the previous review of the work process, and then reviewed by business group representatives.
6. **Pre-move survey:** Administer Group Performance and Workplace Effectiveness surveys shortly before the move. The survey can be administered by telephone interview, written survey or by e-mail. The latter has been found to be very efficient since the participants input their own responses. In companies with an "e-mail culture," this is the preferred method. If it is possible to include a control group in the study, the same pre-move and post-move surveys would be administered to that group as well.

7. **Design Development:** Contract Documents/Construction/Move-in
  
8. **Post-move survey:** Administer surveys three months or more after the move. Although more than a single post-move survey would be desirable to study if the responses continue to change through time or stabilize, clients usually are not willing to pay for this extra insurance.
  
9. **Survey Analysis:** Analyze the results of the pre- and post-move measurements. Compare the results of the measurements for group performance and workplace effectiveness.
  
10. **Report:** Report results of the survey back to the group and the company. It is important to get results back to the group since they "earned" that right by participating in the process

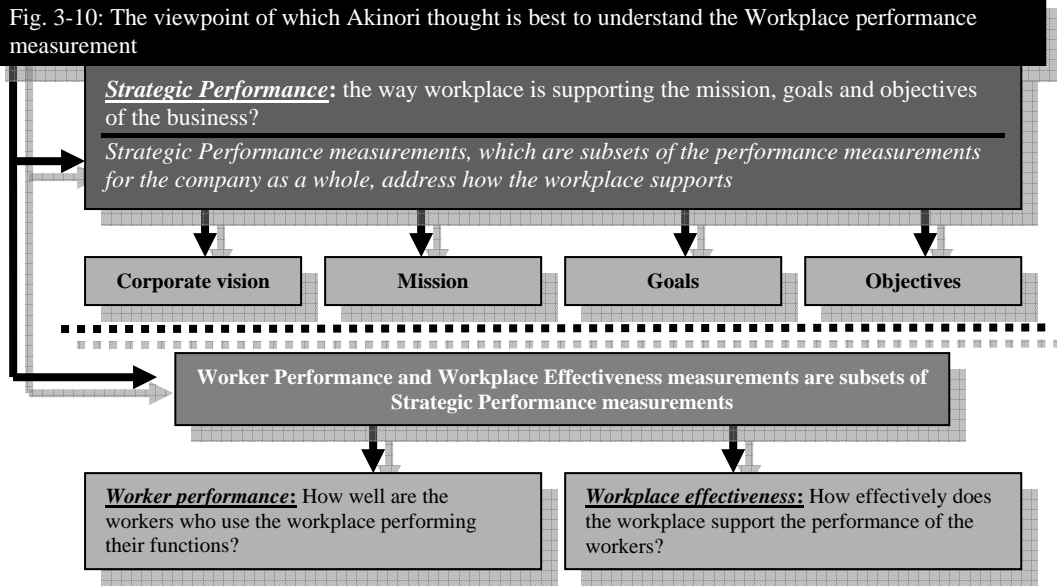
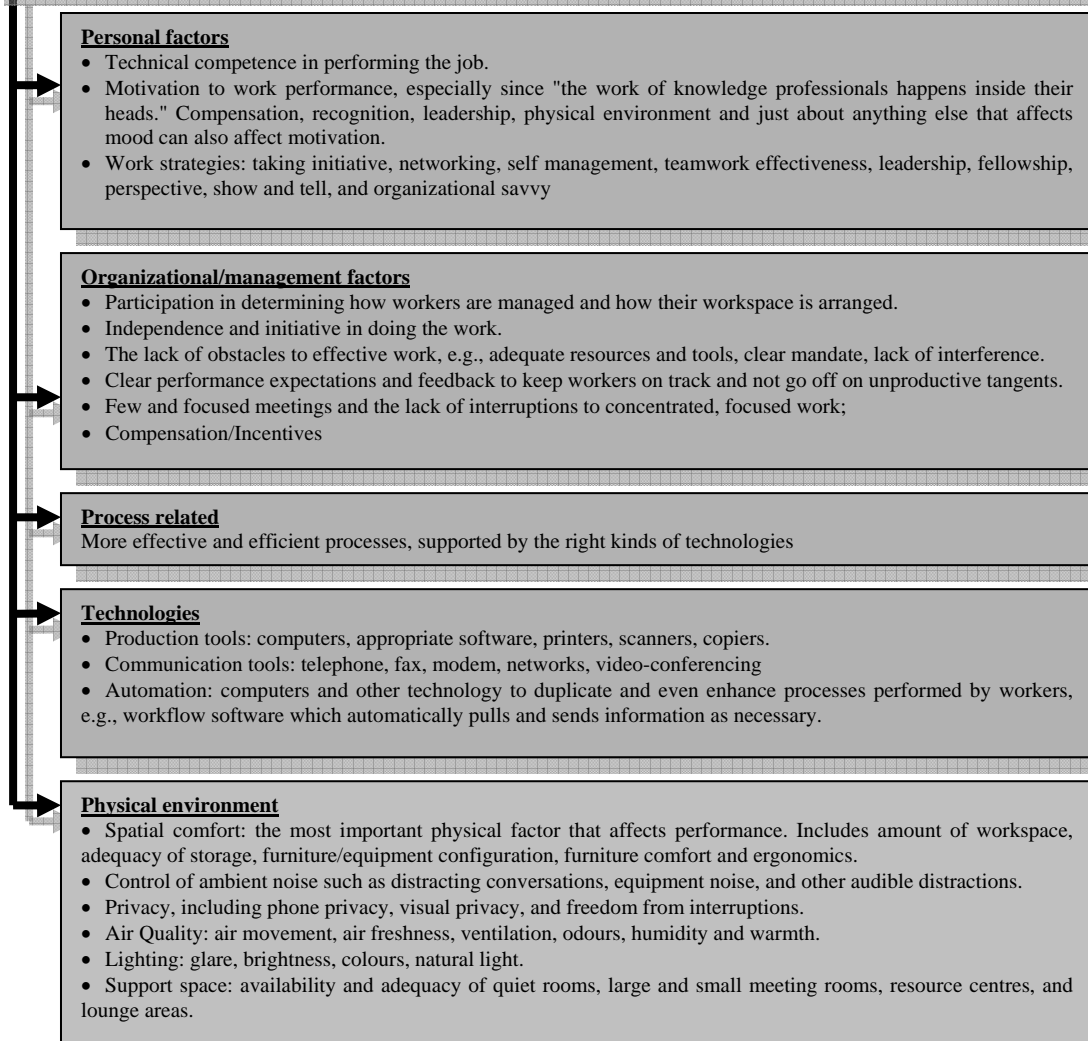


Fig. 3-11: Factors which directly or indirectly affect individual performance in some way, and by extension affect group performance, range across the spectrum of the workers' physical and social environment:



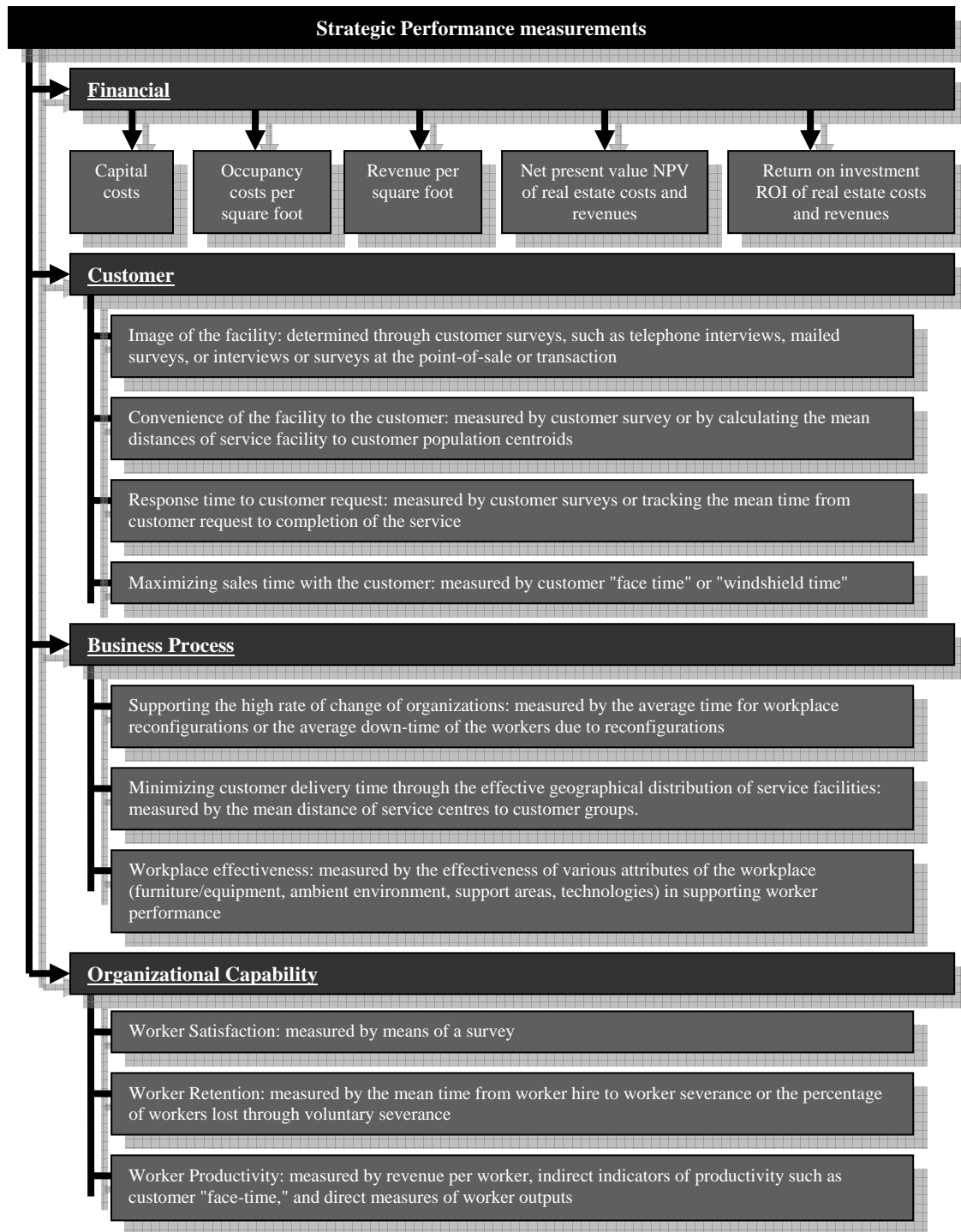


Fig. 3-12: An application of measurements on each of the Strategic performance perspective, also parallel to the perspectives of the balanced scorecard.

(Source: author after Ouye)



### **3.6 - MEASURING WORKPLACE PRODUCTIVITY**

An independent research that was commissioned by ASID (American society of Interior designers) and conducted by L.C. Williams & Associates in 1998, showed a lot of important findings concerning workplace design and its effect on workplace productivity. ASID's goal in pursuing this research was to explore how design can influence performance, change corporate culture and lead to a deeper understanding of how office surroundings can contribute to improved work life, all in a step to build up an effective measurement strategy.

Nearly 90 percent of the consultants, researchers and designers said that they have seen improvements in interior design lead to increases in office productivity<sup>13</sup>; strengthening the hypothesis that office design can lever organizational performance. They also added that an increasing number of companies are now focusing on the physical work space as a key component of their corporate strategy to improve productivity – rather than looking at office facilities only as an expense.

In addition, the productivity experts' survey that they have conducted in this research identified five key factors for creating and maintaining productive and efficient offices; people performance, designed environment, workflow, technology and human resources. (Fig. 3-13) These keys are essential components to help improve the performance and efficiency of individuals, teams and organizations.

Those experts also reaffirmed the findings of a previous survey of business executives, also commissioned by ASID, confirming the four primary ways in which interior design affects office productivity; access to people and resources, comfort, privacy and flexibility. (Fig. 3-14)

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<sup>13</sup> This project involved surveying three groups of productivity experts. The first group, management consultants, includes representatives from consulting practices at Big Six accounting firms and top-ranking executives at other firms who frequently address workplace design as part of their consulting work. The second group includes researchers from major universities who have investigated various aspects of productive workplace practices. The third group includes leading interior designers who have worked on numerous projects to design, or redesign, offices for improved productivity. Collectively, the survey respondents represent a broad range of knowledge.

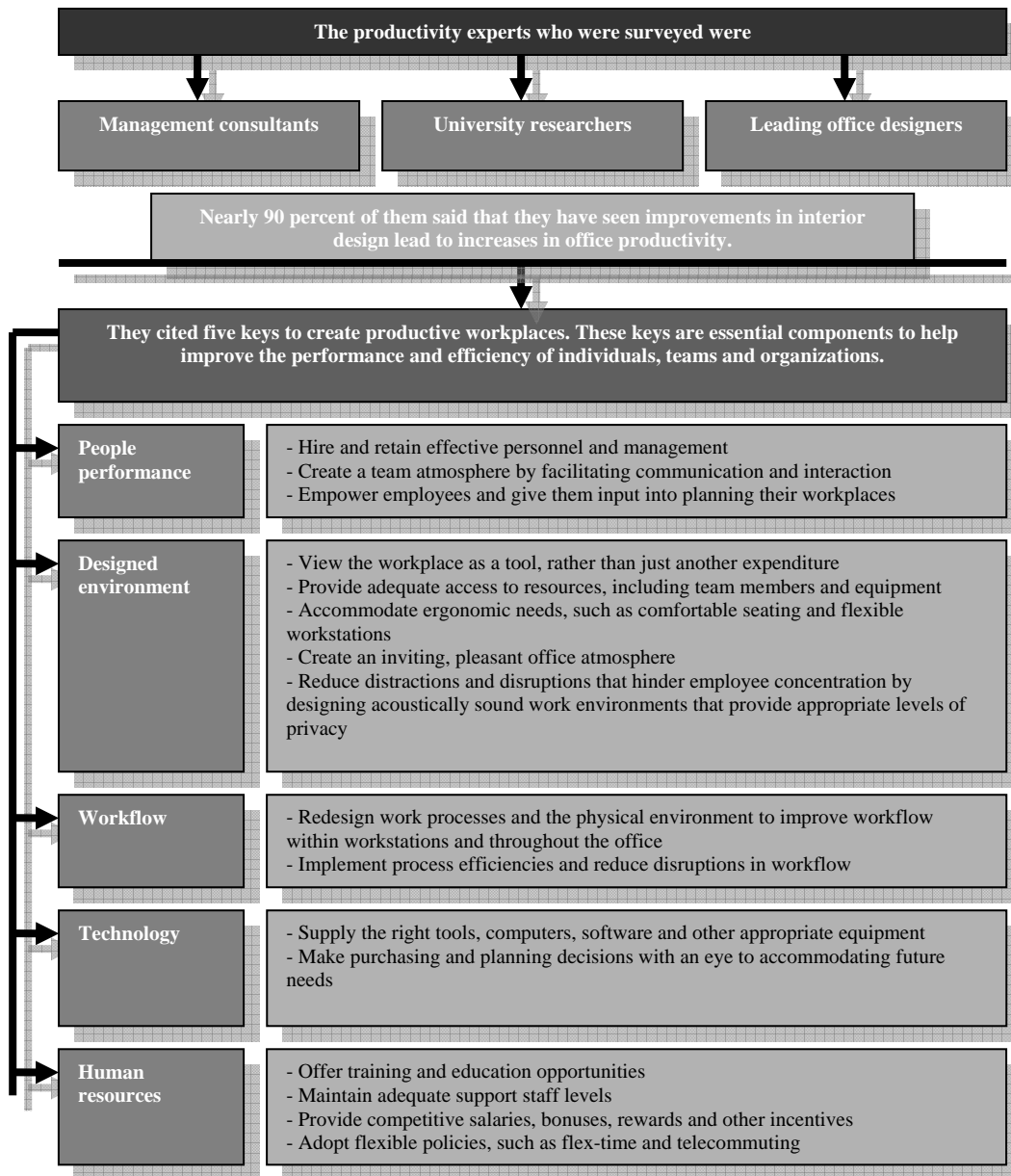


Fig. 3-13: the five key factors to create workplace productivity.

(Source: Author after the American Society of Interior Designers)

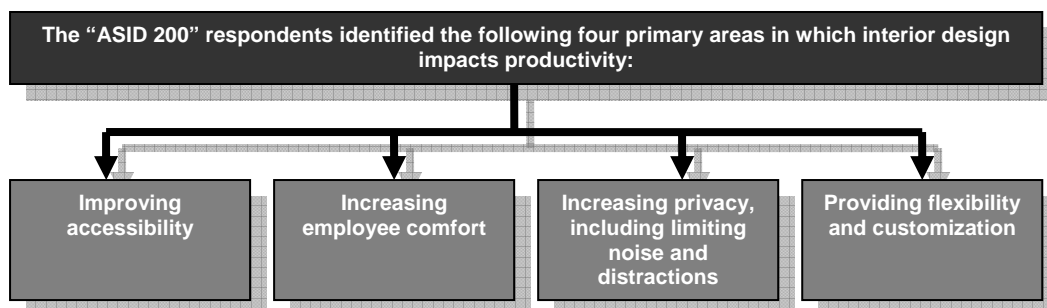


Fig. 3-14: The four primary areas in which the workplace design impacts productivity

(Source: Author after the American Society of Interior Designers)

All four design factors are part of an effectively designed workplace. They affect the physical environment of the office by improving one or more of the five keys to a productive workplace. (Fig. 3-15)

**Design to provide improved access (Fig. 3-16)**

- Group team members together to improve workflow
- Improve access to information and resources, including computer systems, shared equipment and hard copy files
- Eliminate communication barriers and provide meeting spaces to facilitate collaboration

**Design to provide more comfort (Fig. 3-17)**

- Accommodate ergonomic needs with comfortable chairs and adjustable desk configurations
- Improve lighting, air quality and temperature control
- Create a more comfortable and pleasant overall environment, including high-quality office furniture and carpeting

**Design to provide sufficient privacy (Fig. 3-18)**

- Provide an appropriate level of privacy based on specific work tasks
- Reduce visual and acoustical distractions

**Design to provide added flexibility (Fig. 3-19)**

- Design workspaces and floor plans so they are easy to reconfigure
- Plan for changes in teams, tasks and processes
- Balance organizational and individual needs

Nearly all surveyed participants said that productivity depends on the nature of the client's particular business, and that the meaning of productivity changes from client to client and project to project. Thus, productivity is best defined as a general concept similar to effectiveness and performance.

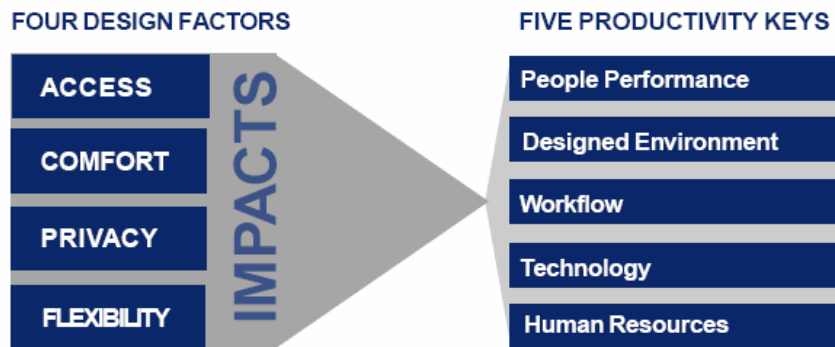


Fig. 3-15: All four design factors are part of an effectively designed workplace. They affect the physical environment of the office by improving one or more of the five keys to a productive workplace.

(Source: American Society of Interior Designers)

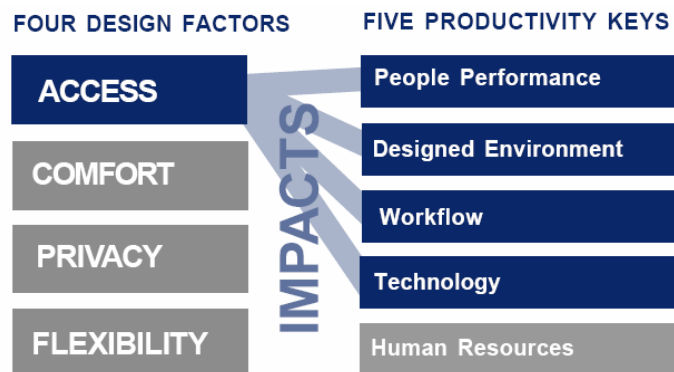


Fig. 3-16: Design to provide improved access

(Source: American Society of Interior Designers)

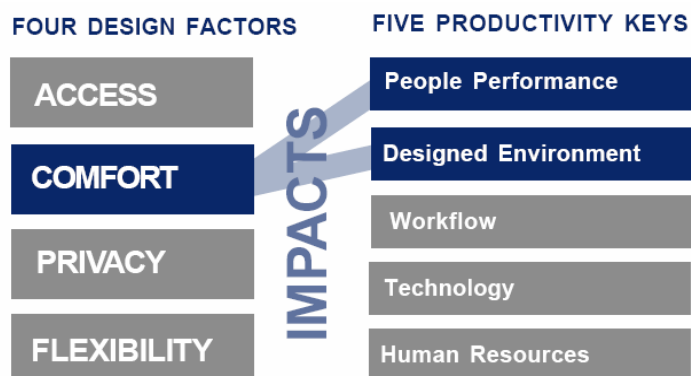


Fig. 3-17: Design to provide improved comfort

(Source: American Society of Interior Designers)

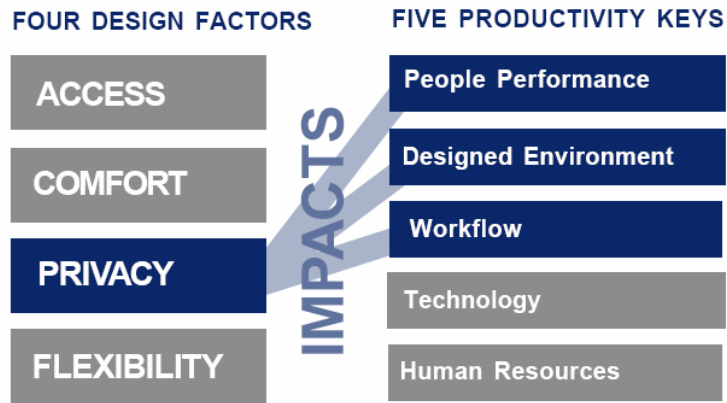


Fig. 3-18: Design to provide improved privacy

(Source: American Society of Interior Designers)

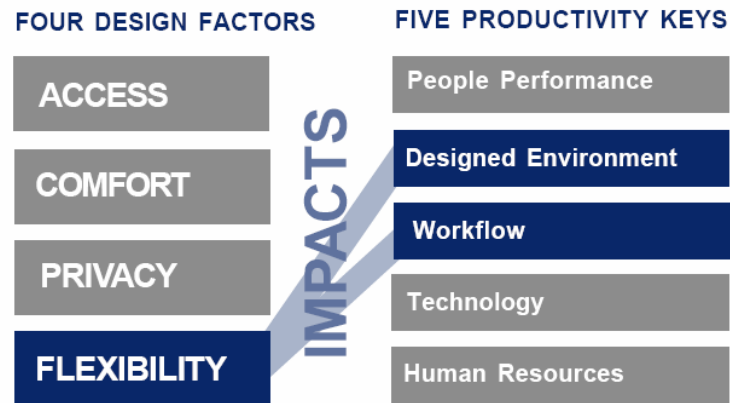


Fig. 3-19: Design to provide improved flexibility

(Source: the American Society of Interior Designers)

The research also suggests that there are three primary components of productivity; employee satisfaction, customer satisfaction and financial performance. Employee satisfaction factors include teamwork and absenteeism. Customer satisfaction factors include loyalty and repeat business. Financial performance factors include sales, profitability and shareholder value. (Fig. 3-20)

To further explore the impact that redesign has on productivity and performance, ASID conducted a field experiment that measures the effect of redesign on the four design factors – Access, Comfort, Privacy, and Flexibility – and provide hard evidence that redesign leads to increased productivity in the workplace. (Fig. 3-21)

Before and after redesign, business performance measurements are involved in the project. Increased performance is measurable by improvements in three primary areas: employee satisfaction, customer satisfaction and financial performance. (Fig. 3-22) A minimum of two types of measures, attitudinal surveys and physical tests, are used to measure design factors such as access. (Fig. 3-23)

Performance measures for the three primary areas of employee satisfaction, customer satisfaction and financial performance are comprised of two types of measures: behavioural and attitudinal. The behavioural measures provide more concrete evidence for CEOs, such as actual reduction in customer complaints, actual increases in orders filled per employee, etc. (Fig. 3-24)

Finally, ASID's approach to measure the effect of the workplace design over the Workplace productivity is multi-disciplinary and is met by performing a cause and effect relationship; both sides of this relationship must be measured and explained.

### Employee and Customer Satisfaction: The Road to Financial Performance



Fig. 3-20: there are three primary components of productivity: employee satisfaction, customer satisfaction and financial performance.

(Source: American Society of Interior Designers)

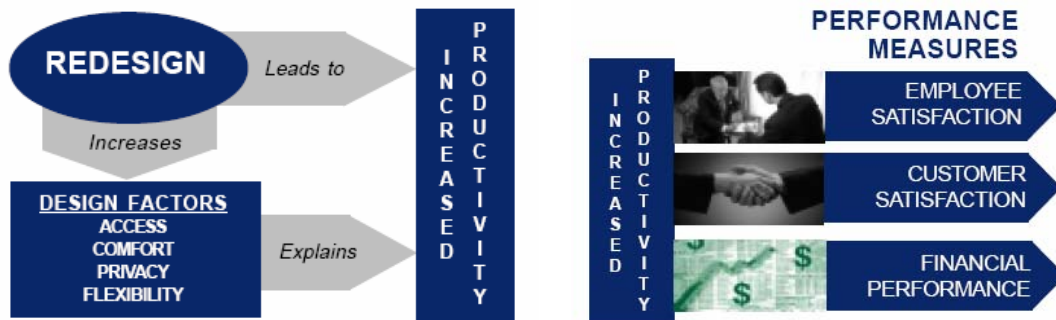


Fig. 3-21: ASID conducted a field experiment that measures the effect of redesign on the four design factors – Access, Comfort, Privacy, and Flexibility – and provide hard evidence that redesign leads to increased performance in the workplace.

(Source: American Society of Interior Designers)

Fig. 3-22: Increased performance is measurable by improvements in three primary areas: employee satisfaction, customer satisfaction and financial performance.

(Source: American Society of Interior Designers)

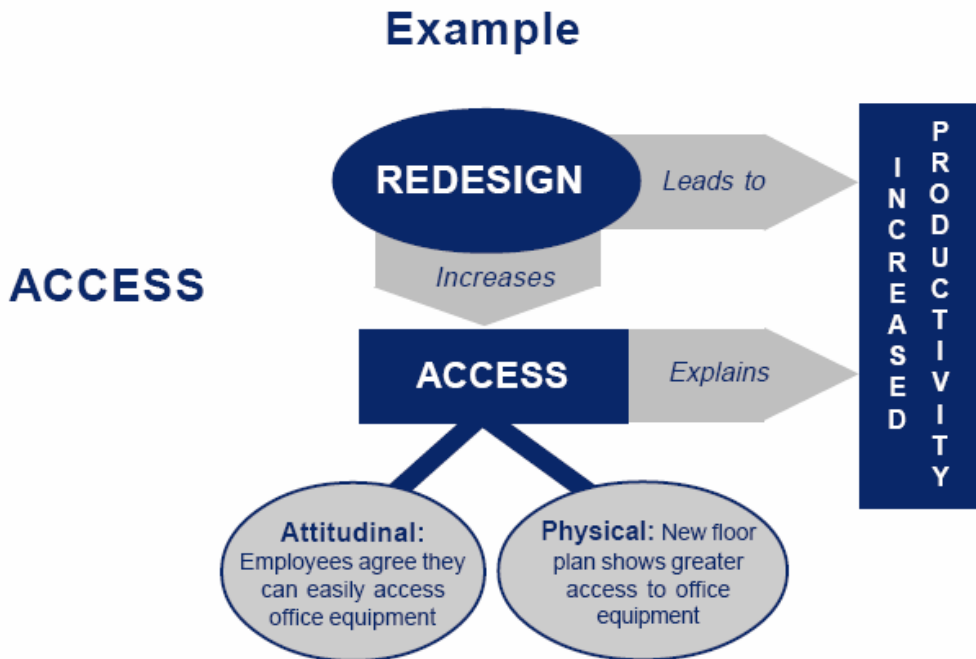


Fig. 3-23: A minimum of two types of measures, attitudinal surveys and physical tests, are used to measure design factors such as access.

(Source: the American Society of Interior Designers)



Fig. 3-24: Performance measures for the three primary areas of employee satisfaction, customer satisfaction and financial performance are comprised of two types of measures: behavioural and attitudinal.

(Source: the American Society of Interior Designers)



### 3.7 - SUMMARY

In developing a measurement plan and tracking results, three sets of questions must be addressed;

- What is it that needs to be accomplished? How success will be measured?
- How is it going to be accomplished? How will the process be assessed?
- How can space help? How will its impact be measured?

Basically and as answer for these questions, most of the approaches previously shown focused on achieving either organizational performance, or focused on achieving worker productivity, which is also a subset of the organizational performance. Most of the methodologies focused on extracting workplace performance metrics that are in its nature related to the strategic performance measurements already set and used by tenants.

There are five practices for measuring high-end knowledge work. These practices were found useful in developing an effective workplace measurement methodology. These practices are;

- Involve knowledge workers and top management in identifying measures.
- Identify only a few, simple measures that are “good enough.”
- Build a casual chain of evidence.
- Don’t rely on measures alone.
- Compare apples to apples.

It must be noted that correlating the different measurements of workplace performance is difficult. If there is an improvement in workplace effectiveness, it is not clear that improvement of worker performance results. And certainly the same is true for strategic performance.

To address whether workplace effectiveness infers improved worker performance or strategic performance requires a well designed and rigorous experimental or analytical approach which must confirm the following conditions:

1. Improved workplace effectiveness and improved worker performance vary together in a consistent and predictable fashion
2. Improved worker performance occurred after improved workplace effectiveness
3. Improved worker performance is not due to other factors

A workplace performance measurement methodology must insure that the measurement process is a part of an overall planning/design process for the development of a workplace. The information developed in the process of planning naturally feeds into the following steps of this process;

1. **Orientation:** determine project goals and objectives, corporate context, vision, goals and objectives of business units, and performance objectives.
2. **Strategic Performance Measurements:** Prepare draft strategic performance measurements and review with representatives of the business group.
3. **Work Process Review:** review the business visions, goals and objectives, understand organizational structure, analyze business processes (by mapping them), identify obstacles to better group performance, discuss possible Group Performance measures, and explore workplace strategies
4. **Group Performance and Workplace Effectiveness Measurements:** Develop Group Performance and Workplace Effectiveness measurements based on the results of the Work Process Review and review with the focus group
5. **Workplace Strategies:** Workplace strategies are best developed beforehand, by the planning team, based on the results of a focus group review of the work process, and then reviewed by business group representatives.

6. **Pre-move survey:** Administer Group Performance and Workplace Effectiveness surveys shortly before the move.
7. **Design Development:** Contract Documents/Construction/Move-in
8. **Post-move survey:** Administer surveys three months or more after the move.
9. **Survey Analysis:** Analyze the results of the pre- and post-move measurements. Compare the results of the measurements for group performance and workplace effectiveness.
10. **Report:** Report results of the survey back to the group and the company.

It is also concluded that an approach to measure the effect of the workplace design over the Workplace productivity must be multi-disciplinary and is met by performing a cause and effect relationship, if both sides of this relation ship were sought to be measured and explained.

It should be noticeable that as in all measurement systems, it is the comparisons that give meaning. A measurement tells nothing at all unless it is compared against a yardstick of some kind; another company, a previous year, or a budget. So, in order to be meaningful, some sort of a scale must be constructed for building up a measurement system. This is considered quite a challenge, because no specific workplace design could be thought of as the optimum solution or standard that will guarantee the positive impact on the organizational performance. Also workplaces differ in scale, in type or nature, and in location, which makes it impossible to compare cases.

**Part Two:**

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**A FRAME WORK FOR MEASURING WORKER  
SATISFACTION**

**Chapter Four:**

**WORKER SATISFACTION AS AN APPROACH TO**  
**MEASURE WORKPLACE DESIGN**  
**PERFORMANCE**

## 4.1 - INTRODUCTION

It was previously shown how the workplace as a physically designed environment is an element that contributes to the organizational performance, and how there were different previous approaches and attempts to measure that workplace performance. With the rising complexity in the process of workplace planning, subjective measurements are becoming more important than ever. A multiple, diverse set of measures for the same workplace may be the most accurate way to measure workplace design performance. In the same way that many variables or factors combine to create an effective working environment, a variety of measurement activities must be combined to get the most accurate picture of the workplace design performance.<sup>1</sup> Accordingly, this chapter developed its own approach, and the door is opened for other new approaches of other research works to participate and add value to the process.

It should also be strongly noted that the approach in this research is only exploratory and not experimental; to address whether workplace design effectiveness infers improved worker performance or strategic performance would require a well designed and rigorous experimental or analytical approach, a cause and effect relationship which needs to be applied in a living lab or applied on a real case. This will need resources that are not available for this research work.

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<sup>1</sup> Steelcase net published paper, 'A new look at traditional concept.' URL: <http://www.steelcase.com>

## 4.2 - IDENTIFYING MEASUREMENT PARAMETERS

Ouye says:

**You can measure workplace performance in any number of ways.<sup>2</sup>**

This was found to be true. While reviewing the different measurement approaches in chapter three, it was clear that they differed in their approach, true that they did all aim to measure workplace design performance, but each had its own approach. To prove this issue, for example, is the debate about whether to measure workplace efficiency or effectiveness, or perhaps measure both. About this Arend wrote:

**One place to start is to determine what drives workspace, or real estate, decisions — effectiveness (doing the right thing) or efficiency (doing things the right way)? The ideal answer is a blend of the two, doing the right things the right way, where in customers, employees and management all benefit. But we must realize that the real estate community is driven by real estate efficiency, which is at least easier to measure than effectiveness.<sup>3</sup>**

This holds true, most of the measurements applied in most of the reviewed cases were found to be efficiency measurements. They are easy to apply, and simple to interpret. Measurements of effectiveness are qualitative, needing more effort to apply, and are hard to interpret. But again this proves Ouye's assumption that workplace design performance is measurable in a number of ways.

After all, the quest is to concentrate on developing an effective approach that is capable of measuring workplace design performance. In order to achieve this, two very important issues had to be clearly identified in order to guide this research measurement approach. These issues were:

- What is it exactly that needs to be measured?
- Why it needs to be measured?

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<sup>2</sup> Ouye J, Ph.D. Principal FT/SYSTEMs. **Measuring workplace performance**. Paper presented at the World Workplace 97. <http://www.workplayce.com/news/press/meas.html>

<sup>3</sup> Arend M, **Design Experts Shed Light On Workplace Performance Measures**, Site Selection v45 no4 p644-6 July 2000

The logical steps of identifying any measurement approach are determining exactly what is it that needs to be measured and what scale is needed to establish this measurement. For example, to measure the length of an object you will need a meter scale. Length measurement is an approach that is completely different from measuring surface area, mass, or even weight, each has its own measurement scale and is translated into a certain numerical value. (Fig. 4-1)

In the business world it was previously shown the importance of measuring organizational performance, which can't be done without the numerical values of quantitative measurements.<sup>4</sup> For example, units of production per hour are a direct quantitative measurement, easily obtained for routine processing jobs or work that has little variation. Likewise, profit margin, cycle time, and cost of sales are all quantifiable measurements, easily attainable with good record keeping and accounting. If methods are sound, results are clear.<sup>5</sup>

Focusing on the role of the physical environment in accommodating organizational performance, measuring the design qualities of this environment is important in understanding the cost and benefit relationship. But again the available measurements only focus on what could be quantitatively measured. The research team at Steelcase Inc. wrote:

**Measurements related to the workplace have typically focused on cost per workspace, space efficiency, reconfiguration costs, and energy use—the cost side of the cost/benefit equation.<sup>6</sup>**

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<sup>4</sup> Review Chapter two: **Measuring office building performance.**

<sup>5</sup> Steelcase Inc. **Assessing Workplace Intangibles: Techniques for understanding.** Grand Rapids, MI: Steelcase Inc., 1997. URL: <http://www.steelcase.com>

<sup>6</sup> Steelcase Inc. **Measuring Business Results: the role of the workplace.** Grand Rapids, MI: Steelcase Inc., 1997. URL: <http://www.steelcase.com>



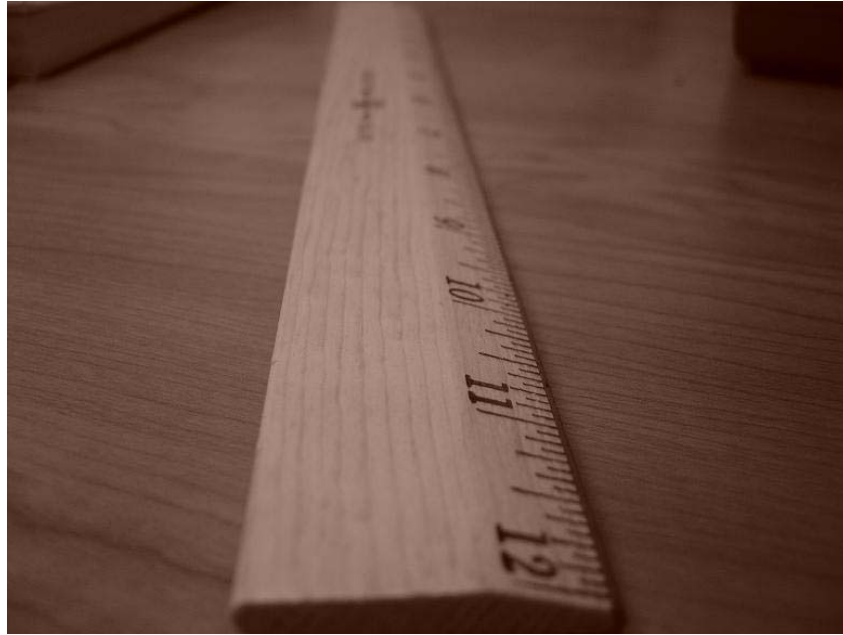


Fig. 4-1: To measure the length of an object you will need a meter scale. Length measurement is an approach that is completely different from measuring surface area, mass, or even weight, each has its own measurement scale and is translated into a certain numerical value.

(Source: <http://www.pages.drexel.edu/~fas25/pictures/ruler.JPG> )



Fig.4-2: Adding more people and equipment may require more air conditioning capacity. The effectiveness of the air conditioning is direct and easily measured with temperature and humidity readings.

(Source: <http://www.buzolich.com/indecorum/media/crampedJapaneseOffice.jpg> )

They also explained in another paper how those measurements are for the tangible design variables that are easily quantified:

**Tangible variables are direct, quantifiable, and easily measured. For example, most environmental factors are measured with precise, specialized instruments that leave little room for interpretation. If readings are collected correctly, measurements are clear. The connection between workplace changes and these measures is direct and easily understood: adding more people and equipment may require more air conditioning capacity. The effectiveness of the air conditioning is direct and easily measured with temperature and humidity readings.<sup>7</sup> (Fig. 4-2)**

But the problem is with those intangible design variables. For example, describing that the interaction between workers in the workplace is ‘GOOD’ is a qualitative value, an intangible variable, that doesn’t contribute to the company’s profitability calculations; it has to be translated into a numerical value and measured quantitatively. (Fig. 4-3) Arend wrote:

**To get more specific, it’s necessary to measure workplace performance in order to quantify its role. Otherwise, it’s just a concept.<sup>8</sup>**

Therefore, an approach to measure workplace design performance should not split but rather merge tangible and intangible design variables in relevance to the organizational performance criteria. For example, accommodating organizational efficiency holds both tangible and intangible variables that work together like reducing occupancy costs and supporting the worker productivity or creativity. About this Ree wrote:

**The office accommodation of an organization is part of the resource use; therefore it could influence organizational performance. Accommodation can contribute to organizational efficiency, for example by reducing occupancy costs or/and by supporting the productivity of the individual employees of an organization. The accommodation could also contribute to organizational creativity, for example by providing an inspiring environment.<sup>9</sup>**

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<sup>7</sup> Steelcase Inc. Assessing Workplace Intangibles: Techniques for understanding. Grand Rapids, MI: Steelcase Inc., 1997. URL: <http://www.steelcase.com>

<sup>8</sup> Arend M, Design Experts Shed Light On Workplace Performance Measures, Site Selection v45 no4 p644-6 July 2000

<sup>9</sup> Ree H. The added value of office accommodation to organizational performance. Work Study. Vol. 51. No. 7. 2002. pp. 357-363



Fig.4-3: Qualitative values must be translated into quantitative values in order to contribute to the organizational profitability calculations

(Source: author)

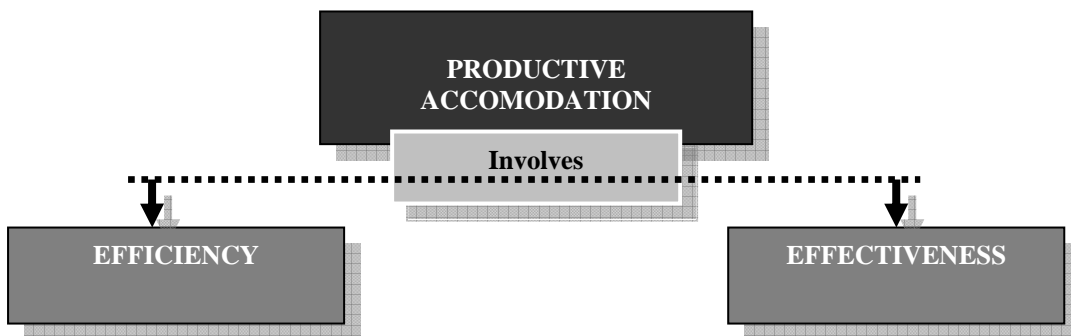


Fig.4-4: This research focuses its measurement approach on the productive accommodation. Productivity is one of the five performance criteria and at the same time involves two of the most important – efficiency and effectiveness

(Source: author)

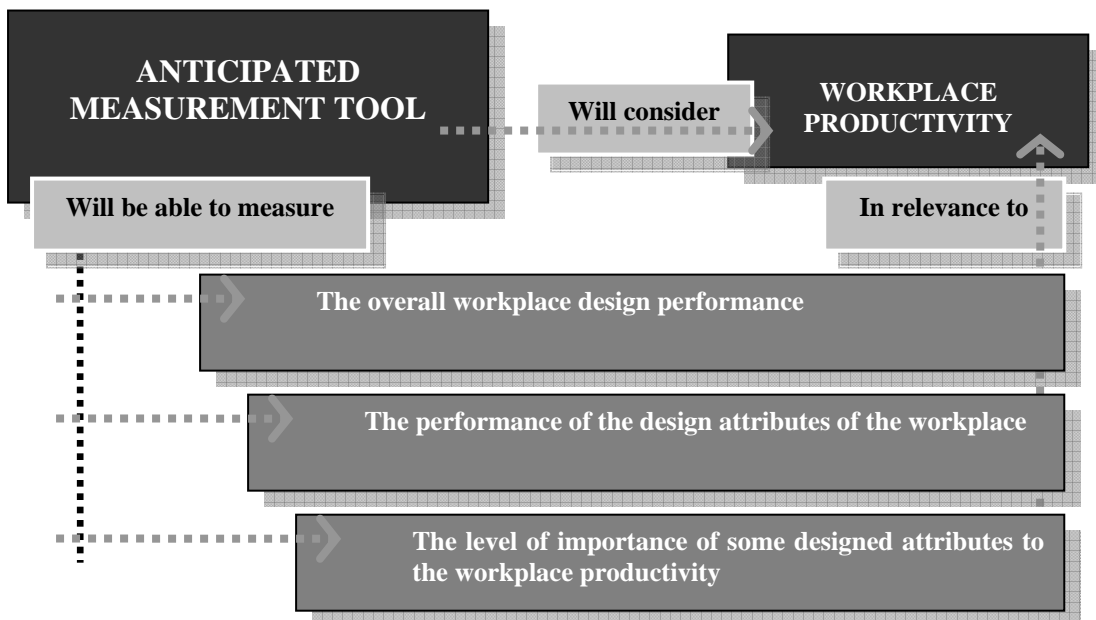


Fig.4-5: In summary, it can be concluded that the anticipated measurement tool considers workplace productivity as a parameter, and must be able to measure the following points in relevancy to that parameter and in the shown order

(Source: author)

About productivity – one of the five organizational performance criteria – Ree adds:

**Productivity refers to the ratio between the actual results of the transformation process and the actual resource use – in fact productivity relates effectiveness to efficiency – and therefore it makes both criteria simultaneously controllable.**

**By approaching the accommodation from a productive point of view, we gain insights into the impact of efficiency on effectiveness and vice versa, thus making it controllable.**

This makes it clear that accommodating organizational productivity involves both efficiency and effectiveness. (Fig. 4-4) the Productive accommodation is also considered one of the most important, for it directly relates to the financial results of an organization.<sup>10</sup>

Therefore, from the previous review the first point in identifying what to measure is quantitatively measuring the OVERALL workplace design performance. More specifically, the performance of the workplace here is related to the progressive accommodation of organizational productivity.

But this does not offer details, thus may not be enough; it will only give insights of how successful or effective the overall workplace design is being in accommodating productivity. Usually organizations would like to invest in specific design attributes that will relate to, for example worker productivity, and would benefit more if they were able to evaluate these office design attributes separately.

Therefore, and as a second point in identifying what to measure, an effective measurement tool must be able to specify, or in other words separately evaluate the design attributes of the workplace.

It also has to be clearly noticed that when looking at a progressive workplace design as an added value that leads to better financial results, organizations don't have

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<sup>10</sup> American Society of Interior Designers. **Productive Workplace – How design increases productivity: Expert insights.** Net published paper. URL: <http://www.asid.org>

to invest in the improvement of the design attributes of the workplace design collectively to gain efficient results. For example, Improvements in raising confidentiality as one of these attributes could be a costly investment to a company that employs a culture of openness. If they don't need it, then there is no logic in emphasising on it.

Therefore, it is very important to determine the importance level of some workplace design attributes to the workplace productivity before attempting to invest in any of them. This is considered the third point in identifying what to measure.

In summary, it can be concluded that the anticipated measurement tool considers workplace productivity as a parameter, and must be able to measure the following points in relevancy to that parameter and in the following order; (Fig. 4-5)

1. The overall workplace design performance – this will give an insight of how progressive or effective that very specific workplace is performing.
2. The performance of the design attributes of the workplace – After the overall result, it has to be significantly diagnosed the individual variables that did cause this result. This will help in directing the workplace planner in what design attributes developments should be made.
3. The level of importance of some designed attributes to the workplace productivity – Work confidentiality, an example of a workplace design attribute, might be of high importance to an organization while of no importance to another, it will be wiser to measure that importance before investing in such an attribute.

The following table answers the earlier two questions: [Table 4-1]

- What needs to be measured
- Why it needs to be measured

**Table 4-1: identifying the points of measurement**

(Source: author)

	<b>What needs to be measured</b>	<b>Why it needs to be measured</b>
1	The overall workplace design performance	Give insights of how successful or effective the overall workplace design performance is
2	The performance of the design attributes of the workplace	Diagnosing specifically what attributes of design work positively and need to be sustained and what works negatively of those attributes and needs urgent developments
3	The level of importance of some designed attributes to the workplace productivity	Not all design attributes are important to all organizations, and to efficiently invest in the workplace design some of these attributes are of no importance to an extent that it can be neglected

### 4.3 - WORKER SATISFACTION AS AN APPROACH

Looking at ASID’s approach in explaining the role of the office design in maintaining workplace productivity, measured by Worker satisfaction, Customer satisfaction, and financial results consequently, works as a good starting point in developing a measurement approach in this research. (Fig. 4-6) Increased performance is measurable by improvements in these three primary areas. They presented these components of productivity in the following lines:

**Current thinking suggests that there are three primary components of productivity: employee satisfaction, customer satisfaction and financial performance. Employee satisfaction factors include teamwork and absenteeism. Customer satisfaction factors include loyalty and repeat business. Financial performance factors include sales, profitability and shareholder value.**<sup>11</sup>

When reviewing these components, it was assumed by this research that measuring worker satisfaction comes first in order before customer satisfaction and financial results. If the workplace design, as one of the five factors that affect workplace productivity, succeeds in satisfying the workers, then consequently it is anticipated that the productivity of these workers will be levered, leading to both customer satisfaction and financial results.

<sup>11</sup> American Society of Interior Designers. **Productive Workplace – How design increases productivity: Expert insights.** Net published paper. URL: <http://www.asid.org>

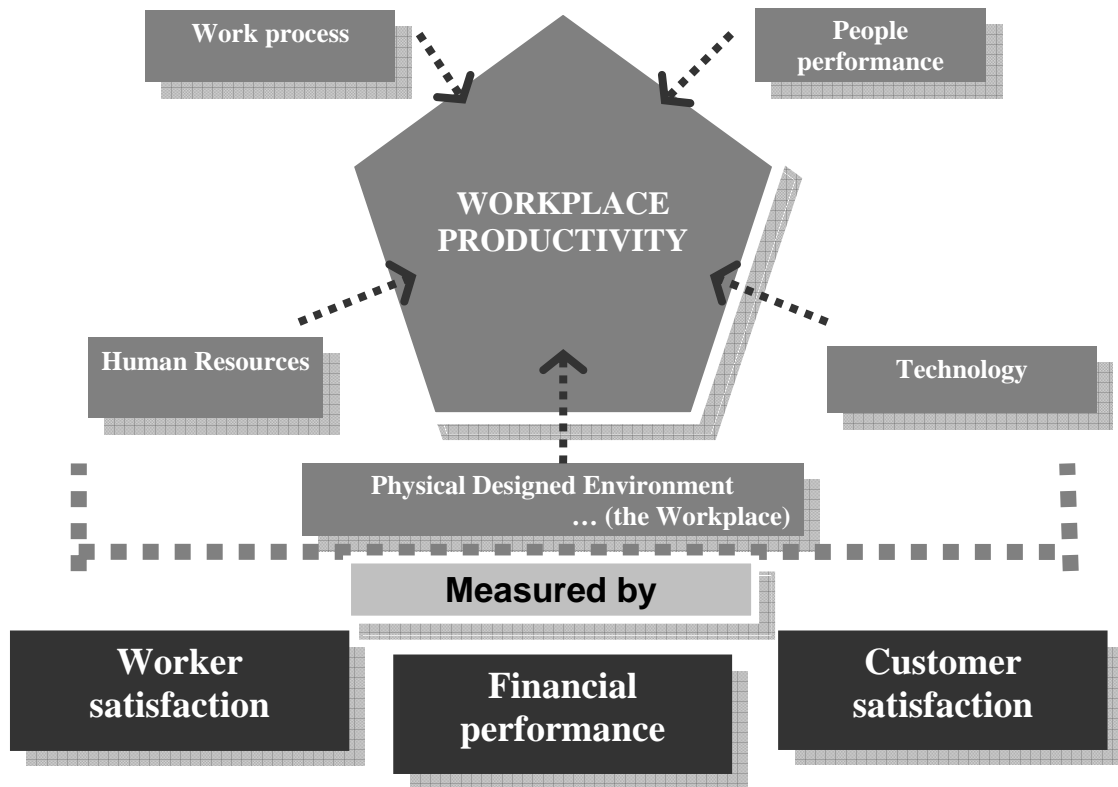


Fig.4-6: According to ASID’s approach in explaining the role of the office design in maintaining workplace productivity, measured by Worker satisfaction, Customer satisfaction, and financial results consequently, works as a good starting point in developing a measurement approach in this research. (Source: author after the American Society of Interior Designers – ASID)

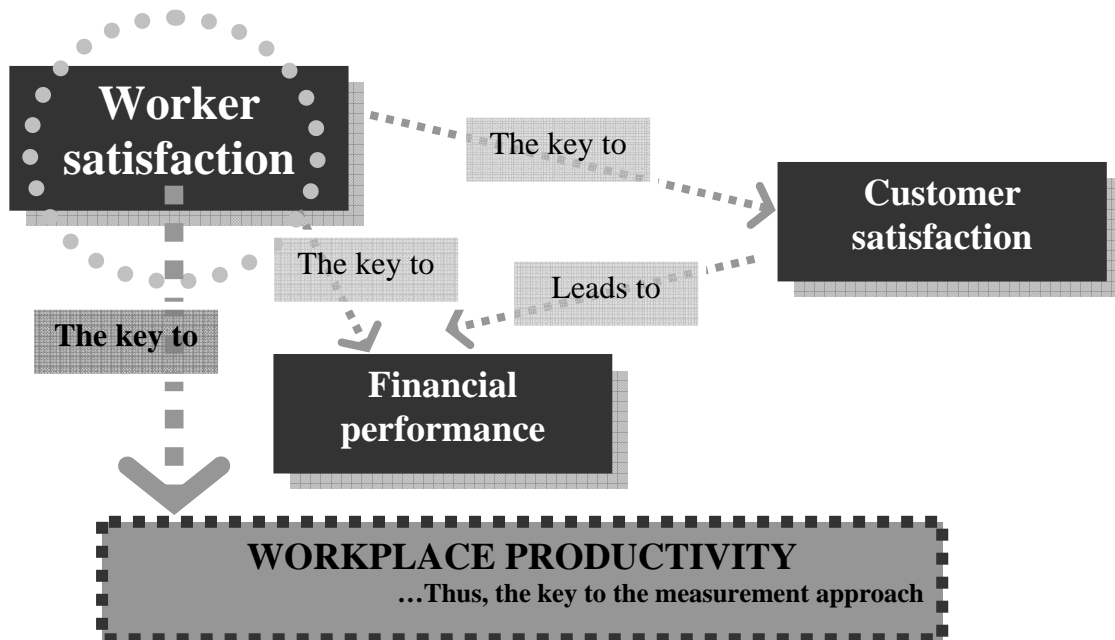


Fig.4-7: If the workplace design, as one of the five factors that affect workplace productivity, succeeds in satisfying the workers, then consequently it is anticipated that the productivity of these workers will lever, leading to both customer satisfaction and financial results. Hence, worker satisfaction is the key to workplace productivity, and also the key to the measurement approach of this research.

(Source: author)

Hence, it is concluded that worker satisfaction is the key to workplace productivity, and also the key to the measurement approach of this research. (Fig. 4-7) Its importance has been proven by Brennan, Chugh, and Kline, saying:

**Employees' satisfaction with their work environment is important to organizations, as it has been shown to be directly related to employees' job satisfaction and indirectly related to commitment and turnover intentions<sup>12</sup>**

But should the other four factors that maintain workplace productivity be isolated when measuring the role of the workplace? Perhaps assuming that these factors - people performance, the technology used, the business processes, and human resources - are constants, and the only interchangeable factor is the physically designed environment would sound logical, for then the performance of this environment can be measured in direct relation to the worker satisfaction. But Ouye disagrees with this idea by saying:

**Since we are starting with the viewpoint that worker performance is the resultant of the interplay of many factors, perhaps the point is to see how and if performance was improved as a result of all those factors, instead of just trying to understand the impact of isolated factors.<sup>13</sup>**

And even if he agreed, it wouldn't have been applicable because these other four factors are not constant and are in continuous change, its effect over human behaviour and their performance cannot be frozen according to Brenner as he says:

**Studying human behaviour is like working in a living lab, you can't freeze it... it's constantly changing. Not only can't most variables be held constant, the interdependencies between the variables also change. Each time management restructures, new technologies are introduced, people switch projects, or priorities shift, it impacts how people get their work done.<sup>14</sup>**

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<sup>12</sup> Brennan, A., Chugh, J.S., & Kline, T. (2002). **Traditional versus open office design: A longitudinal field study.** *Environment and Behavior*, 34, 279-299.

<sup>13</sup> Ouye J, **Measuring Workplace Performance.** IFMA, World Workplace '97, Conference Proceedings, 1997, International Facility Management Association (IFMA).

<sup>14</sup> Brenner P, Steelcase Manager of Workplace Issues.



Therefore the measurement tool cannot practically freeze or isolate the other factors that affect productivity; rather it can be designed in a way that will selectively extract information regarding the design variables of the designed environment.

In measurements, comparisons are very important. This assumes that there is an ideal workplace design to compare to. This raises a very important issue – the existence of an ideal workplace – which was discussed by Ouye saying:

**There is no single approach or ideal integrated workplace or "Office of the Future." Any such endeavours are doomed to fail, because approaches must vary as much as there are different corporate intents, different group goals, objectives and constraints.<sup>15</sup>**

Therefore there is no such thing as standard results or a standard ideal workplace design that could be referred to when comparing the results of a measurement tool. For example, if we consider two companies working in the fields of telecommunication, one is in Sweden and the other is in Egypt, it is never guaranteed that what works effectively in Sweden could be taken as a successful prototype in Egypt. The difference in culture, awareness, and past experiences of the workers in both countries will affect the outcome. Also the difference in the corporate culture, or even the scale of business could affect the outcome, although these two companies work in the same field. Factors that might affect the worker's perception were introduced by Williams<sup>16</sup> and are identified as: Relativity, Significant aspects, Knowledge and past experience, Level of involvement, Social context, and Tastes and fashions, those factors are explained in the following table. [Table 4-2]

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<sup>15</sup> Ouye J, *Ph.D.*, *FT/SYSTEMs and Members of the R&D Workplace Productivity Consortium*, **Improving productivity through integrated workplace planning**. IFMA, World Workplace '96, Conference Proceedings, 1996, International Facility Management Association (IFMA). URL: <http://www.workplayce.com/news/press/integrat.html>

<sup>16</sup> Williams, A.M. **Obsolescence and Re-use: A study of multi-storey industrial buildings**, school of land and building studies, Leicester Polytechnic, Leicester. 1985.

**Table 4-2: factors that affect worker’s perceptions**

(Source: Williams)

factor	Effect
Relativity	Relative conditions are easier to perceive than absolute conditions, this being in direct proportion to the magnitude of the relative difference. For instance, it is the easier to judge that one building is in better condition than it is to judge the condition of a building in isolation
Significant aspects	Some aspects of a building are easier to perceive than others. For example, the decorative state of repair and the internal thermal environment are easier to perceive than structural performance or the adequate provision of fire exits. These aspects may have a disproportionate influence on the overall assessment
Knowledge and past experience	These are important were the occupant has particular knowledge relating to the building itself or the activity in question. The occupants experience of other buildings will also influence their perceptions
Level of involvement	Infrequent visitors are likely to perceive change as being at a higher rate than the occupants due to their discontinuous view of the building.
Social context	Were judgments are made by an occupant, either as part of a group or individually, but with knowledge of the group consensus, then the occupants perception will tend to concur with that consensus more than if the occupant’s perceptual judgment was formed in isolation.
Tastes and fashions	Fashion permeates all facets of life and experience suggests that whatever the long term view about a particular style, it will invariably fall out of favour in the medium term; changes in fashion provoke an adverse reaction against styles that characterized the preceding era

Therefore, What makes this approach – relating workplace design performance to worker’s satisfaction – significant is that the design attributes of the workplace are evaluated by the users themselves, they are considered as the only reference, making each case of measurement independent from the other regardless the culture, the type of business, the awareness of workers, the location, or even the scale of company.

Another benefit in this approach is that since the results are user driven - what is considered un-satisfying in one case might be considered satisfying in the other – this ensures the efficiency of investing in the workplace design. For example, if two different companies installed the same type and model of workstations, and the workers of one of them think that those workstations do not offer them the status and image they deserve, this does not mean that the other company will have to invest in this point as a negative side, because the status and image found unsatisfying there could be found satisfying with their workers.

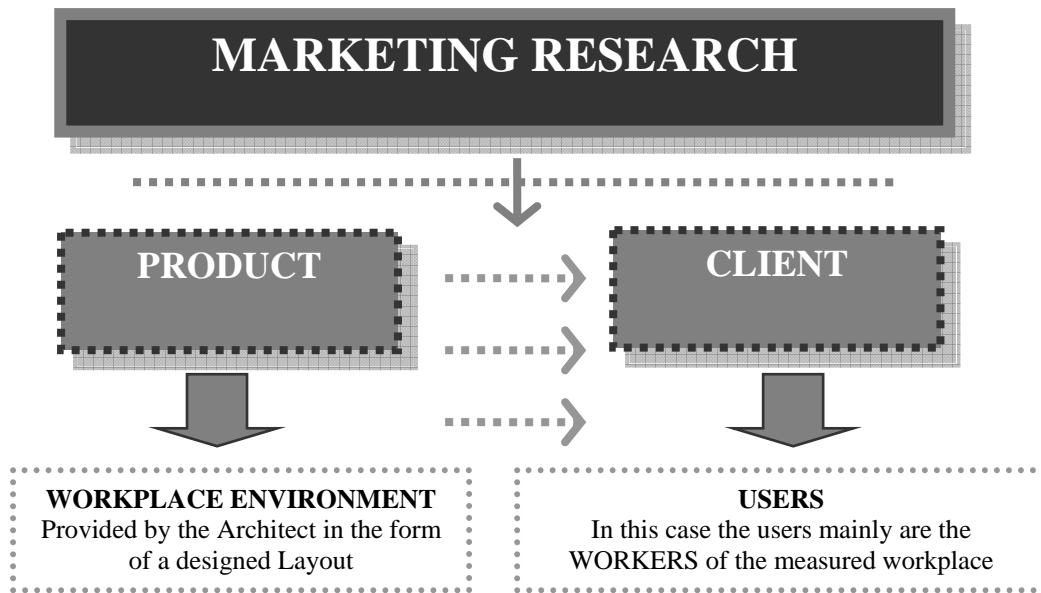


Fig.4-8: the user can be perceived as the client and the product is presented in the physically designed environment provided by the architect. This perception is adopted for the remainder of this research.

(Source: author)

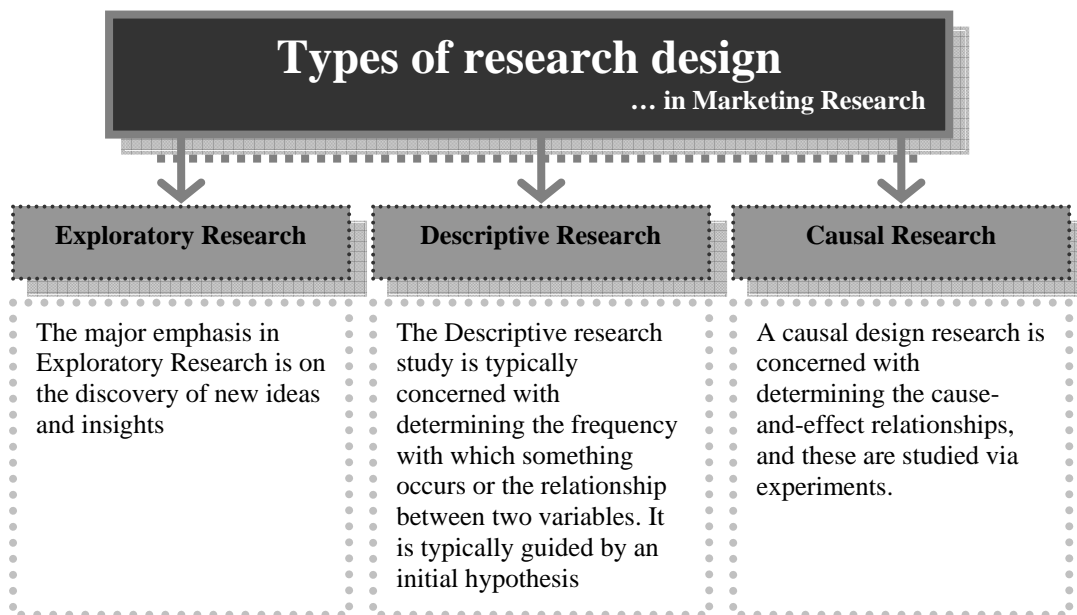


Fig.4-9: Types of research design and the description of each in Marketing Research

(Source: author after Churchill)

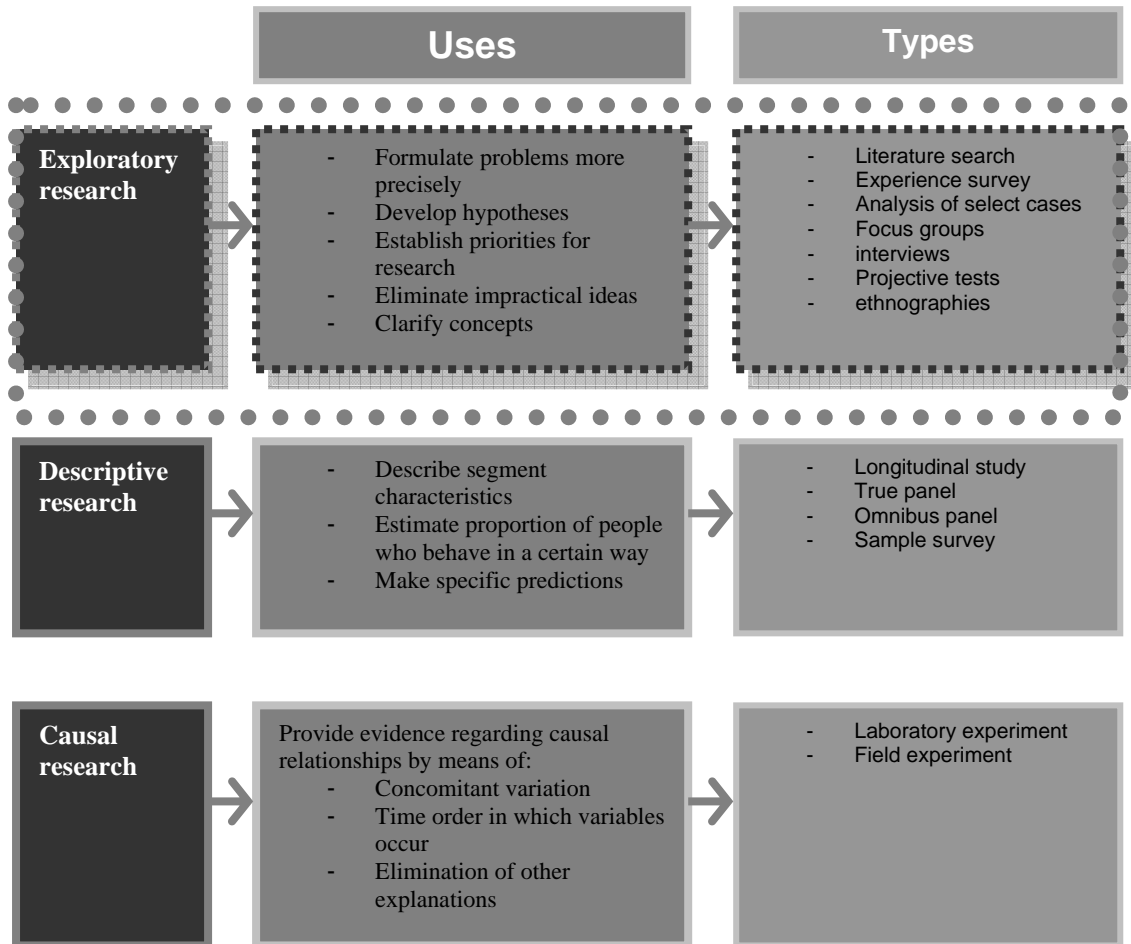


Fig.4-10: Uses and Types of study of each research design in Marketing Research – Exploratory research methods were chosen to be applied in this research since its general objective is to gain insights and ideas; it is particularly helpful in breaking large, vague problem statements into smaller, more precise sub-problem statements, ideally in the form of specific hypotheses, where this is the case for the desired measurement tool of this research.

(Source: author after Churchill)

The approach of measuring user satisfaction better relates to the field of *marketing research* where the behavior and attitude describe the degree of satisfaction of the users; the basic structure of the desired measurement tool. The research team at Steelcase Inc. assumes that changes in design will definitely affect those behaviors and attitudes. They say:

**Because physical space is a profound influencer of human behaviour, small changes in the workplace can affect big changes in behaviour and attitude: patterns of interaction, channels of communication, and development of relationships.<sup>17</sup>**

The user in this case can be perceived as the client and the product is the service provided by the architect and presented in the physically designed environment. This perception was adopted for the remainder of this research to help in guiding the measurement framework in the next chapter. (Fig. 4-8)

In the field of marketing research there are three types of research designs; exploratory research, descriptive research, and causal research. (Fig. 4-9) Exploratory research methods were chosen to be applied in this research since its general objective is to gain insights and ideas; it is particularly helpful in breaking large, vague problem statements into smaller, more precise sub-problem statements, ideally in the form of specific hypotheses, where this is the case here. (Fig. 4-10)

Exploratory research methods are appropriate for any problem about which little is known. It is perceived as the foundation of a good study, and is characterized by flexibility with respect to the research methods used. Churchill describes exploratory research in the following lines:

**In exploratory research, investigators rarely use detailed questionnaires or complex sampling plans. Rather, they frequently change the research procedure as the vaguely defined initial problem is transformed into one with more precise meaning. Researchers follow where their noses lead them. Ingenuity, judgment, and good luck inevitably play a part in leading to the one or two key hypotheses that may ultimately account for the phenomenon.<sup>18</sup>**

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<sup>17</sup> Steelcase Inc. **Assessing Workplace Intangibles: Techniques for understanding**. Grand Rapids, MI: Steelcase Inc., 1997. URL: <http://www.steelcase.com>

<sup>18</sup> Churchill, G.A. **Marketing research: Methodological foundations**, 9<sup>th</sup> edition, Dryden press. Hinsdale, IL. 2002.

## 4.4 - SUMMARY

In order to guide this research measurement approach, two very important issues had to be clearly identified. These issues were:

- What is it exactly that needs to be measured?
- Why does it need to be measured?

Generally, and before identifying the answer to both questions, a parameter for the measurement process had to be identified. Looking at the five criteria of the organizational accommodation, the productive accommodation was chosen as a parameter for the process of measurement. It was chosen because it holds a wider scope of accommodating both efficiency and effectiveness. And to be more specific, the performance of the workplace here is related to the successful accommodation of productivity.

Hence, the measurement process will consider workplace productivity as a parameter, and in an answer to the *nature* and *purpose* of the measurement, it must be able to measure the following points in relevancy to that parameter and in the following order;

1. The overall workplace design performance – this will give an insight of how progressive or effective that very specific workplace is performing.
2. The performance of the design attributes of the workplace – After the overall result, it has to be significantly diagnosed the individual variables that did cause this result. This will help in directing the workplace planner in what design attributes developments should be made.
3. The level of importance of some designed attributes to the workplace productivity – Work confidentiality, an example of a workplace design attribute, might be of high importance to an organization while of no

importance to another, it will be wiser to measure that importance before investing in such an attribute.

The problem with measuring the workplace performance is the qualitative measurements, the intangible variables, which add value to the organizational performance but don't contribute to the company's profitability calculations; it has to be translated into a numerical value and measured quantitatively. An approach to the measurement process must realize this fact.

Generally, workplace productivity is measured by worker satisfaction, customer satisfaction, and financial results. It is assumed by this research that worker satisfaction comes first in order before customer satisfaction and financial results. If the workplace design succeeds in satisfying the workers, then it is anticipated that the productivity of these workers will be levered, leading to both customer satisfaction and financial results. Hence, it is concluded that worker satisfaction is the key to workplace productivity, and also the key to the measurement approach of this research, which will also consider the quantitative values of the intangible design variables.

What makes this approach significant is that the design attributes of the workplace are evaluated by the users themselves, they are considered as the only reference, making each case of measurement independent from the other regardless the culture, the type of business, the awareness of workers, the location, or even the scale of company.

Some points must be noted and taken into consideration while developing this measurement tool. These points are;

- The measurement tool must not work in isolation from the other factors that affect productivity for the sake of the physically designed environment; rather it will be designed in a way that will selectively extract information regarding the design variables of the designed environment.

- There is no such thing as standard results or a standard ideal workplace design that could be referred to when comparing the results of a measurement tool.
- The difference in culture, awareness, and past experiences of the workers can affect the outcome of the measurement process. Also the difference in the corporate culture, or even the scale of business could affect the outcome. Factors that might affect the worker's perception were identified as:
  - Relativity,
  - Significant aspects,
  - Knowledge and past experience,
  - Level of involvement,
  - Social context, and
  - Tastes and fashions

The approach of measuring user satisfaction better relates to the field of *marketing research* where their attitudes describe their degree of satisfaction. In this case the user can be perceived as the client and the product is the service provided by the architect and presented in the physically designed environment.

In the field of marketing research there are three types of research designs;

- exploratory research,
- descriptive research, and
- causal research

Exploratory research methods were chosen to be applied in this research since its general objective is to gain insights and ideas; it is particularly helpful in breaking large, vague problem statements into smaller, more precise sub-problem statements, ideally in the form of specific hypotheses, where this is the case in this research.



**Chapter Five:**

**A FRAME WORK TO MEASURE WORKPLACE  
DESIGN PERFORMANCE**

## 5.1 - INTRODUCTION

This framework aims to drive the measurement process through practically applied steps that are capable of extracting meaningful data. Respecting the order of these steps is also important.

As a reminder, the outcomes needed to be identified by this measurement process were identified as:

1. The overall workplace design performance – relevant to worker satisfaction
2. The performance of the design attributes of the workplace – relevant to worker satisfaction
3. The level of importance of some designed attributes to the workplace productivity

In order to achieve these outcomes the framework proposed in this research is a two-step procedure represented in the following paragraphs. (Fig. 5-1)

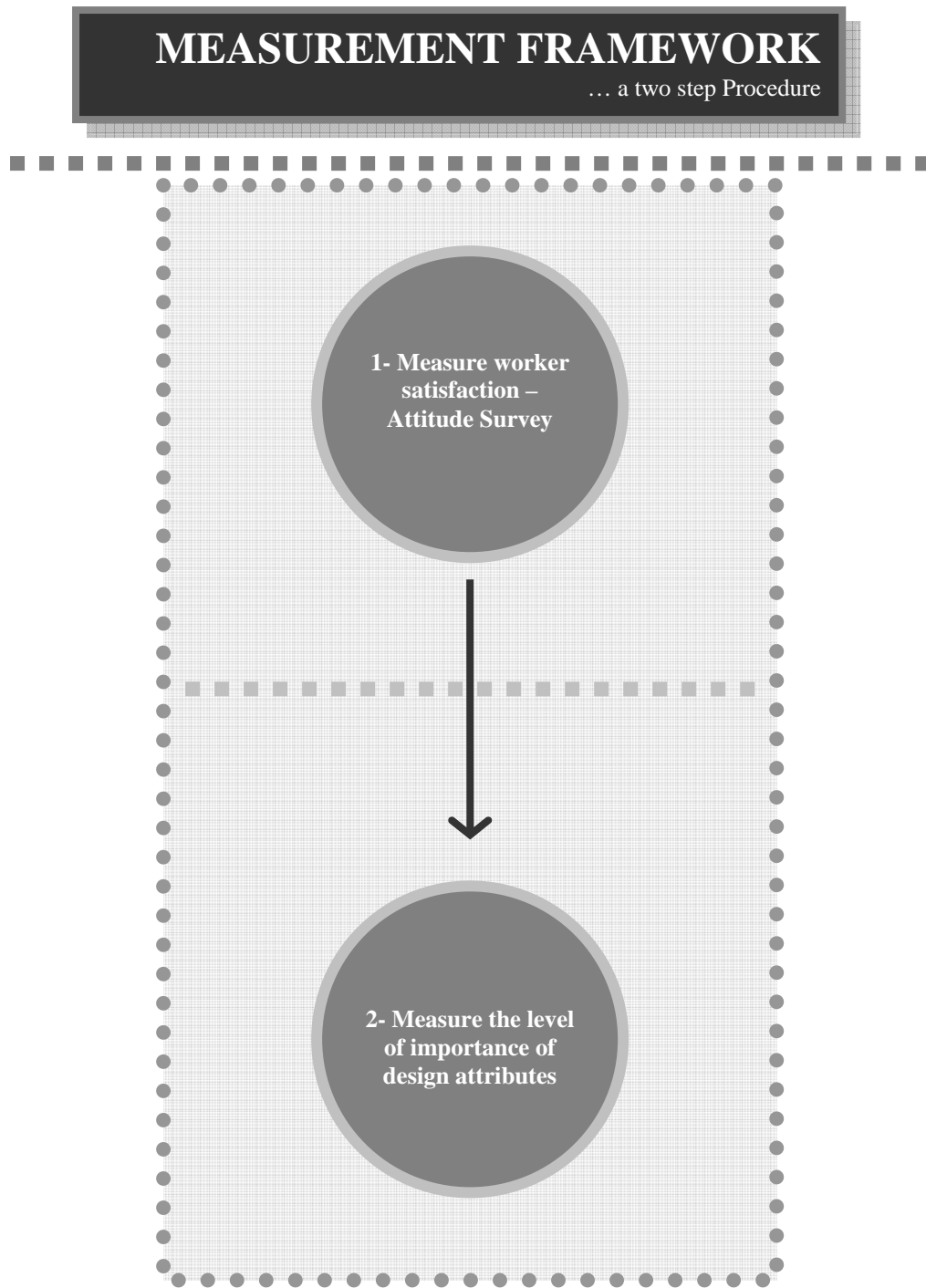


Fig.5-1: the proposed framework is a two-step procedure

(Source: author)

## 5.2 - MEASUREMENT PRE-REQUISITES

Planning the workplace to accommodate organizational performance and dealing with all the disparate elements as a system is a radical departure from simply "planning a space," or dealing with each element separately. Going through a process which systematically considers the business context and workplace elements is highly recommended.

Therefore, it is very important to note that the measurement process comes in the larger course of re-designing an existing workplace; after all, it is the results/outcomes that are anticipated to rule the new design. Hence, if integrated workplace design is the aim, certain pre-requisites<sup>1</sup> to the measurement process are needed to be gathered and are identified by this research in five points, but they don't count as steps of the measurement framework.

1. Learn about the organization message, business objectives, strategic aims
2. Learn about the Corporate Culture, Organizational structure
3. Learn about the Working modes and work forms
4. Inspect the Facility
5. Create a sense of trust

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<sup>1</sup> More details about these Pre-requisites can be reviewed in Appendix B.

### 5.3 - STEP 1: ATTITUDE SURVEY

The first step in this framework is to measure user satisfaction by constructing an attitude survey. According to Churchill<sup>2</sup>, attitude is one of the most widely used ideas in all of social psychology or consumer behavior, but it is also difficult to pin down a definition. However, there seems to be agreement about the following:

1. Attitude represents a *predisposition* to respond to an object (not yet the actual behavior toward the object). Attitude thus possesses the quality of readiness.
2. Attitude is *persistent* over time, and changing a strongly held attitude requires substantial pressure.
3. Attitude is a latent variable that produces consistency in verbal and physical behavior.
4. Attitude has a directional quality. It connotes a preference regarding the outcomes involving the object, evaluations of the object, or positive/neutral/negative feelings for the object.

These consistencies lead to the definition of attitude as: ***representing a person's ideas, convictions, or liking with regard to a specific object or idea.***

Therefore, the degree of worker satisfaction towards the workplace design performance was measured by using an attitude survey. The process of constructing an attitude survey is divided into six steps shown below in [Table 5-1].

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<sup>2</sup> Churchill, G.A. **Marketing research: Methodological foundations**, 9<sup>th</sup> edition, Dryden press. Hinsdale, IL. 2002.

**Table 5-1: Steps of applying an attitude survey**

(Source: author adapted from Churchill)

	<b>Description</b>	<b>Technique or coefficient</b>
1	Specify the domain of construct	Literature search
2	Generate the sample of items – develop questionnaire	Literature search Interviews with workers
3	Collect data	Survey of building tenants
4	Purify measures	Cronbach's alpha, factor analysis
5	Assess reliability	Cronbach's alpha
6	Assess validity	Content, Construct, & Discriminant validity

### ***5.3.1 - Step 1- Specify the domain of construct***

The domain of construct here is **'the accommodation of organizational productivity'** as regards to the design attributes affecting workplace productivity. This step includes content validity in reviewing mostly all the available literature concerning workplace and office design, identifying and categorizing those variables that affect the office spaces and have an impact on workers' productivity and satisfaction.

As an outcome, the needs of the workplace design were best addressed by Raymond and Cunliffe<sup>3</sup> in the following four categories;

- Activity needs – subdivided into physical and psychosocial needs
- Communication,
- Ambience, and
- Spaces

These spaces that constitute the workplace are divided into the following categories;

<sup>3</sup> Raymond .S, Cunliffe .R , **Tomorrow's office, creating effective and humane interiors**, E & FN Spon . 1997

- Primary,
- Support,
- Service,
- Social,
- Ancillary spaces, and
- Circulation elements & spaces.

They were detailed here in [Table 5-2]:

**Table 5-2: Spaces that constitute the workplace**

(Source: Author adapted from Raymond and Cunliffe)

Space	Description	Example
<b>Primary</b>	The principal workspaces (housing the core activities)	Solo
		Group
		<i>Spaces for solitary work</i> <i>Workstations</i> <i>Transient space</i> <i>Booths</i> <i>Private offices</i> <i>Spaces for collective work</i>
		<i>Meeting points</i> <i>Team spaces</i> <i>Studios and drawing offices</i> <i>Conference Boxes</i> <i>Meeting rooms</i> <i>Electronic meeting rooms</i> <i>Presentation rooms</i>
<b>Ancillary</b>	Spaces containing functions which support an individual work group or department	<i>Paper processing centers</i> <i>Filing centers</i> <i>Refreshment points</i> <i>Toilets</i>
<b>Support</b>	Spaces containing functions that support the work of the whole organization	<i>Reception areas</i> <i>Libraries</i> <i>Training suites</i> <i>Auditoria</i> <i>Mail rooms</i> <i>Reprographic units</i> <i>Archives</i> <i>Medical centers</i>
<b>Social</b>	Spaces containing functions to do with the non-work activities of the occupants	<i>Restaurants and cafes</i> <i>Eating areas</i> <i>Dining rooms</i> <i>Serveries</i> <i>Kitchens and ancillary areas</i> <i>Shops</i> <i>Clubrooms and bars</i> <i>Health centers</i> <i>Retreats</i> <i>Crèches</i> <i>Atria and terraces</i>

<b>Service</b>	Spaces containing functions to do with the operation and maintenance of the building	<i>Workshops</i> <i>Staff rooms</i> <i>Stores</i> <i>Plant rooms</i>
<b>Circulation</b>	Spaces or elements to do with movement around the office	<i>Lifts and lift lobbies</i> <i>Escalators</i> <i>Staircases</i> <i>Refuges</i> <i>Corridors</i> <i>Passages</i> <i>Delivery areas and goods lifts</i>

As for the variables that affect workplace productivity, an approach was made by ASID (American Society of Interior Designers) in a study<sup>4</sup> that delves into what workers value most in their workplace and were stated in the following order:

1. Comfort
2. Communications
3. Access
4. Function & Efficiency

Prior to that study a survey which was also made by ASID between researchers, academics, workplace consultants, and managers to identify what variables of design affect the workplace productivity. The study resulted in identifying four design variables that affect workplace productivity:

1. Improving **Access**
2. Increasing worker **Comfort**
3. Increasing **Privacy**, including limiting noise and distraction
4. Providing **Flexibility** and customization

In another published paper on evaluating office building performance, Pinder<sup>5</sup> identified four dimensions affecting the utility performance:

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<sup>4</sup> American Society of Interior designers, **Workplace Values: How Employees Want to Work**. Net paper. URL: [www.asid.org](http://www.asid.org)

<sup>5</sup> James Pinder, **A method for evaluating workplace utility**, The College of estate management, Reading, UK.



1. Appearance
2. Configuration
3. Environment
4. Functionality

Another paper that was published in *Environment and Behaviour*<sup>6</sup> suggests that the analysis of physical environments in organizations should recognize three separate dimensions:

1. Instrumentality,
2. Aesthetics, and
3. Symbolism.

As a result of this literature review, office design attributes were divided and categorized by the author in four dimensions; Physical needs, Psychosocial needs, Ambience, and Movement. [Table 5-3]

**Table 5-3: Four dimensions of office design attributes**

(Source: Author)

Dimension	Attributes / Variables
<b>PHYSICAL NEEDS</b>	SPACE Furniture, Equipments, and Ergonomics Lighting ( <i>natural / artificial</i> ) Views Ventilation ( <i>Air quality, Flow, &amp; Temperature</i> )
<b>PSYCHOSOCIAL NEEDS</b>	Interaction Flexibility <i>in performing multiple tasks or office work activities</i> Personal Privacy Work Confidentiality Stimulation of workers Peace Territoriality – <i>tangible separation (not necessarily walls) between units/Dept/Teams</i> Status & Image Personalization Good manners Learning

<sup>6</sup> Vilnai-Yavetz, Rafaeli, Faculty of Industrial Engineering and Management, Technion-Institute of Technology, Haifa, ISRAEL. Yaacov, New Jersey School of Architecture, New Jersey Institute of Technology, Newark, New Jersey, USA, **Instrumentality, Aesthetics, and Symbolism of Office Design**, Paper in press, Environment and behaviour, Running head: office design, July, 2005

<b>AMBIENCE</b>	<b>Interior appearance:</b> Emphasize corporate image ( <i>Image of the company</i> ) Offer visually appealing spaces  <b>Support:</b> Security / Accessibility / Confidence / Learning / Feeling in control  <b>Provide Artworks</b>
<b>MOVEMENT</b>	Flow of people Flow of objects ( <i>Like files or mail</i> ) Flow of Information ( <i>verbal and written</i> ) Sense of direction – <i>the clarity and literacy of circulation patterns</i>

### ***5.3.2 - Step 2- Generate the sample of items - develop the questionnaire***

In this step, a number of items will be generated in order to be used in the scale. Each of these items will refer to the design attributes of step 1. Each item will be represented in the attitude survey by using statements of favourableness. These items must prove their reliability and validity in producing meaningful results when applied in different cases.

At this stage, the first validity test – content validity – has already been performed in step 1 and is completed in step 2. Content validity focuses on the adequacy with which the domain of the characteristic is captured by the measure; in this case the characteristic is the *workplace performance*, and the domain is the *design variables*. It is assessed by looking at the measure to ascertain the domain being sampled. If the actual items look different from the possible domain, the measure is said to lack content validity.

It is considered very critical in content validity to define the domain of the characteristic. The definition of the domain was expedited by literature review – in step 1 – to determine how the variables are defined and used.

Next, a large collection of items was written that broadly represents the variables as defined. Items must be included to represent all the relevant dimensions of the variables. The number of items must be large so that after scale refinement or

purification – using factor analysis – the measure still contains enough items to adequately sample each of the proposed dimensions of the domain.

Accordingly a big number of items were generated for each of the proposed four dimensions. For example, in the *physical needs* dimension, Space is reviewed with a number of factors, such as *availability, area, comfort* and *efficiency*. This generated an enormous amount of items that were later formulated into statements of favourableness. As an example for the large amount of items that can be generated the case of toilets and restrooms for example, represented in the following statements;

- TOILETS & RESTROOMS are sufficient in number
- TOILETS & RESTROOMS are sufficient in area
- TOILETS & RESTROOMS are comfortable in their use
- TOILETS & RESTROOMS operate efficiently

If every variable of the workplace design produced that number of statements then the list would be very long. It was impractical to list too many statements that sounded very similar and ambiguous or even tiring to comment on – it can be imagined the countless statements that could be generated for each dimension.

Although these statements might seem very precise and have the ability to point directly to the problem, but actually they impose a negative impact more than the positivism of this precision for they tend to confuse the respondent and create a sense of uncertainty and tiredness.

The generated items were refined by the exclusion of those which were found ambiguous or those which were found of little importance. This was completely a judgmental process made by the author and guided by literature review and interviews of a number of workers whom worked in different business fields. This even helped in modifying and rephrasing certain statements. After refinement these items were ready to be used in the questionnaire and are presented in the following table. [Table 5-4]

**Table 5-4: List of the generated scale items**

(source: author)

**PHYSICAL NEEDS – space requirements**

- 1 Sufficient No. of Formal meeting rooms
- 2 Sufficient No. of Informal meeting points
- 3 Sufficient No. of document processing points
- 4 Sufficient No. of toilets and restrooms
- 5 Sufficient No. of prayer rooms
- 6 Sufficient No. of retreats
- 7 Sufficient No. of Refreshment points

**PHYSICAL NEEDS – area and space fit**

- 8 Sufficient Workspace area
- 9 Sufficient Personal storage area
- 10 Sufficient area of Formal meeting rooms
- 11 Sufficient Reception area

**PHYSICAL NEEDS – Comfort and efficiency requirements**

- 12 Comfort usage of Furniture and Equipment
- 13 Efficient Furniture and Equipment
- 14 Lighting
- 15 View
- 16 Ventilation

**PSYCHOSOCIAL NEEDS**

- 17 Interaction
- 18 Concentration
- 19 Personal privacy
- 20 Work confidentiality
- 21 Stimulation & Motivation
- 22 Territoriality
- 23 Status & image
- 24 Learning & knowledge exchange

**AMBIENCE**

- 25 Corporate image
- 26 Unit/Team/Dept Workspace Visually appealing
- 27 Other Spaces Visually Appealing
- 28 Circulation elements Visually appealing
- 29 Sense of safety
- 30 Artworks

**MOVEMENT**

- 31 Accessibility
- 32 Way finding

The questionnaire was built on the basis of an *interval scale* and used *Lickert summated ratings* to acquire the user's perception on a five-point scale and values were assigned in an ascending order as 1 for strongly disagree till 5 for strongly agree;

1. strongly disagree,
2. disagree,
3. neutral,
4. agree, and
5. strongly agree

Each statement was allowed to be answered as (not applicable). Statements of favourableness were listed each under its proposed dimension. Only the physical needs dimension was sub-divided into three sub-titles;

- *Space availability,*
- *Area and space fit, and*
- *Comfort & efficiency*

Note that these dimensions were only proposed by the author, and later in the practical application, factor analysis will be applied to re-arrange them under relevant factors or dimensions.

An open-ended question was also included in the questionnaire for respondents to express their opinions. Open-ended questions help give explanations to some of the replies obtained from the statements.

Finally, questions acquiring information about the respondent's gender, age, business unit, and job level were included in the questionnaire to develop further useful statistical analysis. The questionnaire was anonymous to give freedom for the respondent to express his attitude towards the given statements.<sup>7</sup>

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<sup>7</sup> A copy of the e-mail questionnaire can be reviewed in Appendix C.

The step-by-step procedure for building a questionnaire adapted by Churchill<sup>8</sup> was used more as a checklist for building up the questionnaire and was often modified via some iteration and looping. According to him working back and forth among stages is natural.<sup>9</sup>

### ***5.3.3 - Step 3 - Collect Data***

Data collection entails the use of some kind of field personnel operating either literally in the field or from an office, as in a phone, mail, e-mail, web, or fax survey. According to Churchill there are three types of administration methods for collecting data:<sup>10</sup>

- Personal Interview
- Telephone interview
- Mail Questionnaire

The method of administration that is mostly preferable will be the written format (e-mail questionnaire) to ensure that all invited respondents did receive the survey, and to save time. It also is preferable because the respondent chooses the desirable time and place for him to reply to the questionnaire.

The minimum sample size appropriate for scale development as indicated by Bernard<sup>11</sup> is 200. This will limit the application of this tool to organizations that host more than 200 workers eligible to respond to the survey. With an estimated average response rate of 20%, companies hosting more than 1000 are more preferable to work with.

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<sup>8</sup> Churchill, G.A. **Marketing research: Methodological foundations**, 9<sup>th</sup> edition, Dryden press. Hinsdale, IL. 2002.

<sup>9</sup> Steps that were used for building up the questionnaire can be reviewed in Appendix D

<sup>10</sup> Difference between the three methods of administration are presented in Appendix E

<sup>11</sup> Bernard HR, **Research methods in anthropology. Qualitative and Quantitative approaches**. 2<sup>nd</sup> edition, Walnut Creek, London, New Delhi, Alta Mira Press, 1995

### ***5.3.4 - Step 4- Purify measures***

The fourth step will purify the scale items using factor analysis which is a method of data reduction by which few combined variables named factors could replace many original variables.

Missing data will be recorded and a missing value analysis will be conducted using SPSS, which reveals that missing data was randomly distributed across the data matrix. Mean series values will then be calculated and used to replace missing data, thereby maximizing the number of valid cases in the analysis.<sup>12</sup> The replacement of missing data has the effect of “smoothing” individual variables so that the influence of extreme values is diminished this approach could be regarded as “conservative”, but given the potential drastic decline in cases due to the combined impact of missing values it was regarded as justifiable.

This step also aims to purify the replies received after conducting the survey by excluding obviously biased replies. Also if the scale item was found to be applicable to some individuals while it didn't apply to others, it was excluded from the scale to properly continue with the statistical applications of validity and reliability. Later, in the practical application, only one item was excluded - prayer rooms - because it only focused on a certain specific category of the population.

### ***5.3.5 - Step 5 – Assess reliability***

The similarity of results provided by independent but comparable measures of the same object or construct is called reliability<sup>13</sup>. It is often said that:

- 1- if a measure is valid, it is reliable
- 2- if it is not reliable, it cannot be valid
- 3- if it is reliable, then it may or may not be valid

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<sup>12</sup> Hair, J.F., Anderson, R.E., Tatham, R.L., and Black, W.C (1995), **Multivariate Data Analysis with Readings**, 4<sup>th</sup> ed., Prentice-Hall, London.

<sup>13</sup> Churchill, G.A. **Marketing research: Methodological foundations**, 9<sup>th</sup> edition, Dryden press. Hinsdale, IL. 2002.

In sum, reliability is a necessary, but not sufficient, condition for validity. The basic assumption in constructing an attitude scale is that when several items are summed into a single score, the items are measuring the same underlying attitude. Each item can be considered a measure of the attitude, and the items should be consistent (or equivalent) in what they indicate about the attitude. The equivalence measure of reliability focuses on the internal consistency or internal homogeneity of the set of items forming the scale.

Reliability will be tested using Cronbach's alpha which refers to the degree or level of consistency with which the respondent answers all the scale items. Values of Cronbach's alpha, the most widely used reliability coefficient, can range from 0 to 1, with higher figures indicating greater scale reliability.

### ***5.3.6 - Step 6 – Assess validity***

The final part of the data analysis involves assessing the validity of the results to the population and reliability of the scale items for use in future research. The application of Validity was actually done in different steps of the attitude survey ranging from content to construct to discriminant validity. The validity applications used were as shown below:

1. ***Content validity.*** Content validity of the scale was established by a review of the literature and validation of item representation and clarity by the author and supervisors.
2. ***Construct validity.*** Construct validity of the scale was determined by principal component factor analysis with Varimax rotation<sup>14</sup>. Factor analysis is a method of data reduction by which few combined variables named factors could replace many original variables. Four criteria were used in selecting the number of factors and number of items within a factor:
  - a. *Eigen value greater than 1*
  - b. *Item factor loading was at least 0.25*

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<sup>14</sup> Afifi A. A., Clark V., **Computer-aided multivariate analysis**, 3<sup>rd</sup> ed., New York, Van Nostrand Reinhold Company. 1996



- c. *All or most items have higher loadings on the first factor than on subsequent factors*
  - d. *Interpretability*
3. **Discriminant validity.** The mean value of the subjects below the 1<sup>st</sup> quartile for that scale was composed with the mean of those above the third quartile using the Wilcoxon Mann-Whitney Z test<sup>15</sup>. According to Bernard<sup>16</sup> a good scale is that which discriminate well between subjects that favour a concept (the top 25% i.e. 3<sup>rd</sup> quartile) and those that don't (the bottom 25% i.e. 1<sup>st</sup> quartile).

## 5.4 - STEP 2: MEASURING THE LEVELS OF IMPORTANCE

As previously mentioned measuring the attitudes of workers towards the designed attributes of the workplace is not enough. It has been explained that to efficiently invest in certain workplace design attributes, these have to be importantly impacting the workplace productivity. Correlation between satisfaction/performance with importance is very important in directing investments in the workplace design. (Fig. 5-2) This is the reason why levels of importance, or in other words the magnitude of the design items, have to be measured.

Later in the empirical study of this research work, it was concluded that not all the items would be measured for its magnitude. Observations and discussions that were made in more than five cases resulted in that six out of the thirty two items were considered always very important to everyone and would not require any measurements for its magnitude. As a result, the following 6 items were excluded from the importance measurement survey and were constantly given the highest values:

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<sup>15</sup> Lehmann E. **Nonparametric statistical methods based on ranks.** 1<sup>st</sup> ed. San Francisco, Holden-Day. 1975

<sup>16</sup> Bernard HR, **Research methods in anthropology. Qualitative and Quantitative approaches.** 2<sup>nd</sup> edition, Walnut Creek, London, New Delhi, Alta Mira Press, 1995

- 1- Sense of safety: *It is very important that the design offer a sense of safety to all the workers in all departments.*
- 2- Comfort usage of Furniture and Equipment: *It is anticipated that all the furniture and equipments be comfortable in their usage, no department would want to compromise this item.*
- 3- Efficient Furniture and Equipment: *Also this item relates to the productivity of departments, they wouldn't want to sacrifice it.*
- 4- Lighting: *A very important item to everyone.*
- 5- Ventilation: *Also a very important item to everyone.*
- 6- Toilets and restrooms: *Another very important item.*

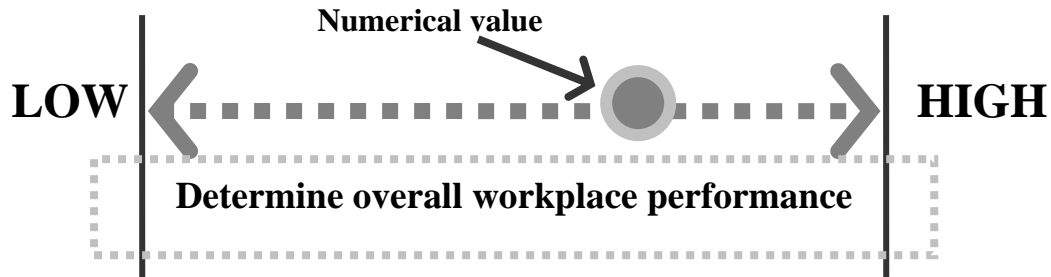
Levels of importance are qualitative values that need to be measured by using *focus groups*. Focus groups are a qualitative data gathering technique in which a small number of participants discuss selected topics as a group for approximately one or two hours, while the interviewer focuses the discussion on to relevant subjects in a non-directive manner.<sup>17</sup> The technique is based on the premise that individual's attitudes and beliefs do not form in isolation, and that people need to hear other opinions before forming their own.

In this case, at least three members of each department must be present. The reason that they have to be from the same department is that each department has its own working mode that would definitely differ from others, and the reason they can't be less than three is that they have to come up with a single answer, so a third voice will be necessary to cut clear a confused answer.

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<sup>17</sup> Tynan, A.C. and Drayton, J.L. "Conducting focus groups: a guide for first-time users", Working paper No. 86/20, Department of Business Studies, University of Edinburgh, Edinburgh.

## Presenting results diagrammatically



## Correlating Performance level with Importance level

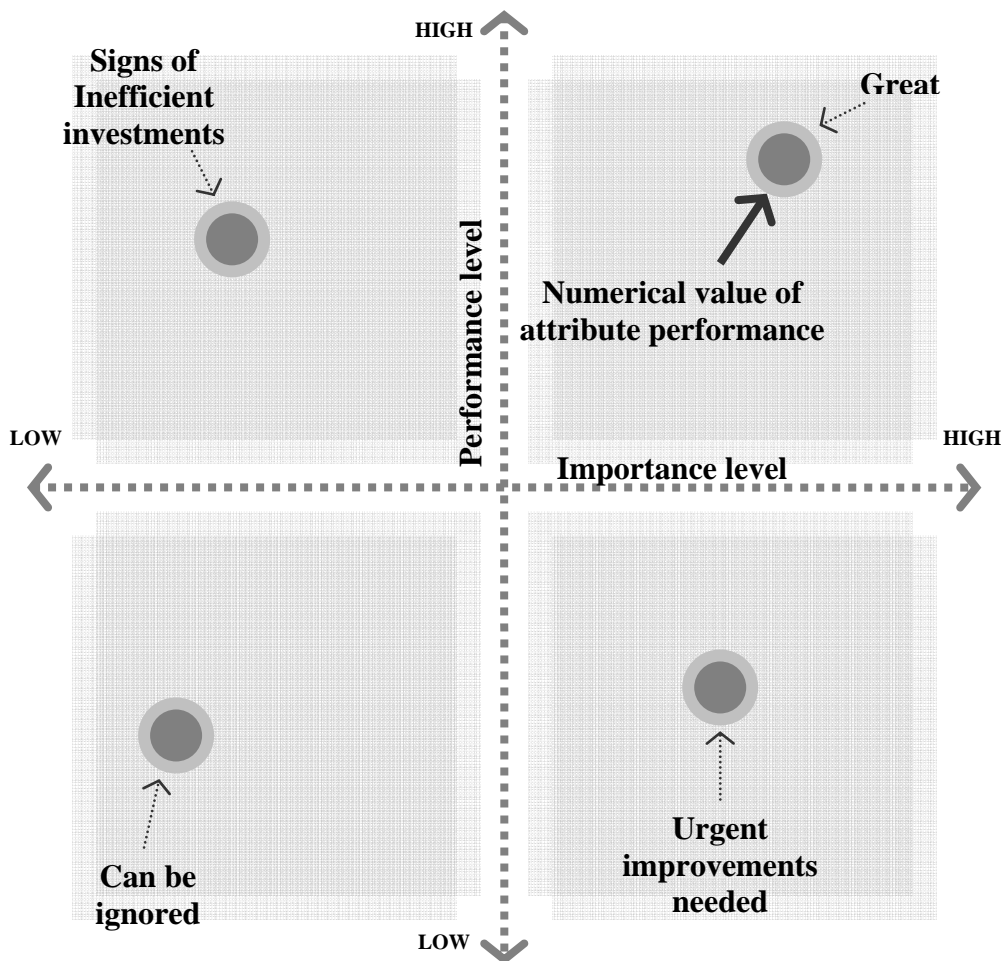


Fig.5-2: Results will be diagrammatically represented also a correlation between performance and importance is made

(Source: author)

On a five-point scale rating similar to that of the attitude survey, some of the design attributes will be rated relevant to its importance. Applying this rating will enable the correlation of results of the attitude survey with the level of importance of every specific attribute to the workplace productivity producing a quadrant analysis of the measurement scale.<sup>18</sup>

Meeting with a single representative of each dept. is considered a *personal interview* which is also another way of collecting qualitative data, but its problem is that it will only describe alone the representative's point of view. This method will be applied in cases where focus groups cannot be constructed. In this case a large number of respondents from the same business unit will be interviewed and each will be confronted with the replies of others. The final results will be left to the judgement of the interviewer after examining and comparing replies of all the interviewed respondents. This method will require more time and effort than focus groups.

## 5.5 - SUMMARY

The measurement frame work is simply divided into two steps:

- Step 1: *Attitude* measurement of the design items
- Step 2: Measuring the levels of *importance* of design items

The definition of attitude is: *representing a person's ideas, convictions, or liking with regard to a specific object or idea*. Accordingly, the degree of worker satisfaction towards the workplace design performance will be measured by using an attitude survey. The process of constructing an attitude survey is divided into six steps shown below:

- Specify the domain of construct
- Generate the sample of items – develop questionnaire
- Collect data
- Purify measures

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<sup>18</sup> To review a copy of the importance level questionnaire please check Appendix F.

- Assess reliability
- Assess validity

In order to efficiently invest in certain workplace design attributes, these have to impact workplace productivity. This is the reason why the levels of importance of the design attributes or design items have to be measured. Levels of importance are qualitative values that will be measured using *focus groups*.

Finally, data analysis will be presented literally and diagrammatically at the end of the application in a way that will enable architects or facilities managers to make use of the available data in re-designing any measured workplace.

## **Part Three:**

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# **MEASURING WORKPLACE DESIGN PERFORMANCE**

**Chapter Six:**

**EMPIRICAL STUDY**

## 6.1 - INTRODUCTION

This chapter aims to apply the proposed measurement tool on an existing case; a company named **Equant** that works in the field of *Virtual Private Networks*.

The application is presented in this chapter in three parts:

1. The measurement pre-requisites
2. Phase 1: the attitude survey
3. Phase 2: importance measurement

In the first part – the measurement pr-requisites – certain data is gathered that is helpful to the measurement process and to the re-design process.

The second part – the attitude survey – represents the core of the application itself, were the survey is distributed, data collected, analyzed, and statistically calculated for validity and reliability. According to these calculations, the tool will produce valid and reliable results that enable to move on to part three.

The third part – importance measurement – aims to measure the importance of the items that were measured previously in the attitude survey. Based on the fact that corporations don't have to invest in all the items to efficiently raise organizational performance, this phase is considerably important because it will help efficiently direct those investments.

In general, the chapter aims to present the results of the application and demonstrate its capability of measuring the workplace design performance. Whether these results produce meaningful data or not will be presented as a discussion in the next chapter.



## 6.2 - CASE SELECTION

In order to apply the measurement tool, a number of organizations were contacted – shown in the list below – but out of these organizations only **Equant** did show interest and complete cooperation. The list of organisations was:

- **Equant**
- **Mobinil**
- **Vodafone**
- **Alcatel**
- **CultNat**
- **Smart village head quarter office**

### *6.2.1 - Mobinil – Nile City towers*

Since its inception in May 1998, Mobinil has thrived to maintain its position as the leading mobile service operator in Egypt. Serving over seven million customers, Mobinil is committed to be the leading mobile service provider in Egypt, providing the best quality service for its customers, the best working environment for its employees, and top value for its shareholders, and contributing to the development of the community.

In an attempt to explore its organizational structure, the director of corporate governance, was contacted and was very helpful in providing information about the company's organizational structure. He noted that there were some departments with a mode of work characterized by being transactional knowledge work, the focus of interest, but he also mentioned that routine process work and other traditional work modes were extensively available. He also noted that the company's structure is hierarchical and not of a flat nature.

Due to the large scale of the company, with many departments and divisions, it was suggested that the measurement framework can be selectively applied to the Technology and Marketing departments that do promote transactional knowledge

work and collectively host more than 200 workers, which was the minimum sample size required.

Moreover, what made Mobinil a significant case is that those two departments have recently migrated, along with other departments, to their new offices at Nile City towers. The workers of these departments already have expressed frustration with the new workplace. Therefore, the application of a measurement framework that would help in directing this workplace was very much welcomed.

A contact was initiated with the facilities manager, and the attitude survey was prepared for launching, but unfortunately work halted for a while, due to unknown reasons. Later it was discovered that the application of this framework was refused and the request for doing so was rejected.

The problem was then investigated and turned out to be a two-fold problem. The Facilities manager felt sceptic about this measurement framework and the architect responsible for designing the workplace environment, refused to apply the measurement framework to his work. Finally, the Mobinil case was closed.

### ***6.2.2 - Vodafone Egypt – smart-village***

In February 1998, Vodafone Group, showed interest in acquiring their first GSM license in the Middle East and North Africa Region. Vodafone Group chose to invest its experience and resources in the Egyptian telecommunications market as it hosted the most prominent telecommunications environment in the region. Since its inception in May 1998, Vodafone Egypt has drawn on the global strength and innovative products of the Vodafone Group for the introduction of new services in the Egyptian mobile telecommunications market.

In an attempt to pick Vodafone as an alternative case, the product development manager at Vodafone Egypt was contacted. She offered to initiate contacts with the facilities department in Vodafone offices located at the smart village. She also, offered a preliminary investigation of the office.

From this investigation, it was concluded that most of the working mode was transactional knowledge work and that although there were many departments, the company's structure is somewhat flat and networked. This made Vodafone in the smart-village a very good case study.

Unfortunately, the facilities department was contacted but they did not respond positively. The request was neither rejected nor approved, instead they said that the request is being revised by top management – there was no response afterwards.

### ***6.2.3 - Alcatel Egypt – Smart-village***

In July 2002, Alcatel signed a 10-year rental contract with the Smart Village Company of Egypt. Alcatel Egypt leased 6,200 square meters (66,736 square feet) in a prime location of the Smart Village, a high-tech business park currently under construction on the outskirts of Cairo. Alcatel Egypt moved all its operations - including its International Service and Software Centre, its Training Centre and its Middle East Regional Headquarters - to its new premises in the Smart Village by the end of 2003. The Smart Village is a key part of the Egyptian government's effort to turn Egypt into a regional hub for communications and IT-related businesses. Thanks to its prime location at the crossroads of Asia, Africa and Europe, Egypt is already attracting numerous high-tech companies from all over the world to set up operations in the country.

The project planning specialist was contacted and helped in initiating the contacts with the facilities manager. A meeting was prepared with the facilities manager to describe for him how useful the measurement framework would help manage the workplace design. The facilities manager indirectly pointed that every one in the workplace is satisfied and that he needs no external bodies to spy on the company's business processes. But again he didn't refuse the request directly, therefore he was contacted numerous afterwards, but unfortunately, and as similar as Vodafone, he noted that the request was being revised by top management, and there was no response afterwards.

#### ***6.2.4 - Smart-Village head quarter office***

In an attempt to widen up the chances of finding a proper case to apply the measurement framework, the marketing department of the Smart village management was contacted. The deal was to offer the measurement framework as a free service to the companies that lease offices in the smart village by the management of the park itself. The management will benefit in strengthening after sales image, and the companies will benefit from the outcomes of the measurement.

Unfortunately, the person responsible of promoting this deal failed in promoting it to the top management of the smart village.

#### ***6.2.5 - CultNat – Smart-village***

CultNat is the Centre for Documentation of Cultural and Natural Heritage. The top management of CultNAt was contacted. He welcomed the idea of applying the measurement framework and the attitude survey was sent to the workers by e-mail.

There were two obstacles; the first is that although the mode of work was transactional knowledge work, the total number of workers was 120 only, less than the minimum required sample size. The other problem was that only 2 workers replied to the questionnaire, which shows that they were not interested at all in participating in this measurement framework. As a conclusion, CultNat case was not considered.

#### ***6.2.6 - Concluding remarks***

As previously shown it was always the facilities manager that was contacted to facilitate the measurement process, this turned out to be a faulty approach. In its nature, the facilities manger's job is to sustain high levels of performance of the facility. Although it was assumed at the beginning that they would welcome the idea of evaluating their facility in order to help them direct their work and developments, but it turned out that they wouldn't want any external analysis or evaluation to be implemented for they thought this would show that they aren't managing things

properly. Later, and as a first outcome, it was learned that the proper individual to contact was either the Public Relations Manager or the General Manager.

Therefore, not all of these organizations did welcome the idea that the design performance would be measured. Even in **Equant**, the request was first refused until a contact was initiated with the General Manager, who expressed a lot of interest in applying the measurement tool. Moreover, there were other reasons like the lack of desire to change, or preventing classified internal business processes.

### **6.3 - MEASUREMENT PRE-REQUISITES**

Work started at Equant by March 2006. Before applying the measurement tool on the existing case, a number of pre-requisite data was gathered and presented in the following paragraphs.

#### ***6.3.1 - Company profile (Message, Aim, Objectives)***

**Equant**, a subsidiary of **Orange**, and a member of the **France Telecom Group**, is the recognized leader in global, integrated and customized communication infrastructure solutions to enable the key business processes of its customers. It combines its network expertise - with its seamless network reach and local support of its 9,300 employees in 164 countries, manages more than 152,000 user connections across the world.<sup>1</sup>

As a global leader in communication infrastructure services for multinationals, they aim to play a crucial role in helping their customers run their businesses more efficiently and grow their revenues. The communication services that they provide encompass data & IP networks, voice, mobility and video and are a key strategic asset for most large corporations.

The company head quarters are now located in France and the UK, but with increasing advents in the field of Information & Communications Technology, the

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<sup>1</sup> Equant Website URL: [www.equant.com](http://www.equant.com)

company now have service branches geographically distributed around the world that tend to serve their clients remotely. This helps them lever their organizational efficiency by benefiting from reductions in real estate and worker costs.

One of these global service centres is the one located in Cairo city, the capital of Egypt that began its business operations by the year 2002.

### ***6.3.2 - Organizational structure & corporate culture***

The organizational structure of the company can be described as a flat networked structure, organized as teams; a typical new economy type of business. The company hosts around 1200 workers distributed over the following main departments:

- GCSC
- OTB – Order to Bill
- NAM central FOIS support
- RADI – Revenue Assurance Data Integrity
- CNM – Customer Network Management
- IT Services Operation
- VSM – Voice Service Management

Each department is designed like a network with sub-divisions that work interdependently and are authorized to make decisions. As an example, GCSC is divided into five divisions; each has its own manager and divided into teams that interact and work collaterally with each other. (Fig. 6-1)

Other small support departments are:

- Regional HR Middle East & Africa
- Training centre of Excellence
- Facilities Planning & Imp-EUM
- Corporate Services Corporate Telecom – EUMA
- Finance

- Sales and Marketing MENA (Middle East & North Africa)

The basic job levels describe the vertical hierarchy in this company which is considered somehow shallow and flat. Job levels in Equant are vertically organized as follows:

- General Manager
- Head of Department / Senior Manager
- Manager
- Supervisor
- Team leader
- Professional / Agent

It has a corporate culture that is characterized by being;<sup>2</sup>

- Open to Innovation, and promotes communication between workers.
- Workers are encouraged not to fear of making mistakes or taking risks.
- Teams are empowered to make decisions. Hence, Decision making is decentralized and polycentric.
- Workers have a certain level of autonomy in time but not always in place.

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<sup>2</sup> Author, based on a personal interview with Equant-Cairo general manager – Mr. Yasser RADWAN – in his office on the 2<sup>nd</sup> of March, 2006.

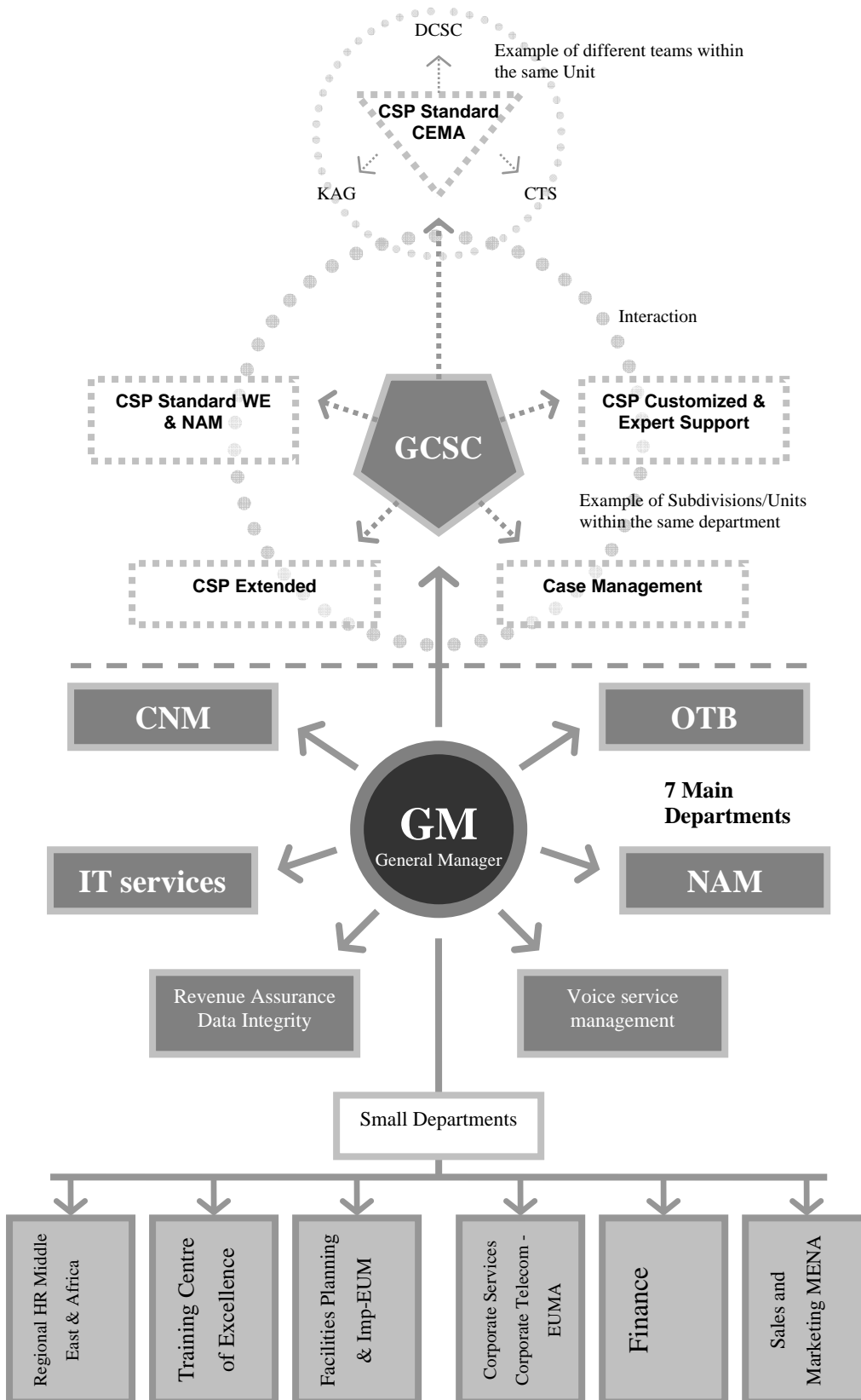


Fig. 6-1: the organizational structure of Equant-Cairo shows that it is a flat, star-shaped network.

(Source: Author)



### ***6.3.3 - Site inspection & description***

**Equant**-Cairo expanded rapidly in a very short time and is now leasing an office space area of 1375 squared meter distributed between two adjacent office building blocks and over 6 storeys, 3 in each block. **Equant** started by leasing 3 storeys in “*Star Capital - 2,*” (Fig. 6-2) an office building block of a large business and residential complex in Cairo named “*City Stars.*” (Fig. 6-3) Soon after that their workforce count expanded rapidly, demanding the lease of an extra 3 storeys of office space in the neighbouring “*Star Capital - 3.*” (Fig. 6-3)

Star capital 2 and 3 are very similar in design; a square shaped plan with a central core holding the vertical circulation elements and all the technical and service amenities in the middle and mostly a free opened plan all over the perimeter. The structure of the building is of a simple beam and column design. The ceiling height is around 3.00 meters, and the floor height clearance is around 2.50 meters.<sup>3</sup> The office is centrally air conditioned and fire protected with a fire alarm and protection system.

Since the very first visit to the workplace, it was unquestionably clear that conventional office planning was used in designing the offices. This was also very clear in the given furnished plans and images of the office. (Figs. 6-4, 6-5) Although the working modes are expected to differ between departments<sup>4</sup>, the same design was universally implicated.

The office design concept was found to be a combination of two very traditional design features, open area offices mostly on the perimeter, and closed private offices mostly near the core. (Fig. 6-6) They also tended to use some shared amenities in their design such as the meeting rooms, the refreshment points, and the document processing points. (Fig. 6-7) Also some of the workstations are shared knowing that some departments in the company work 24-7.

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<sup>3</sup> Data obtained from the Facilities planning department

<sup>4</sup> A preliminary casual interview made with a number of workers from different departments conducted at the first visit to the site.



Fig. 6-2: Left & top right: Photos showing Star Capital 2 office block in the City Stars complex. In the background shows Star Capital 3

Right Bottom: Entrance to the Star Capital 2

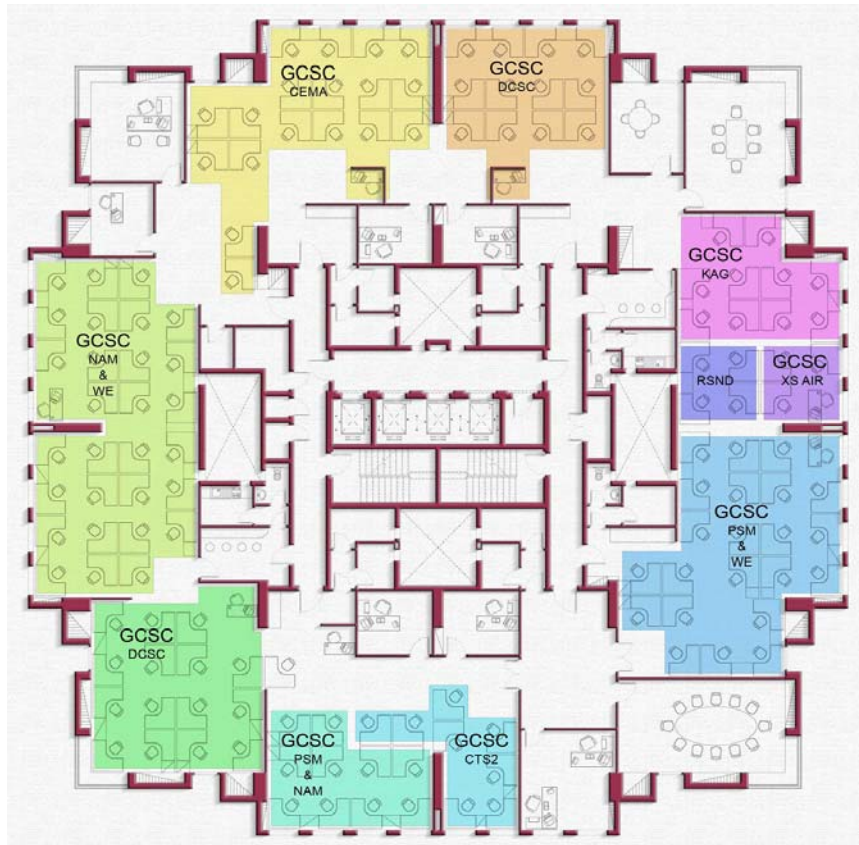
(Source: author)



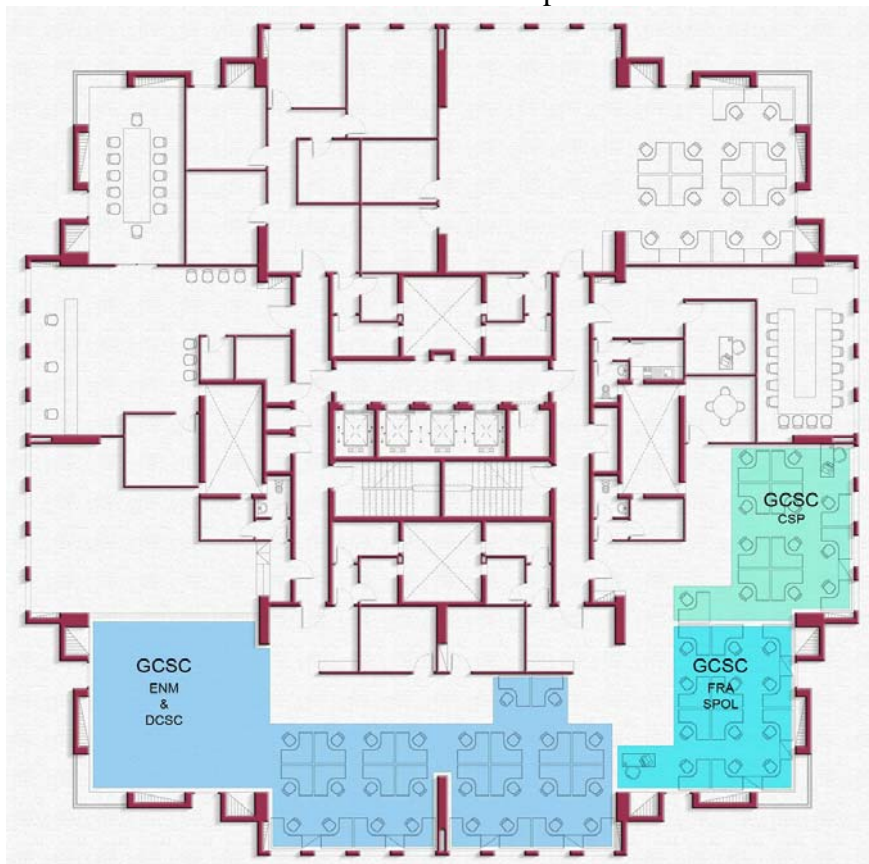
Fig. 6-3: Top left & bottom: Photos of the City Stars Complex

Right: A photo of Star Capital 3. In the background shows Star Capital 2

(Source: author)

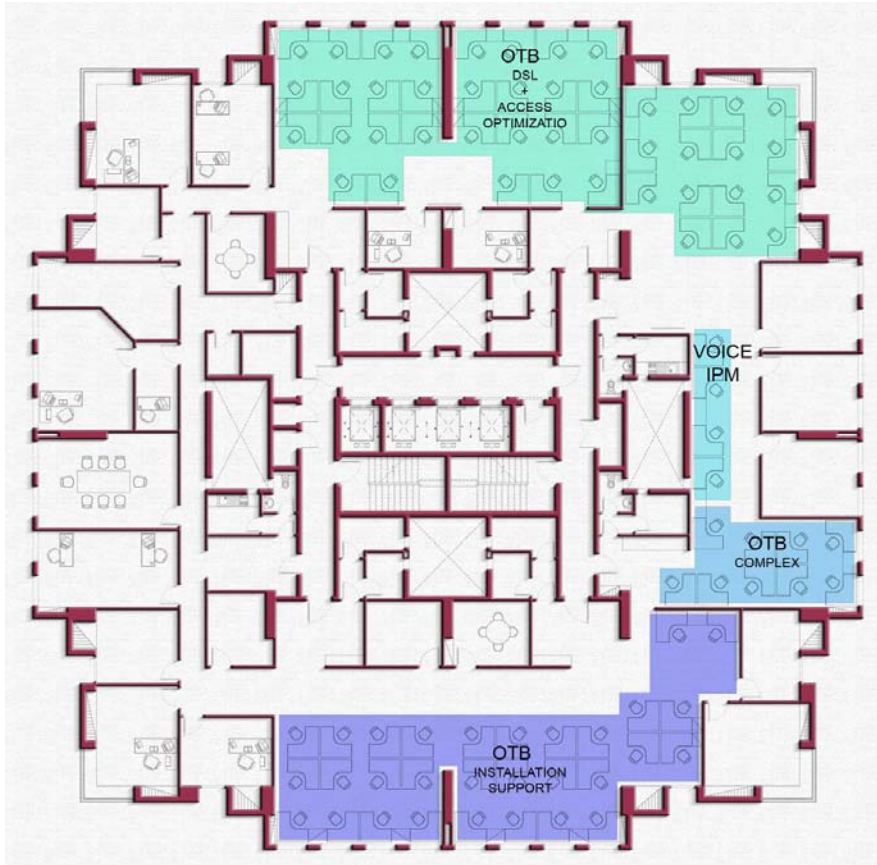


9<sup>th</sup> Floor at the Star Capital 2.

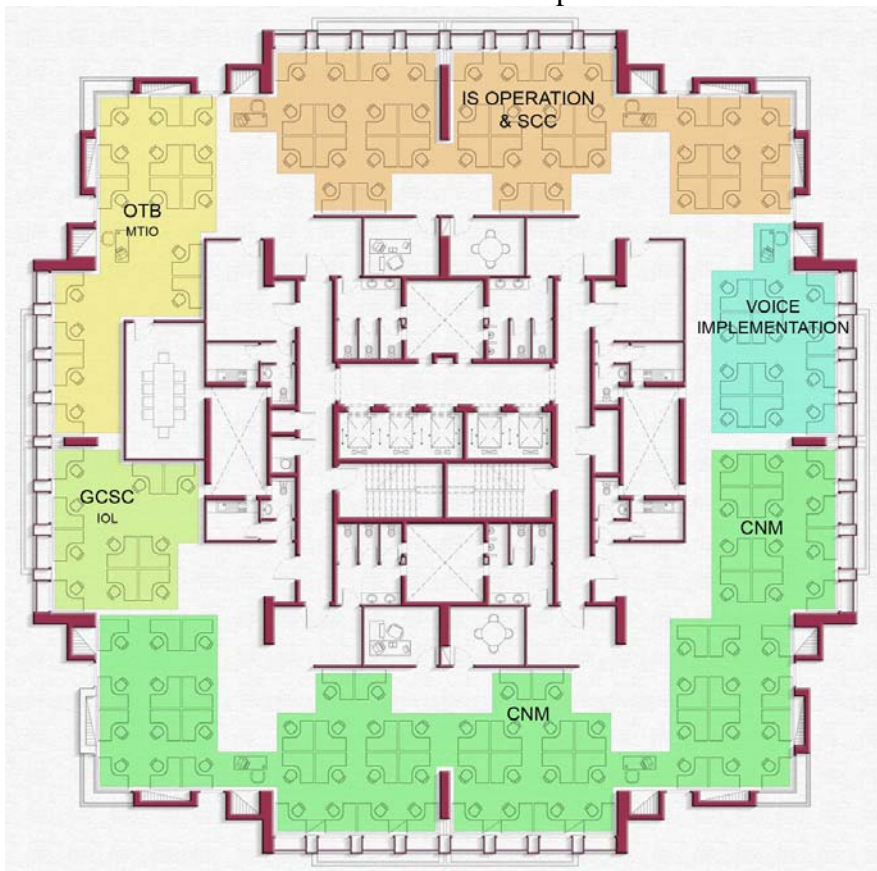


10<sup>th</sup> Floor at the Star Capital 2.

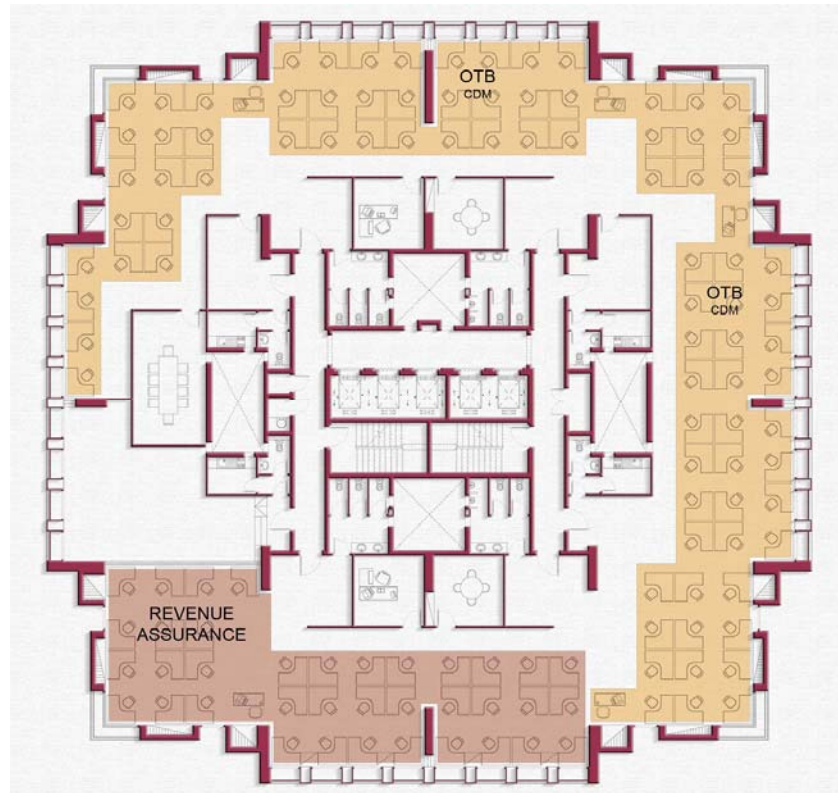




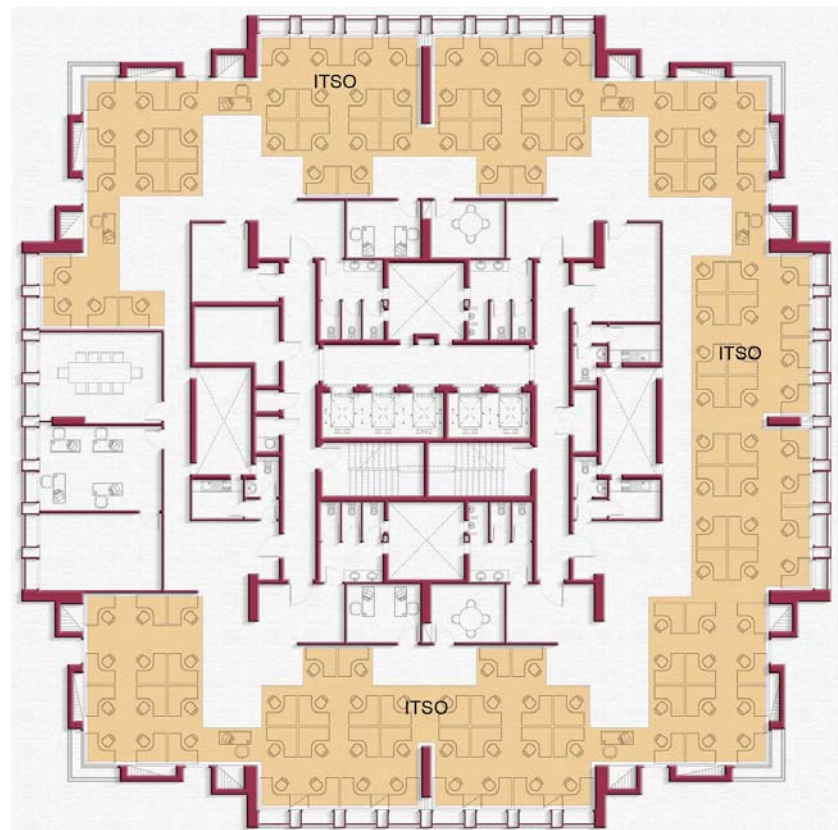
11<sup>th</sup> Floor at the Star Capital 2.



2<sup>nd</sup> Floor at the Star Capital 3.



3<sup>rd</sup> Floor of the Star Capital 3.



4<sup>th</sup> Floor of the Star Capital 3.

Fig. 6-4: plans from Star Capital 2 and 3. The plans show an inner centralized core that is surrounded with offices around the perimeter.

(Source: author)





Fig. 6-5: Top: Star Capital 3 – 2<sup>nd</sup> Floor, CNM Dept. Bottom: Star Capital 2 – 11<sup>th</sup> Floor, OTB Department. It is clear from the photos that conventional office planning was implicated in designing the offices.

(Source: author)

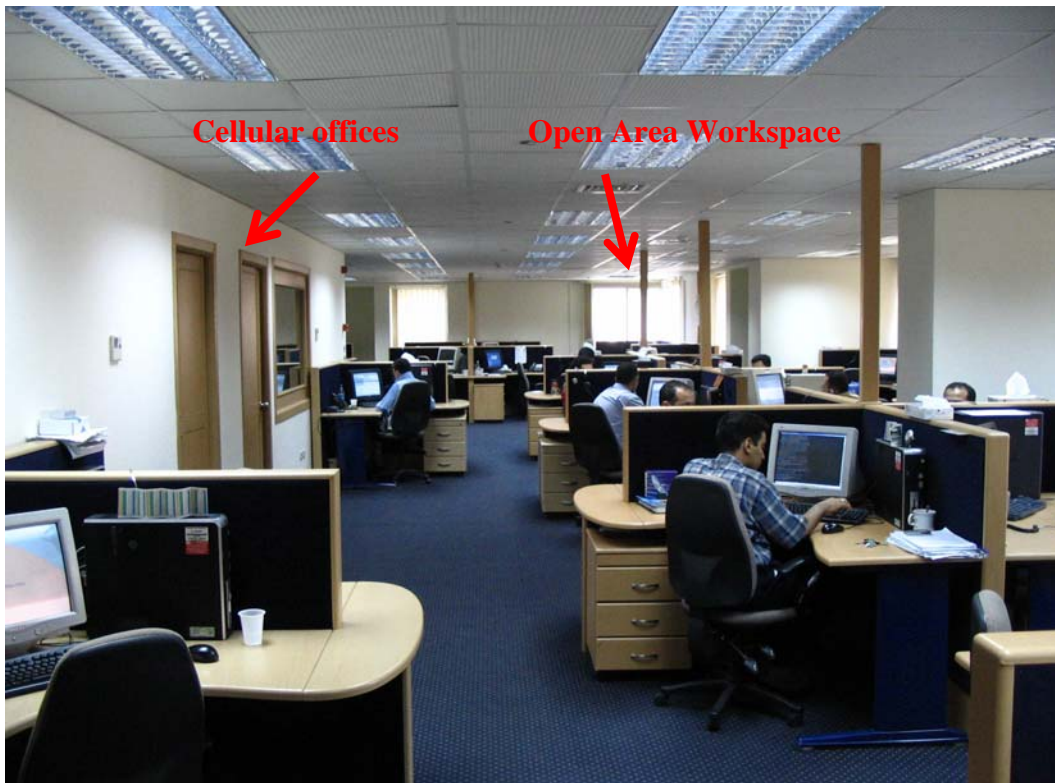


Fig. 6-6: The office design concept was found to be a combination of two very traditional design features, open area offices mostly on the perimeter, and closed private offices mostly near the core. Photos taken in Star Capital 2, 11<sup>th</sup> floor, at the OTB dept.

(Source: author)



Document processing points



Huddle rooms (Meeting rooms)



Refreshment points

Fig. 6-7: The office design tended to use some shared amenities such as the meeting rooms, the refreshment points, and the document processing points.

(Source: author)



Initially, a number of issues were detected at the first site investigation, these were;

- High levels of distraction and noise between workstations
- Lack of artworks and the visual appearance was not appealing
- The design does not support the corporate image
- Lack in area and configuration of refreshment points
- There were no retreats and no smoking rooms, instead, workers had to leave the building to smoke
- No prayer rooms except in the 9<sup>th</sup> floor of Star Capital 2
- Informal meeting points were created by workers and not integrated by design
- Some complained about the insufficiency of formal meeting points
- Some of the air vents were malfunctioning
- Way finding is nearly impossible; you always get lost inside the place
- No territoriality between units or departments
- Direct vertical circulation elements between floors were the elevators (time consuming), and the emergency exit staircase.
- Signage in the office space was printed papers stuck on doors and walls.

Relying on these initial observations in drawing a conclusion of the given design performance is neither really sufficient nor reliable. It only serves the surveyor in building an insight and a justification of some of the measurement outcomes.

#### ***6.3.4 - Building trust***

The participation of workers in the process is essential as the whole measurement process will depend on the outcome that they themselves will provide. Making them devotionally participate in this process is important and was anticipated that this can be achieved by creating a sense of trust. Methods that were used to achieve this sense are identified in the following points:

1. Interviewing workers asking about their opinion of the existing workplace design & their opinion on the statements of favourness of the attitude survey.
2. An e-mail message was sent to the workers addressing the survey invitation to publicize that the aim of the organization in investing in the physically designed environment is worker satisfaction.
3. Showing up a number of times in front of the workers, observing and catching images, and sketches to give them a sense of credibility that a change is happening and encouraging them to be part of this change.
4. Socializing with some of the workers and trying to explain in a friendly way their role in the attitude survey, and how their participation will be effective in developing the existing workplace design.

### ***6.3.5 - Work forms & working modes***

It is important to develop a solid image of the working modes and forms of the given workplace. It helps in many ways in relating the physically designed environment with the true needs of the workers and the corporation served. Extracting this type of data was accomplished by forming a *focus group*. This focus group included four members of different job levels and each group represented one of three different departments of the company. These were *CNM*, *OTB*, and *GCSC*. Four representatives from each department and of different job levels (Manager, Supervisor, and agent) formed the focus group.

In order to extract data from them, each group was asked to identify the *volume of work* done in their department or unit within the previously identified four types of office work activities. (Fig. 6-8) They were also asked to identify the ratio of their *working modes* in their department. (Fig. 6-9) Finally, they were asked to identify the relationship between the types of office activities they perform, their working modes, and the spaces that they think could help them establish these modes in a *Profile Map*. (Fig. 6-10)

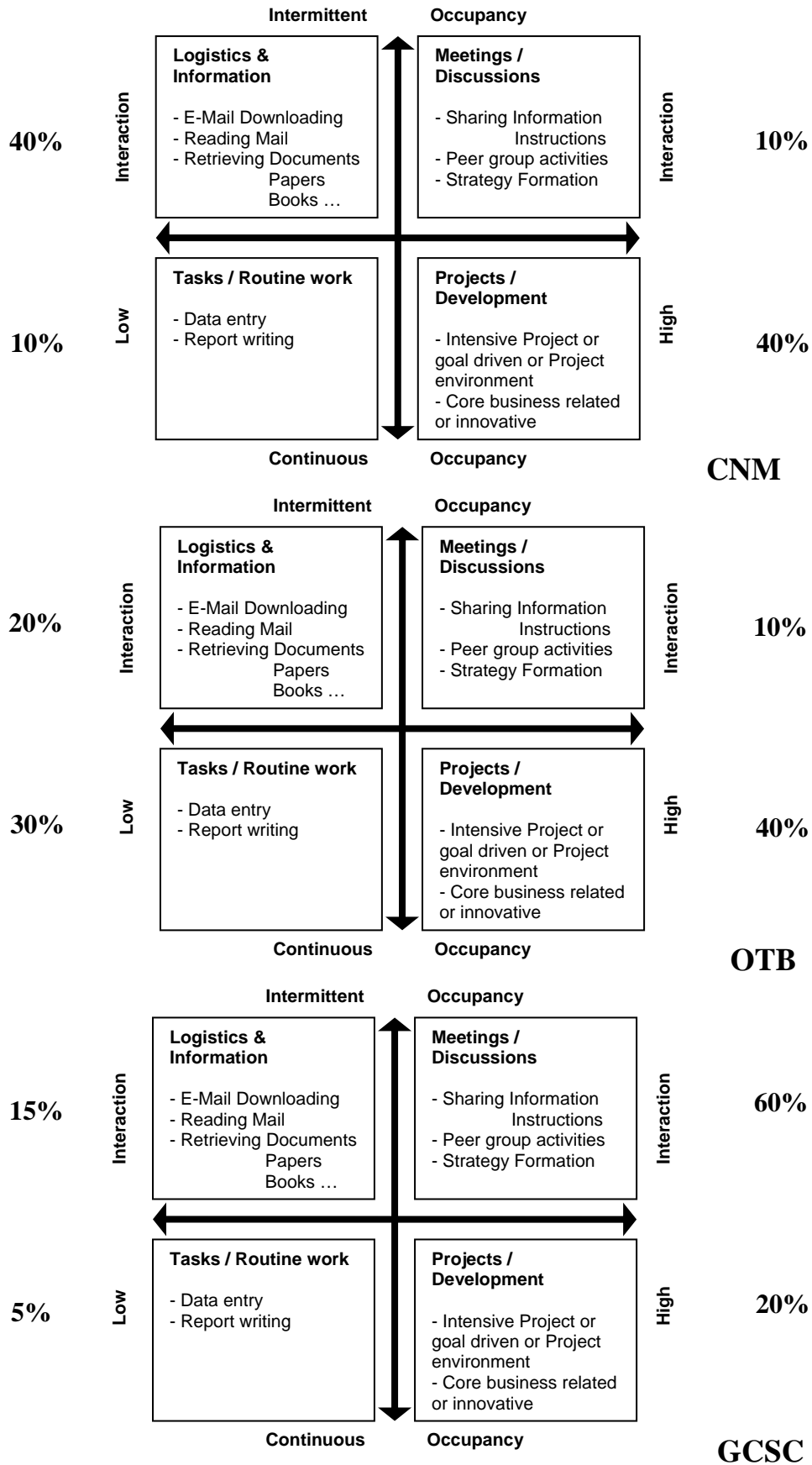


Fig. 6-8: The volume of office work activities for CNM, OTB, and GCSC respectively (Source: author based on a focus group with workers of the three different departments)

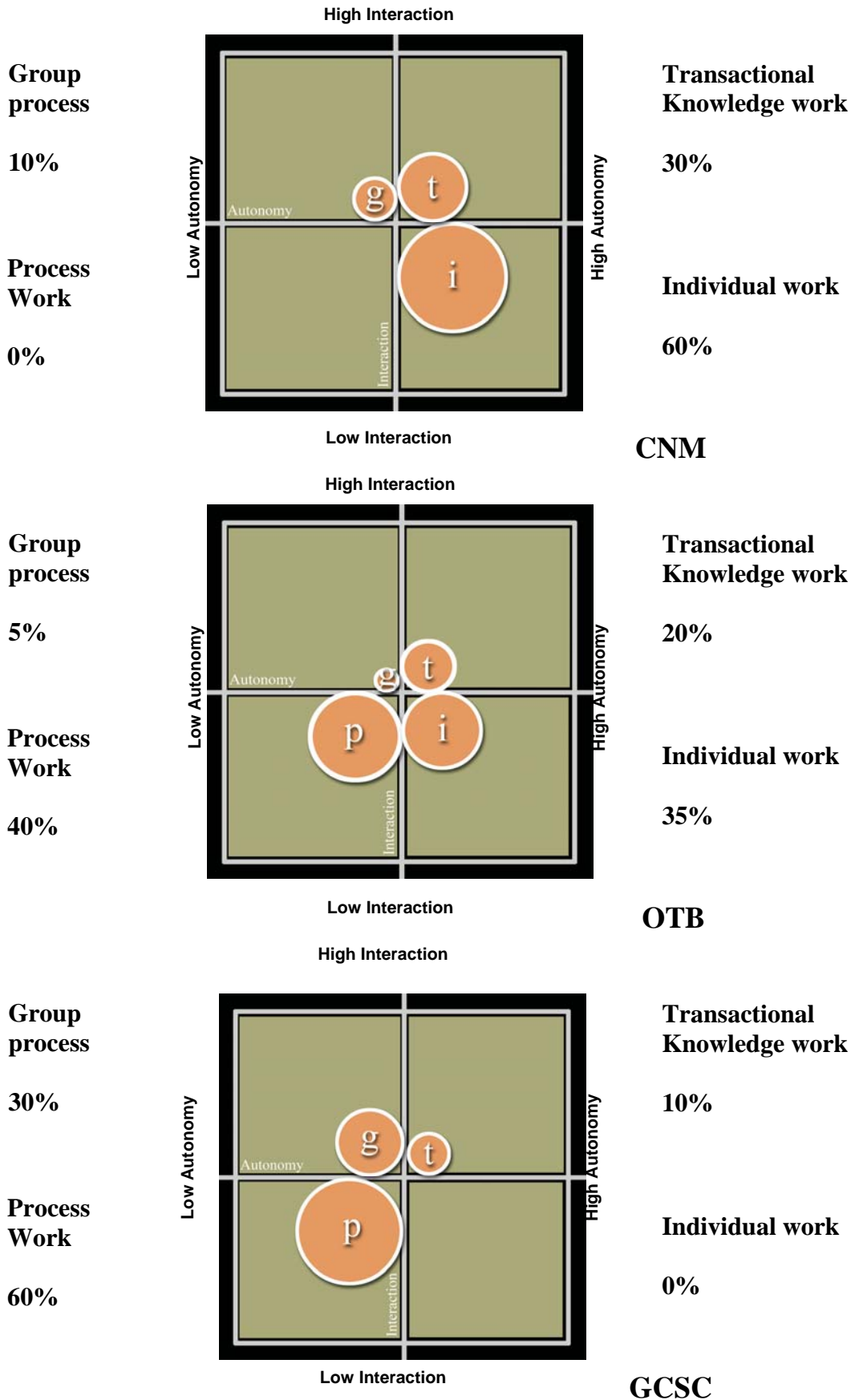
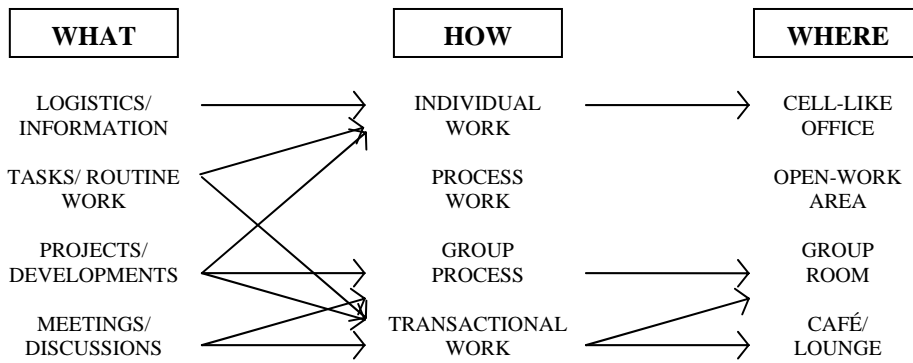
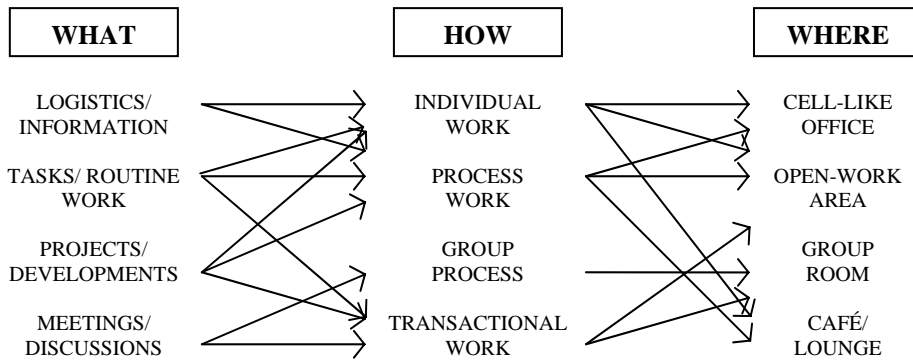


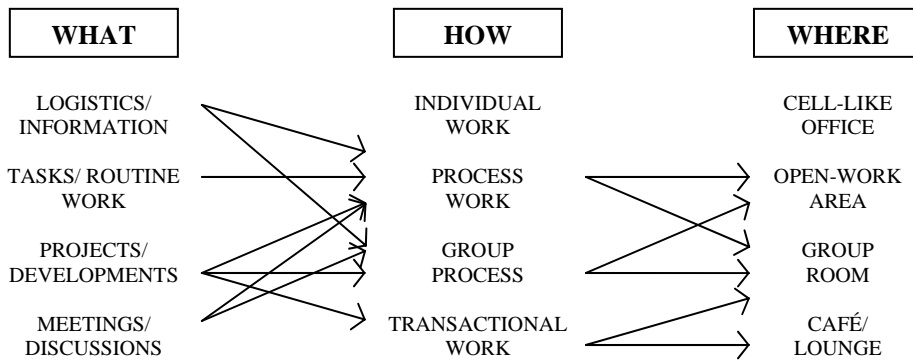
Fig. 6-9: The volume of office working modes for CNM, OTB, and GCSC respectively (Source: author based on a focus group with workers of the three different departments)



**CNM**



**OTB**



**GCSC**

Fig. 6-10: The relationship between the Types & Modes of work with Office design Models for CNM, OTB, and GCSC respectively

(Source: author based on a focus group with workers of the three different departments)

Looking at CNM department for example, they stated that they mostly do their work *Individually* (60%), this individual work is distributed between three office activities which are *Logistics & Information* (40%), *Projects/Developments* (40%), and *Tasks & Routine work* (10%). Logistics and information was purely made individually, but the Projects/Developments and Tasks & Routine Work were distributed among other working modes and are also made individually. This shows that individual work is the dominant working mode in this department; therefore they preferred to choose the *Cell-like offices* as a model to work within.

The second office working mode was *Transactional Knowledge Work* (30%) which was also distributed among three office work activities; *Tasks & Routine work* (10%), *Projects/Developments* (40%), and *Meetings/ Discussions* (10%). With the advents of IT in connecting people, they preferred that Transactional work could first be achieved virtually in the Cell-like offices, without having to physically interact, and then for the Informal meetings they preferred the *Café/Lounge*, and/or the *Group room*.

The profile map showed that working collectively in groups (10%) was a bit rare. This mode was for performing Projects/Developments or for Meetings /Discussions. They Preferred the Group room as a model for hosting this working mode.

This means that as a conclusion the profile map helped in identifying the department needs, which will mainly be designed in Cell-like offices for most of the Individual work, and as for the Transactional work it could be through computers and phones, Then the Café/Lounge which will facilitate the rest of the Transactional work and Informal meetings. The Group room will host the group work and formal meetings.

The profile map also helps in validating the results of the importance measurements.

## 6.4 - STEP 1: THE ATTITUDE SURVEY

The survey was globally delivered to all the workers of Equant-Cairo, whom numbered around 1200 worker.<sup>5</sup> The method of administration used was the '*e-mail survey questionnaire.*'<sup>6</sup> Using this administration method held the following benefits;

- Widest range of distribution
- Assurance of delivery – guaranteed delivery to all the workers
- Respondents work at their own space
- They also are free to take the survey at any time of the day
- This method ensures anonymity, this serves personal and sensitive questions
- This is considered the cheapest method of administration
- Considerably short response times

The drawbacks of this method were summarized in the following;

- The speed of completing the survey could not be controlled
- Low response rates
- Some respondents did submit the survey incomplete
- Due to the lack of supervision some responds were biased

Before the initiation of the survey, a sample was tested by a number of 20 workers. Diversity in age, gender, job level, and autonomy was taken into consideration. As an outcome, there have been minor changes that occurred to the survey such as:

- Rephrasing some statements of favourness, and
- Changing the physical layout of the questionnaire

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<sup>5</sup> A copy of the e-mail questionnaire can be found in Appendix C.

<sup>6</sup> The survey questionnaire was administered and constructed by a web based service named 'Zoomerang.' URL: [www.zoomerang.com](http://www.zoomerang.com)

The survey was then ready and launched on the 12<sup>th</sup> of March, 2006<sup>7</sup> but it didn't actually start to receive replies until after that by three weeks. The reason for that was because it had to be revised by the top management before it was sent by e-mail to all the workers. In three weeks time, the survey website received around 600 visits and around 300 replies making the response rate 25% which was better than expected.

### ***6.4.1 - Results***

The demographical analysis showed that more than 80% of the respondents were considerably young; less than 30 years of age. 75% were males, and more than 65% were working as agents. The highest response counts came from 2 departments; OTB- Order to Bill (83 counts), and GCSC (87 counts). (Fig. 6-11, 6-12)

The only item that did have remarkable missing data was the '*Prayer room*' due to the nature of the item which doesn't apply to every one in the population and it was found reasonable to exclude it from the scale before applying the construct validity, reducing the total number of items from 32 to 31. Biased and repeated replies were also excluded reducing individual replies from 322 to 312.

#### ***6.4.1.1 - Construct validity of the scale***

Bartlett test of sphericity, a statistical test for the presence of correlation between variables was significant and Kaiser-Meyer Oklin measure of sampling adequacy was 0.9, well above the acceptable level of 0.50. These measures all indicated that factor analysis was appropriate.

Factor analysis of the 31 variables [Table 6-1] revealed that the variables were loaded across 8 factors – also called dimensions – representing 58.8% of the total variance. All 31 variables had a factor loading of 0.25 or more. Those factors were represented as follows:

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<sup>7</sup> Please visit the survey website at the following link: <http://www.zoomerang.com/recipient/survey-intro.zgi?p=WEB2254MVJXQ6W>



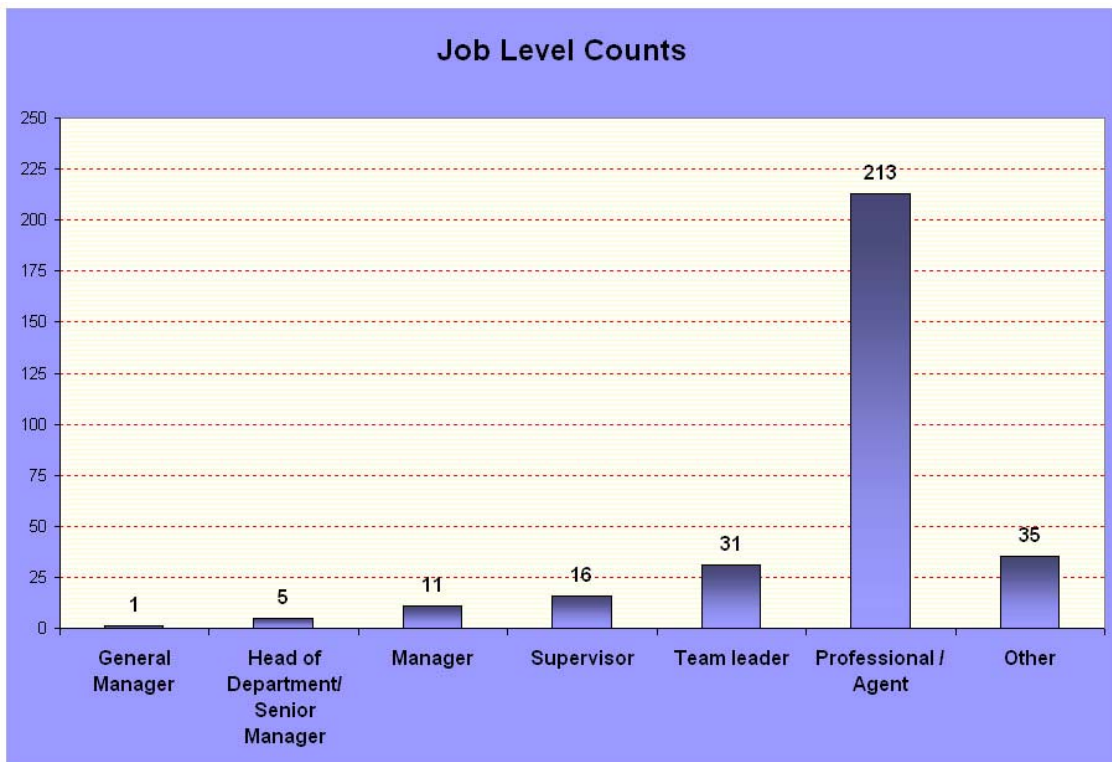
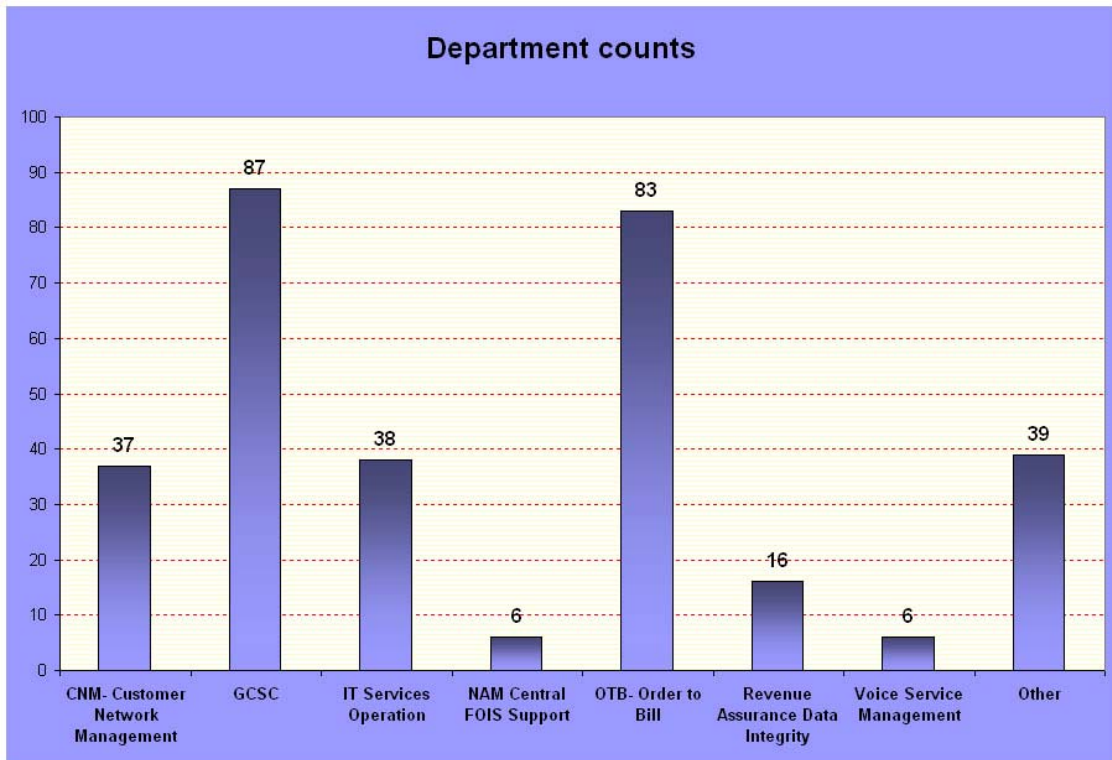


Fig. 6-11: Top: Population count for Different departments that delivered replies

Bottom: Population count for different job levels

(Source: author based on the survey replies)

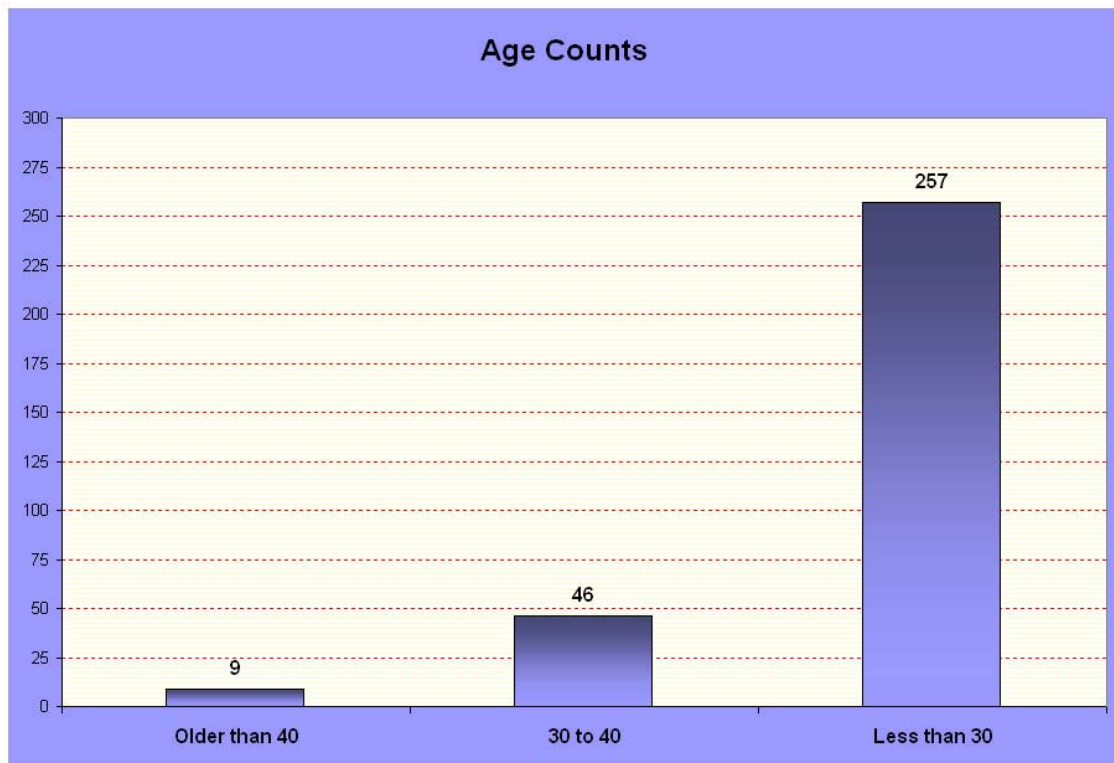
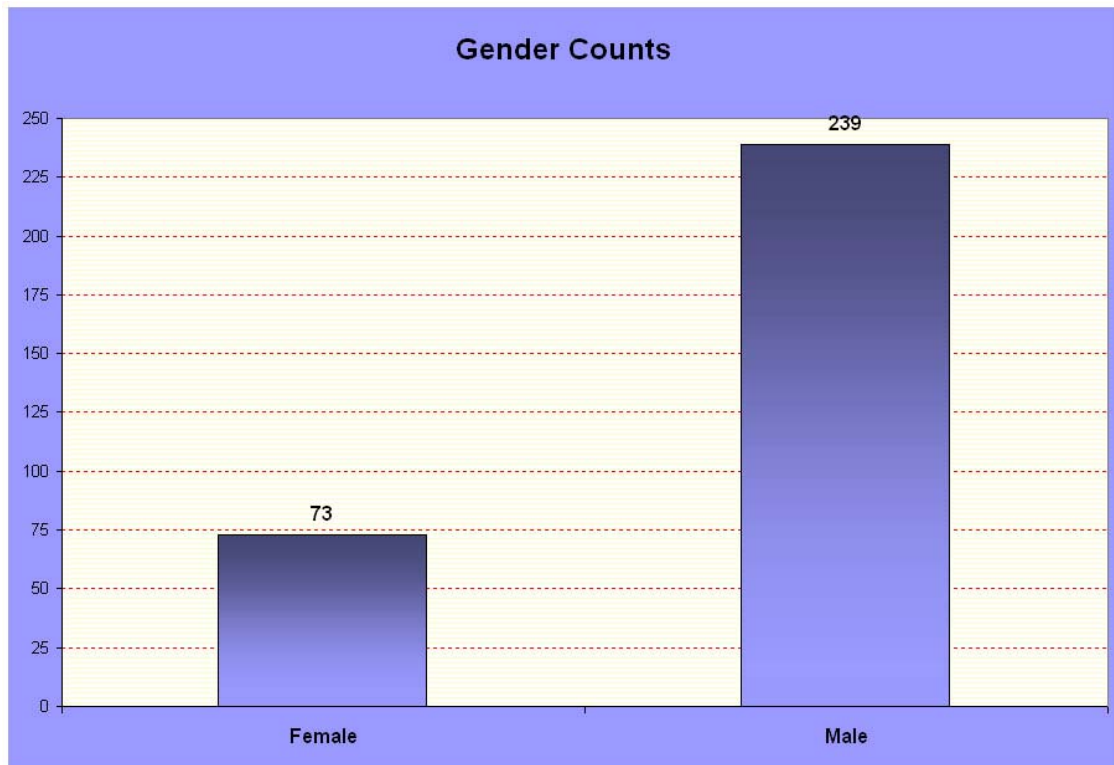


Fig. 6-12: Top: Population count for Different genders

Bottom: Population count for different age levels

(Source: author based on the survey replies)

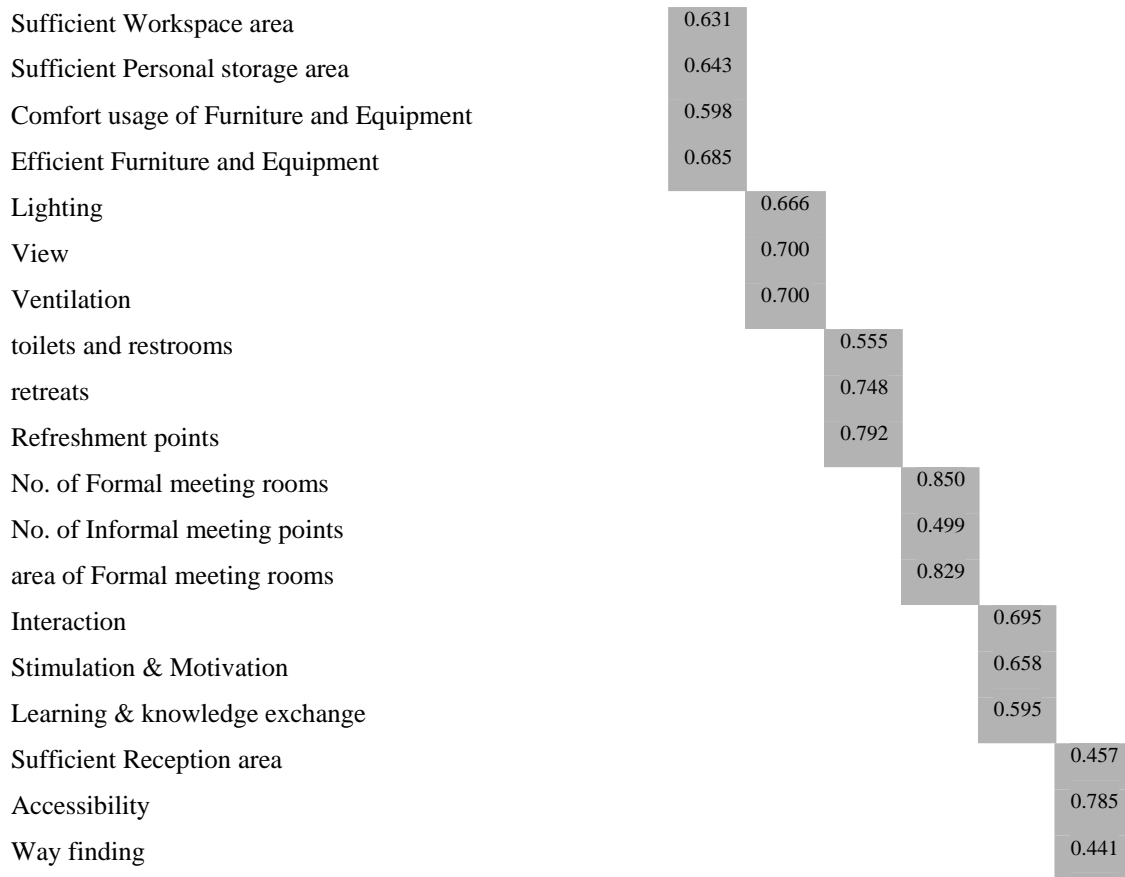
1. Factor 1 was concerned with **Personal Psychological Factors** explained 10.1% of variability and was loaded by 6 items:
  - a. *Concentration*
  - b. *Personal privacy*
  - c. *Work confidentiality*
  - d. *Territoriality*
  - e. *Status & image*
  - f. *Sense of safety*
2. Factor 2 was concerned with the **Appearance** explained 8.8% of variability and was loaded by 5 items:
  - a. *Corporate image*
  - b. *Unit/Team/Dept. workspace visual appeal*
  - c. *Other spaces visual appeal*
  - d. *Circulation Elements visual appeal*
  - e. *Artworks*
3. Factor 3 was concerned with **Work Functionality & Efficiency** explained 8.2% of variability and was loaded by 5 items:
  - a. *Sufficient No. of Document Processing points*
  - b. *Sufficient workspace area*
  - c. *Sufficient personal storage area*
4. Factor 4 was concerned with the **Environment** explained 7.1% of variability and was loaded by 3 items:
  - a. *Lighting*
  - b. *View*
  - c. *Ventilation*
5. Factor 5 was concerned with **Physical Comfort & Hygiene** explained 7.0% of variability and was loaded by 3 items:
  - a. *Toilets & restrooms*
  - b. *Retreats*
  - c. *Refreshment points*
6. Factor 6 was concerned with **Group Work Activities** explained 6.6% of variability and was loaded by 3 items:
  - a. *No. of formal meeting rooms*

- b. *No. of informal meeting points*
  - c. *Area of formal meeting rooms*
7. Factor 7 was concerned with **Knowledge Interaction & Transaction** explained 6.5% of variability and was loaded by 3 items:
- a. *Interaction*
  - b. *Stimulation & motivation*
  - c. *Learning*
8. Factor 8 was concerned with **Circulation & Movement** explained 4.6% of variability and was loaded by 3 items:
- a. *Sufficient reception area*
  - b. *Accessibility*
  - c. *Way finding*

**Table 6-1: Generated items of the construct validity test**

(Source: based on calculations of factor analysis)

Design Variable/Item	Factors/Dimensions							
	1- Personal Psychological factors	2- Appearance	3- Work Functionality & Efficiency	4- Environment	5- Physical Comfort & hygiene	6- Group Work activities	7- Knowledge Interaction & Transaction	8- Circulation & Movement
Concentration	0.701							
Personal privacy	0.809							
Work confidentiality	0.814							
Territoriality	0.560							
Sense of safety	0.299							
Status & image	0.491							
Corporate image		0.626						
Unit/Team/Dept Workspace Visual appeal		0.734						
Other Spaces Visual Appeal		0.552						
Circulation elements Visual appeal		0.606						
Artworks		0.625						
Sufficient No. of document processing points			0.528					



**6.4.1.2 - Discriminant validity of the scale**

From [Table 6-2] it is evident that the scale could discriminate significantly between those who attained a total or subscale score below the 1<sup>st</sup> quartile and those with values above the 3<sup>rd</sup> quartile, where (W-Z) for total score = 10.577 and = 10.025, 9.316, 10.116, 9.289, 9.317, 8.802, 10.734, 9.537 for the 8 factors respectively and (P<0.05).

**Table 6-2: Results of Wilcoxon Mann-Whitney for comparison between total scale and subscale score below 1<sup>st</sup> and 3<sup>rd</sup> quartile**

(source: author)

Scale	W-Z	P
Personal Psychological Factors	10.025	0.00
Appearance	9.316	0.00
Work Functionality & Efficiency	10.116	0.00
Environment	9.289	0.00
Physical Comfort & Hygiene	9.317	0.00
Group Work Activities	8.802	0.00
Knowledge Interaction & Transaction	10.734	0.00
Circulation & Movement	9.537	0.00
<b>Grand Total</b>	<b>10.577</b>	<b>0.00</b>

[Table 6-3] present the total scale and subscale score according to the different studied factors where the rate of significance is 95% ( $P = <0.05$ ). For different age groups Kruskal Wallis test yielded the differences in scores as regards for (Work functionality and efficiency -  $P = 0.017$ ) and (Knowledge Interaction and Transaction -  $P = 0.019$ ) are significant. As for different Gender the test also yielded that the differences in scores as regards for (Personal Psychological Factors –  $P = 0.035$ ) is significant. For different job levels it yielded that the differences in scores as regards for (Grand Total –  $P = 0.036$ ), (Personal Psychological factors –  $P = 0.011$ ), and (Work Functionality & Efficiency –  $P = 0.001$ ) are significant. Finally and as for different departments the test revealed that the differences in scores as regards for the subscales and total scale are all significant ( $P = 0.003, 0.001, 0.000, 0.006, 0.000, 0.004, 0.008$  respectively).

**Table 6-3: Comparison of total scale and subscale reading to the different studied factors**

(source: author)

	Department		Job Level		Gender		Age	
	Chi-Square	P	Chi-Square	P	Chi-Square	P	Chi-Square	P
<b>Personal Psychological Factors</b>	21.987	0.003	16.528	0.011	4.422	0.035	1.426	0.490
<b>Appearance</b>	23.584	0.001	8.777	0.187	0.593	0.441	2.057	0.358
<b>Work Functionality &amp; Efficiency</b>	36.610	0.000	22.314	0.001	0.862	0.353	8.199	0.017
<b>Environment</b>	19.999	0.006	7.492	0.278	0.138	0.710	0.847	0.655
<b>Physical Comfort &amp; Hygiene</b>	54.465	0.000	7.251	0.298	0.339	0.560	1.487	0.476
<b>Group Work Activities</b>	20.783	0.004	5.394	0.494	1.248	0.260	2.989	0.224
<b>Knowledge Interaction &amp; Transaction</b>	19.063	0.008	6.232	0.398	0.567	0.451	9.218	0.010
<b>Circulation &amp; Movement</b>	13.162	0.068	0.868	0.990	1.261	0.261	2.466	0.291
<b>Grand Total</b>	<b>34.280</b>	<b>0.000</b>	<b>13.506</b>	<b>0.036</b>	<b>1.636</b>	<b>0.201</b>	<b>2.327</b>	<b>0.312</b>

#### 6.4.1.3 - Reliability

A total scale Cronbach's alpha of 0.89 indicated that the scale had very good reliability. Reliability of the individual factors was satisfactory (Cronbach's alpha = 0.79, 0.76, 0.72, 0.63, 0.65, 0.68, 0.68, 0.43 respectively)

## **6.5 - STEP 2: IMPORTANCE MEASUREMENT**

As explained in the previous chapter, this sort of measurement needed to be applied by conducting a focus group. Managing to organize a focus group at Equant was not an easy job. There were a number of obstacles that faced the process. It was very hard to find workers from different departments who would voluntarily participate in such a meeting. Knowing that the focus group could consume more than one hour, it was considered as a sacrifice as most of their work was task oriented. Adding to this was the date and time of the focus group, for it was very hard to determine a date suitable for every one. It took five weeks in order to successfully hold this focus group.

Of course, due to the previously explained obstacles, it was impossible to do a focus group that includes all the departments. As a result, three departments did participate – CNM, OTB, and GCSC – two of which were of the highest population in the company. From each department four participants resembling different job levels (Agents, Team leaders, and Supervisors) constituted the total number of attendants which was twelve. This number of departments and participants was satisfactorily reasonable to test this step of the measurement process.

Since this step was performed to test the validity and reliability of this measurement tool in measuring importance, it was not necessary to perform further focus groups with the rest of the departments. The values obtained from this tool are of no interest, but the production of valid and reliable values was the aim here.

The focus group took around one and a half hour, where the participants were asked to fill in the importance survey.<sup>8</sup> For each department, the participants were asked to answer collectively. The benefit out of this was that the participants did not answer any question until they discussed the reply and was approved by everyone.

The importance measurement was very successful in obtaining replies. It is assumed that in focus groups workers would produce valid and reliable replies, but

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<sup>8</sup> A copy of the importance level survey can be found in Appendix F.

also the validity and reliability of these replies could be determined by observations and/or participation of the investigator.

## 6.6 - SUMMARY

A list of corporations working in different fields and of different scales were contacted to apply the measurement tool of this research. A very important conclusion was formed out of this contact was that if the request to measure the workplace design performance was presented to the facilities manager it most probably will get refused. The cause was investigated and it turned out that the facilities manager considers this process as a threat to his job; were he would perceive it as an audit from an external body. Finally, only a single company – **Equant** – showed interest in the measurement process, and agreed to apply the measurement tool.

**Equant** is a multinational company – a subsidiary of France Telecom and Orange – working in the field of Networks. Their satellite office in Cairo is located in the City Stars complex exactly at Star Capital 1 and 2. They started operating over there since the year 2002 occupying a total gross area of about 8900 squared meters of office space.

Information about the company's message and aim, corporate culture and structure, the facility itself, and the work forms were gathered first. This was followed by building trust to get the workers to participate in the survey.

The application of the tool started in March 2006 by delivering the attitude survey to all the 1200 workers that form the entire company's population. The method of administration was the e-mail questionnaire. A month was allowed before performing any statistical calculations of any kind. The total amount of replies received after the purification process was around 300 which make the response rate 25%.

Statistical calculations proved that the scale and subscale had very good reliability. The validity tests that were performed for the attitude survey were:



1. **Construct validity** - revealed that the scale items were loaded across 8 factors represented as follows:

a. Factor 1 - **Personal Psychological Factors** - loaded by 6 items:

- i. Concentration*
- ii. Personal privacy*
- iii. Work confidentiality*
- iv. Territoriality*
- v. Status & image*
- vi. Sense of safety*

b. Factor 2 - **Appearance** - loaded by 5 items:

- i. Corporate image*
- ii. Unit/Team/Dept. workspace visual appeal*
- iii. Other spaces visual appeal*
- iv. Circulation Elements visual appeal*
- v. Artworks*

c. Factor 3 - **Work Functionality & Efficiency** - loaded by 5 items:

- i. Sufficient No. of Document Processing points*
- ii. Sufficient workspace area*
- iii. Sufficient personal storage area*

d. Factor 4 - **Environment** - loaded by 3 items:

- i. Lighting*
- ii. View*
- iii. Ventilation*

e. Factor 5 - **Physical Comfort & Hygiene** - loaded by 3 items:

- i. Toilets & restrooms*
- ii. Retreats*
- iii. Refreshment points*

f. Factor 6 - **Group Work Activities** - loaded by 3 items:

- i. No. of formal meeting rooms*
- ii. No. of informal meeting points*
- iii. Area of formal meeting rooms*

g. Factor 7 - **Knowledge Interaction & Transaction** -loaded by 3 items:



**Chapter Seven:**

**DISCUSSIONS & DESIGN GUIDELINES**

## 7.1 - INTRODUCTION

After applying the measurement tool on **Equant** and producing valid and reliable results from the attitude survey, or from the level of importance measurement, these results were discussed here in this chapter. This discussion is based not only on the results produced earlier, but also on the observations made by the author based on the fact that user perception should not always be taken for granted.

This discussion will produce design recommendations that will facilitate for the architect or the decision maker to progressively direct investments in the design of the workplace environment.

The discussion is supported by correlation plot graphs. Correlation is made for each item of the scale comparing the level of importance of that very item to its level of performance or, in other words, user satisfaction. This correlation helps in directing investments in the office environment for each department separately. In this case it will be about the three departments that participated in the focus group; CNM, OTB, and GCSC.

This chapter will discuss the total scale and each item of the eight subscales that were generated from the measurement process. For each subscale a comment will be given on the generated mean value.

Finally, and at the end of this chapter a summary of design recommendations that regulate decision making and investments in the workplace design will be presented.

## 7.2 - OVERVIEW

### 7.2.1 - Total scale

The obtained results showed that the total workplace satisfaction is nearly neutral – of mean value 2.94. (Fig. 7-1) On the level of different Departments<sup>1</sup> it was found that those who expressed the highest levels of satisfaction in the total scale were the following:

- Revenue Assurance & Data Integrity – mean value: 3.41
- NAM Central FOIS support – mean value: 3.30

While those departments that expressed the lowest levels of satisfaction were:

- Others – mean value: 2.67
- GCSC – mean value: 2.86
- Voice Service Management – mean value: 2.89

Other Departments felt slightly neutral about their overall satisfaction with the workplace. Among the different job levels<sup>2</sup>, those who expressed high levels of overall satisfaction were those who worked as:

- Managers – mean value: 3.21

While those who expressed low levels were those who worked as:

- General Manager – mean value: 2.61
- Supervisors – mean value: 2.71
- Team leaders – mean value: 2.80

People working for the rest of the job levels felt slightly neutral about their overall satisfaction with the workplace.

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<sup>1</sup> Please review Appendix G for different trends of Departments.

<sup>2</sup> Please review Appendix H for different trends of Job levels

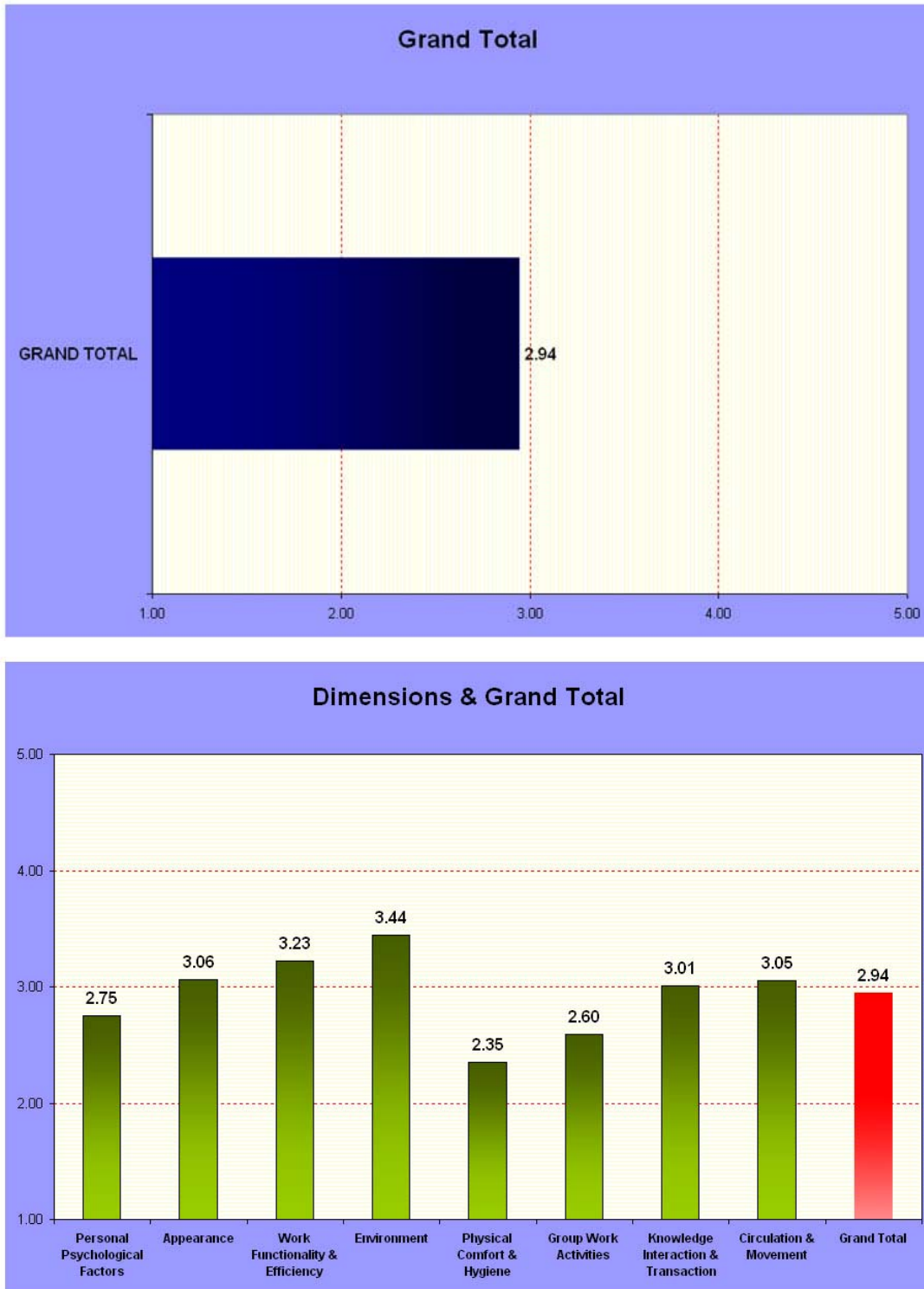


Fig. 7-1: Top: The *Grand Total scale* of the Attitude Survey Showing that the overall satisfaction was slightly less than neutral

Bottom: The mean value of the 8 eight sub-scales or dimensions in relevance to the Total Scale, Notice that the *Environment* and *Work functionality & Efficiency* were the highest dimensions and that the *Physical comfort & hygiene* and the *Group work activities* scored the least

(Source: author)

Finally, there was no big difference between different genders<sup>3</sup> or even the different age groups<sup>4</sup> in their perception of the overall workplace satisfaction.

### **7.2.2 - Subscales**

Results also showed that for the entire population, there were three dimensions that were of significantly low values, (Fig. 7-1) these were:

- |                                   |                    |
|-----------------------------------|--------------------|
| 1- Physical comfort and hygiene   | – mean value: 2.35 |
| 2- Group work activities          | – mean value: 2.60 |
| 3- Personal psychological factors | – mean value: 2.75 |

While the highest values of satisfaction were obtained from the following two dimensions:

- |                                      |                    |
|--------------------------------------|--------------------|
| 1- Environment                       | – mean value: 3.44 |
| 2- Work functionality and efficiency | – mean value: 3.23 |

The rest of the dimensions were very close to obtaining neutral values and they were:

- |  |                    |
|--|--------------------|
| 1- Appearance                            | – mean value: 3.06 |
| 2- Circulation & movement                | – mean value: 3.05 |
| 3- Knowledge interaction and transaction | – mean value: 3.01 |

### **7.2.3 - Importance levels**

From the replies received<sup>5</sup> some items were of high levels of importance for all the three participating departments:

- 1- Informal meeting points
- 2- Retreats
- 3- Refreshment points
- 4- Workspace area
- 5- Personal storage area
- 6- Interaction
- 7- Stimulation

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<sup>3</sup> To review the different trends of Gender see Appendix J

<sup>4</sup> To review the different trends of Age groups see Appendix I

<sup>5</sup> To review the trends of the importance levels see Appendix K

- 8- Learning and Knowledge exchange
- 9- Concentration
- 10- Personal privacy
- 11- Territoriality
- 12- Corporate image
- 13- Unit or Dept Visual appeal
- 14- Other spaces visual appeal

Some other items varied significantly between departments like:

- 1- Sufficient document processing units
- 2- Work confidentiality
- 3- Status and image
- 4- Circulation elements visual appeal
- 5- Artworks
- 6- Accessibility
- 7- Way finding

Only one item was of low importance for all departments - Reception area. Other variables were either neutral or didn't show a significant variance between departments.

#### ***7.2.4 - Replies of the Open ended question***

The replies to the open ended question<sup>6</sup> were important because they helped give a logical explanation to some of the results calculated for each dimension and help the researcher investigate problems that wouldn't show up in the survey results. For example, the ventilation could be fine; scoring high values in the survey, but a small population of the workers – that didn't have a strong effect on the scoring system – had expressed serious problems with the ventilation system that can't be ignored. This was of course validated by observation. On the other hand many replies didn't imply any sense, like typing one's name, or department, or complaining about something that doesn't have to do with the workplace design.

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<sup>6</sup> To review all the replies received by the survey, see Appendix L



## 7.3 - PERSONAL PSYCHOLOGICAL FACTORS

Generally this dimension didn't perform well in the attitude survey – with a mean value of 2.75 – which means that the general worker population was quite unsatisfied with it.

There were no big differences between the perception of males and females, while it varied between different departments and job levels. For departments it was found that they were all below the line of being neutral while only one department showed satisfaction with this dimension; Revenue assurance and data integrity. It wasn't applicable to judge why they were satisfied with this dimension as they didn't participate in the *work form* focus group.

As for the job levels, the general manager had the least perception of satisfaction towards this dimension, followed by supervisors, team leaders, and agents. The head of departments and managers were, on the contrary, satisfied with this dimension. This was found very reasonable, as the supervisors, team leaders and agents all worked in opened area offices with no boundaries or walls that provide concentration, privacy, or confidentiality, unlike the managers whom had their own private cellular offices. The only contradiction was with the General Manager who has his own private office, but most probably, and according to observations, suffers from continuous interruptions.

For different age groups, those who were considered old – above 41 years – were the only ones satisfied with this dimension. This sounded very reasonable and parallel to what was perceived by different job levels, as most of the managers, who were also satisfied, were in this age group. Finally, results didn't differ much between different genders.

### **7.3.1 - Concentration – mean value: 2.18**

This item was in the tail of the group, (Fig 7-2) scoring the least mean value, which means that the workers mainly complained about distractions and the lack of concentration. According to observations, the workplace was found in many incidents noisy – workers talking out loud, either replying to a call or talking to each other. A

number of gatherings were spotted for workers eating and chatting at the very same workspace where their other fellow workers were trying to finish some work - a conference call for example. (Fig. 7-4) Also a number of workers whose workstations were next to the doors were distracted by the motion caused.

### ***7.3.2 - Personal privacy – mean value: 2.55***

This is another item that didn't perform well in satisfying workers. It was observed that there are no barriers or partitions between the majority of workers who worked at the open area offices and who were actually working for longer hours (Fig. 7-5) Walking between the workstations, it was easy to see a lady worker fetching for some personal belongings in her bag or easily hear a personal phone call.

### ***7.3.3 - Work confidentiality – mean value: 3.06***

This value means that this item is considered slightly more than neutral in its performance in satisfying workers. While it was easy to peep into a workers' screens and follow up the tasks that they were holding (Fig. 7-6) the importance level of this item later explained why this was not an issue to some departments.

### ***7.3.4 - Territoriality – mean value: 2.80***

Territoriality is the separation – not necessarily physical walls – between different departments or units. There was absolutely no separation of any kind between adjacent teams/units sensed at all on site. (Fig. 7-7)

### ***7.3.5 - Sense of safety – mean value: 2.84***

This means that the workplace design doesn't offer a sense of safety, and that this design item didn't perform quite well in satisfying workers. In an attempt to investigate this issue, it was observed that only a few signs for emergency exits could be found outside the office and not inside it except on doors. There were no handheld fire extinguishers found anywhere. Also No written instructions could be found anywhere to guide people in case of emergency. All doors of the office in each of the 6 floors in both building blocks opened inwardly; against the flow of people in case of rushing outwards. (Fig. 7-8) Finally, the emergency staircase doesn't lead to the outdoors, which means that one is literally trapped inside the building if the main exit was blocked by fire or a terrorist act.

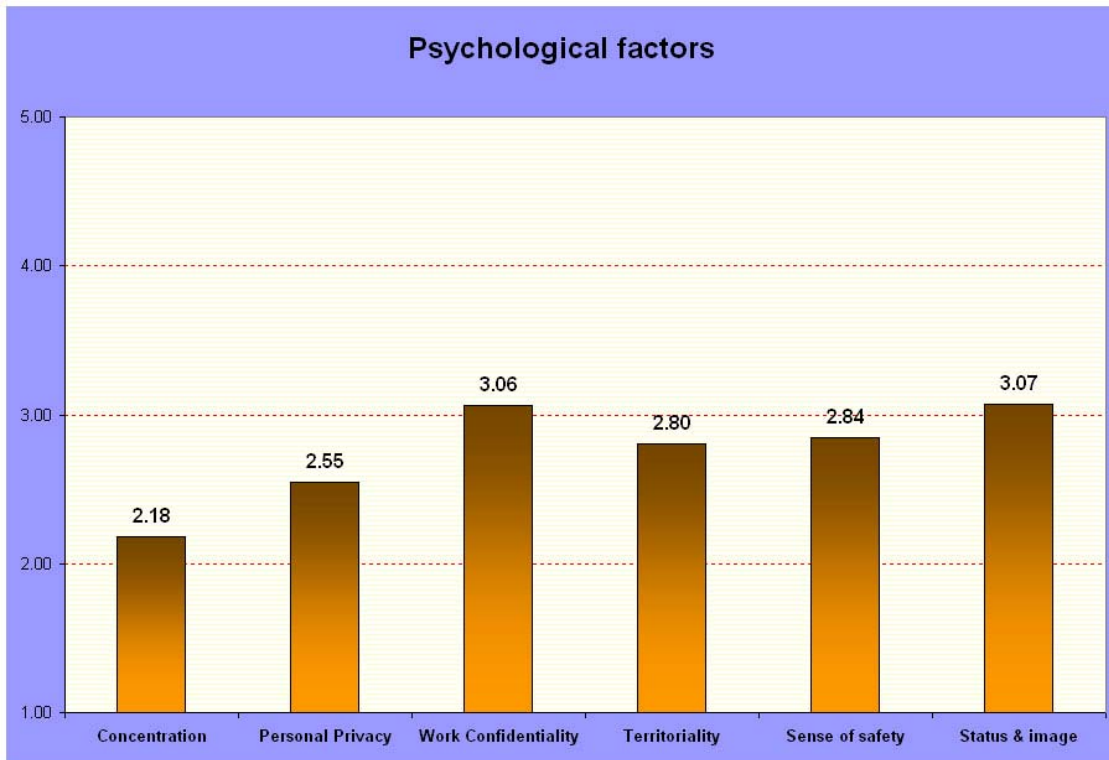


Fig. 7-2: Items of the Personal Psychological factors dimension and their scoring; Concentration and Personal privacy are items that were very low in satisfaction

(Source: author)

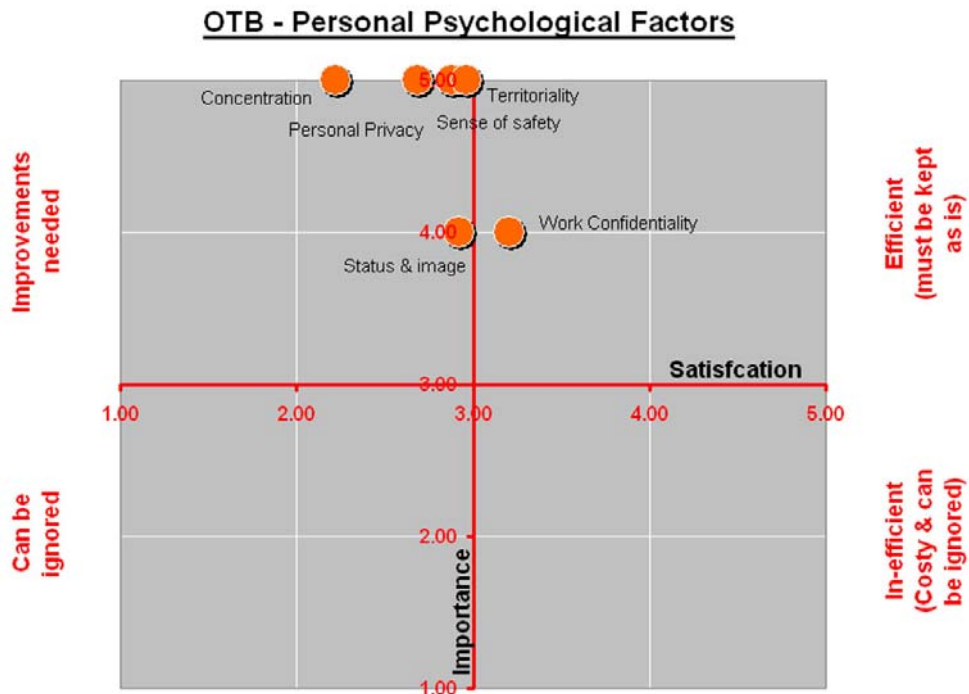


Fig. 7-3: Correlation between Satisfaction and Importance of the personal psychological factors dimension.

(Source: author)

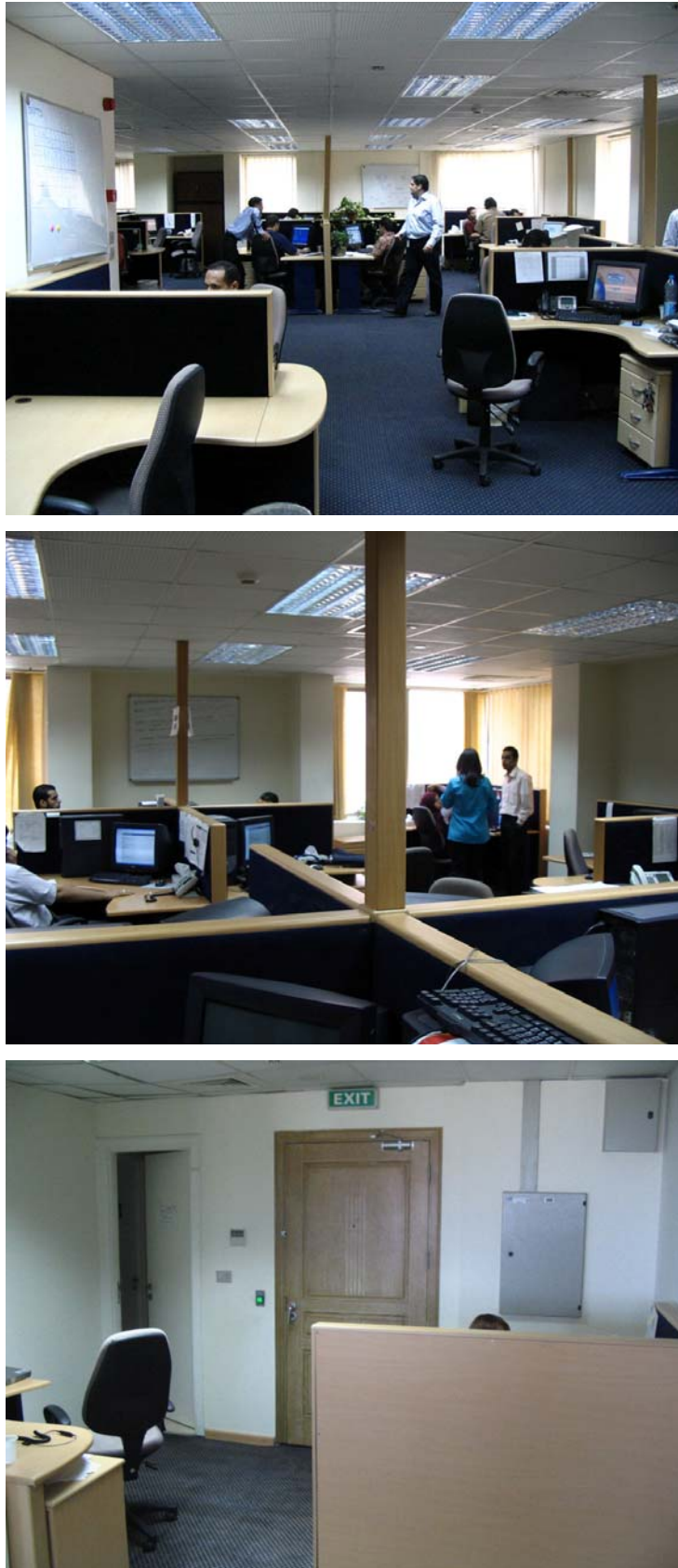


Fig. 7-4: Considerable amounts of distraction either by movement of people, or the opening and closing of doors, or chatting workers who were spotted in different points around the workplace

(Source: author)



Fig. 7-5: Top & Bottom: walking between the workstations it was easily observed that there is no sustained personal privacy for those who are working in the open area offices

(Source: author)



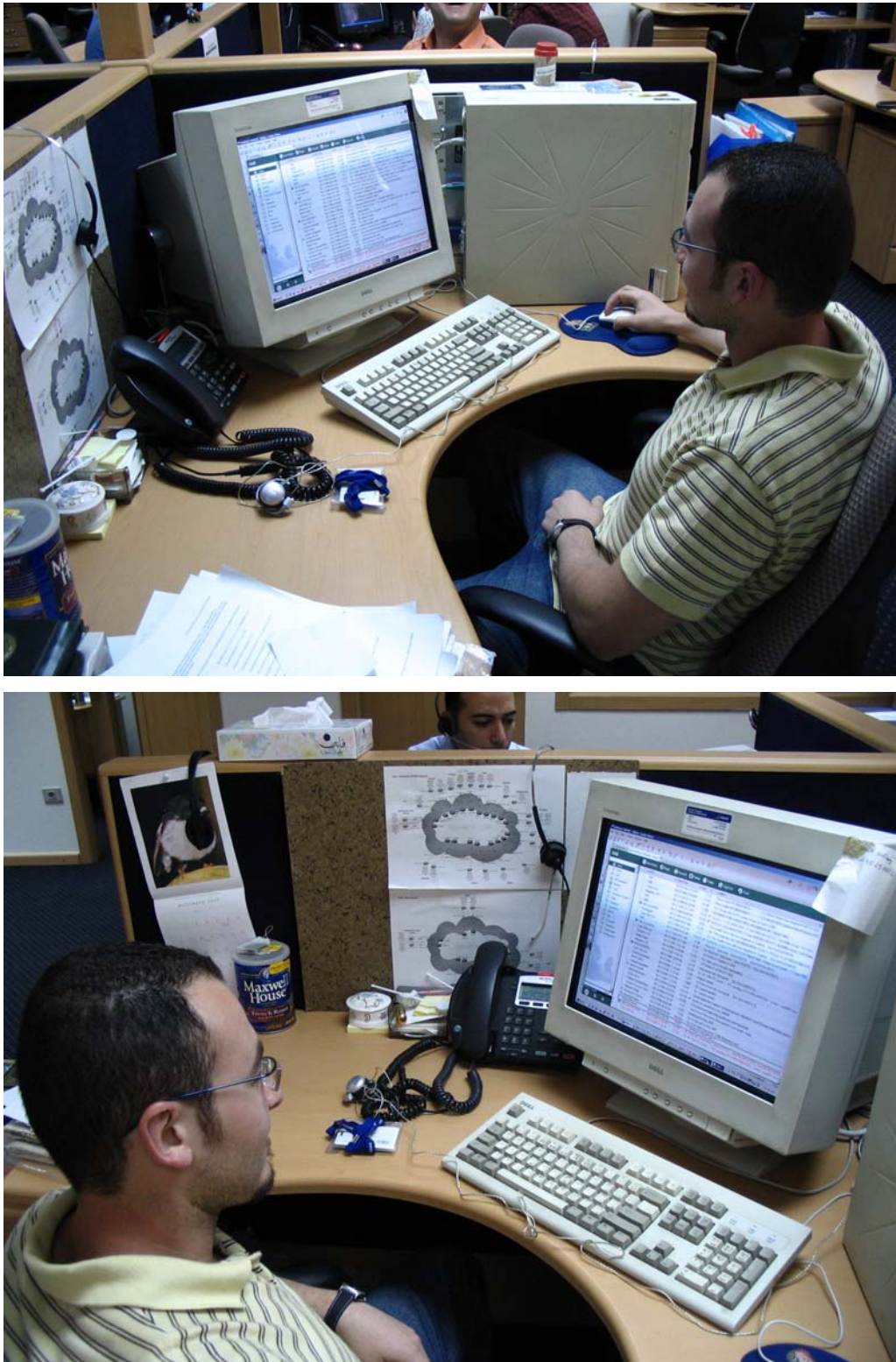


Fig. 7-6: Top & Bottom: the workstation design doesn't offer any work confidentiality for It was easy to peep into the workers' screens and follow up the tasks that they were holding. But also, work confidentiality was found to be unimportant for many departments.

(Source: author)

**Two different departments**

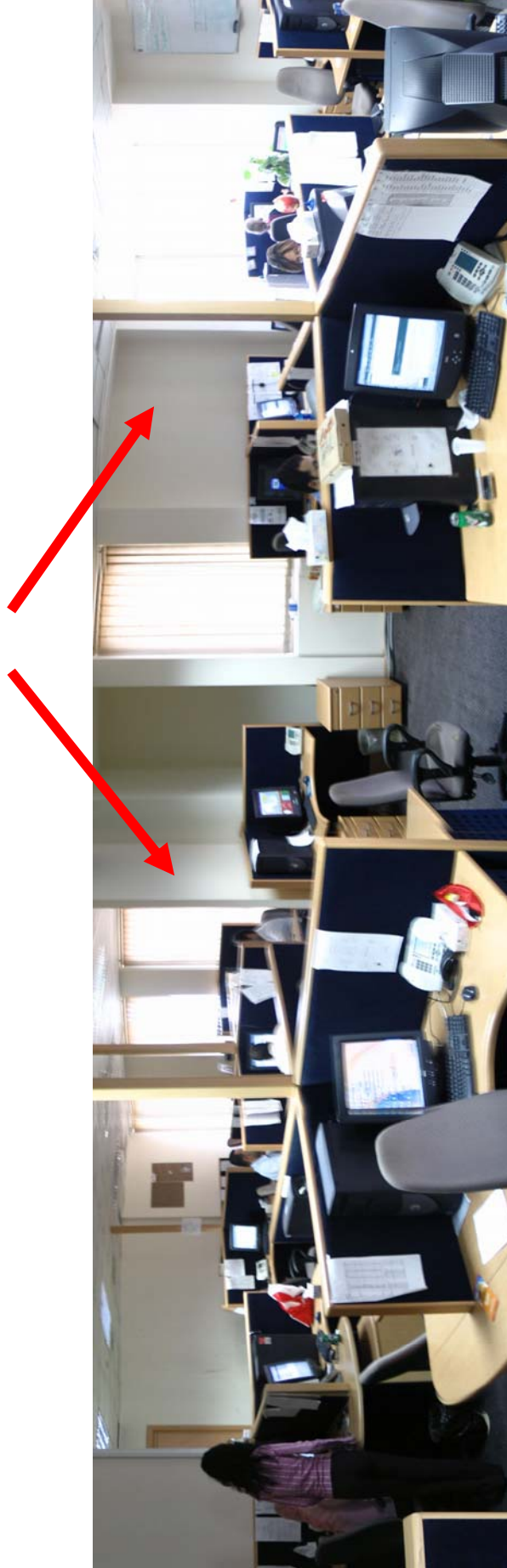


Fig. 7-7: No separation of any kind between teams/units was sensed at all in the site

(Source: author)





Fig. 7-8: Only a few signs for emergency exits could be found outside the office

No handheld fire extinguishers could be found

All 4 doors of the office in each of the 6 floors in both towers opened inwardly; against the flow of people in case of rushing out

(Source: author)



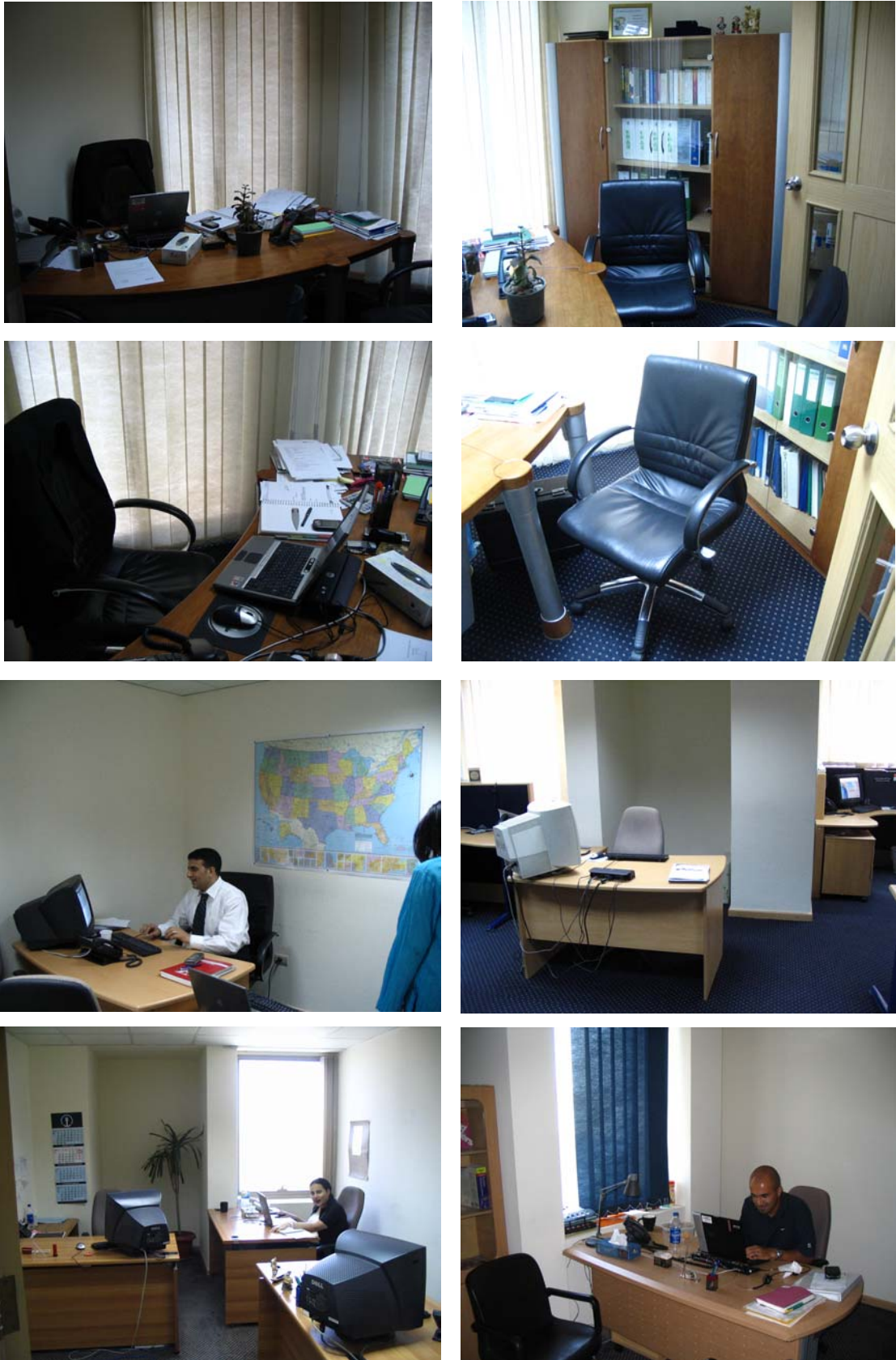


Fig. 7-9: Different images of offices for workers of different job levels showing different expressions of status and image

(Source: author)

### ***7.3.6 - Status & image – mean value: 3.07***

This item is considered slightly satisfying or neutral to most of the workers. (Fig. 7-9) But this basically depends on the workers' culture, experiences, and backgrounds. This varies deeply from one individual to another; hence it was not applicable to judge this item.

### ***7.3.7 - Recommendations***

In OTB for example, the correlation map between importance and performance (Fig. 7-3) showed that only ***Work Confidentiality*** was found efficient and should be sustained. Other items of the dimension needed improvements. What urgently would require the architect's attention is the workstation design and layout. Choosing workstations that have higher partitions and that are organized in a way that will repel people outside the workspace and prevent gatherings would be a good idea to increase ***Concentration*** and ***Personal Privacy***. Using white noise nozzles fitted in workstations and decreasing laminated surfaces would be another good idea to decrease noise and increase concentration. Another indirect effect on concentration is to create retreats that will attract workers away from the primary workspace when they need to have a chat or a break time.

Using colors and textures – like chair fabrics – that are specific to that very department would increase the sense of ***Territoriality***. Also the quality of workstation design will raise the ***status and image perception***.

## **7.4 - APPEARANCE**

This dimension is composed of five items and performed slightly more than neutral in the attitude survey – with a mean value of 3.06 – which means that the workers were neutrally satisfied with it. (Fig. 7-10)

Results showed that between different departments only those who chose **other** to describe their department showed low levels of satisfaction with the appearance, while two departments showed satisfaction – **NAM Central FOIS**

**support / Revenue Assurance Data Integrity** – while the rest expressed their neutrality towards this dimension. There was nothing very special to observe about those two departments. Those who were addressed as **other** are those who worked in cluttered and cramped small rooms to support top management. Thus, it sounded reasonable that they would complain about the appearance of their offices.

Astonishingly the highest dissatisfaction came from the General Manager followed by Head of Departments. While there was no big difference sensed either between different age levels or genders.

#### ***7.4.1 - Corporate image – mean value: 3.33***

The mean value of this item shows that a considerable amount of population somehow perceive the corporate image in the office design as satisfying. According to the author, the interior design resembles a conventional but also a modernized office image. On the other hand, nothing in the interior resembles the company's image except for some posters. There was a logo for the company near the entrance door for the company to identify itself to visitors. (Fig. 7-12)

#### ***7.4.2 - Unit/Team/Dept Workspace visual appeal – mean value: 3.05***

The mean value shows that this item is almost neutral in achieving worker satisfaction. Anyhow, this depends on the workers' culture, tastes, and backgrounds and also varies deeply from one individual to another. Though, the author agrees with the opinions obtained from the open ended questions that the workplace lacks any lively elements like indoor plantation for example. (Fig. 7-13)

#### ***7.4.3 - Other Spaces visual appeal – mean value: 2.58***

This item is low in satisfying workers; the worst of all other items. From the opinions obtained out of the open ended question it shows that these other spaces - like refreshment points, document processing points, and toilets - were cramped and were not at all appealing. (Fig. 7-14)

#### ***7.4.4 - Circulation elements visual appeal – mean value: 3.04***

This item is almost neutral. Though it held many contradictions, It was observed that while the lift lobbies are visually appealing while the staircase is contradictory (Fig. 7-15)

#### ***7.4.5 - Artworks – mean value: 3.31***

It shows that workers are slightly satisfied with the artworks. This is a bit confusing because although this item depends on the workers' culture, tastes, and backgrounds, there were very little artworks observed, represented in some posters that were hung on the walls. Any how, this varies deeply from one individual to another. (Fig. 7-16)

#### ***7.4.6 - Recommendations***

In OTB for example, the correlation map between importance and performance (Fig. 7-11) showed that only the *other spaces visual appeal* fell in the quadrant of needed improvement. The company here must invest in re-decorating those spaces. Other items fell in the quadrant of efficiency and should be kept as is.

The architect should pay attention here that these are based on the user perception of aesthetics, which differs completely from one individual to another, but there are some additions that could cause no harm if introduced in this case. Like for example adding internal plantation or adding some inexpensive artworks. Perhaps because most of the workers are young in age and weren't introduced to many other workplace environments, they consider their own environment a visually pleasing one. Hence, the architect here can sometimes impose some aesthetical design trends, and observe the reaction of people, without introducing expensive ideas.

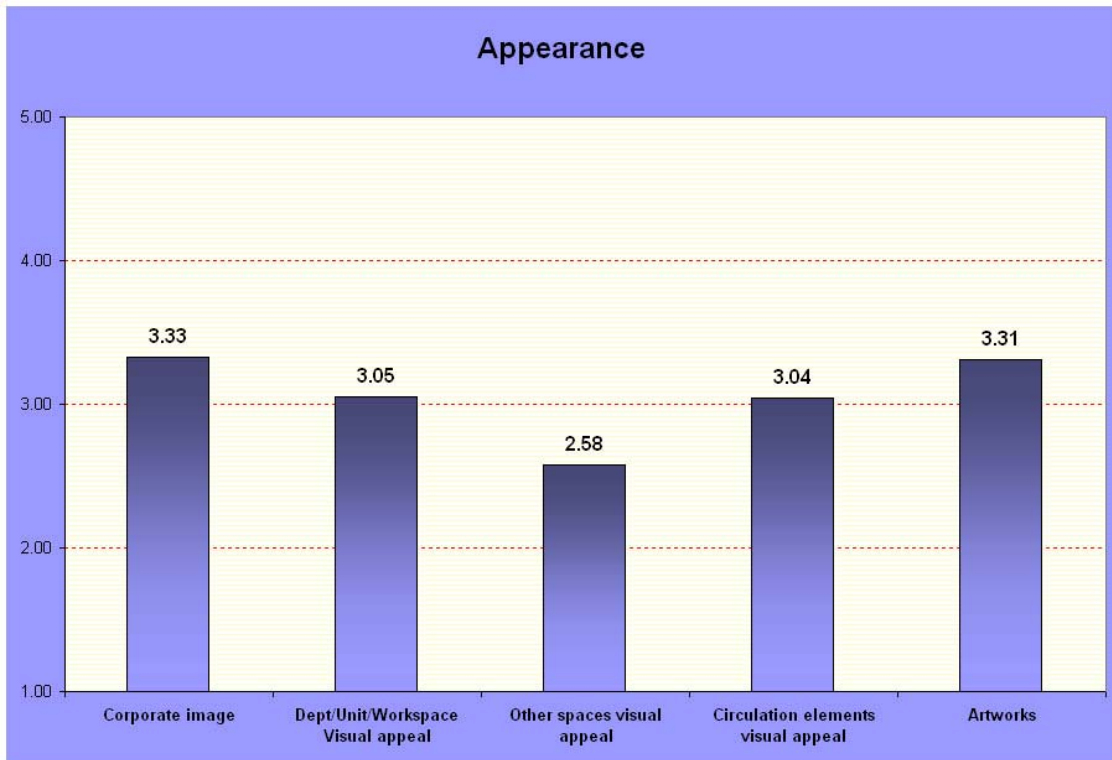


Fig. 7-10: Items of the Appearance dimension and their scoring; mostly neutral except for other spaces like the document processing points, refreshment points, or toilets & restrooms

(Source: author)

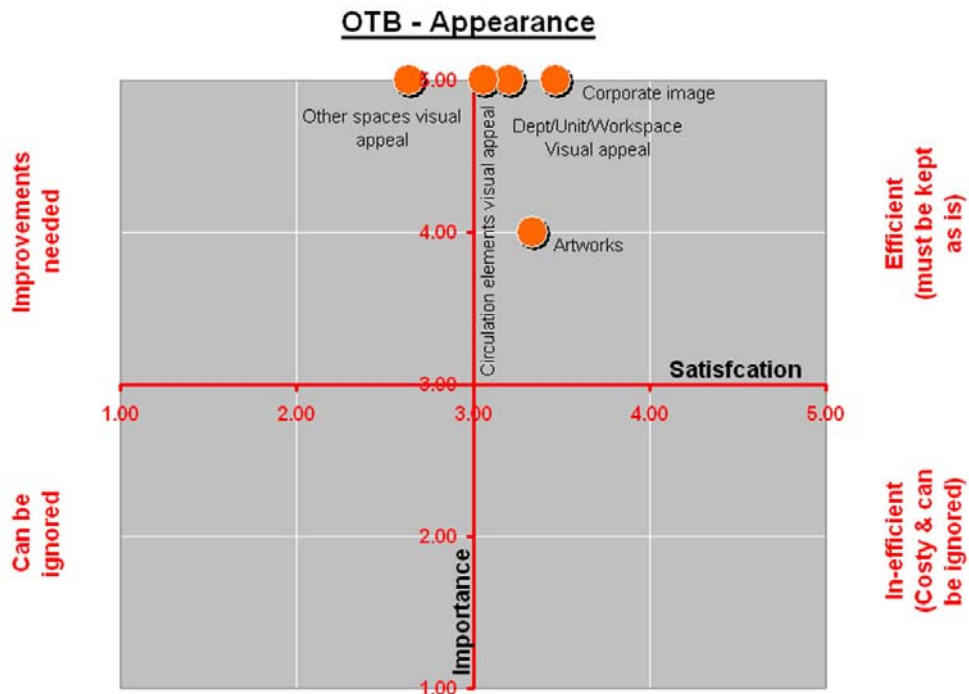
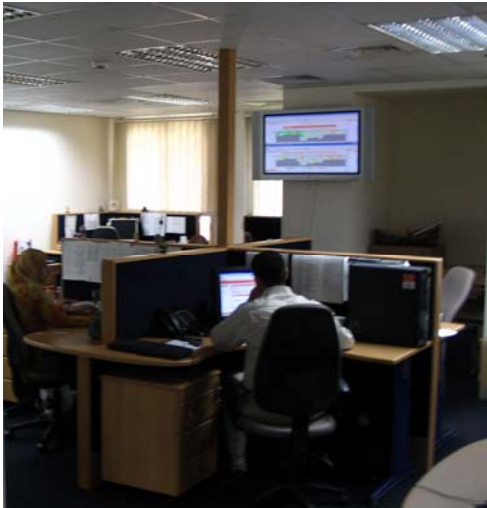


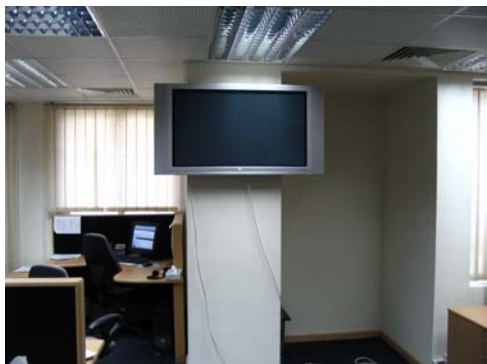
Fig. 7-11: Correlation between Satisfaction and Importance of the appearance dimension items.

(Source: author)





The Company's Logo in the Lift Lobby



Screens used to demonstrate some illustrations



Some other Dept. used white boards



Fig. 7-13: The interior design resembles a conventional but a bit modernized image. Nothing in the interior artworks resembles the company's image except for some posters. There was a logo for the company near the entrance door for the company to identify itself to visitors.

(Source: author)



Those laptops were just left over



The sense of a cramped and disorganized space



This huddle room was mis-furnished



A dead area in the HR dept. that was misused



Poor quality storage unit in a manager's office



Dull corridors

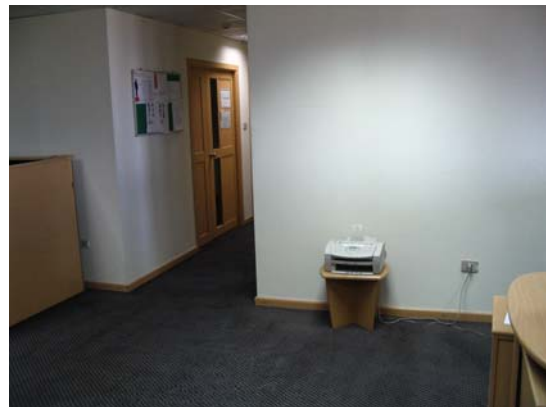
Fig. 7-14: The internal appearance of some units/departments workspaces where some negative observations made about the visual appeal.

(Source: author)

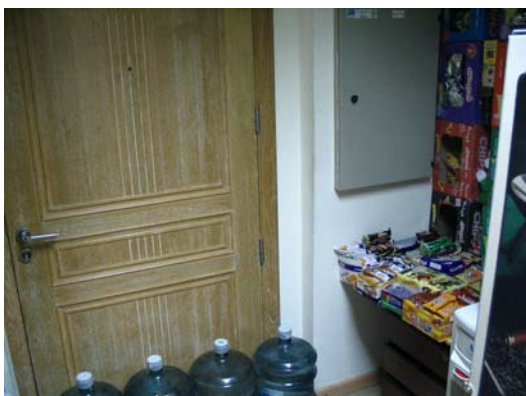




Document processing point



This Fax machine was simply PUT next to the wall



Dull Refreshment points



The toilet





Dull refreshment points



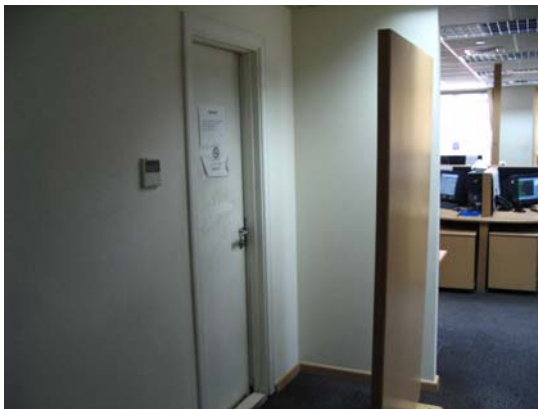
Toilets



Another Document processing point



A larger toilet



A partition used to hide the WC's entrance

Fig. 7-14: the author agrees with the opinions obtained from the open ended questions that spaces like refreshment points, document processing points, and toilets are cramped and are not at all appealing

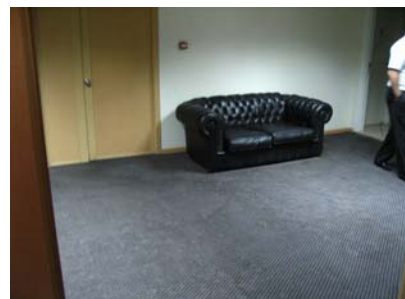
(Source: author)



Lift Lobby



Emergency staircase which is also used as the main staircase



Meeting room Foyer



Reception area



Corridor in Marketing dept.

Fig. 7-15: it was observed that there has been a large contradiction between circulation elements for while the reception area was presentable, lobbies, corridors, and the staircase were dull.

(Source: author)

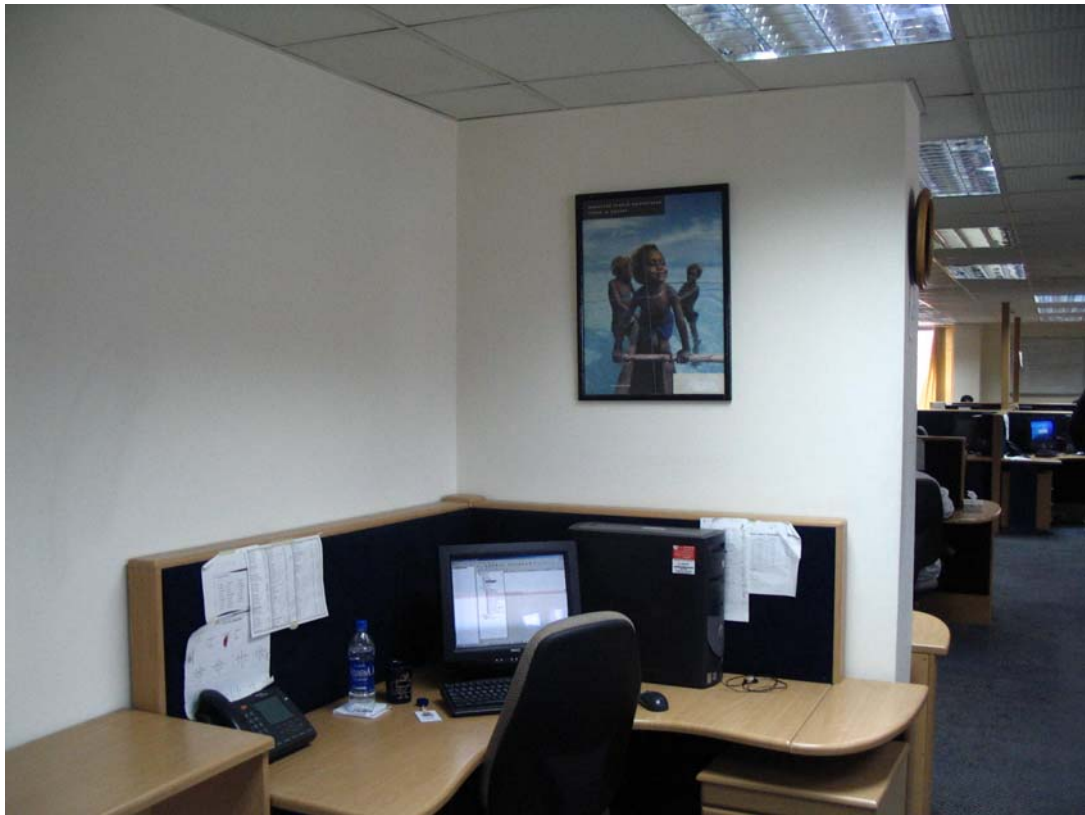


Fig. 7-16: it was observed that the workplace actually lacks any artworks except for some posters that resemble the company

(Source: author)

## **7.5 - WORK FUNCTIONALITY & EFFICIENCY**

This dimension performed well more than neutral in the attitude survey – with a mean value of 3.24 – which means that the workers were satisfied with it. (Fig. 7-17)

Most of the departments were either neutral or more than neutral; the highest rate of satisfaction was given by Revenue Assurance Data Integrity. Only supervisors were slightly less than neutral between different job levels and those of mid-age levels as well. It makes sense because most supervisors are of the mid-age level. No difference was detected between different genders.

After investigating why these supervisors were not satisfied, it turned out that they used either the same workstations or maybe smaller ordinary desks than the lower level agents or professionals. It turned out that they could use extra workspace and personal storage area.

### ***7.5.1 - Sufficient No. of document processing units – mean value: 3.77***

This item scored the highest satisfaction rate in this dimension compared to other items. When observed for a long time, these units were never over crowded and were operating efficiently. To ensure this, a number of workers from different departments were individually interviewed and they didn't complain about the quantity or functionality of these units

### ***7.5.2 - Sufficient workspace area – mean value: 3.33***

Workers of different departments and job levels were observed using their workspaces, area was not an obstacle in performing their office work activities.



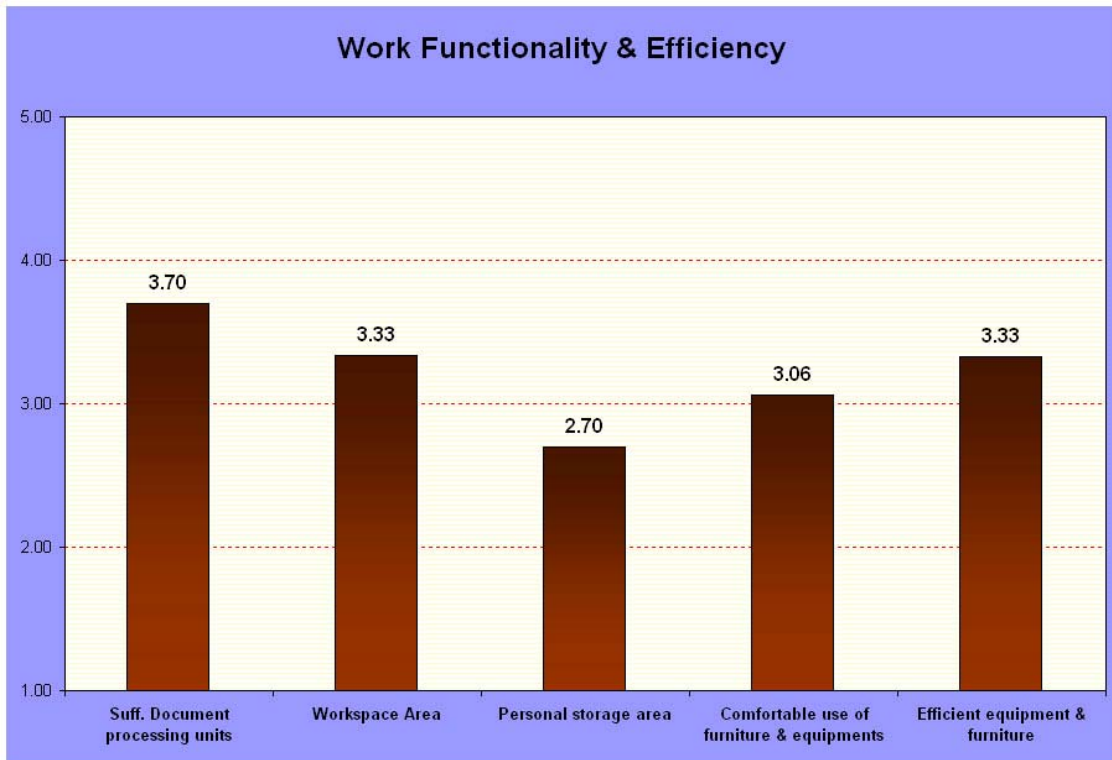


Fig. 7-17: Items of the Work Functionality & Efficiency dimension and their scoring; remarkably good except for the personal storage units

(Source: author)

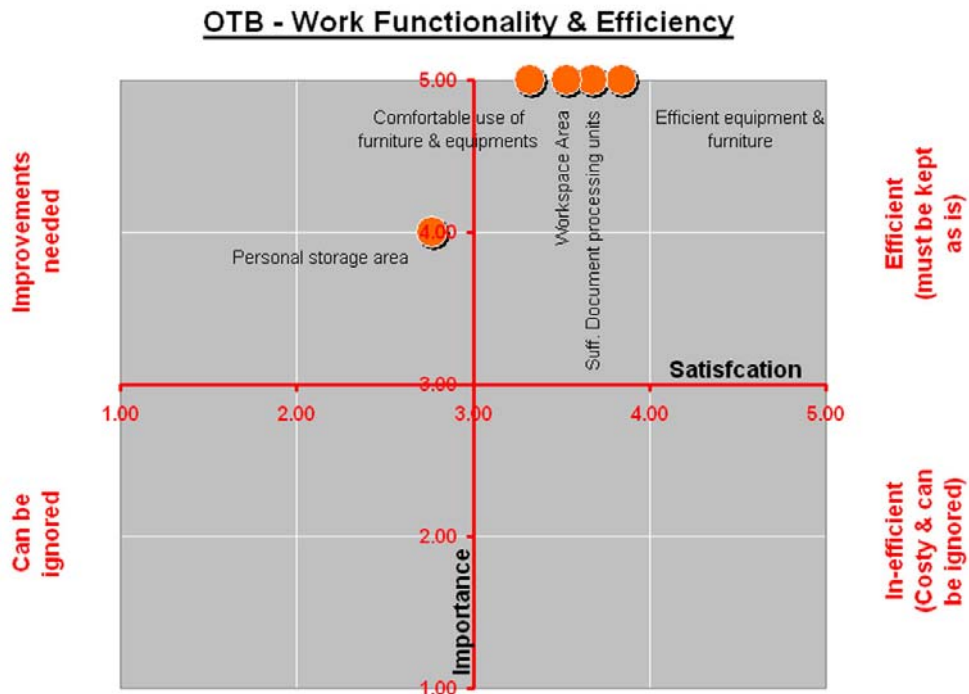


Fig. 7-18: Correlation between Satisfaction and Importance of the work functionality & efficiency dimension.

(Source: author)

### ***7.5.3 - Sufficient personal storage area – mean value: 2.70***

This is considerably the lowest rate of satisfaction compared to other items of the same dimension. It was observed that each worker had his own personal storage unit next to him which was composed of a set of small mobile drawers next to his workstation. Later it was learned from the focus group that workers could use extra personal storage areas, were it was considered an important item.

### ***7.5.4 - Comfort usage of furniture & equipment – mean value: 3.06***

Considerably a neutral item, Satisfaction depends on the workers' own perception and feel of comfort. Though, some drawbacks were observed like, in some of the workstations near windows some of the PC screens had direct sun light beam falling on it causing glare to the worker, others had some malfunctioning chairs.

### ***7.5.5 - Efficient furniture & equipment – mean value: 3.33***

This was considered an item that performed well in satisfying workers. Though, this depends on the workers' own perception and feel of efficiency, therefore some personal complains could individually appear and have to be dealt with.

### ***7.5.6 - Recommendations***

In OTB for example, the correlation map between importance and performance (Fig. 7-18) showed that only the *personal storage area* item was recommended for improvements. There rest of the items for this dimension was efficient and required no change. The architect should, in this case, propose a solution by which the storage area is increased. This doesn't have to be by adding extra furniture next to the workstation, but some lockers can be added in an adjacent area.

## **7.6 - ENVIRONMENT**

This dimension is considered the highest of all other dimensions of the attitude survey – with a mean value of 3.44 – which means that the workers were satisfied with it. (Fig. 7-19) this was kind of confusing. When, at the start of the survey, the open ended question was reviewed it was sensed that a lot of frustration between workers is caused by the malfunctioning ventilation system. It was only a problem of a small area in a single floor of the whole offices. If this explains anything, it shows that replies from open ended questions shouldn't be taken for granted, but can explain hypothesis though.

Results showed that all departments, job levels, age groups, and genders were satisfied with this dimension.

### ***7.6.1 - Lighting – mean value: 3.43***

Lighting was normally and appropriately distributed, only some small parts of the workplace were affected by the glare of sun light.

### ***7.6.2 - View – mean value: 3.77***

Unexpectedly this item performed as the highest in satisfying workers. The workplace offers clear views of the outdoor, although the most of the outdoor isn't much of a pleasant view. (Fig. 7-21)

### ***7.6.3 - Ventilation – mean value: 3.12***

The ventilation operates normally, but in some spots serious problems were clearly observed like malfunctioning air vents causing either excess air flow or on the contrary no air flow.

### 7.6.4 - Recommendations

In OTB for example, the correlation map between importance and performance (Fig. 7-20) showed that the *ventilation* is needed to get improved while the *views* and *lighting* are considered efficient items of this dimension.

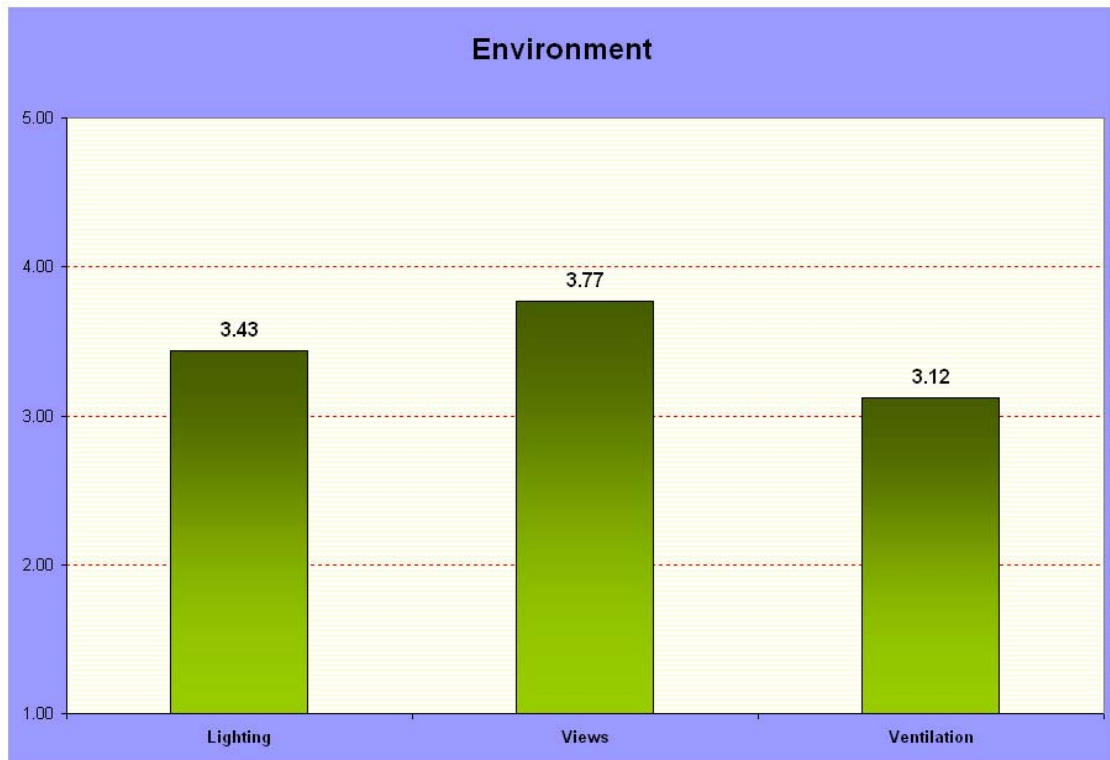


Fig. 7-19: Items of the Environment dimension and their scoring; remarkably good

(Source: author)



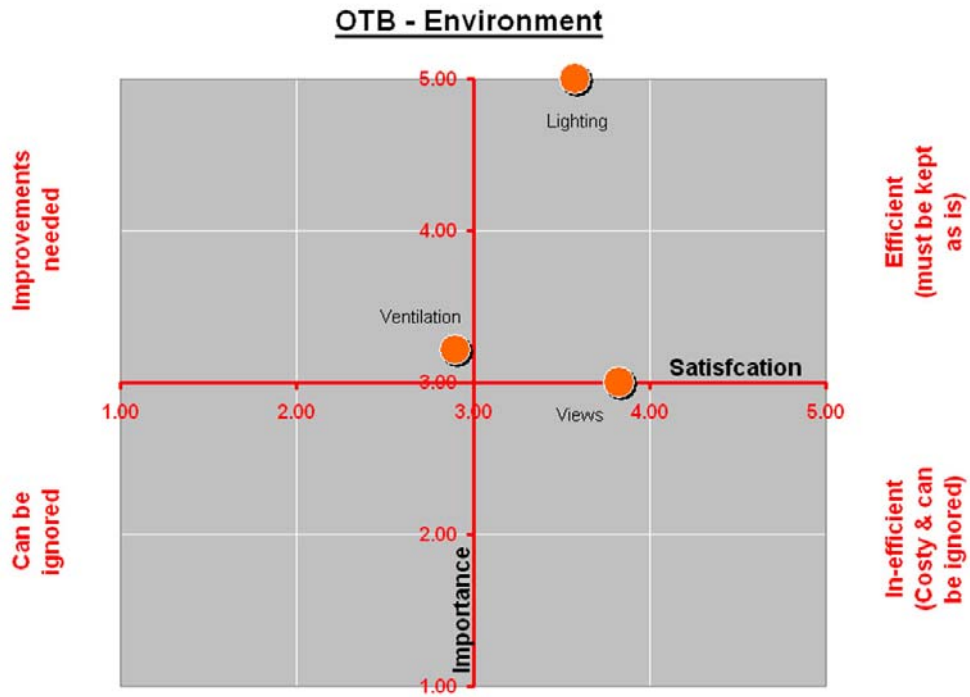


Fig. 7-20: Correlation between Satisfaction and Importance, for the Environment dimension.

(Source: author)



View from the 11<sup>th</sup> floor – Finance dept.



Views from the 9<sup>th</sup> floor

Fig. 7-21: The views outside the building aren't much of a pleasant view, it was satisfying to the workers though.

(Source: author)

## **7.7 -PHYSICAL COMFORT & HYGIENE**

This dimension is considered the lowest of all the other dimensions of the attitude survey – with a mean value of 2.35 – which means that the workers were unsatisfied with it. This was expected from the beginning; two of the three items composing this dimension are *retreats* and *refreshment points* – where most of the complains in the open ended question were from these two specific items. (Fig. 7-22)

Results showed that one department, unexpectedly, was slightly satisfied with this dimension; NAM Central FOIS support. Also Revenue Assurance Data Integrity was unique in being slightly less than neutral. The rest of the departments were unsatisfied with this dimension. All the workers with different job levels were dissatisfied with this dimension; unexpectedly most of all was the General Manager. There was no difference between either different age groups or genders.

### ***7.7.1 - Toilets & restrooms – mean value: 3.06***

Although it's slightly neutral in value, this is considered the greatest item in value compared to the other two items. When observed, toilets and restrooms were sufficient in some places, but for others they weren't. In some other places toilets were misused and were unclean. The architect here must be aware of differentiating between design faults and the problems of misuse that are caused by the lack of awareness and common ethics of workers.

### ***7.7.2 - Retreats – mean value: 1.85***

This is the least value of an item, not only in this dimension, but in the entire survey. This wasn't surprising for *Retreats* were completely neglected in this design. Retreats are places for refreshing and socializing, basically for breaks in between work hours. Numerous comments were made on this issue, that workers needed dedicated spaces for nesting and socializing, away from their primary workspace. Actually these spaces are useful in another way for they attract workers all the time, which allows for clearing the primary workspace from the noise and distractions that were made by casual encounters. Thus, Retreats have a positive indirect effect on concentration.

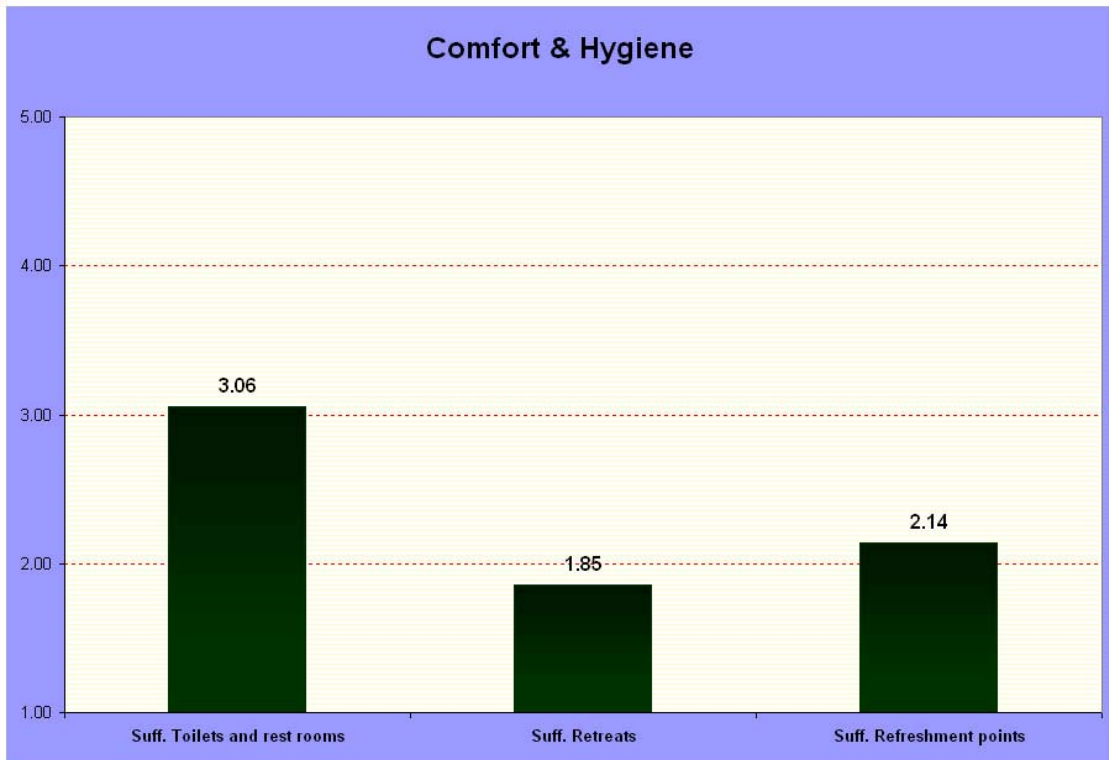


Fig. 7-22: Items of the Physical Comfort & Hygiene dimension and their scoring; remarkably low except for the toilets which were almost neutral

(Source: author)

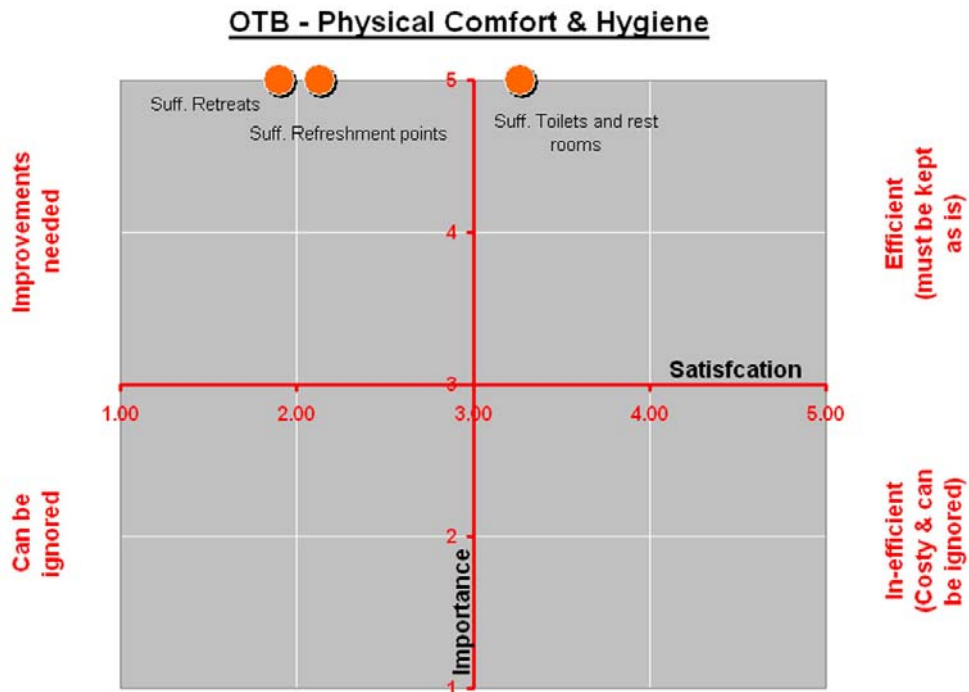


Fig. 7-23: Correlation between Satisfaction and Importance, of the physical comfort & hygiene dimension

(Source: author)

### ***7.7.3 - Refreshment points – mean value: 2.14***

Also considered very low in value, refreshment points were very small in area in most of the workplace and were also not well equipped. The architect must be aware that refreshment points are used to provide workers with treats and beverages, thus they must be either embedded within retreats, or adjacent to it.

### ***7.7.4 - Recommendations***

In OTB for example, the correlation map between importance and performance (Fig. 7-23) showed that workers didn't express any dissatisfaction with restrooms and toilets, thus this design item needs no change. It would be inefficient to invest in it. But on the contrary, refreshment points and retreats are greatly needed, where investments in these two design items would increase the diversity needed in the workplace design, and will positively affect concentration in an indirect way.

## **7.8 - GROUP WORK ACTIVITIES**

This dimension is also considered the second lowest of the other dimensions of the attitude survey – with a mean value of 2.60 – which means that the workers were unsatisfied with it. Different from the previous dimension, the three items constituting this dimension were collectively below neutral. (Fig. 7-24) But the importance level in this dimension plays a critical role because of the diversity of office work activities and modes between different departments.

Results showed that only one department was satisfied with their existing situation; NAM Central FOIS Support. The rest of the departments collectively were unsatisfied. Because this department didn't participate in the focus group it was not applicable to describe the reason for this rate of satisfaction. There was no significant difference in values between different job levels, age groups, or genders.

### ***7.8.1 - No. of formal meeting rooms – mean value: 2.56***

This item is low in satisfaction. Judging this item depends on the workers' own perception according to their working needs and modes. Though, in a number of interviews and in the focus group, most of the workers discussed the issue that huddle rooms are misused by managers, residing the entire daytime in it, knowing that this room is used on reservation basis. (Fig. 7-26) The architect must raise these type of complains to the top management in order to take actions and to filtrate design problems from others.

### ***7.8.2 - No. of informal meeting points – mean value: 2.33***

The mean value of this item shows that it is considerably low in satisfaction. It was observed that for each unit/department, the supervisors ordered for a white board that wasn't actually installed in the first place. The actual design didn't support this issue at the first place. If for a specific department the informal meeting points were found important, then it is recommended that the new workplace design take into consideration these points.

### ***7.8.3 - Area of formal meeting rooms – mean value: 2.89***

This value also indicates that the workers are quite unsatisfied with the area of their formal meeting rooms. On observation, some of the meeting rooms were small in area but not all of them actually. Some were spacey and well equipped.

### ***7.8.4 - Recommendations***

In OTB for example, the correlation map between importance and performance (Fig. 7-25) showed that informal meeting points are needed to be re-designed in the new workplace. The importance of the Formal meeting rooms' areas were high in this department, but it was neutral in satisfaction, so if possible, it would be recommended to increase these areas. As for the number of formal meeting rooms it was found that it can be ignored, but also, it is preferable to increase these numbers though.

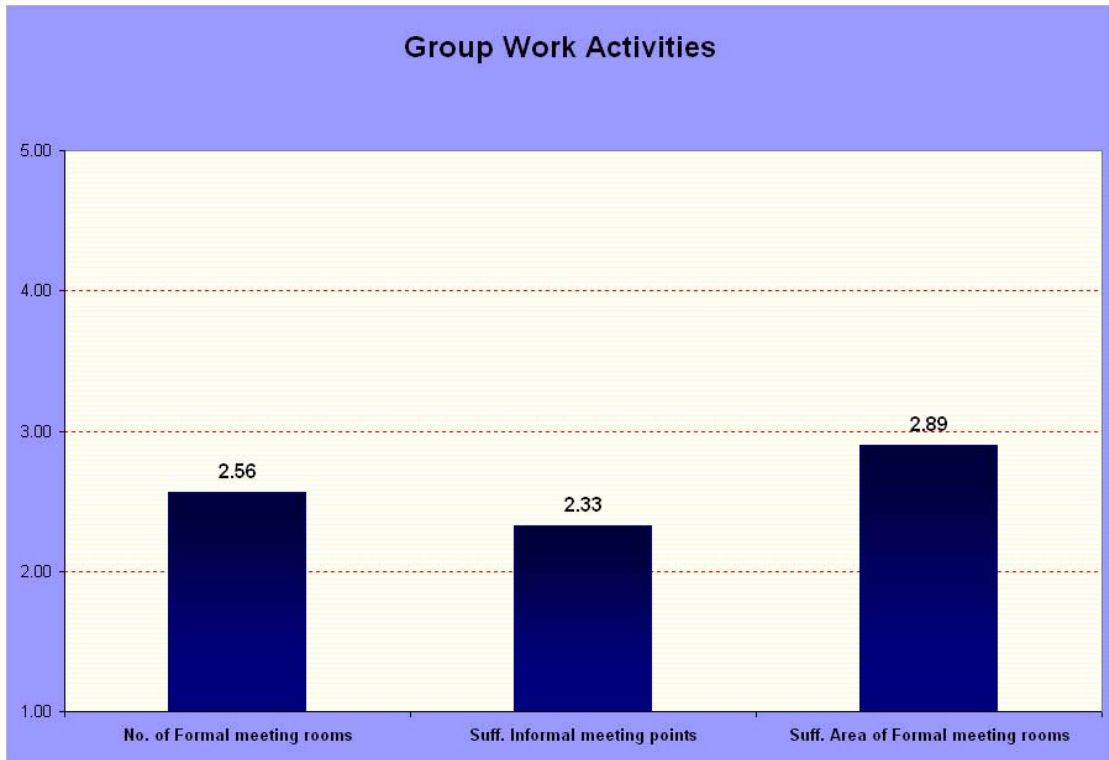


Fig. 7-24: Items of the Group Work Activities dimension and their scoring; Seems that there is lack in the numbers of formal and informal meeting points while the area of the existing formal meeting rooms were perceived as slightly less than neutral – unsatisfying.

(Source: author)

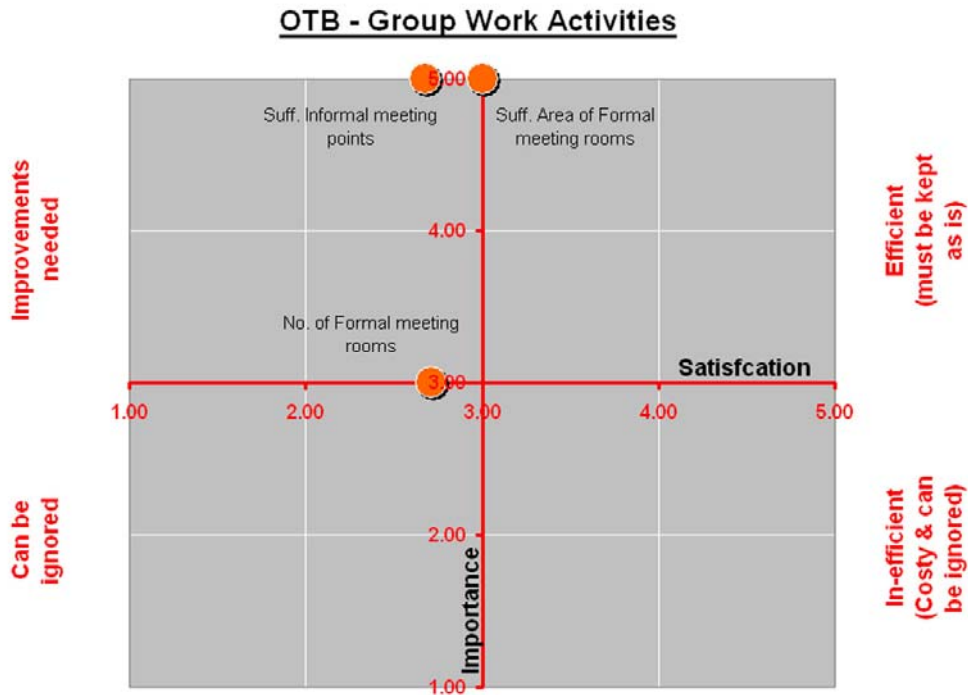
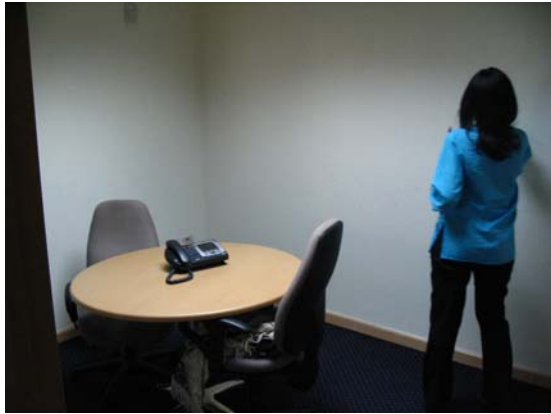


Fig. 7-25: Correlation between Satisfaction and Importance, of this group work activities dimension

(Source: author)





Huddle room used for informal meetings



White board used as an informal meeting point



9<sup>th</sup> Floor Formal meeting room



Marketing Dept. Formal meeting room



Main Formal meeting room

Fig. 7-26: in these images it could be noticed that huddle rooms are small in area, and that informal meeting points were imposed over the actual design. While it also shows that most of the main formal meeting rooms are sufficient in area.

(Source: author)



## **7.9 - KNOWLEDGE INTERACTION & TRANSACTION**

This dimension is considered very neutral– with a mean value of 3.01 – which means that the workers were neutrally satisfied with it. The results of the three items constituting this dimension are confusing. While the interaction and stimulation performed relatively well in satisfying workers, learning didn't do well, which raises the question of whether this is a design or cultural problem. (Fig. 7-27)

Results categorized departments into three groups. First were those who thought this dimension is not quite satisfying; GCSC and those who worked as support for the top management (Other). Then were those who were relatively well satisfied with this dimension; Revenue Assurance Data Integrity, NAM Central FOIS Support, and Voice service management. The rest of the departments thought neutrally of this dimension. While most of the workers in different job levels felt neutral about this dimension, the General Manager and supervisors were not satisfied. There was no big difference in perceptions between different age groups and genders.

### ***7.9.1 - Interaction – mean value: 3.10***

This value expresses that the workers are quite satisfied with interaction in their workplace. Actually, a considerable amount of interaction was observed between workers on all the visits made to the site. This is perceived mainly at open area offices where the interaction is at its highest levels. Those who worked in cellular offices, as shown in the values of different departments, were those who expressed dissatisfaction with the dimension, which could be mainly because of the lack of physical interaction between workers.

### ***7.9.2 - Stimulation & motivation – mean value: 3.77***

This value indicates that the workers perceive the workplace design as a facilitator for stimulation and motivation between workers. Actually, the open area workspace, encourages interactions and eye contacts, this by turn helps in creating a stimulating atmosphere. This also could be another reason why those who worked in cellular offices not satisfied; interaction is a facilitator of stimulation & motivation.

But again such issues can never be any clearer without organizing focus groups with different departments where these issues can be discussed with proposing proper solutions as well.

### ***7.9.3 - Learning & Knowledge exchange – mean value: 2.16***

Although interaction is high, but this value indicates that learning and knowledge exchange – unfortunately – isn't one of the outcomes of this high level of interaction. After investigating this issue with a number of workers, the reason was the culture. Most of the time workers are chatting in day life issues; basically this is the root problem of a previous item – concentration – when they don't have any retreats or lounges to socialize and chat at. Also after a long discussion in the focus group that was organized with three departments, if whether introducing spaces like libraries or information centers where workers could increase their knowledge and experiences, would be a good idea in order to raise satisfaction of this item, they said that these spaces will be misused by other workers who will use it as hideouts to escape work, or they could be used as retreats or even meetings.

### ***7.9.4 - Recommendations***

In OTB for example, the correlation map between importance and performance (Fig. 7-28) showed that Stimulation was of high rate of satisfaction but interaction needed little improvements. They expressed that interaction was of high importance but the survey expressed that they were slightly less than neutrally satisfied with this item. Again learning was an issue that needed improvements. Generally when looking at this dimension it can be concluded that policies and regulation have to be implemented to rule the implication of these items and the repetitive complain of misuse.

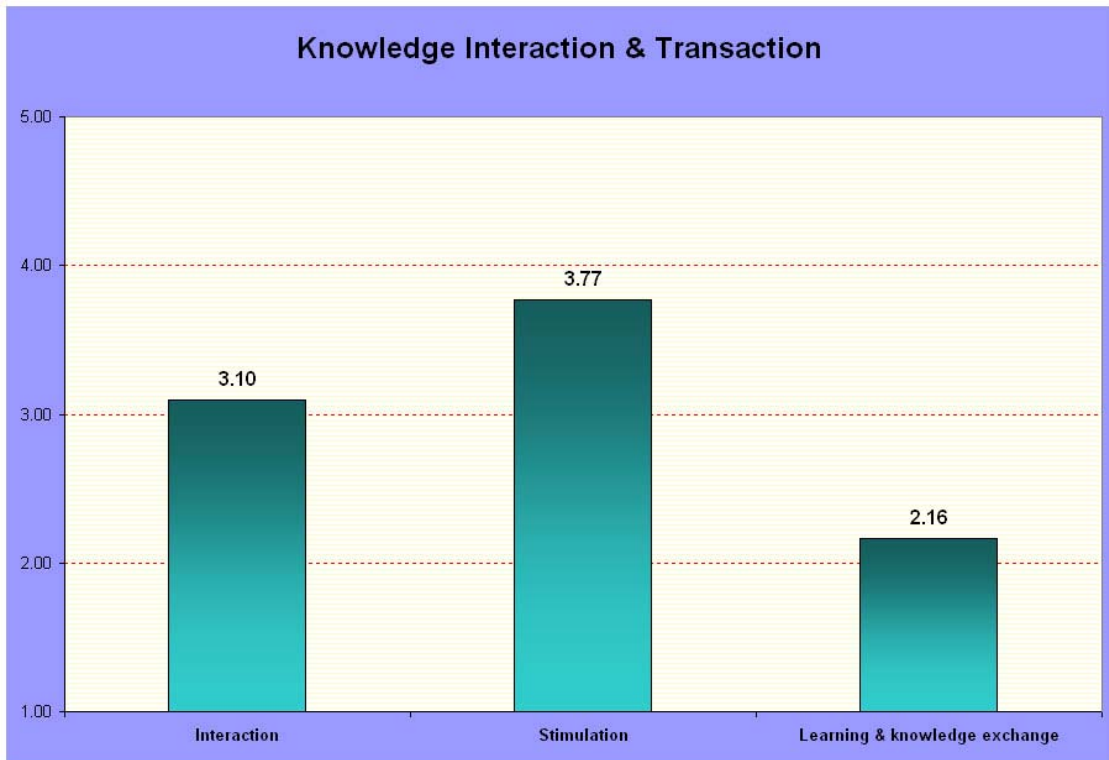


Fig. 7-27: Items of the Knowledge Interaction & Transaction dimension and their scoring; Stimulation and Interaction were high while Learning and Knowledge exchange was low

(Source: author)

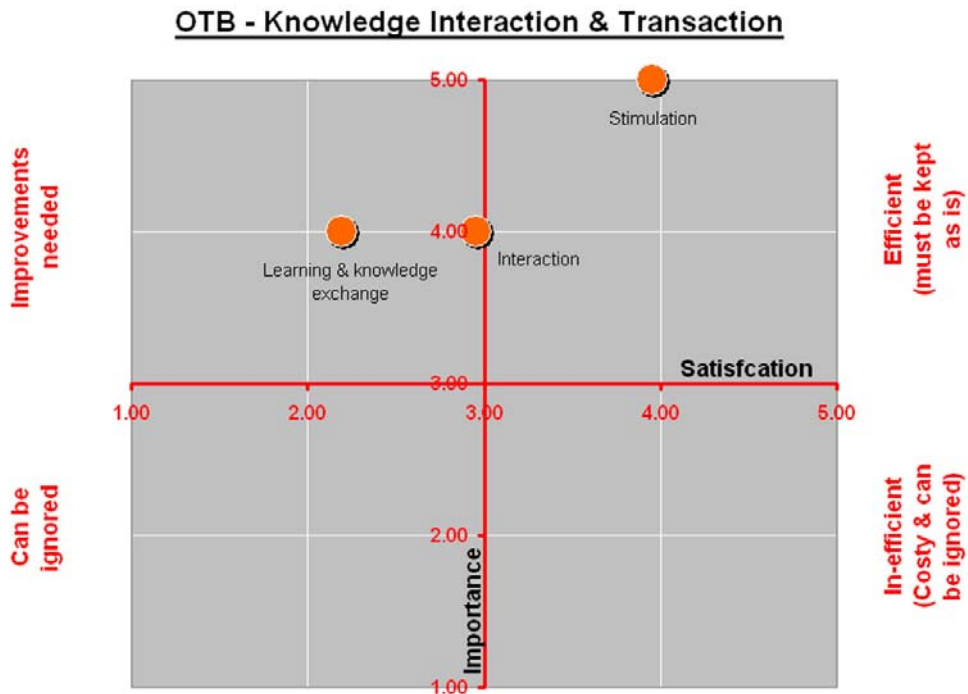


Fig. 7-28: Correlation between Satisfaction and Importance of the Knowledge interaction & transaction dimension

(Source: author)

## **7.10 - CIRCULATION & MOVEMENT**

This dimension is considered quite a neutral dimension – with a mean value of 3.05 – which means that the workers were neutrally satisfied with it. This dimension consists of three items where two scored high rates of satisfaction and only one was low, which was the reception area that later showed very low rates of importance as well. (Fig. 7-29)

Results showed that three departments were relatively satisfied with this dimension; Revenue Assurance Data Integrity, IT Services Operation, and NAM Central FOIS Support. Two were unsatisfied; Voice Service Management and Other. The rest of the departments were slightly more than neutral. There were no significant variances in values between different job levels, age groups, or even genders.

### ***7.10.1 - Sufficient reception area – mean value: 2.40***

This is considered the lowest item in value for this group. On observation, the reception was considerably small in area and didn't have enough seats in it, knowing that any visitor had to wait for his host to come to the reception area and accompany him throughout the premises of the workplace. In the conducted focus group none of the three departments did express any importance for the reception area, but here in this case the architect mustn't leave this item with no improvements. This is considered as the face of the company and is very important to visitors who would build up their first impressions of this company from this very unique space.

### ***7.10.2 - Accessibility – mean value: 3.52***

Considerably a high value item, and on observation workers were observed moving considerably smooth between departments and different floors with no significant obstacles. Main doors were unlocked using a magnetic card system, and all workers were granted accessibility by this card.

### ***7.10.3 - Way finding – mean value: 3.22***

This item as well is quite satisfying to workers. Workers were observed easily finding their way across workstations within their departments or other departments. Though, it was very hard for an outsider to locate himself inside the workplace knowing that all doors looked the same in all floors and the layout was homogenously similar with no significant variances – this issue relates to territoriality - that could help in giving a sense of direction, also there was no signage system in the workplace. The architect must not forget that new workers will perceive way finding as a problem at the beginning until they get used to the office.

### ***7.10.4 - Recommendations***

In OTB for example, the correlation map between importance and performance (Fig. 7-30) showed that Accessibility and way finding were already efficient. But still and as explained earlier, way finding relates to territoriality which if developed will help new comers and outsiders find their way easily. As for the reception and although they weren't satisfied with it, they showed no interest in developing this space, which is also used by other departments and individuals who definitely think it must be improved.

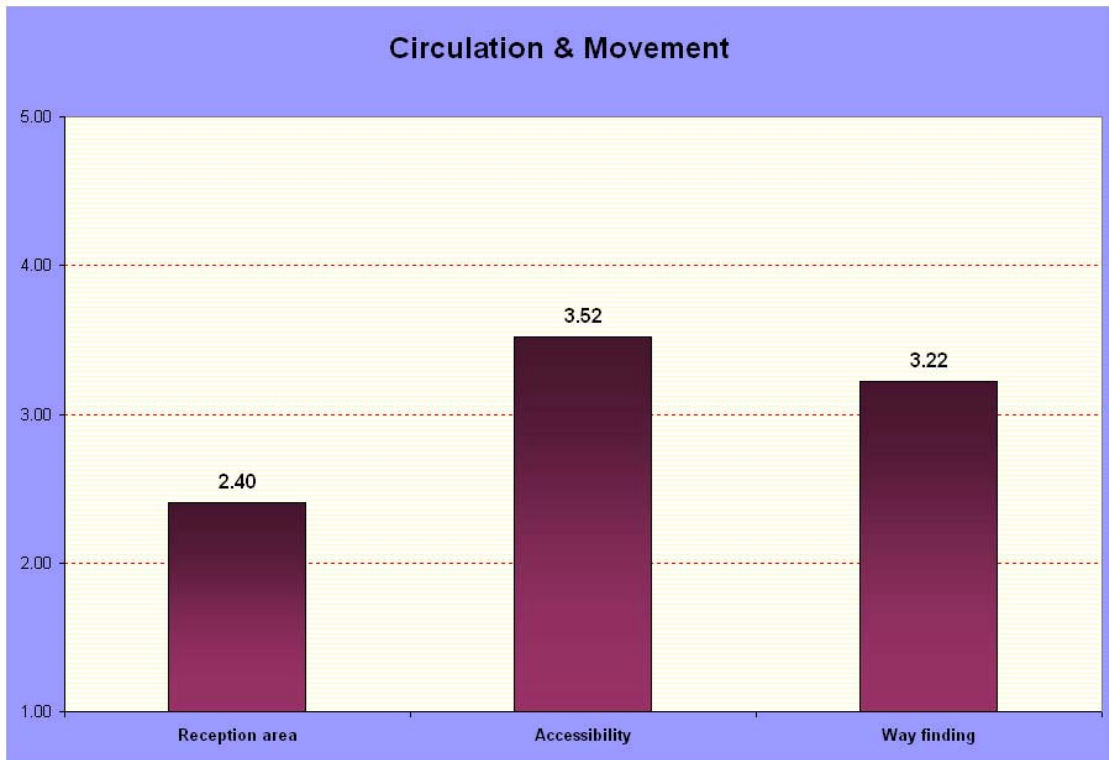


Fig. 7-29: Items of the Circulation & Movement dimension and their scoring; Reception area was low in value while accessibility was noticeably good. Way finding was found to be more than neutral (Source: author)

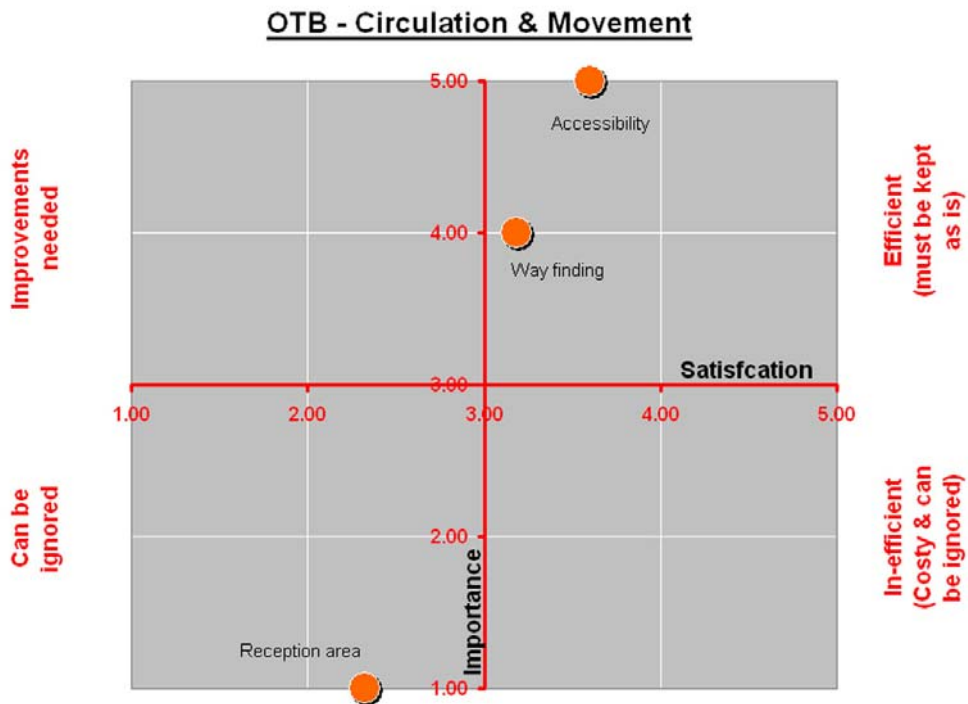


Fig. 7-30: Correlation between Satisfaction and Importance, of the circulation and movement dimension

(Source: author)

## 7.11 - SUMMARY OF DESIGN GUIDELINES

The purpose of this chapter was to discuss the outcomes of the measurement tool in order to present a number of design recommendations that are helpful to the architect in directing the company's investments in their workplace design.

This was targeted by correlating the *performance* levels with the *importance* level of each item of the dimensions for all the departments of the company. Only a number of three departments participated in the focus group which makes the image of the resulting recommendations incomplete. But again, the only difference sensed between departments were the variables concerned with group work activities. So the recommendations therefore are based on the worst case scenario to avoid the dissatisfaction of those who didn't participate in the focus group.

The recommendations were also based on observations that helped very much in explaining a number of confusing issues that resulted either from the survey values of each item or the replies to the open ended questions in the survey.

The problems that were concluded from the whole measurement process are summarized in the following lines, followed by the suggested recommendations that only express the author's view. It has to be noticed here that these recommendations are not the aim of this research and is not a subject for judgments. This is just a demonstration of how the outcomes of the measurement process could be useful in producing logical design recommendations that could direct the architect in his re-design process.

### 7.11.1 - Problems

Problems here are divided into two categories; Non-Design and Design Problems. (Fig. 7-31) The benefit of identifying these problems is the filtration of those that concern the design development from other problems that concern either the business process or people culture. The point is that some of these problems may confuse the designer as they might seemingly look as design problems. The

segregation capability of these types of problems is the proof of success of this whole measurement process, which aims to guide investments in the workplace design.

#### **7.11.1.1 - Non-Design Problems**

These are problems that did have an effect over the workers' satisfaction and were gathered from the survey, personal interviews, or focus group. These problems can be briefed in the following points:

1. **Toilets & Restrooms.** A number of complains were made about the cleanliness and tidiness of restrooms and also smoking inside it. This issue has to deal with people culture and setting some strict regulations in the first place, and maintenance issues in the second place.
2. **Huddle rooms.** The usage of huddle rooms is according to reservation basis. Number of workers complained that those of higher authorities – like managers – would stay in the room for longer periods. Again due to cultural issues they won't complain about people in person and about specific incidents which doesn't help in solving such problems by the top management.
3. **Noise.** In designing open area workspaces, there must be a balance between interaction, privacy, and concentration. But what can't be controlled by design is the behavior of people in producing too much noise, chatting, laughing, and eating at the very primary workspace. Again, strict regulations by management must be set, and people have to be more cooperative in reporting incidents.
4. **Unwillingness to learn.** Although high levels of interaction and stimulation exist in the existing design, but unfortunately the workers themselves are misusing interaction and produce a lot of noise. Interaction was supposed to serve learning and knowledge exchange. People expressed that they are unsatisfied with learning. What was observed was that they did exchange knowledge and experience for attaining their jobs, but they said they don't learn something extra which doesn't add to their knowledge. This was an issue that was discussed with management and also in a focus group. It turned out



that workers have a wealth of material for them to learn from and increase their knowledge, but they actually were unwilling to use it. This issue could be double sided; a non-design and a design problem. The design problem of this issue will be discussed later, but if this is a people culture problem, the design will not be able to solve it.

#### ***7.11.1.2 - Design problems***

These were the problems that mainly affected most of the workers population. They are mainly the outcomes of the survey and are validated by observations and they need the designer's attention. They are briefly listed as follows:

1. ***Concentration***. A lot of workers complained that they have a considerable amount of distraction.
2. ***Personal privacy***. Workers do need to raise the levels of privacy. Especially supervisors, who most of the time are interrupted due to the communal nature of their jobs.
3. ***Retreats***. No retreats are introduced at all in the existing design. Many workers did express a lot of frustration because of this issue.
4. ***Refreshment Points***. Those need to be well equipped.
5. ***Territoriality & Way finding***. There has been no sense of separation between units/departments sensed in the existing design at all. This is an issue that negatively affects way finding.
6. ***Appearance***. This is a major issue, although the survey didn't express a lot of dissatisfaction about this issue, but it was initiated in personal interviews and focus groups. The reason why people didn't express this dissatisfaction in the survey is that they thought that it would be inefficient and an excessive luxury. This of course tells something about people's culture. After all, many spaces must be reconsidered in terms of appearance, including document processing points, circulation elements, refreshment points, workspaces, meeting rooms and some toilets and restrooms. Indoor Plantation and artworks were also missing elements.

7. **Personal storage areas.** Extra units for storage are needed to be added to workstations.
8. **Meetings.** Informal meeting points are imposed to the existing design, which makes it either function improperly or has no place at all.
9. **Learning.** Again the problem of learning is discussed now as a design problem. Actually, a worker psychologically refuses to use the same space where he performs his job for reading or learning and gaining extra knowledge. Other dedicated spaces must be available like libraries or information centers in the workplace that will work as a haven for knowledge. The existing design didn't have any spaces of the kind.
10. **Reception area.** This space needs more care and attention. It is not well furnished and the appearance needs development.
11. **Increasing worker counts.** This is another problem that was not introduced by the measurement tool but was observed. The company is hiring more and more workers every day and fear the place is getting overpopulated.

### **7.11.2 - Recommendations**

Guided by the problems listed above, the new design must introduce the following solutions listed in the following points: (Fig.7-32)

1. **Introduce new modular workstation solution.** These new workstations must attain the following points:
  - a. **Smaller areas.** To invite more worker counts and decrease voids between workstations to prevent uninvited group gathering inside the workspace, thus reducing noise and increasing concentration.
  - b. **Higher partitions.** Fixed and removable, to control the level of privacy and interaction needed. Also this will avoid chatting and gatherings between workstations.
  - c. **Built-in informal meeting.** The modular setting of workstations should allow for internal and enclosed areas to be

used by teams for casual and unplanned meetings that turned out to be important for some departments. This could also be helpful for supervisors to conduct private meetings and interviews with no distractions.

- d. **More storage units.** Workers need more storage units which will be applicable if higher partitions are introduced.
2. **Introduce diversity.** Diversity in the workplace design is a very important issue. People need to change locations and views from time to time. This helps them freshen up and become more productive. The following should be introduced to enhance diversity:
    - a. **Touchdown desks.** These are unaddressed workstations that work on – first come first served – basis. They are also called free address workstations or touchdown. Whatever the name, these are aimed for telecommuters who wish to finish some in-house jobs or for workers who would like to move around and change their places while working. The desk is either equipped with a pc or has plugs for laptops to connect to the company’s network.
    - b. **Couches, café or lounge.** These aim to serve as touchdown stations but in a more casual manner, like placing the couch facing a nice view or surrounding it with a joyful atmosphere as if in a café. These items are not intended to be used as a primary workspace but they surely enhance diversity.
    - c. **Knowledge hubs.** Small and serene spaces completely isolated from the surrounding environment. Intended for research and reading to gain knowledge and learn more.
  3. **Create retreats.** This is a very important issue. These are the places where workers socialize and can always go to for lunch, dinner or any sort of break. They could watch TV or follow news. They can have their own bulletin board to share their thoughts with others. This is the place where a lot of fun and cooling down must happen. Refreshment points are either adjacent or most preferably be integrated with the

space. A counter bar would give the aura of a club. This refreshment point should be well equipped with all the gadgets needed.

4. **Improve Appearance.** Appearance of the workplace must be improved by introducing more artworks and the usage of plantation and more stylish furniture. This will also add to the corporate image which also needs to show in the new design. Other spaces like document processing points or refreshment points need a lot of attention in the new design.

Finally, these design recommendations are subject for editing and change. They only express an approach for using the outcomes of the measurement tool in directing the workplace design. The final design solution must be thoroughly revised by the concerned company and must be approved by them.

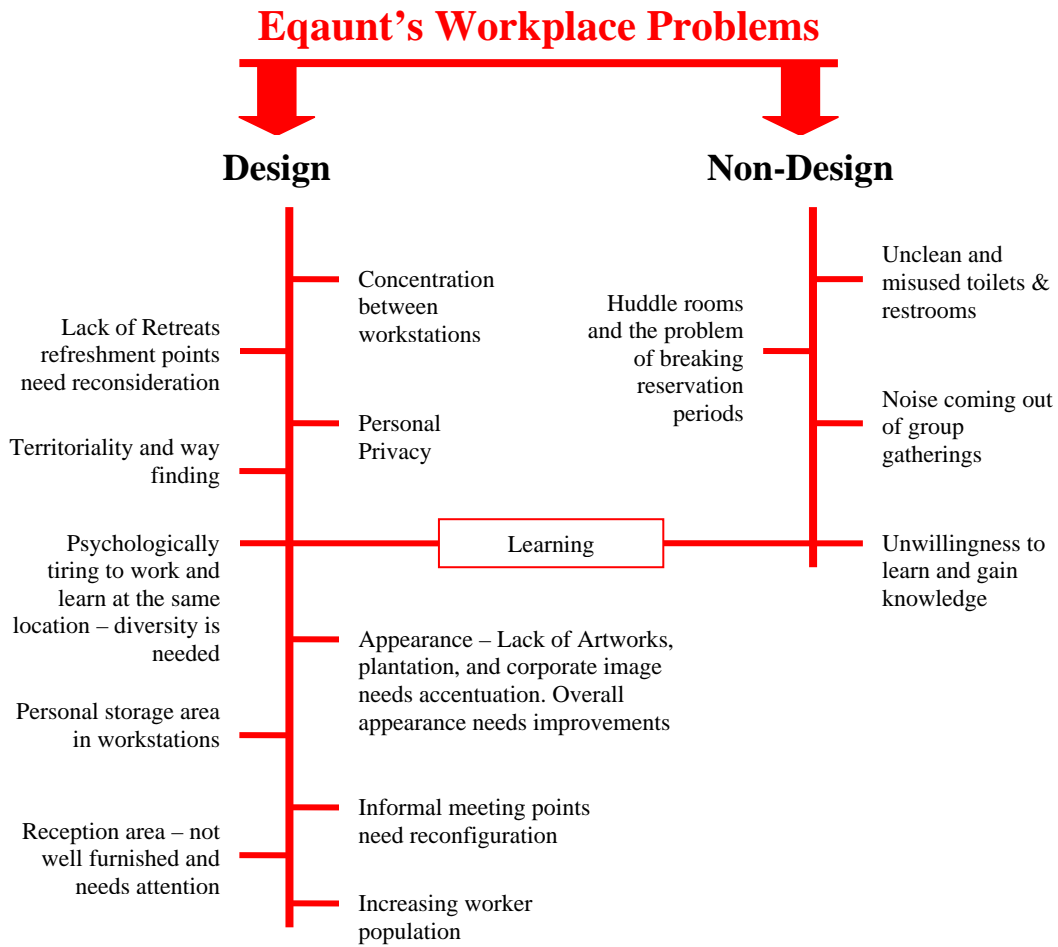


Fig. 7-31: Diagram showing Design and Non-Design problems – the outcome of the measurement process.

(Source: author)

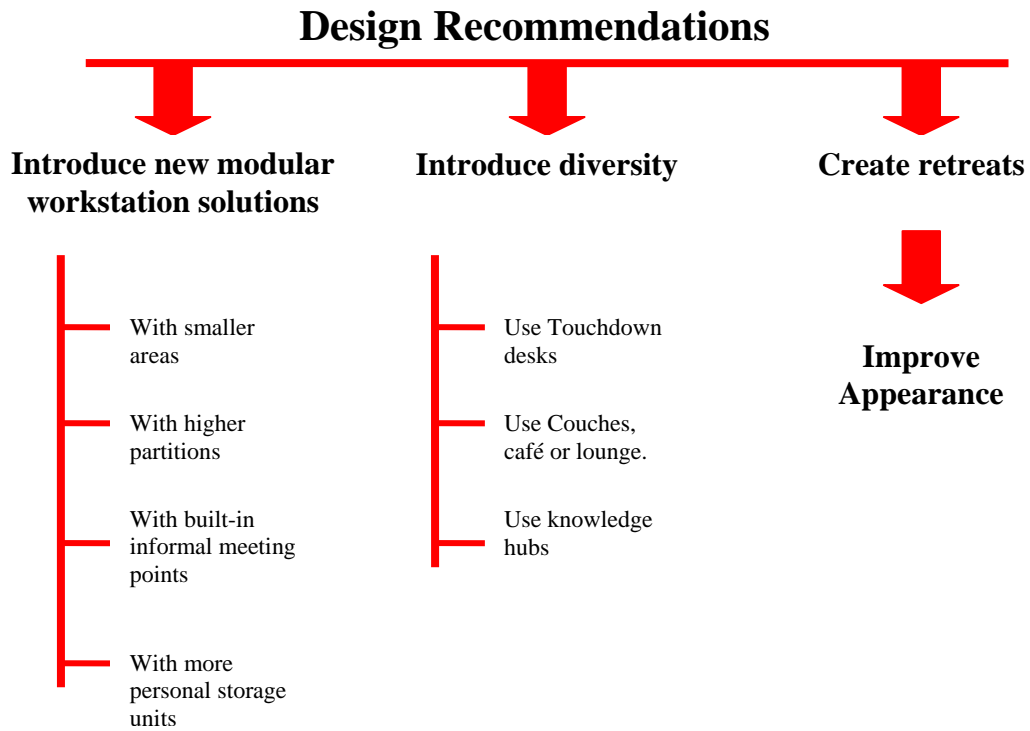


Fig. 7-32: Diagram showing the suggested design recommendations made by the author.

(Source: author)

## **Chapter Eight:**

# **CONCLUSION**

## **8.1 - CONCLUSIONS**

The primary conclusion that could be drawn out of this research work is that the workplace design performance **is** measurable in a number of ways and should be used in directing efficient investments in the workplace design. This research has introduced an approach based on user satisfaction and a frame work that was practically applied and proving to be valid and reliable. In this general setting, a number of conclusions that relate to this subject – measuring workplace design performance – were drawn and stated in the following points.

### ***8.1.1 - The workplace is in continuous change***

The First point in the list of conclusions was that the workplace is in continuous change. The factors that affect this change are many but can be briefly stated in four points which are;

1. The evolution of Information Technology,
2. The new ways of working (the new economy),
3. The changing Real Estate business, and
4. The change in life styles

### ***8.1.2 - There still is a need for building workplaces***

Another very important point is that in spite of this state of continuous change, the office as a built environment is not on its way to extinction as many would suggest. Offices need to be built for the following reasons;

- Stimulating workers
- Working as a repository for information
- Promoting team working (getting people together, sharing ideas and instructions)
- Enhancing personal contacts
- Presenting a tangible corporate image



### ***8.1.3 - Supporting business objectives***

In the knowledge economy, organizations are experiencing a shift from a culture of hierarchical organizational structure and centralised control, to a structure characterized of being flat, decentralized, and networked. This changed the ways of working, producing new workplace design strategies that could serve one or more of the following business objectives;

1. Reducing real estate costs
2. Increasing sales and revenue
3. Increasing team interaction in order to reduce Research & Development cycle time.
4. The need to use the office as a tool of talent recruitment and worker retention.

As a result of the introduction of these alternative workplace design strategies, three trends are now recognisable in the real estate business;

1. **Opening up** – with the linking of space to function rather than status
2. **Sharing** – by increasing the amount of shared space, that can be used by different staff over time
3. **Variety** – providing a wider and richer range of work settings that can support creative and collaborative work.

It has to be noted that there is no ideal workplace design model that can work as a repetitive prototype serving organizations that works in the same field. Again, the effective design of the Workplace depends on the feedback given to the planner, the more precise it is, the more effective the design will be.

### ***8.1.4 - Accommodation of organizational performance***

Another very important issue was concluded which is that the physically designed environment directly affects the organizational behaviour, and the productivity of the workers. In increasing the productivity of knowledge workers, the

designed environment along with the other three key factors - Business processes, People/Organization, and Technology - can lever financial performance that leads consequently to the leveraging of *organizational performance*.

This indicates that the aim in designing workplaces is to accommodate organizational performance which can be consequently achieved by accommodating the five criteria of performance; effectiveness, efficiency, productivity, flexibility, and creativity.

The ultimate contribution to the organizational performance can be reached if a reduction in occupancy costs (efficient accommodation) leads to increased effectiveness of the employees (effective accommodation). But the fear is that organizations are more focused on cost reductions on the expense of effectiveness, therefore a balance should be made between both – efficiency & effectiveness. And since productivity is the ratio between effectiveness and efficiency, therefore this balance can be met by the (productive accommodation) with also a focus on flexibility and creativity. To be more specific, the performance of the workplace design is referred to, here in this research, as the successful accommodation of productivity.

### ***8.1.5 - A multi-disciplinary approach***

Since all the previous factors work collectively to improve organizational performance, then the process of effectively designing workplaces must be of a multidisciplinary approach. The success of the planning process depends on the feedback that is delivered to the architect. The architect should set a special focus on the corporate culture, organizational structure, the organization's message and aims, and drawing an image of the work form of the given organization. This process will involve many disciplines.

### ***8.1.6 - What can't be measured can't be managed***

There still is a lack of awareness by top management un-recognizing the interdisciplinary role of the workplace planner, thus isolating the planner from

translating the true needs of the tenant, which in turn led to the implication of unsuitable conventional office planning – the cause of the problem.

The *problem nature* of this research was identified in the following lines;

**‘The fear that existing workplace environments might be of less responsiveness to knowledge work and does not support the productive accommodation of organizational performance’**

If this accommodation of organizational performance can’t be measured then it can’t be managed. This lead to the *problem decision* which was to;

**‘Measure the workplace design performance in achieving a productive accommodation of organizational performance in the New Economy’**

Therefore, this *research problem* was precisely identified as to;

**‘Develop a measurement tool that would be able to measure workplace design performance in productively accommodating organizational performance regardless the Nature or Location of this organization’**

### ***8.1.7 - Aims of the anticipated measurement tool***

This tool should be able to measure the following points in relevancy to the accommodation of productivity and in the following order;

1. ***The overall workplace design performance*** – which will give insights of how progressive a given workplace, can accommodate productivity.
2. ***The performance of the workplace design attributes*** – The individual variables that did cause this overall result need to be significantly analysed. This helps in diagnosing the workplace performance distinctively.

3. *The level of importance of some design attributes to the workplace productivity* – this will help in efficiently directing the investments only in those attributes that are considered important.

#### ***8.1.8 - User satisfaction – a measurement approach***

Any measurement approach must realize the fact that intangible variables, that add value to the organizational performance but doesn't contribute to the company's profitability calculations, have to be translated into numerical values and measured quantitatively. A conclusion was made that this could be achieved by looking back at workplace productivity – achieved by: people performance, business process, technology used, human resources, and the physically designed environment - is basically measured by worker satisfaction, customer satisfaction, and financial results. It was assumed by this research that worker satisfaction comes first in order before customer satisfaction and financial results. So, if the workplace design succeeds in satisfying the workers, then it is anticipated that the productivity of these workers will be levered, leading to both customer satisfaction and financial results. Hence, it was concluded that worker satisfaction is the key to workplace productivity, and also the key to the measurement approach of this research.

#### ***8.1.9 - Significance of the approach***

What creates the significance of this approach – user satisfaction – is that the design attributes of the workplace are evaluated by the users themselves, they are considered as the only reference, making each case of measurement independent from the other regardless the culture, the type of business, the awareness of workers, the location, or even the scale of company.

#### ***8.1.10 - Measurement considerations***

Some points must be taken into consideration while developing a measurement approach. These points are;

- The measurement tool must not isolate the physically designed environment from the other factors that affect workplace productivity; rather it will be designed in a way that will selectively extract information regarding the design variables of the designed environment.
- There is no such thing as standard results or the ideal workplace design model that could be referred to when comparing the results of a measurement tool.
- The difference in culture, awareness, and past experiences of the workers can affect the outcome of the measurement process. Also the difference in the corporate culture, or even the scale of business could affect the outcome. Factors that might affect the worker's perception were identified as:
  - Relativity,
  - Significant aspects,
  - Knowledge and past experience,
  - Level of involvement,
  - Social context, and
  - Tastes and fashions

### ***8.1.11 - Marketing research and user satisfaction***

The approach of measuring user satisfaction better relates to the field of *marketing research* where the user attitude describes his degree of satisfaction. In this case the user can be perceived as the client and the product is the service provided by the architect and presented in the physically designed environment.

Exploratory research methods are suitable for building-up the measurement frame work since its general objective is to gain insights and ideas; it is particularly helpful in breaking large, vague problem statements into smaller, more precise sub-problem statements, ideally in the form of specific hypotheses, where this should be the aim of any measurement tool.

### ***8.1.12 - Measurement & the re-design process***

It is very important to note that the measurement process comes in the larger course of re-designing an existing workplace; after all, it is the results/outcomes that are anticipated to rule the new design. Design recommendations will help decision makers efficiently invest in the new workplace design. Hence, if integrated workplace design is the aim, certain pre-requisites to the measurement process are needed to be gathered and are identified by this research in the following five points:

- **Learn about the organization message, business objectives, strategic aims**
- **Learn about the Corporate Culture and Organizational structure**
- **Learn about the Working modes and work forms**
- **Inspect the Facility or site**
- **Create a sense of trust**

### ***8.1.13 - Measurement framework***

It was concluded that the building up of the measurement frame work in this research would be brought up in two steps:

- Step 1: ***Attitude*** measurement of the design attributes
- Step 2: Measuring the levels of ***importance*** of design attributes

The degree of worker satisfaction towards the workplace design performance was measured by using an attitude survey. The levels of importance of the design attributes had also to be measured in order to efficiently invest in certain workplace design attributes. Levels of importance are qualitative values that were measured using ***focus groups***.

### ***8.1.14 - Facilities managers & the measurement process***

A list of corporations working in different fields and of different scales were contacted for applying the practical section of this research. Thereby, a very important conclusion was noted; if the request was made to the facilities manager it most

probably will get refused. The facilities manager considers this process as a threat to his job; were he would perceive it as an audit from an external body.

### ***8.1.15 - The Eight dimensions of the measurement scale***

From the results received out of the attitude survey, there were eight subscales or factors that were produced. These factors, named dimensions in this research, constitute a number of relative items concerning certain aspects. These dimensions were presented as follows;

#### **1- Personal Psychological factors**

- 1-1 Concentration
- 1-2 Personal privacy
- 1-3 Work confidentiality
- 1-4 Territoriality
- 1-5 Sense of safety
- 1-6 Status & image

#### **2- Appearance**

- 2-1 Corporate image
- 2-2 Unit/Team/Dept Workspace Visual appeal
- 2-3 Other Spaces Visual Appeal
- 2-4 Circulation elements Visual appeal
- 2-5 Artworks

#### **3- Work Functionality & Efficiency**

- 3-1 Sufficient No. of document processing points
- 3-2 Sufficient Workspace area
- 3-3 Sufficient Personal storage area
- 3-4 Comfort usage of Furniture and Equipment
- 3-5 Efficient Furniture and Equipment

#### **4- Environment**

- 4-1 Lighting
- 4-2 View
- 4-3 Ventilation

#### **5- Physical Comfort & hygiene**

- 5-1 toilets and restrooms
- 5-2 retreats
- 5-3 Refreshment points

## **6- Group Work activities**

- 6-1 No. of Formal meeting rooms
- 6-2 No. of Informal meeting points
- 6-3 area of Formal meeting rooms

## **7- Knowledge Interaction & Transaction**

- 7-1 Interaction
- 7-2 Stimulation & Motivation
- 7-3 Learning & knowledge exchange

## **8- Circulation & Movement**

- 8-1 Sufficient Reception area
- 8-2 Accessibility
- 8-3 Way finding

### ***8.1.16 - Importance level items***

Another conclusion that was drawn out of this application was that not all the items would be measured for importance because some items are considered very important to everyone like lighting and ventilation for example. Therefore, from the available 31 items the following 6 items were excluded:

- 1- ***Sense of safety:*** It is very important that the design offer a sense of safety to all the workers in all departments.
- 2- ***Comfort usage of Furniture and Equipment:*** It is anticipated that all the furniture and equipments are comfortable in their usage; no department would want to compromise this item.
- 3- ***Efficient Furniture and Equipment:*** Also this item relates to the productivity of departments, they wouldn't want to sacrifice it.
- 4- ***Lighting:*** A very important item to everyone.
- 5- ***Ventilation:*** Also a very important item to everyone.
- 6- ***Toilets and restrooms:*** Another very important item.

### ***8.1.17 - Correlations of performance vs. importance***

The outcomes of the measurement tool can present a number of design recommendations that are helpful to the architect in directing the company's



investments in their workplace design, achieved by correlating the *performance* levels with the *importance* level of each of the produced dimensions for all the departments of the company.

### ***8.1.18 - Observations***

The design recommendations should be based on observations that will help in explaining a number of confusing issues that result either from the survey values of each item or the replies of the open ended questions in the survey.

## **8.2 - RECOMMENDATIONS**

### ***8.2.1 - Involvement of the architect***

It was previously shown how important it is to involve the physically designed environment into the strategic planning of any organization by accommodating organizational performance. In order to achieve this goal, Workplace planners and facilities managers have to be part of the strategic planning process of their organizations, the top management has to realize this fact and adopt it. It also has to realize that the planning of the workplace now has become of an interdisciplinary approach where not only architects are involved but also architects of the business processes, consultants of the technological solutions, human resources, and some times even representatives of the workers from different departments as well.

### ***8.2.2 - Feeding the architect***

This leads the subject to a very important issue, which is feeding the architect with very accurate, precise, and specific information. It was shown that the implication of conventional office planning is way too far from what the office planning of the new world economy requires. Data given to the architect is crucial, for he will design different solutions that not only will fit each department, but will fit different individuals of the same department as well, according to business objectives.

### ***8.2.3 - Architect awareness***

Mentioning business objectives, architects working in this field must be aware of all the modern workplace design strategies – sometimes named (Alternative Workplace Environments or Strategies) AWE or AWS – that are used to serve these business objectives. Any architect specializing in the field of workplace design must also be well aware of the changes and trends that are taking place in the real estate business of opening up, sharing, and variety.

### ***8.2.4 - Realizing the significance of measurements***

What can't be measured can't be managed. All the players in the field of workplace design from architects to managers have to realize the importance of measuring the workplace design performance. Measuring performance will help them document the role of the workplace in accommodating organizational performance. It will also help decision makers on all levels in directing their investments in the workplace design.

### ***8.2.5 - Involving customer satisfaction***

The measurement approach proposed by this research was based on user satisfaction. This research focused on worker satisfaction as the key to customer satisfaction and financial results. After succeeding in applying this tool on workers, where the statistical calculations showed it produces reliable and valid results, this measurement approach can expand precision by also measuring customer satisfaction as well. But this is not always applicable were not all organizations directly host customers in their facilities.

### ***8.2.6 - Recommended sample size***

It was stated before that this type of multi-item scales has a minimum sample size of 200 replies. It is recommended that this tool would be applied on cases that have a total population of not less than 1000 workers if the survey will be delivered by an e-mail questionnaire. The e-mail questionnaire has a 20% estimated response rate; it was 25% in Equant which showed that the rate of participation was higher than

expected. If another method of administration will be applied then the rule is to obtain more than 200 replies. This was found to be the only limitation for this measurement tool, but there were no other limitations like different business types, or different cultures, or even different locations.

### ***8.2.7 - Managing the application approach***

It is also recommended that when trying to propose the measurement of workplace design performance as a service, permission should be obtained from the top management and contacts with facilities managers should be prevented. If the inverse happens, then most probably the facilities manager will do his best to refuse this service in order not to be a subject for external judgements.

### ***8.2.8 - Observations are important in measurements***

It is recommended that the architect would build up his final decisions supported by observations. Observations either support or reject replies and outcomes achieved from the measurement tool. There was found to be some problems that might seem as design issues, but then turned out to be either cultural issues or any other non-design issues. Observations help segregate design from non-design issues.

### ***8.2.9 - Apply focus groups in similar measurements***

In a trial to measure importance levels by a survey, it was found that the results were very contradicting. It meant that every individual has his own opinion about the business needs of his job and his department as well, which can never be valid as an answer because of the contradictions between him and his fellow partners of the same job level and department. It is recommended that importance levels should be measured in focus groups as was shown in this research application.

## **8.3 - FUTURE RESEARCH WORK**

### ***8.3.1 - Accommodating productivity***

More studies should be made on the physically designed environment in accommodating workplace productivity. Researchers in the field of marketing research and organizational behaviour are invited to participate in such studies. In these studies, worker and workplace needs should be explored creating a wider range of design items that can be separately developed for usage in attitude surveys.

### ***8.3.2 - Exploring new measurement approaches***

Other measurement approaches also have to be explored in measuring workplace design performance. These measurement approaches have to concentrate on translating qualitative design attributes to quantitative values. It also must be based on directing the investments of the workplace design.

### ***8.3.3 - Developing the feedback process***

The process of mapping work forms has to be more developed. In these further studies, details of the type of work activities and work modes have to be further explored. The whole process of extracting this type of information in order to create a profile map of a specific unit or department needs developments.

### ***8.3.4 - Strengthening user participation***

In measuring the workplace design performance, user participation was found to be crucial for the success of the whole process; this is basically built upon building trust. The building of trust is not an easy process, it is very important to an extent that it needs to be developed in a methodological way. Again, researchers in the field of organizational behaviour are invited to participate in this area.

### ***8.3.5 - Cause-effect research***

After drawing the final design results that are also approved by the top management, this new proposal has to be tested. This could never be achieved unless a Cause-Effect relationship study is conducted. This study needs huge resources, it needs an organization that is willing to invest in at least a single department and wait and see the effect of the new proposal on the department's productivity. Another way is to build up the new proposal in a living lab – also another costly solution.

### ***8.3.6 - Expanding measurements***

This research opens the door to apply design performance measurements on other public building types like hospitals or airports. Based on user satisfaction, the same framework could be applied but after introducing design items that are concerned with certain building types.

### ***8.3.7 - Developing workplace design solutions***

Workplace solutions also need development. This measurement tool opens the door – using its diagnostic capabilities – for directing these developments and producing new ideas that could serve specific needs like collaborative work or group work for example. More research work will be needed in this area.

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- **American society of interior designers** - <http://www.asid.org>
- **Architectural Programming,** Boston Architectural Center - <http://www.predesign.org/Office.html>
- **Architecture Guide** web site - <http://www.architectureguide.com/>
- **Architecture Minnesota:** The Magazine of AIA Minnesota - [http://www.aia-mn.org/am\\_magazine/editorial.cfm](http://www.aia-mn.org/am_magazine/editorial.cfm)
- **architecture.com:** one of the world's most extensive built environment portals, all courtesy of the Royal Institute of British Architects - <http://www.architecture.com/go/Architecture/Home.html>
- **ASTM International:** An open forum for the development of high-quality, market relevant international standards used around the globe - <http://www.astm.org/cgi-bin/SoftCart.exe/index.shtml?E+mystore>
- **AUC Libraries:** <http://library.aucegypt.edu/>
- **Bene:** Office furniture and solutions - [http://bene.com/benecom/Cont\\_en.nsf/webhtml/benecom.html](http://bene.com/benecom/Cont_en.nsf/webhtml/benecom.html)
- **BRE** - the UK's leading centre of expertise on buildings, construction, energy, environment, fire and risk. URL: <http://www.bre.co.uk/>
- **Breathe:** workplace design and relocation consultants - <http://www.breathegroup.com/>
- **CABE:** Commission for Architecture and the Built Environment - <http://www.cabe.org.uk/>
- **Callison Architecture:** workplace consultancy firm - <http://www.callison.com>
- **Center for social research methods:** a website for people involved in applied social research and evaluation. - <http://www.socialresearchmethods.net/>
- **Conway Data:** The Information Resource for the Development Industry - <http://www.conway.com/geofacts/documents/>
- **DEGW** - an international design consultancy committed to delivering strategy as well as practical design solutions - <http://www.degw.com/>
- **EDRA** - Environmental Design Research Association: an international, interdisciplinary organization founded in 1968 by design professionals, social scientists, students, educators, and facility managers. The purpose of edra is the advancement and dissemination of environmental design research, thereby improving understanding of the interrelationships between people, their built and natural surroundings, and helping to create environments responsive to human needs - <http://www.edra.org>
- **Emerald:** Emerald is a leading English language publisher of academic and professional literature in the fields of management, library services and engineering. -

<http://www.emeraldinsight.com/Insight/menuNavigation.do?hdAction=InsightHome>

- **Equant:** A subsidiary of France telecom specialized in Virtual private networks - <http://www.equant.com>
- **Facilities First:** specializes in workplace design and project management. - <http://www.facilitiesfirst.ab.ca/>
- **Gabion:** the site of Hugh Pearman, London-based architecture and design critic - <http://www.hughpearman.com/articles>
- **HR Files** - <http://adtimes.nstp.com.my/jobstory/articles.htm>
- **ICF:** A not-for-profit, non-governmental, scientific and educational organization. Their mission is to improve the functionality, suitability and quality of the places where people work and live, and of other constructed assets - <http://www.icf-cebe.com/>
- **IDC:** the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. - <http://www.idcresearch.com>
- **IFMA:** the largest and most widely recognized professional association for facility management, supporting more than 18,500 members - <http://www.ifma.org>
- **InformeDesign:** A research and communication tool for designers - <http://www.informedesign.umn.edu/>
- **INTRA:** the interiors magazine for the working architect and designer - <http://www.intra-design.com/>
- **Neal Zimmerman and Associates:** Home office designs - <http://www.atworkathome.com/>
- **NRC:** National research council Canada - <http://www.nrc.ca>
- **Occupier:** A wealth of valuable information linking real estate and facilities with corporate output and productivity. - <http://www.occupier.org/>
- **Optrys:** a company that specialise in design, fit out and furnishing of commercial interiors. - <http://www.optrys.com/>
- **PdK Consulting:** a firm which focuses on Workplace performance optimization and on measuring the resulting performance improvements - <http://www.pdkconsulting.com>
- **POE** - A specialist architectural practice operating in the field of POE - <http://www.postoccupancyevaluation.com>
- **RKW Space Management Consultants** - <http://rkw.co.uk/>
- **Steelcase:** The Metal Office Furniture Company in Grand Rapids, Michigan - <http://www.steelcase.com>
- **The Center for Building Performance and Diagnostics**, in the School of Architecture at Carnegie Mellon University, conducts research, demonstrations, and teaching in relation to the performance of advanced building systems and technologies. - <http://www.arc.cmu.edu/cbpd/index.html>
- **The Cornell University International Workplace Studies Program (IWSP)** - <http://iwsp.human.cornell.edu/>
- **The Environments Group:** a full-service design firm that specializes in the creation of effective workspace - <http://www.envgroup.com>

- **The International Interior Design Association (IIDA):** A professional networking and educational association of more than 10,000 Members in 8 specialty Forums, 9 Regions, and more than 30 Chapters around the world committed to enhancing the quality of life through excellence in interior design and advancing interior design through knowledge. - <http://www.iida.org/i4a/pages/index.cfm?pageid=122>
- **The World Confederation of Productivity Science** - <http://www.wcps.info/>
- **U.S. census bureau** - <http://www.census.gov>
- **WBDG:** Whole building design guide - office buildings - <http://www.wbdg.org/design/office.php?email=1>
- **Webster's online dictionary** - <http://www.websters-online-dictionary.org>
- **Working Wounded:** the brainchild of author, speaker and columnist Bob Rosner. Bob is the author of "Working Wounded: Advice That Adds Insight to Injury" (Warner Books and Time Warner Audio Books, 1998). - <http://www.workingwounded.com>
- **Workplace Designs Limited:** a design consultancy practice specialising in the design and effective use of space within the workplace. - [http://www.wdLtd.com/start\\_html.asp](http://www.wdLtd.com/start_html.asp)
- **WorkPlace Dynamics:** is dedicated to creating dynamic workplaces where employees are fully engaged in the business of the organization and feel more connected to their work. - <http://www.wplaced.com/>
- **Workplayce:** Workplace consultancy agency - <http://www.workplayce.com>
- **Workspace:** Distributed Work support through component based SPAtial Computing Environments - <http://www.daimi.au.dk/workspace/index.shtml>
- **World Workplace :** IFMA's World Workplace Conference & Expo - <http://www.worldworkplace.org>
- **Zoomerang:** a pioneer in online survey software - <http://www.zoomerang.com>

## PLANNING THE WORKPLACE

There has been a big challenge in the real estate business to build workplaces in the New Economy that would host all types of office work activities, modes, and forms of the 'Knowledge Work'. This made the real challenge of the planning process is to meet those demands by concentrating on the internal configuration of the space. Many successful workplaces are now old buildings, not necessarily custom built and have been utilized and re-engineered to host corporate work. The effectively designed workplace is a result of a very thorough process of data gathering – the following topics should be gathered.

### *Corporate culture*

Understanding the corporate culture will not only help draw an image of the work modes that will directly affect the planning of the workplace, but will also help preparing the perception of the different needs like spaces, communication, ambience and activity physical and psychosocial needs that will determine the proper workplace configuration. Edgar Schein<sup>1</sup> defines corporate culture as;

**The pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.<sup>2</sup>**

Another very comprehensive definition of the corporate culture is the one made by Victor S. L. Tan.<sup>3</sup> In his article “**Defining corporate culture**”<sup>4</sup> he defines it as;

**The way people do things in an organization. A set of norms comprised of beliefs, attitudes, core values and behavioral patterns shared by people in an organization. (Fig. a-1)**

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<sup>1</sup> One of the founders of the field of organizational development

<sup>2</sup> Schein, Edgar H., “**Coming to a New Awareness of Organizational Culture**,” in *The Organizational Behavior Reader*, by David A. Kolb, Irwin M. Rubin, and Joyce S. Osland, Fifth Edition (Prentice Hall, Englewood Cliffs, NJ, 1991), 370.

<sup>3</sup> An international consultant and the CEO of “**KL strategic change consulting group**” specializing in strategic change and corporate culture.

<sup>4</sup> HR File website. August 12, 2000. URL: <http://adtimes.nstp.com.my/jobstory/articles.htm>

In the same article, Victor adds that organization behavior experts agree that there are about 10 characteristics that when combined provide an insights to describe the essence of the culture of an organization; (Fig. a-2)

1. **Individual initiative:** *the degree of responsibility, freedom and independence that individuals have.*
2. **Risk tolerance:** *the degree to which employees are encouraged to be aggressive, innovative and risk-taking.*
3. **Direction:** *the degree to which the organization creates clear objectives and performance expectations.*
4. **Integration:** *the degree to which the units within the organization are encouraged to operate in a coordinated manner.*
5. **Management support:** *the degree to which managers provide clear communication, assistance and support to their subordinates.*
6. **Control:** *the number of rules and regulations, and the amount of direct supervision that is used to oversee and control employee behavior.*
7. **Identity:** *the degree to which members identify with the organization as a whole rather than with their particular work group or field of professional expertise.*
8. **Reward system:** *the degree to which reward allocations (that is salary increase and promotions) are based on employee performance criteria in contrast to seniority, favoritism, and so on.*
9. **Conflict tolerance:** *the degree to which employees are encouraged to air conflicts and criticisms openly.*
10. **Communication patterns:** *the degree to which organizational communications are restricted to the formal hierarchy of authority.*

Employees are invited to participate in rating these characteristics in order to understand the corporate culture of an organization. (Fig. a-3)

### ***Types of office work activities (WHAT is the work done?)***

Tailoring an office design that will fit the very specific needs of a corporation, calls for asking three questions; **WHAT** is the work done (types of office work activities), **HOW** is the work done (Modes of work activities), and **WHERE** is the work done (Space configuration). By relating the outcomes of these three issues, a vivid proposal of the workplace design could be reached.

Modes of work are outcomes of the types of office work, they cannot be determined without fully understanding the types of work done in the office. They are essential to determine where the work is done, or in other words, the workplace configuration.



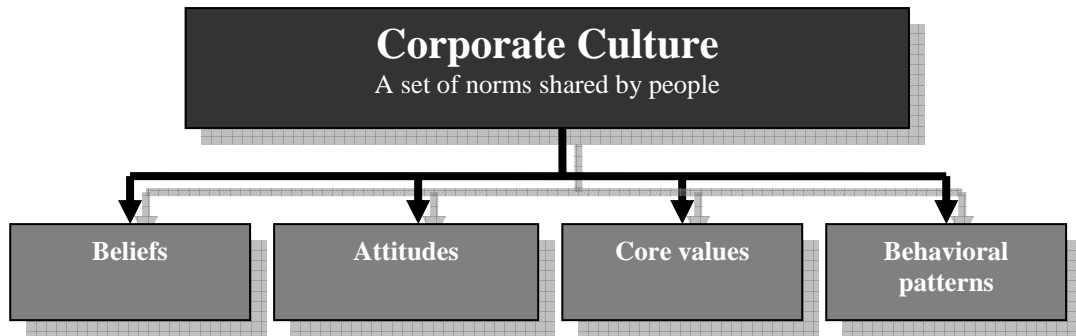


Fig. a-1: Different Norms shared by people that form the Corporate Culture.

(Source: Author, based on the definition by Tan V.)



Fig. a-2: The indoor basketball court at TBWA / Chiat / Day is a relatively extreme example of an exercise area. It reflects the cultural background of the staff, who are for the most part young.

(Source: Arnold, T. Hascher, R. Jeska, S. Klauck, B. *Office buildings, a design manual*. 2002. Birkhauser – Publishers for architecture, Switzerland. P.196.)



Fig. a-3: Employees are invited to participate in rating these characteristics in order to understand the corporate culture of an organization.

(Source: <http://www.postoccupancyevaluation.com> )

Thomas Arnold and Birgit Klauck, describe the types of office work as follows; (Fig. a-4 &)

1. *Logistics and information: Serve to organize the work mode of the organization as well as for the provision and the transmission of information relevant to the organization.*
2. *Tasks: Simple, standardized, repetitive activities that serve to record operational data, to evaluate it and transmit it. In the past, this was the main ingredient of office work.*
3. *Projects: In a project, the knowledge and experiential horizon of a group is drawn upon to solve a problem.*
4. *Discussions or meetings: Targeted communication that serves for the exchange of information, briefing and strategy development.*<sup>5</sup>

Today's job descriptions, however, seldom list just one function; instead, office work consists of a complex combination of these main functions.

### ***Different work modes (HOW is the work done?)***

Understanding the work modes is very essential to office design; an approach to classify office spatial forms from the perspective of occupancy. As a rule, architects used to classify office buildings merely relative to the organization formal and structural criteria<sup>6</sup>. In the seventies, **DEGW** developed the first approaches to analyze the relation between office planning and organizational structure. The categories proposed by **DEGW** focused for the first time not just on the spatial form, but also on the form of organization. Often, office functions can be fulfilled in different ways; alone, alone in the group, together in the group or together in the round of talks. These types of organizations, each with a specific mode of working, were respectively categorized by DEGW as; (Fig. a-6)

1. ***Individual work:*** means work requiring concentrated attention or study – like development tasks – carried out by an individual.
2. ***Process work:*** work carried out alone in the group, clearly structured clerical work organized so that the tasks can be carried out in sequence, whereby the individual steps in the work are repetitive.
3. ***Group process:*** Group process (usually team work) is distinguished by the interaction of all those involved and by a common goal.
4. ***Transactional knowledge work:*** defined as informal conversation with the goal of exchanging knowledge and experience, and it has the effect of consolidating the organization's social system.

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<sup>5</sup> Arnold, T. Hascher, R. Jeska, S. Klauck, B. **Principles of project selection and classification. In Office buildings, a design manual.** 2002. Birkhauser – Publishers for architecture, Switzerland.

<sup>6</sup> Arnold, T. Hascher, R. Jeska, S. Klauck, B. **Office buildings, a design manual.** 2002. Birkhauser – Publishers for architecture, Switzerland. P.82.

These modes differ according to the rate of Interaction and Autonomy. (Fig. a-7) Each of these types will lead to a different usage of space and workplace configuration; they are not necessarily accompanied by specific spatial forms.

With the increasing complexity of projects and tasks involving isolated cases, the office worker is turning into a *‘transactional knowledge worker,’* a worker who exchanges information. The logistics and information proportion and the task-determined need for exchange will increase steadily. Furthermore, there is a growing need for informal exchange in modern network organizations, not least because it also serves the structure and maintenance of the network. The results of *‘Workplace Envisioning’*<sup>7</sup> workshops strengthen this hypothesis. About these results Duffy and Tanis wrote;

**The results far exceeded our expectations of both the rapidity and the direction of change. They also confirmed our fears that the gap between the reality of business life and the norms of the conventional office is already huge and is widening rapidly. Our first surprise was that 58 percent of the respondents already locate themselves today in the upper, “unconventional” half of the matrix. (Fig. a-8)**

**The same respondents were asked where they believed work styles would migrate to in the next three to five years. The astonishing response, as shown in (Fig. a-9), is that they expected no less than 63 percent of office workers will need the higher levels of interaction of the upper part of the matrix. Moreover the respondents expected that 43 percent of office workers will occupy the upper right hand quadrant of the matrix, i.e. they are expected to be operating in the full knowledge worker mode that combines high interaction and high autonomy.**<sup>8</sup>

This *‘knowledge worker’* no longer needs to go to the office to work on tasks and projects, but instead uses it as a meeting point. For this person, the office building is a spatial interface in a wide-reaching network, and transactional work as an autonomous mode of working is therefore gaining in importance.

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<sup>7</sup> The computer aided *Workplace Envisioning* workshops conducted by Steelcase – an office furniture manufacturer were Data was compiled by Steelcase from 23 leading edge North American and European companies. A total of over 5,000 employees from these companies took part in the workshops.

<sup>8</sup> Tanis J, Duffy F. **A Vision of the New Workplace Revisited.** A paper published in The International Development Research Council’s journal, *Industrial Development*, 1999.

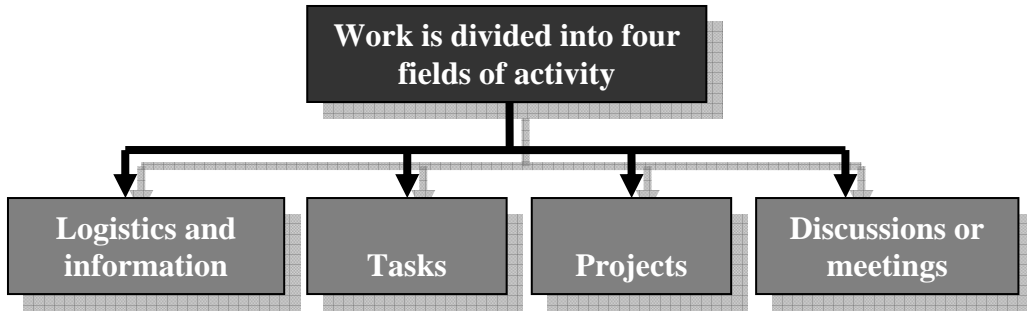


Fig. a-4: The four basic fields of activities that divide work

(Source: Author, based on ‘Principles of project selection and classification,’ an essay written by Arnold T, Klauck B.)

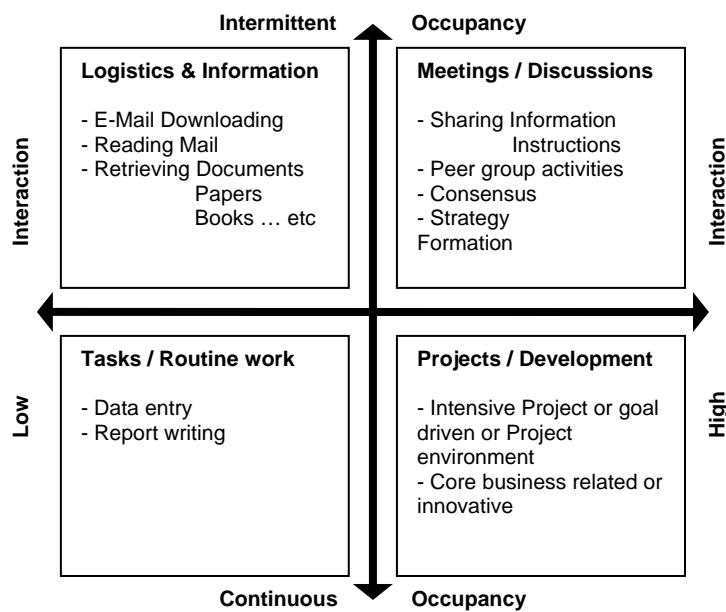


Fig a-5: Types of office work in relation to occupancy and interaction rates

(Source: Author, based on ‘Principles of project selection and classification,’ an essay written by Arnold T, Klauck B)

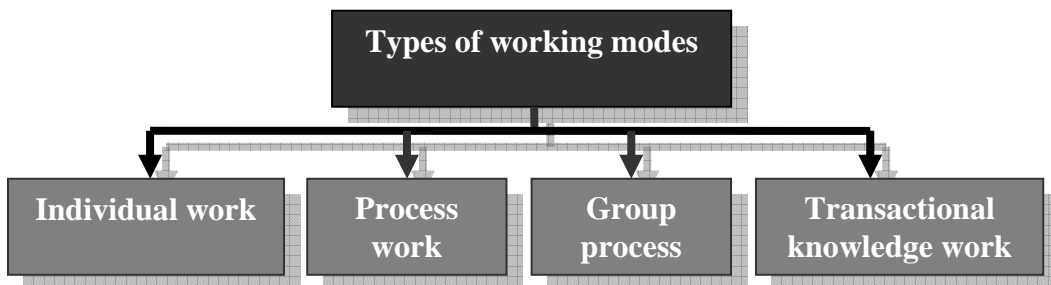


Fig a-6: The four types of working modes.

(Source: Author, based on ‘Principles of project selection and classification,’ an essay written by Arnold T, Klauck B)

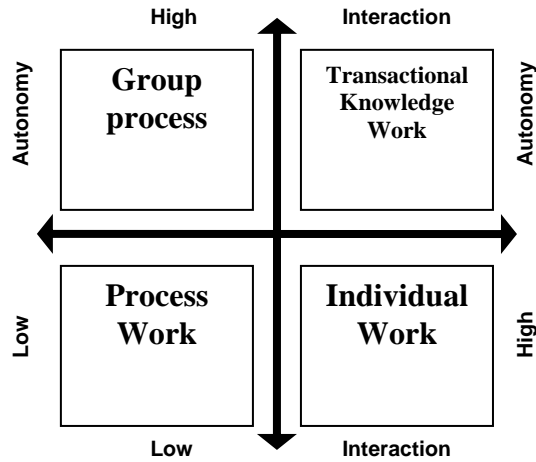


Fig a-7: Modes of work in relation to autonomy and interaction rates

(Source: Author, based on ‘Principles of project selection and classification,’ an essay written by Arnold T, Klauck B)

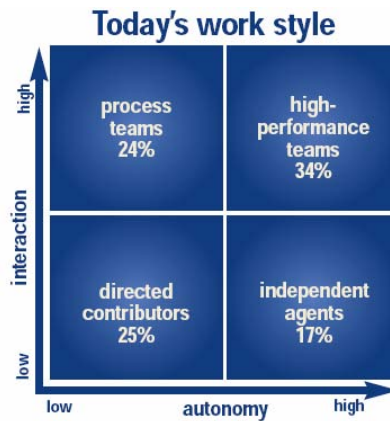


Fig a-8: 58 percent of the respondents already locate themselves today in the upper, “unconventional” half of the matrix

(Source: Tanis & Duffy. A Vision of the New Workplace Revisited. A paper published in The International Development Research Council’s journal, Industrial Development, 1999.)

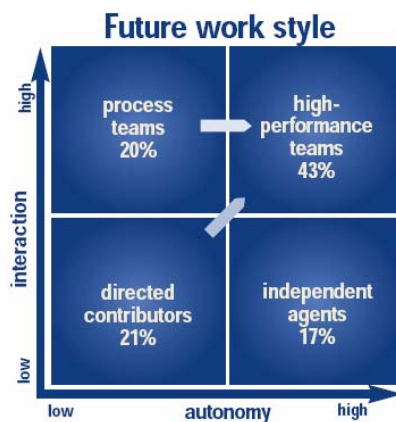


Fig a-9: No less than 63 percent of office workers will need the higher levels of interaction of the upper part of the matrix.

(Source: Tanis & Duffy. A Vision of the New Workplace Revisited. A paper published in The International Development Research Council’s journal, Industrial Development, 1999.)

***Design models (WHERE the work is done?)***

In a direct reflection to the types of office work activities, and the modes of office work, four models of design were identified. In “**New Environments for Working**,” a study that was done by **DEGW** in collaboration with the Building Research Establishment<sup>9</sup> in 1996, these four basic types of office models were metaphorically identified as; (Fig. a-10)

1. **Hive:** *takes its name from the workplaces arrangement and the functions within it. Primarily standardized clerical work being carried out by individuals is found here.*
2. **Den:** *is supposed to convey the idea of a busy place that fosters group processes and interactive team work.*
3. **Cell:** *designates a monastery or convent with cells in which the individual could work in a concentrated fashion.*
4. **Club:** *is intended to draw on the image of the traditional gentlemen’s club, a place for communication.*

Ideally, the different functions, tasks or activities and modes of working require specific spatial situations and workplace configurations. These configurations are found in the previously mentioned models. They could serve perhaps more than one work mode. (Fig. a-11) Following are spatial examples to the four different modes of working;

1. **Individual work:** *requires quiet and concentration and therefore needs a closed room, such as either a cell or one with high, shielding walls in the open work area, like the cubicle. It is also carried out en route cafes and business lounges.*
2. **Process work:** *is based on clearly-structured procedures carried out in sequential steps that are mirrored in the arrangement of the workplace and for this reason can be most efficiently carried out in an open work area. Here, the spatial definition of an ‘open plan layout’ becomes an open work area, an area that not only permits process work, but also informal working in different ways; it is distinguished by a high degree of flexibility. It therefore takes into account the ever more rapid succession of organizational changes in the enterprise.*
3. **Group process:** *The interaction essential for group processes require assigning the work areas directly to the team members, either in the group room or in an open work area with a clearly defined assignment of workplaces and communication areas. Teams that work in a network structure have a fixed framework within which they communicate with each other (web pages, for example), but also actual meeting points.*

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<sup>9</sup> BRE is the UK’s leading centre of expertise on buildings, construction, energy, environment, fire and risk. URL: <http://www.bre.co.uk/>

4. **Transactional knowledge work:** *On the one hand, transactional work takes place formally in the conference room, while on the other, informal communication, which was underrated in the past, is fostered by the provision of spaces such as lounges, clubs, cafes, and the upgrading of service points (office technical support, kitchens).*

### ***Physical work forms***

According to Birgit Klauck, another approach to classify work modes – is individual work, group work or team work.<sup>10</sup> Respectively, the first two correspond to concentrated study and individual process work; group and transactional work together correspond to team work. Work forms are a way to physically describe work modes in their spatial settings. These work forms give insights into the appropriate spatial relations between the basic modules.

Permanent or project-based group activities are those in which the participants have a common goal. In group work, the total task is distributed to individual specialists and worked on in a relatively autonomous fashion.

In contrast, the essence of collaborative teamwork lies in the interaction between all those involved. Different forms of teamwork are distinguished as;

1. **The sequential team:** *Characterized by an information and data flow – in which the development of each stage is based on the previous one – with the accompanying organizational structure.*
2. **The matrix team:** *Brings together people whose strengths lie in different areas in order to carry out specified tasks. It consists of employees from different departments, so the matrix team is cross-functional, multi-disciplinary and often de-centrally organized, which is to say independent of spatial conditions.*
3. **The autonomous team:** *Is also cross-functional. However, the employees belong to the same department, and in spatial terms, the team is centrally located so that significantly greater intensity can be attained with regard to group processes. Here, the focus is on the most effective combination of employees with special knowledge and experience for carrying out a task. (Fig. a-12)*

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<sup>10</sup> Arnold, T. Hascher, R. Jeska, S. Klauck, B. Communication as the focus of office planning. In - Office buildings, a design manual. 2002. Birkhauser – Publishers for architecture, Switzerland.





**Hive**

**Image Source:** Raymond .S, Cunliffe .R, *Tomorrow's office, creating effective and humane interiors*, E & FN Spon. 1997. P.9



**Den**

**Image Source:** [www.sci.tamucc.edu](http://www.sci.tamucc.edu)



**Club**

**Image Source:** <http://lshdesign.com>



**Cell**

**Image Source:** [www.mwcog.org](http://www.mwcog.org)

Fig. a-10 : Different design models of the workplace according to DEGW

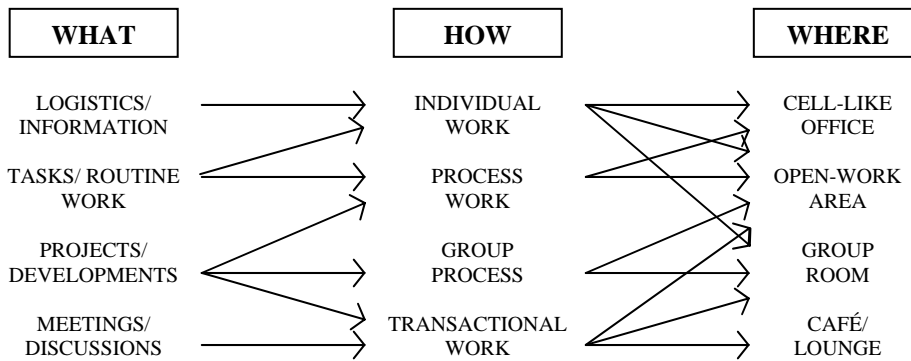


Fig a-11: Relating Workplace design models (WHERE the work is done) with the MODES and TYPES of office work activities.

(Source: author based on Arnold, T. Hascher, R. Jeska, S. Klauck, B. Office buildings, a design manual. 2002. Birkhauser – Publishers for architecture, Switzerland. )



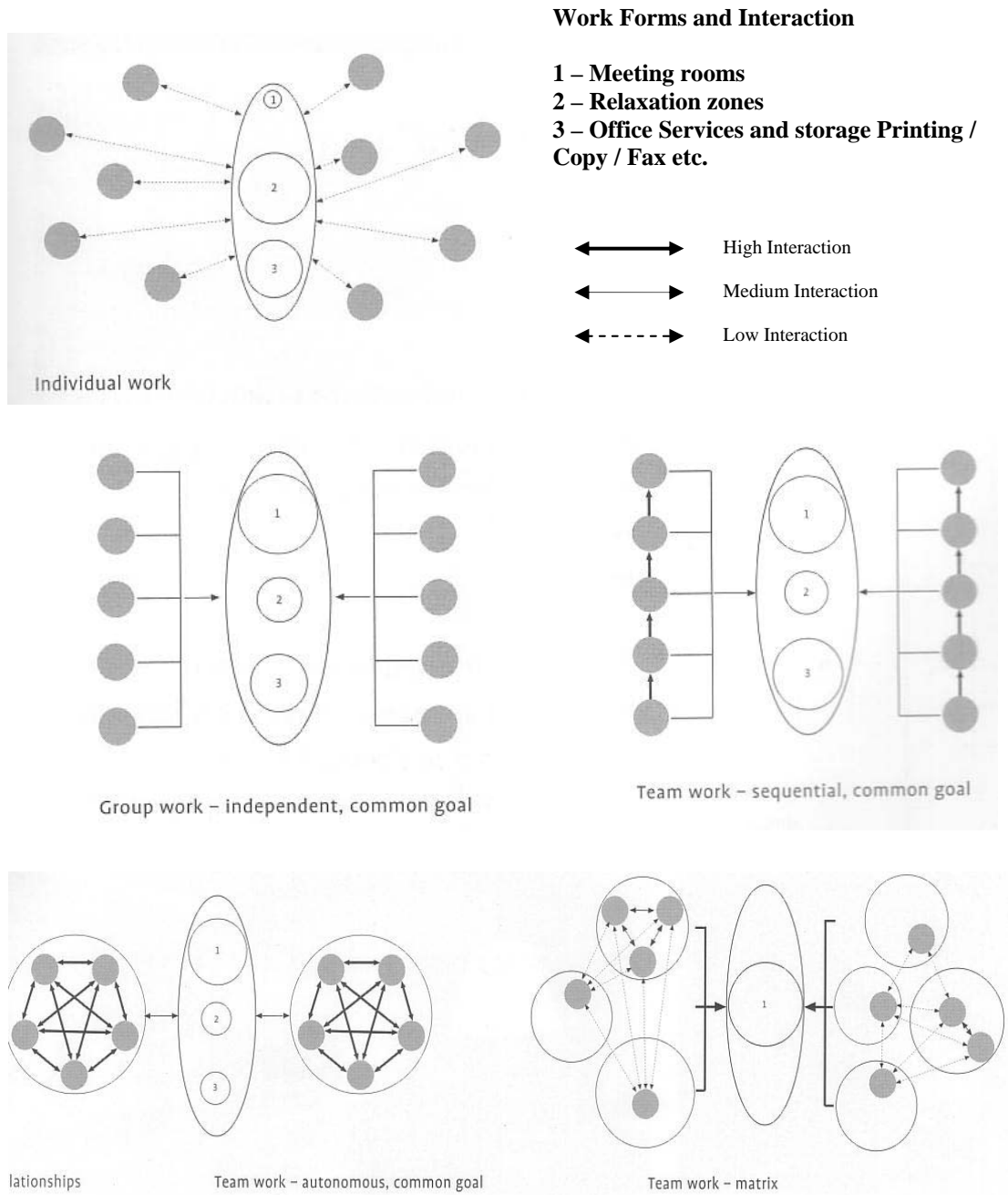


Fig a-12: Work forms and Interaction.

(Source: Arnold, T. Hascher, R. Jeska, S. Klauck, B. *Office buildings, a design manual*. 2002. Birkhauser – Publishers for architecture, Switzerland)

## MEASUREMENT PRE-REQUISITES

Planning the workplace to accommodate organizational performance and dealing with all the disparate elements as a system is a radical departure from simply "planning a space," or dealing with each element separately. Going through a process which systematically considers the business context and workplace elements is highly recommended. Therefore, it is very important to note that the measurement process comes in the larger course of re-designing an existing workplace; after all, it is the results/outcomes that are anticipated to rule the new design. Hence, if integrated workplace design is the aim, certain pre-requisites to the measurement process are needed to be gathered and are identified by this research in five points. These points are explained in the following paragraphs, but they don't count as steps of the measurement framework. (Fig. b-1)

### *Organization's message, strategic aims, and business objectives*

Build-up a solid image of the organization's activities, the message it holds, what it strategically aims to achieve, its business goals, and its objectives. This is initiated from the notion that workplaces must be designed comprehensively and should be integrated into the system of an organization to contribute to productivity. In turn, the goals of the workplace planning should be considerable by the top management, which is mostly, to support the organization's mission or business plan. It is not to cut costs or to develop an alternative workplace strategy. Although this may result, the planner should not have any preconceptions of the solution, since the solution may be to do nothing or to improve the social aspects of the group, without doing much to technologies or the workplace design. Because they're not participants in some of the strategic organizational decisions, Facilities managers or workplace planners sometimes want to be evaluated on the basis of costs and many don't spend enough time with the rest of the organization. Oseland assumes that their role will contribute to the strategic success of the organization on the condition that business needs, long term strategies, and organizational factors are understood:

**Facilities Managers need to understand business needs, long term strategy and organisational factors in order to create an environment which enhances worker performance.<sup>1</sup>**

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<sup>1</sup> Oseland N, Bartlett P, The bottom-line benefits of workplace productivity evaluation, FM Journal, April 1999 issue.

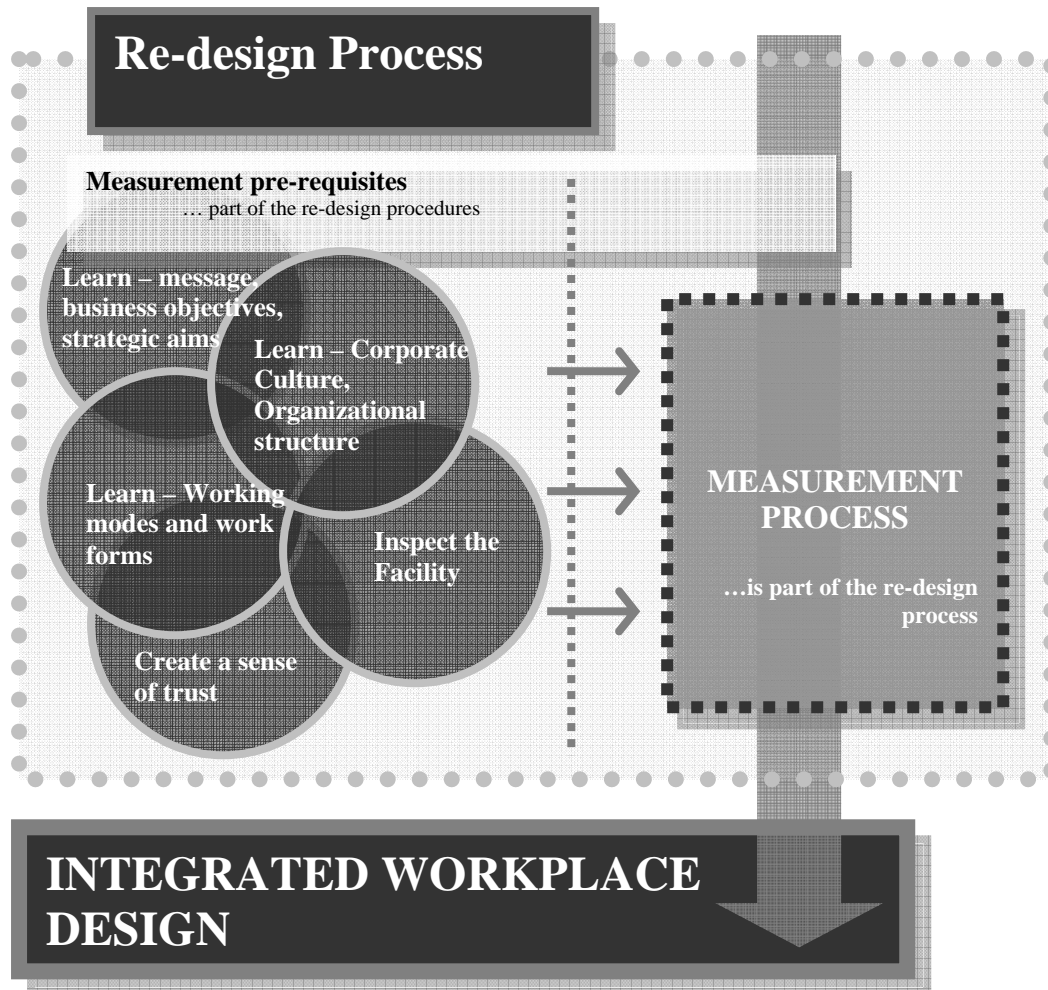


Fig.b-1: it must be realized that the measurement process comes in the larger course of re-designing an existing workplace; after all, it is the results/outcomes that are anticipated to rule the new design. Hence, if integrated workplace design is the aim, certain pre-requisites to the measurement process are needed to be gathered and are identified by this research as five points, but they don't count as steps of the measurement framework.

(Source: author)



Fig. b-2: The physical environment could have a very influential effect over the culture of an organization (Source: Meyerson, J. Ross, P. **The Creative Office**. Corte Madera, CA: Gingko Press, 1999.)

### ***Organization's culture and structure***

Culture is described by Edgar in the following lines:

**Culture serves to bind and motivate people, and it governs organizational arrangements, shapes values, and influences the way information is processed. Understanding corporate culture is important because it can be both a catalyst and a constraint.<sup>2</sup>**

This holds true. The physical environment could have a very influential effect over the culture of an organization, (Fig. b-2) influential to an extent that Duffy wrote:

**The second factor is the eloquence of the physical design of the office environment in expressing ideas about organizational culture. So powerful is this expressive force that some businesses are beginning to believe that design has become truly catalytic, i.e. capable of being used as an agent of change.<sup>3</sup>**

Strengthening this idea, Peter adds:

**Space management may well be the most ignored - and most powerful - tool for inducing cultural change, speeding up innovation projects and enhancing the learning process in far flung organizations.<sup>4</sup>**

This research identifies the Information that should be gathered about the corporate culture in the following points;

- 1. the degree of openness to innovation***
- 2. the promotion of communication between workers***
- 3. the openness to the making of mistakes and risk taking***
- 4. the amount of autonomy in time and place***
- 5. the division / merge of work and leisure***

Organizational structures are also beginning to reform into flatter hierarchies that found support in the newly introduced workplace strategies. ASID noted that:

**In the interests of flatter hierarchies and improved team spirit, some companies are considering adopting uniform office space standards for all employees, regardless of title or seniority. Other companies are looking to adopt alternative officing strategies, such as hoteling.<sup>5</sup>**

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<sup>2</sup> Schein, Edgar H., *Organizational Culture and Leadership* (Jossey-Bass, San Francisco, 1988).

<sup>3</sup> Tanis J, Duffy F. *A Vision of the New Workplace Revisited*. A paper published in The International Development Research Council's journal, *Industrial Development*, 1999.

<sup>4</sup> Tom Peters, *Liberation Management*, Knopf, 1992.

<sup>5</sup> American Society of Interior Designers, 3M, Cooper Lighting, DuPont, Haworth, Masland Carpet. *ASID PRODUCTIVE SOLUTIONS: The Impact of Interior Design on the Bottom Line*. A Professional Paper

The existing organization can be understood by reviewing its structure (the organizational chart), business processes, and job designs. Process mapping of groups, tasks, information flows, skills, and resources is a way to gain this understanding. But basically what needs to be known here is;

1. *whether the company is characterized by being of a flat hierarchy or a vertical one*
2. *whether decision-making is decentralized and polycentric or not*
3. *is it organized in interdisciplinary teams – project teams – or not*

### ***Facility or site inspection***

The third point is to investigate the facility. Methods applied for that are like a tour of the existing space, review of floor plans and interviews with key individuals; this will provide information about the workplace and other aspects, such as communication patterns, morale and motivation, and management style. With the eye of an experienced architect, he/she will build a preliminary image of some of the pros and cons of the existing environment. This does not mean that conclusions are valid. The sighting of two workers communicating across the partitions could be sought by the investigator as a source of distraction, while in fact this could be needed to increase interaction. (Fig. b-3) But in the same time this step is very important for the investigator in relating some of the answers to the open ended questions received from the attitude measurement.

### ***Work forms and working modes***

Companies can offset the possible adverse effects of cutbacks, including smaller work spaces, fewer amenities or moving to a less expensive space, by providing a work environment designed around human needs. This involves strategically tailoring the physical work space to the technical, functional, interactive and psychological requirements of employees' tasks. Clearly, professional workplace designers can play an important role in helping companies adopt this approach by mapping the network of relations and work communication patterns of their clients in an effectively designed physical environment. (Fig. b-4) This strategic approach of space planning is described by ASID:



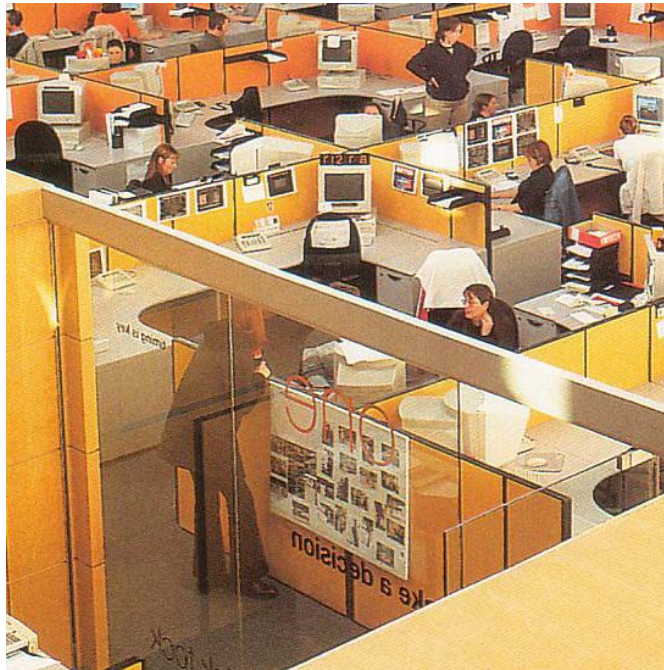


Fig. b-3: The sighting of two workers communicating across the partitions could be sought by the investigator as a source of distraction, while in fact this could be needed to increase interaction and promote transactional knowledge exchange.

(Source: Meyerson, J. Ross, P. **The Creative Office**. Corte Madera, CA: Gingko Press, 1999.)



Fig. b-4: Workplace consultants can build their conceptions and contribute to the business needs of their clients by mapping the network of relations and work communication patterns of their clients in an effectively designed physical environment.

(Source: Meyerson, J. Ross, P. **The Creative Office**. Corte Madera, CA: Gingko Press, 1999.)

**Interior design consultants are professionals who combine knowledge of client business goals and employee work patterns with design and product knowledge. Their knowledge can play a critical role in helping companies take a strategic approach to space planning and interior design.<sup>6</sup>**

The methods of extracting such information are interviews with key members of the business unit and by constructing focus groups. In a focus group, a mix of workers is gathered from different business units, job levels, and gender. Participants will identify:

- 1. the volume of the different types of work they do,*
- 2. the ratio of their working modes in the department, and*
- 3. they will relate the relationship between their working modes and the spaces where they need to establish these modes at*

Each business unit can be understood using a Profile Map which maps the characteristics of a unit against the type of work, the mode of work, and work setting variables. The resulting unit profile can be readily compared against other profiles within the organization. Providing this information will help validating the level of importance of each designed attribute needed to be extracted from the measurement procedures.

### ***Building a sense of trust***

The fact that people do not like to change should not be underestimated. Change is painful to most, even if they know it might be better for them. As mentioned before, participation in the planning of the change makes a big difference. While full participation in the change process is ideal, it is usually not possible for all affected workers to participate. And so constant communication to all involved is necessary so that they understand why the workplace is being changed, how it is being changed, and the extent and timing of the changes.

Change should be viewed as a workplace solution project and not a real estate project. Real estate is the easy part, the technology is more difficult, and the human behaviour side is the hardest. Never take for granted the resistance to behaviour changes. Supporting this are Tobin's words as he says:

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<sup>6</sup> American Society of Interior Designers, 3M, Cooper Lighting, DuPont, Haworth, Masland Carpet. ASID PRODUCTIVE SOLUTIONS: The Impact of Interior Design on the Bottom Line. A Professional Paper

**When dramatic workplace change takes place without active employee participation, the change is destined to fail. When employees do not feel adequately involved in the process of change, there is virtually no likelihood of achieving employee satisfaction. And where there is no satisfaction, there is no support for the change. The result? At best, the organizations; investment in its new environment will not generate a return. At worst, performance will decline and dissatisfaction will disrupt activity in the new environment.<sup>7</sup>**

Therefore, the participation of workers in the re-design process is essential. Consequently, the whole measurement process will depend on the outcome that will be provided by them. Hence, the most important thing that will make them devotionally participate in this process is creating a sense of trust. Methods that could help the workplace investigator achieve this sense are identified by this research in the following points:

1. interviewing the workers and asking for their opinion about the workplace design, will spread the news that there are some serious actions taken to develop a workplace solution
2. informally publicizing that the aim of the organization in investing in the physically designed environment is worker satisfaction
3. the physical appearance of the investigator in front of the workers a number of times, observing and catching images, and sketches gives a sense of credibility
4. if possible, socializing with some of the workers and trying to explain in a friendly way their role in the attitude survey, and how their participation will be effective in developing the existing workplace design
5. Also if possible, the participation of workers from different departments in constructing the statements of favourness of the attitude measurement would be useful. Even if their opinions will be later neglected, but this will raise the sense of credibility.

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<sup>7</sup> Tobin R, Adopting Change, article published by 360 degree e-magazine. February 2004. Steelcase Inc. URL: <http://www.steelcase.com>



## Workplace satisfaction



A top priority in maintaining **WORKPLACE PRODUCTIVITY** is your **SATISFACTION** with your office **ENVIRONMENT**. This is why the **OPINION** you give in this survey is so important to us!!! Please take this survey to help us improve our office design.



Please note that the term **WORKSPACE** used in this survey refers to the primary working space that is personally assigned to you -whether this space is shared or private-(e.g. Workstation, Office room ...etc)



Those are the needs that relate to human requirements and are described in the following statements. We need to now how you agree with these statements!

### 1 SPACE REQUIREMENTS

1	2	3	4	5	
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Doesn't apply
The number of FORMAL MEETING ROOMS in your office is sufficient					
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The number of INFORMAL MEETING POINTS within your team (used in team work / conferencing / mentoring ...etc) are sufficient					
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The number of DOCUMENT PROCESSING POINTS (for printing, photocopying ...etc) are sufficient

1     2     3     4     5   

TOILETS & RESTROOMS are sufficient

1     2     3     4     5   

PRAYER ROOMS are sufficient

1     2     3     4     5   

RETREATS (rooms or spaces used for refreshing, eating, chatting, entertaining, smoking...etc) are sufficient

1     2     3     4     5   

REFRESHMENT POINTS (for food and beverages) are sufficient

1     2     3     4     5   

## 2 AREA & SPACE FIT

1 Strongly Disagree    2 Disagree    3 Neutral    4 Agree    5 Strongly Agree    Doesn't Apply

The area of my WORKSPACE is sufficient to perform all my office activities

1     2     3     4     5   

My PERSONAL STORAGE AREA is sufficient for all my records and supplies

1     2     3     4     5   

FORMAL MEETING ROOMS are sufficient in area

1     2     3     4     5   

The RECEPTION area is considered sufficient

1     2     3     4     5   

## 3 COMFORT & EFFICIENCY REQUIREMENTS

1 Strongly Disagree    2 Disagree    3 Neutral    4 Agree    5 Strongly Agree    Doesn't Apply

I find comfort in the use of my office FURNITURE & EQUIPMENTS

1     2     3     4     5   

The FURNITURE & EQUIPMENTS are efficient in supporting tasks and work activities

1     2     3     4     5   

The office design supports CONCENTRATION and there are no distractions because of the noise

1     2     3     4     5   

The LIGHTING in the office is of good quality

1     2     3     4     5   

The windows in the office offer good VIEWS of the outdoor

<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
The VENTILATION system (Air quality, Flow, Temperature...etc) used in the office is of good quality					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>



Those are the needs that relate to a person's own feelings and his relationships with others. The following statements describe those feelings and we need to now how you agree with them!

#### 4 PSYCHOSOCIAL NEEDS

1	2	3	4	5	
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Doesn't Apply
Your workspace design supports INTERACTION between you and other colleagues (to perform a common task or to exchange experiences)					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
Your workspace design provides you with the desired PERSONAL PRIVACY					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
Your workspace design provides you with the required WORK CONFIDENTIALITY					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
You believe that the office design succeeded in creating a STIMULATING or MOTIVATING atmosphere among workers					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
The office design supports TERRITORIALITY (a sense of separation – not necessarily walls) between Units, Departments, or Teams of the same floor in order to support the sense of belonging					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
You believe that your workspace is offering you the STATUS and IMAGE that you feel deserve					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
You believe that your office design is creating an atmosphere that supports LEARNING and KNOWLEDGE exchange					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>





Atmosphere encourages better work; image shows that better work is being done. Together they constitute ambience. Looked at in another way, it is the synthesis of what our senses tell us as we move around, and how our feelings respond.

5 AMBIENCE: We need to know how you agree with following statements!

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree	Doesn't Apply
You feel that the interior appearance supports your company's image					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
You find your personal workspace and your department, unit, or team space VISUALLY APPEALING					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
You find that other spaces like refreshment points, toilets and restrooms, or document processing points are VISUALLY APPEALING					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
You find that circulation elements (Lobbies, Entrances, Corridors... etc) are VISUALLY APPEALING					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
The office design provides you with the sense of safety					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>
The ARTWORKS in the office are pleasing and of a good taste					
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/>



The following statements describe the physical movement of people, paper or things...etc. We need to know how do you agree with these statements!

6 Movement

1 Strongly Disagree    2 Disagree    3 Neutral    4 Agree    5 Strongly Agree    Doesn't Apply

The movement of people (also while carrying objects like files or mail) around the office is smooth and easy, and accessibility is easily provided for workers

1     2     3     4     5   

It is easy to locate your destination and determine directions without getting lost inside the office

1     2     3     4     5   

7 (OPTIONAL) If you think that there are OTHER issues that you would like to add and relate to your workplace satisfaction – whether having a positive or negative impact on you or your department – please feel free to express them in the following text box

8 Department Name

9 Job Level

10 Gender

11 Age Group



## STEPS FOR BUILDING UP A QUESTIONNAIRE

1. Specify what INFORMATION will be sought
  - a. *Make sure you have a clear understanding of the issues and what it is you want to know (expect to learn). Frame your research questions, but refrain from writing questions for the questionnaire at this time.*
  - b. *Make a list of your research questions. Review them periodically as you are working on the questionnaire*
  - c. *Conduct a search for existing questions on the issue*
  - d. *Revise existing questions on the issue; prepare new questions to address your issues*
  
2. Determine TYPE of questionnaire and method of ADMINISTRATION
  - a. *Use the type of data to be collected as a basis for deciding on the type of questionnaire*
  - b. *Use degree of structure, disguise, and cost to determine the method of administration*
  - c. *Compare the capabilities and limitations of each method of administration and the value of the data collected from each, with the needs of the survey*
  
3. Determine CONTENT of Individual Questions
  - a. *Is the Question necessary? “It would be interesting to know” is not an acceptable answer*
  - b. *Make sure each question is specific and addresses only one important issue*
  - c. *Does the question apply to all respondents? if not, make provision for skipping it*
  - d. *Split questions that can be answered from different frames of reference into multiple questions, one corresponding to each frame of reference*
  - e. *Ask yourself whether respondents will be informed about and can remember the issue that the question is dealing with*
  - f. *Make sure that the time period of the question is related to the importance of the topic*
  - g. *Avoid questions that require excessive effort, that have hard-to-articulate answers, and that deal with embarrassing or threatening issues.*
  
4. Determine FORM OF RESPONSE to each question
  - a. *Determine which type of question provides data that fit the information needs of the project:*
    - i. *Open-Ended Questions (e.g. How old are you?)*
    - ii. *Multichotomous Questions (e.g. choose Age group: 20-29 or 30-39...etc.)*
    - iii. *Dichotomous Questions (e.g. choose: Yes/No or Less/More...etc.)*
    - iv. *Scales (e.g. choose: Never – Occasionally – Sometimes – Often...etc.)*

- b. *Use structured questions whenever possible*
- c. *Use open-ended questions that require short answers to begin a questionnaire*
- d. *If open-ended questions are necessary, make the questions sufficiently directed to give respondents a frame of reference when answering*
- e. *When using dichotomous questions, state the negative or positive side in detail*
- f. *Provide for “don’t know,” “no opinion,” and “both” answers*
- g. *Be aware that there may be a middle ground*
- h. *Be sensitive to the mildness or harshness of the alternatives*
- i. *When using Multichotomous questions, be sure that the choices are exhaustive and mutually exclusive, and if combinations are possible, include them*
- j. *Be sure that the range of alternatives is clear and that all reasonable alternative answers are included*
- k. *If the possible responses are very numerous, consider using more than one question to reduce the potential for information overload*
- l. *Clearly indicate if items are to be ranked or if only one term on the list is to be chosen*

5. Determine WORDING of each question

- a. *Use simple words*
- b. *Avoid ambiguous words and questions*
- c. *Avoid leading questions*
- d. *Avoid implicit assumptions*
- e. *Avoid generalizations and estimates*
- f. *Avoid Double-Barreled questions*
- g. *Use simple sentences; avoid compound sentences*
- h. *Change long, dependent clauses to words or short phrases*
- i. *Make sure each question is as specific as possible*

6. Determine SEQUENCE of each question

- a. *Use simple, interesting questions for openers*
- b. *Use the funnel approach, first asking broad questions, then narrowing them down*
- c. *Ask difficult or sensitive questions late in the questionnaire when rapport is better*
- d. *Follow chronological order when collecting historical information*
- e. *Complete questions about one topic before moving on to the next*
- f. *Prepare a flow chart whenever filter questions are being considered*
- g. *Ask filter questions before asking detailed questions*
- h. *Ask demographic questions last; if the respondent refuses, the other data are still usable*

7. Design PHYSICAL CHARACTERISTICS of questionnaire

- a. *Make sure that the questionnaire looks professional and is relatively easy to answer*

- b. Make the questionnaire as short as possible, but avoid a crowded appearance*
  - c. Use a booklet format for ease of analysis and to prevent lost pages*
  - d. List the name of the organization conducting the survey on the first page*
  - e. Number the questions to ease data processing*
  - f. If the respondent must skip more than one question, use a “go to.”*
  - g. If the respondent must skip an entire section, consider colour coding the sections*
  - h. State how the responses are to be reported, e.g., check mark, number, circle, etc.*
8. RE-EXAMINE steps 1-7 and REVISE if necessary
  - a. Examine each word of every question to ensure the question is not confusing, ambiguous, offensive, or leading.*
  - b. Get peer evaluations of the draft questionnaire*
9. PRETEST the survey, revise where needed
  - a. Pretest the questionnaire first using personal interviews among respondents similar to those to be used in the actual study*
  - b. Obtain comments from the interviewers and respondents to discover any problems with the questionnaire, and revise it if necessary. When the revisions are substantial, repeat steps 1 and 2 of the pretest*
  - c. Pretest the questionnaire by mail or telephone to uncover problems unique to the mode of administration*
  - d. Code and tabulate the pretest responses in dummy tables to determine if questions are providing adequate information*
  - e. Eliminate questions that do not provide adequate information, and revise questions that cause problems*



<b>Different types of Data Collection (Positive / Negative)</b>			
<i>(Source: author after Churchill)</i>			
	<b>Sampling control</b>	<b>Information control</b>	<b>Administrative control</b>
<b>Personal interview</b>	<i>Positive</i>		
	-High response rates -Best for getting response from specific identified person	-Any type of question -Sequence of questions easily changed -Allows probing via open-ended questions -Clarification of ambiguous questions -Easy use of visuals and other sensory stimuli	
	<i>Negative</i>		
	Narrow distribution, difficult to identify sampling frame	Interviewer bias	-Generally most expensive method -Relatively slow
<b>Written Formats (Mail, Fax, Web, E-Mail)</b>	<i>Positive</i>		
	-Only method to reach certain respondents -Sampling frame easily developed with mailing lists -Wide distribution	-Not subject to interviewer bias -Respondents work at their own space -Ensures anonymity -Best for personal, sensitive questions	-Generally least expensive -Very short response time for e-mail
	<i>Negative</i>		
	-Low response rates -Little control in securing specific individuals -Cannot control speed of survey completion	-Researcher cannot explain ambiguous questions -No probing -Respondents can view entire questionnaire as they respond	-Long response time for mail
<b>Telephone</b>	<i>Positive</i>		
	-Relatively strong response rates -Wide distribution possible	-Less interviewer bias than in person, and interviewer supervision is stronger -Sequence of questions is easily changed	-Relatively low cost -Quick turnaround -Little difficulty and cost in handling call-backs -Allows easy use of computer support
	<i>Negative</i>		
	Difficult to establish representative sampling frame due to unlisted numbers	-Cannot use visual aids -More difficult to establish rapport over the phone than in person	Interview must be brief

## Appendix F: IMPORTANCE LEVEL MEASUREMENT

Please mark below the level of importance of each of the following design attributes that relate to your unit or department.

### PHYSICAL NEEDS

Those are the needs that relate to human requirements and are presented in the following statements.

SPACE REQUIREMENTS	Highly important	Important	Neutral	Less important	Can be ignored
FORMAL MEETING ROOMS					
INFORMAL MEETING POINTS within your team (used in team work / conferencing / mentoring ...etc)					
DOCUMENT PROCESSING POINTS (for printing, photocopying ...etc)					
RETREATS (rooms or spaces used for refreshing, eating, chatting, entertaining, smoking...etc)					
REFRESHMENT POINTS (for food and beverages)					
AREA AND SPACE FIT	Highly important	Important	Neutral	Less important	Can be ignored
WORKSPACE area					
PERSONAL STORAGE area					
The RECEPTION HALL					
COMFORT AND EFFICIENCY REQUIREMENTS	Highly important	Important	Neutral	Less important	Can be ignored
CONCENTRATION and low distractions because of noise					
The VIEWS of the outdoors through windows					

### PSYCHOSOCIAL-NEEDS

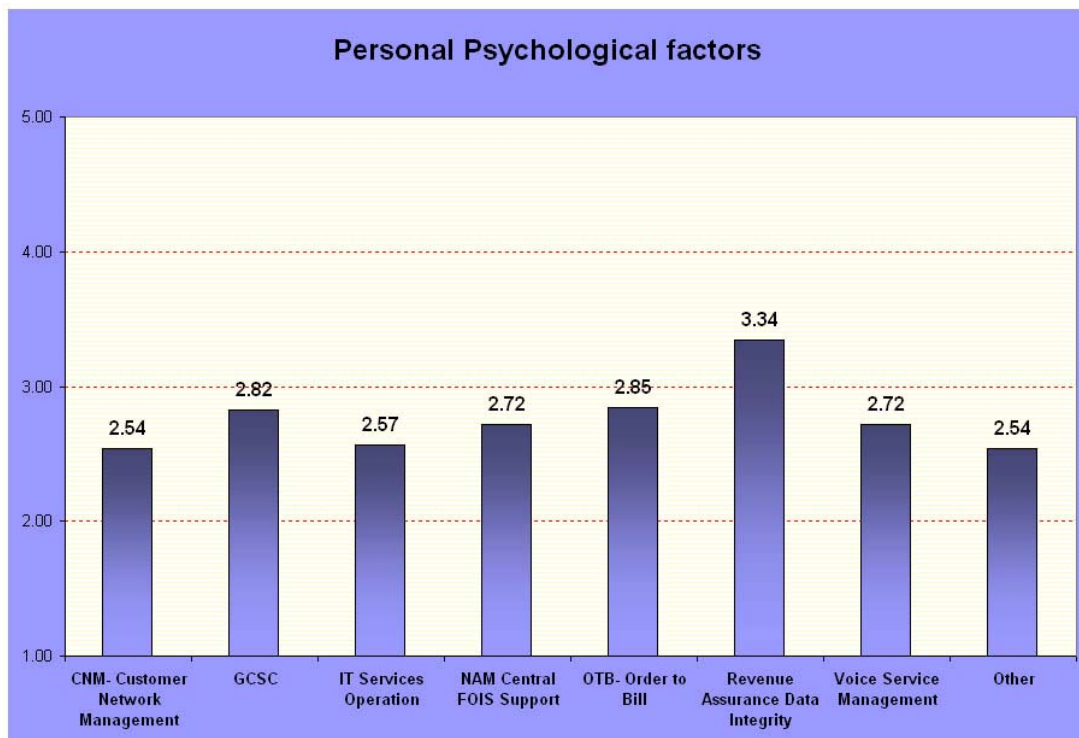
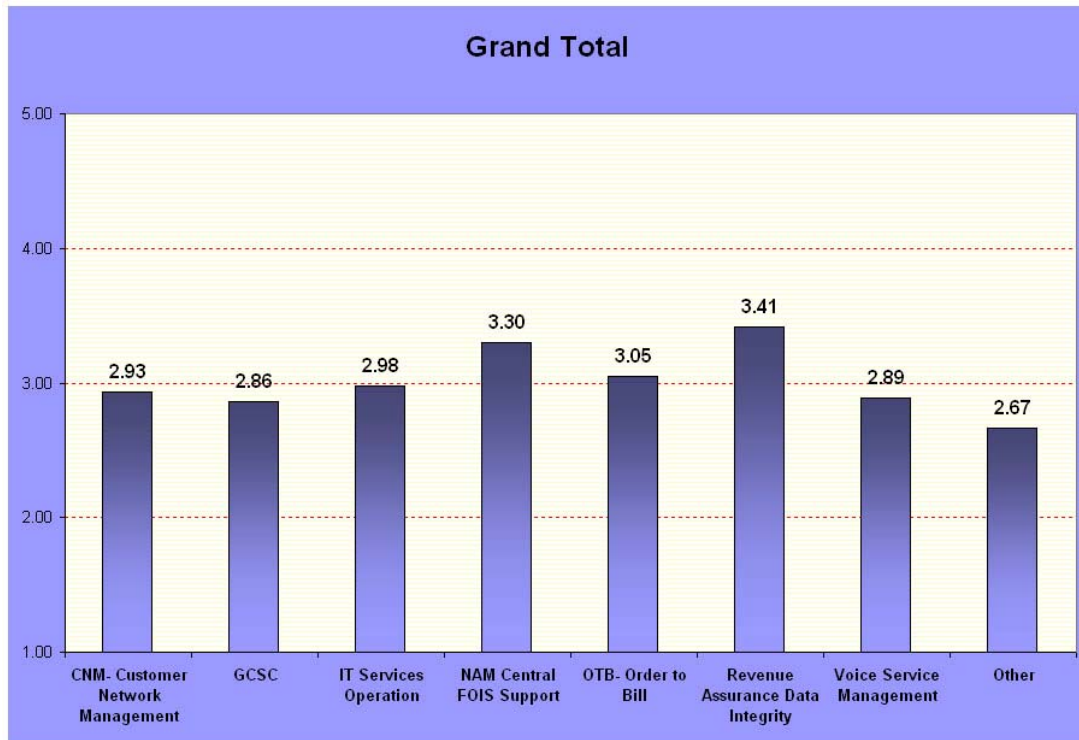
Those are the needs that relate to a person's own feelings and his relationships with others.

	Highly important	Important	Neutral	Less important	Can be ignored
INTERACTION between different workers (to perform a common task or to exchange experiences)					
PERSONAL PRIVACY					

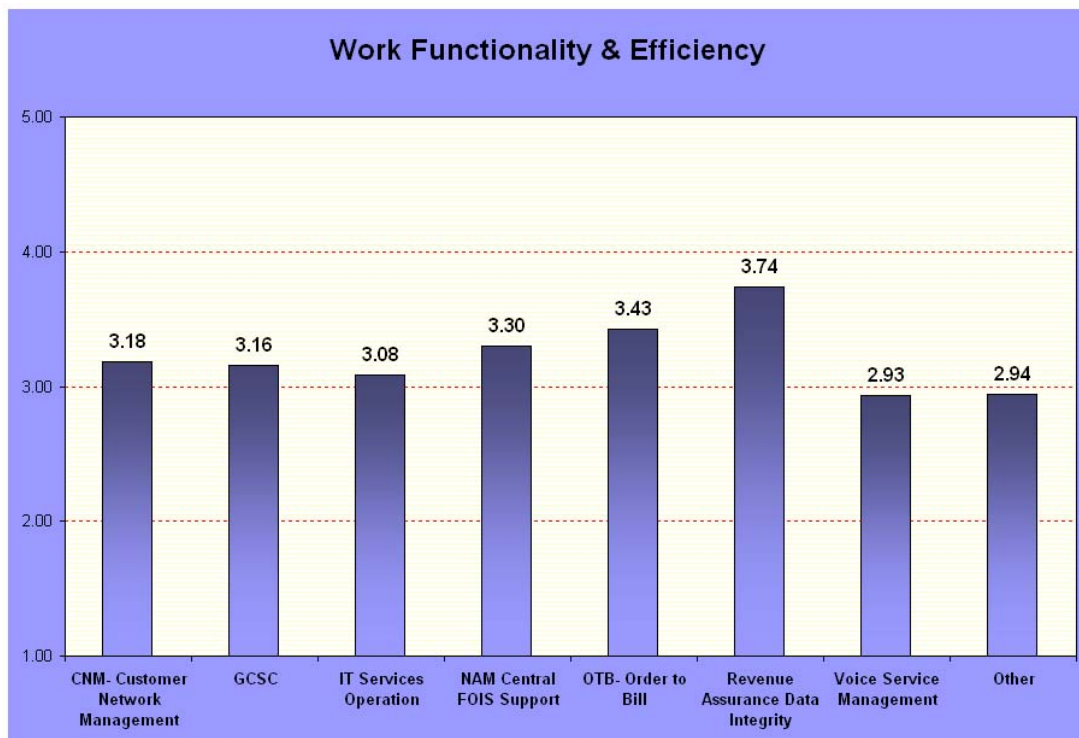
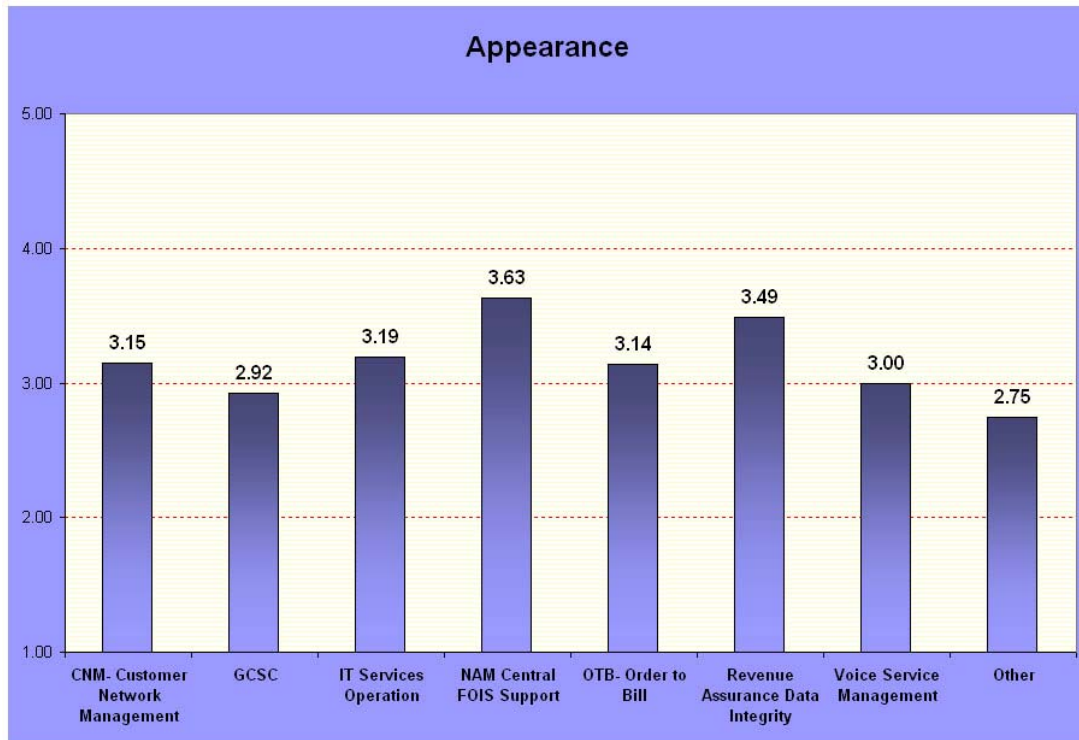
## Appendix F: IMPORTANCE LEVEL MEASUREMENT

WORK COFIDENTIALITY					
Creating a STIMULATING or MOTIVATING atmosphere among workers					
TERRITORIALITY (a sense of separation – not necessarily walls) between Units, Departments, or Teams of the same floor in order to support the sense of belonging					
STATUS and IMAGE					
Providing an atmosphere that supports LEARNING and KNOWLEDGE exchange					
<b>AMBIENCE.</b>					
	<b>Highly important</b>	<b>Important</b>	<b>Neutral</b>	<b>Less important</b>	<b>Can be ignored</b>
company's image in the interior space					
Finding the personal workspace, department, unit, or team space being VISUALLY APPEALING					
Finding other spaces like refreshment points, toilets and restrooms, or document processing points being VISUALLY APPEALING					
Circulation elements (Lobbies, Entrances, Corridors...etc) being VISUALLY APPEALING					
The ARTWORKS					
<b>MOVEMENT</b>					
<b>The physical movement of people, paper or things...etc.</b>	<b>Highly important</b>	<b>Important</b>	<b>Neutral</b>	<b>Less important</b>	<b>Can be ignored</b>
The movement of people (also while carrying objects like files or mail) around the office being smooth and easy, and accessibility being easily provided for workers					
Finding it easy to locate a destination and determine directions without getting lost inside the office					

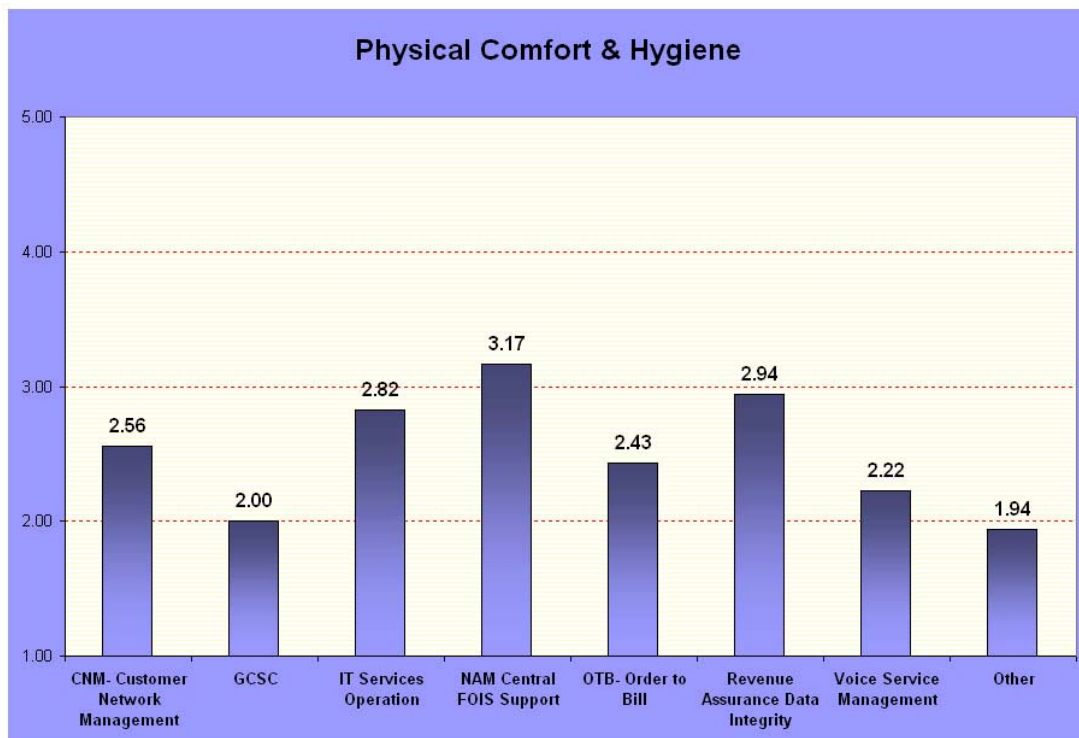
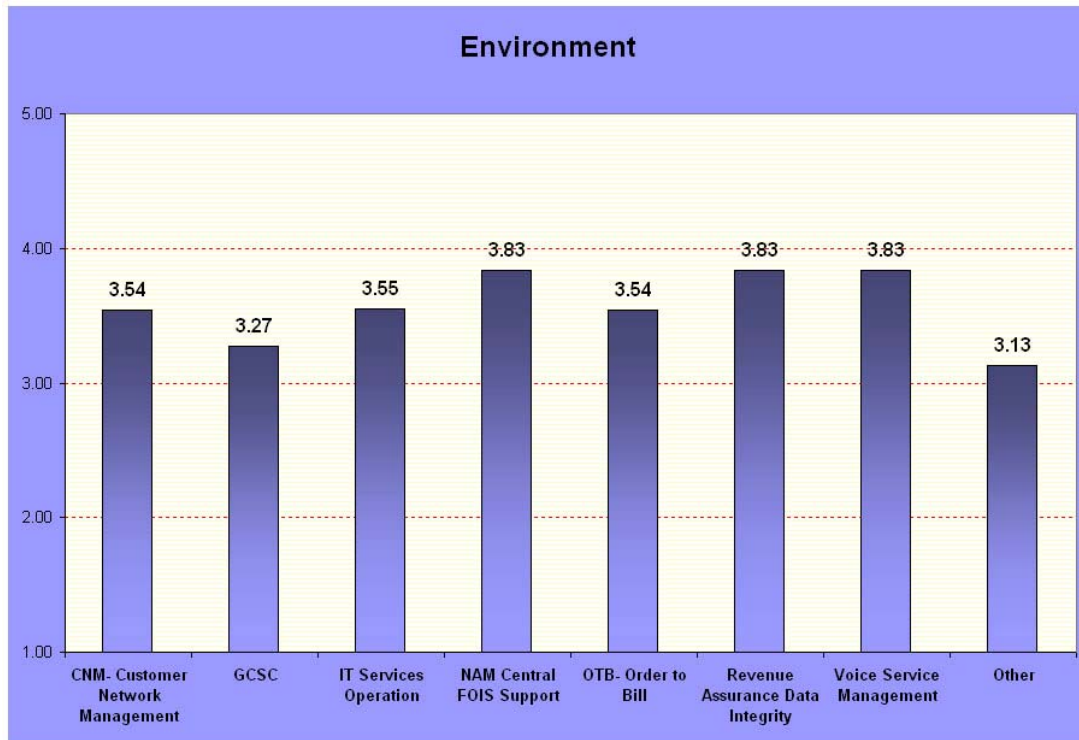
Appendix G: SCALE & SUBSCALE TRENDS OF DIFFERENT DEPARTMENTS



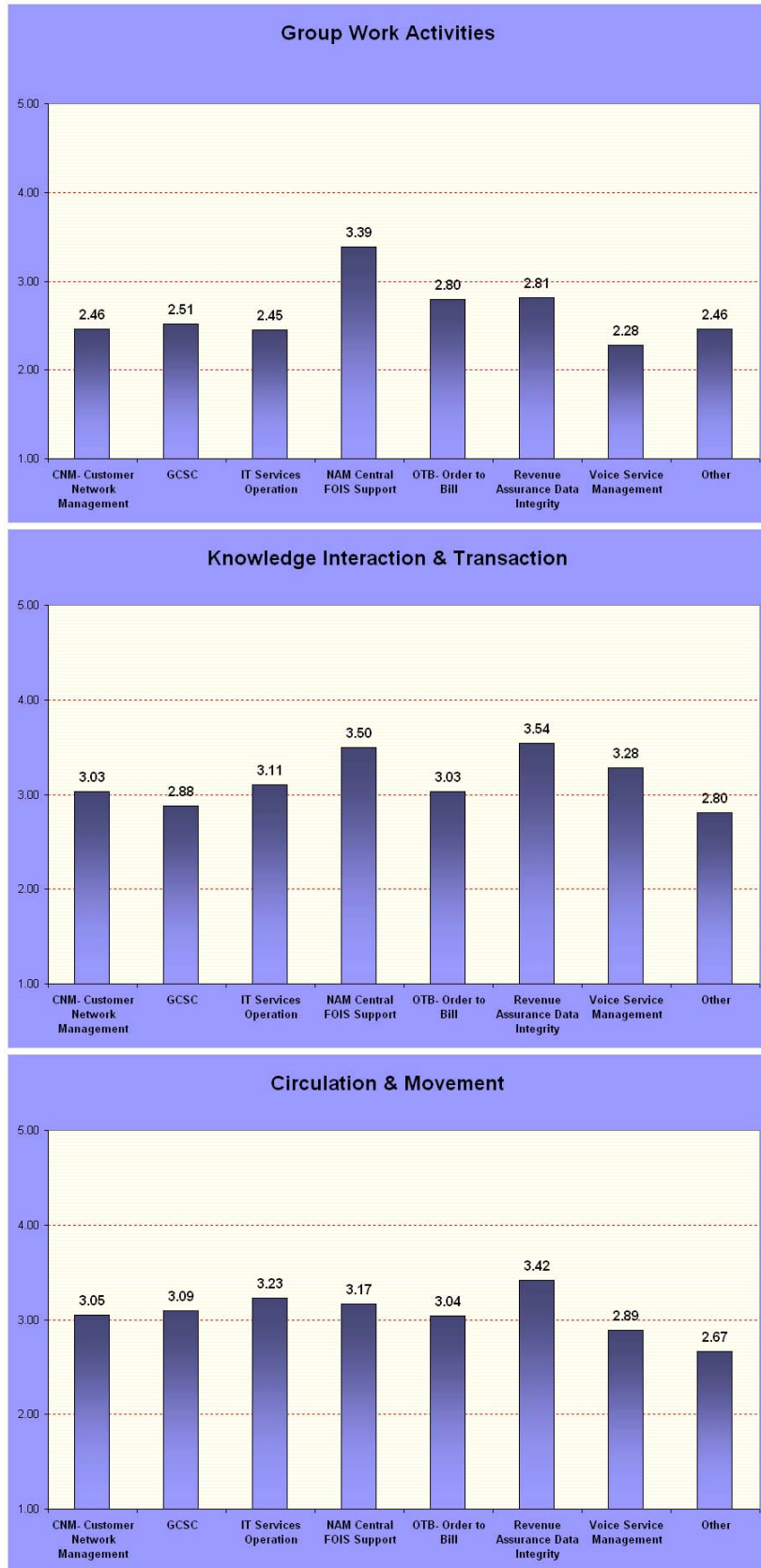
Appendix G: SCALE & SUBSCALE TRENDS OF DIFFERENT DEPARTMENTS



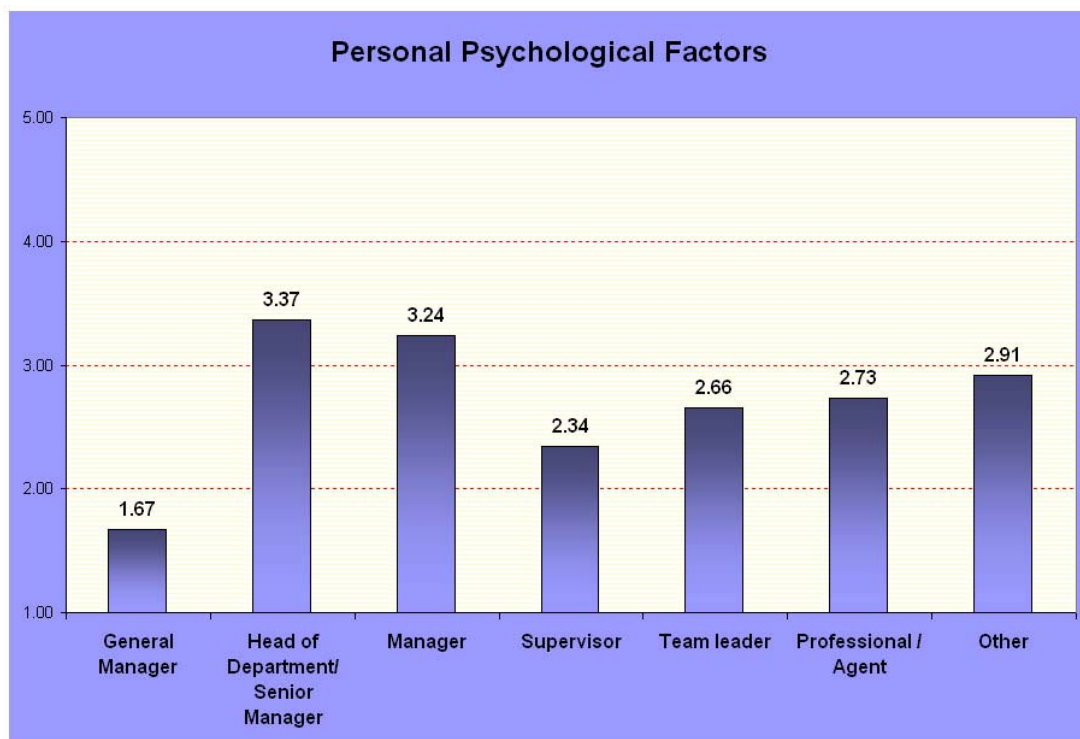
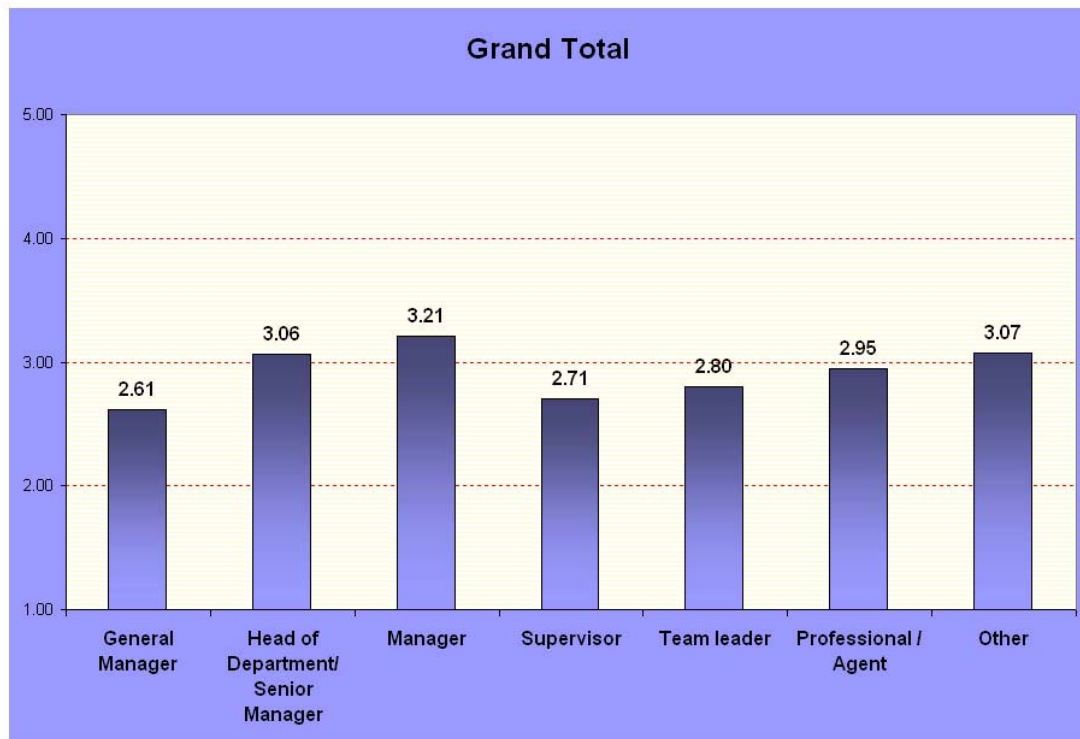
Appendix G: SCALE & SUBSCALE TRENDS OF DIFFERENT DEPARTMENTS



Appendix G: SCALE & SUBSCALE TRENDS OF DIFFERENT DEPARTMENTS

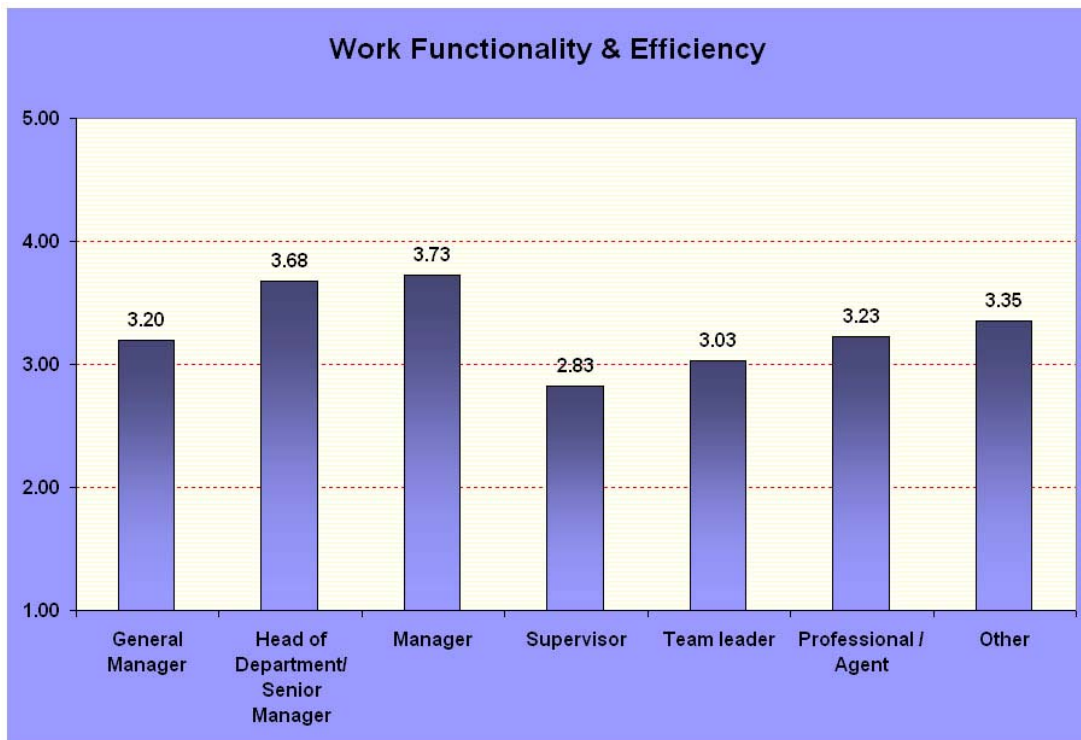
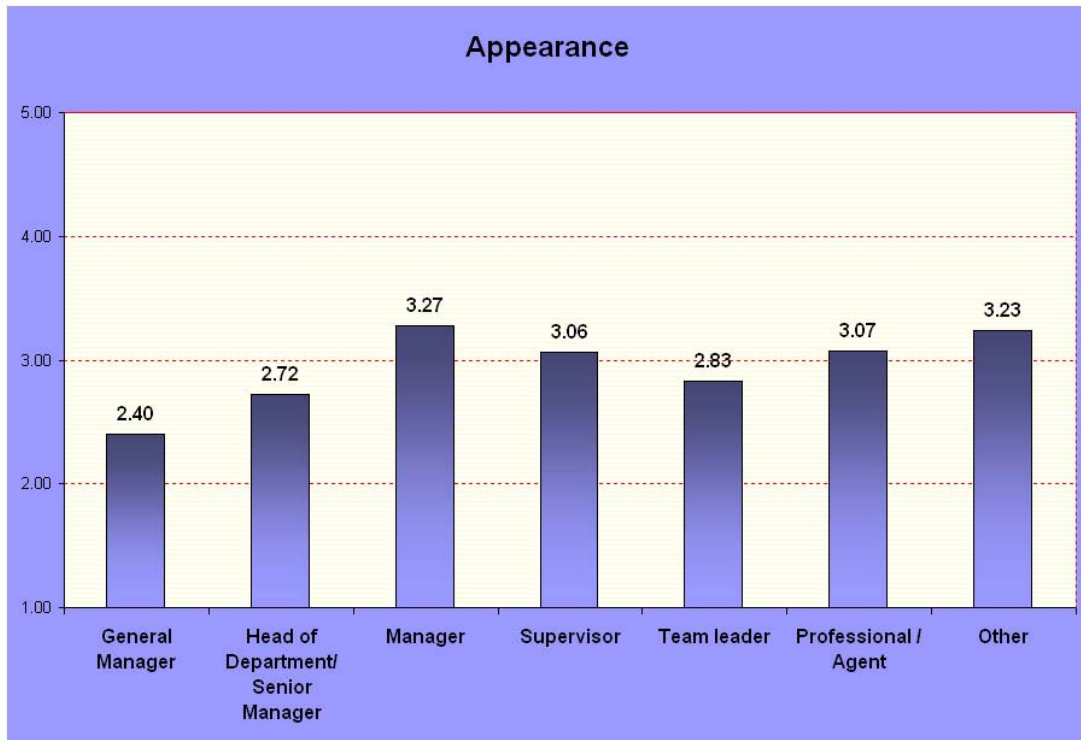


Appendix H: SCALE & SUBSCALE TRENDS OF DIFFERENT JOB LEVELS

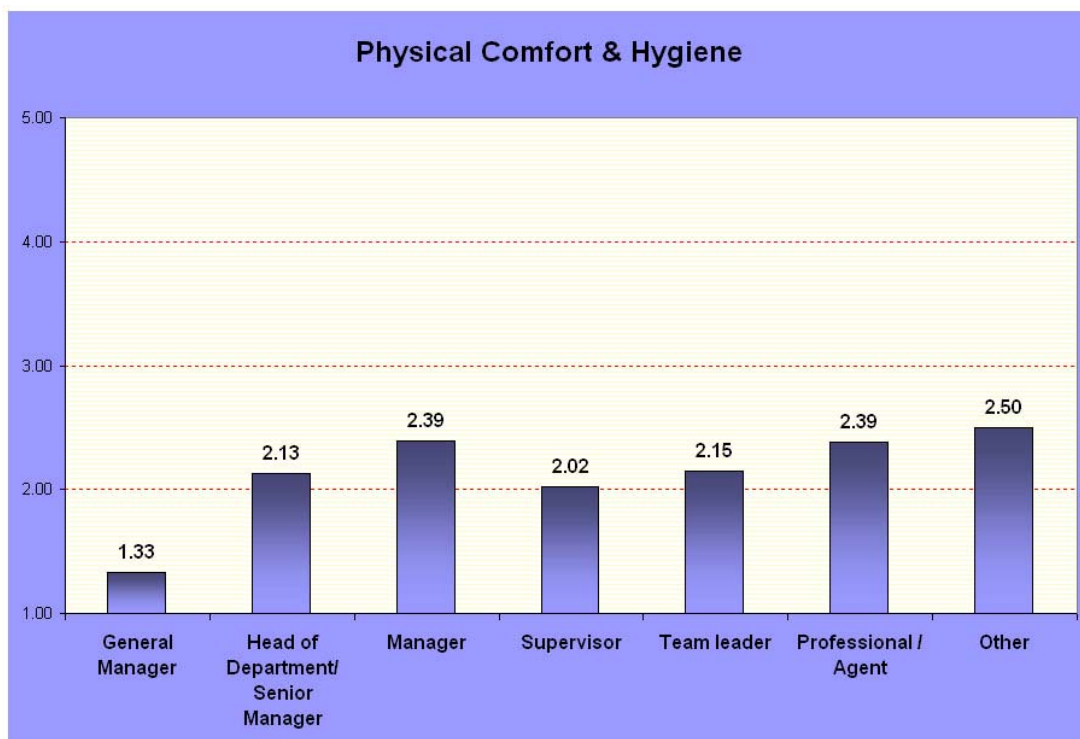
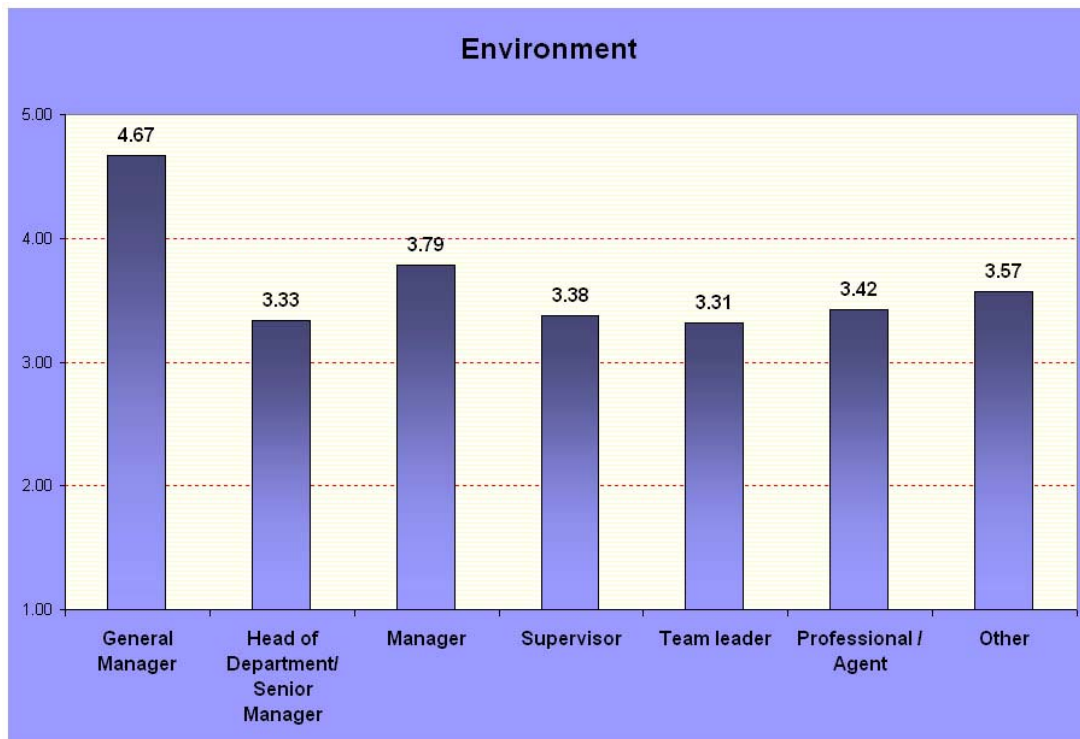




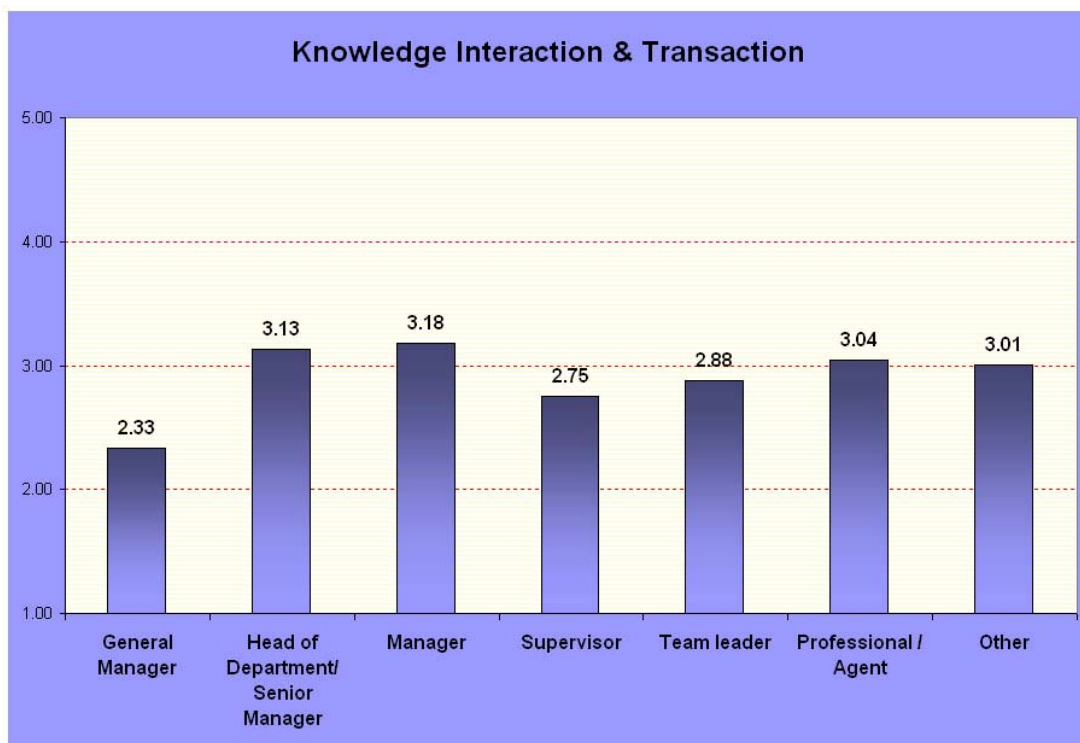
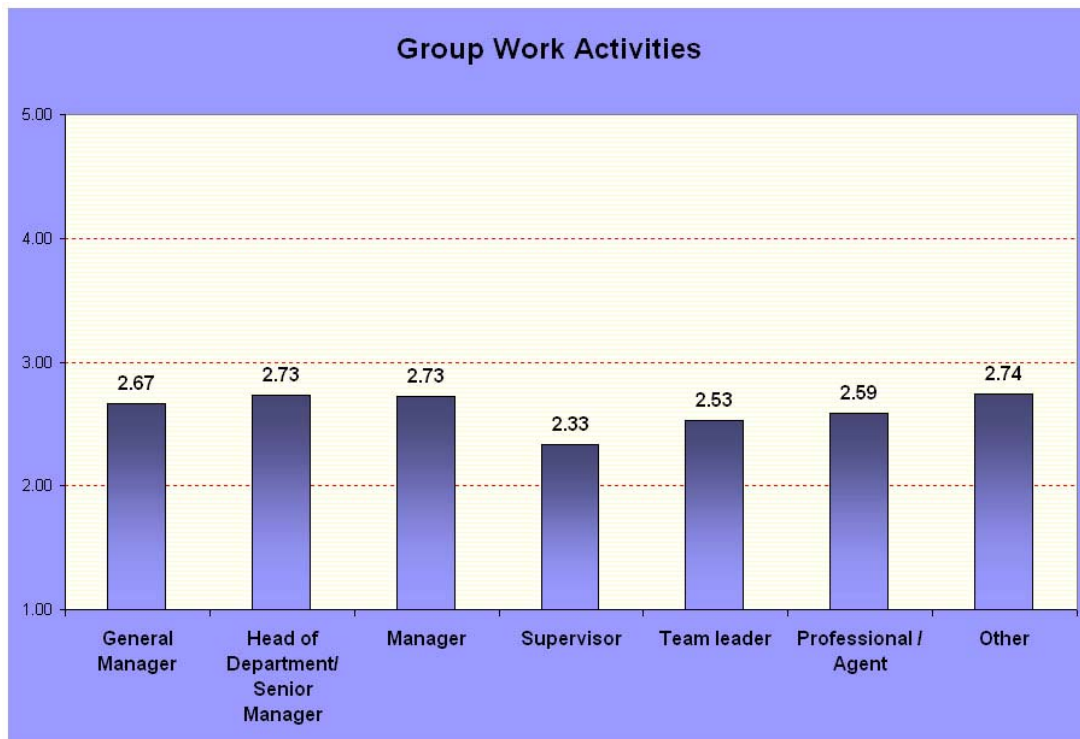
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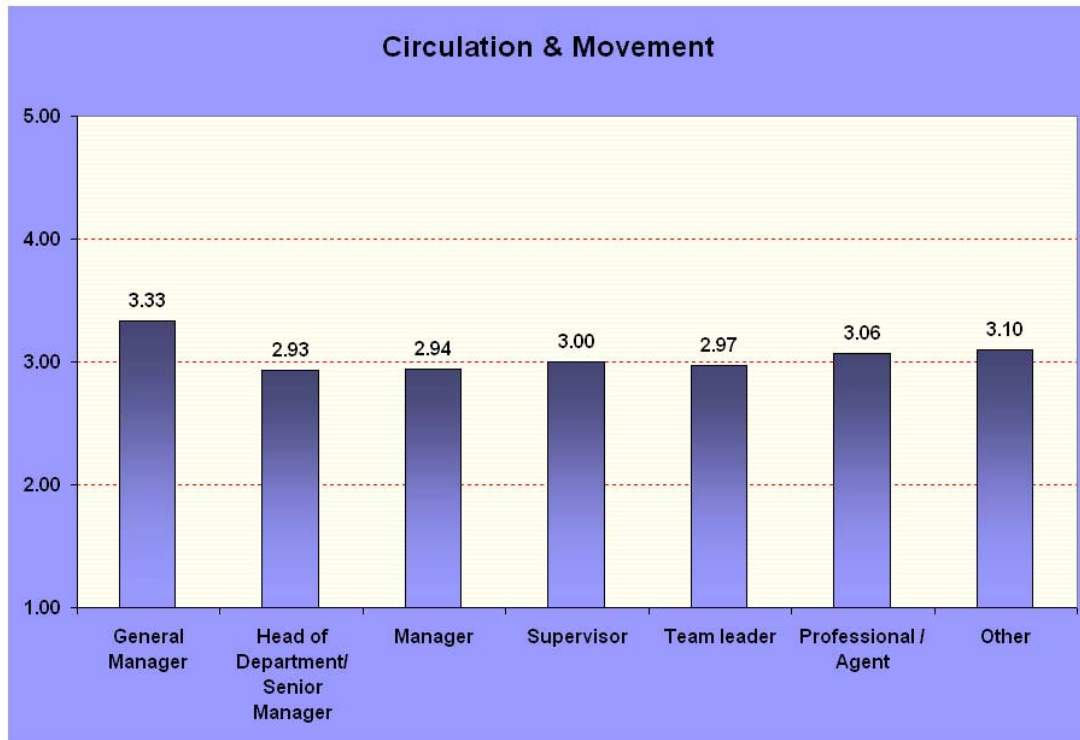
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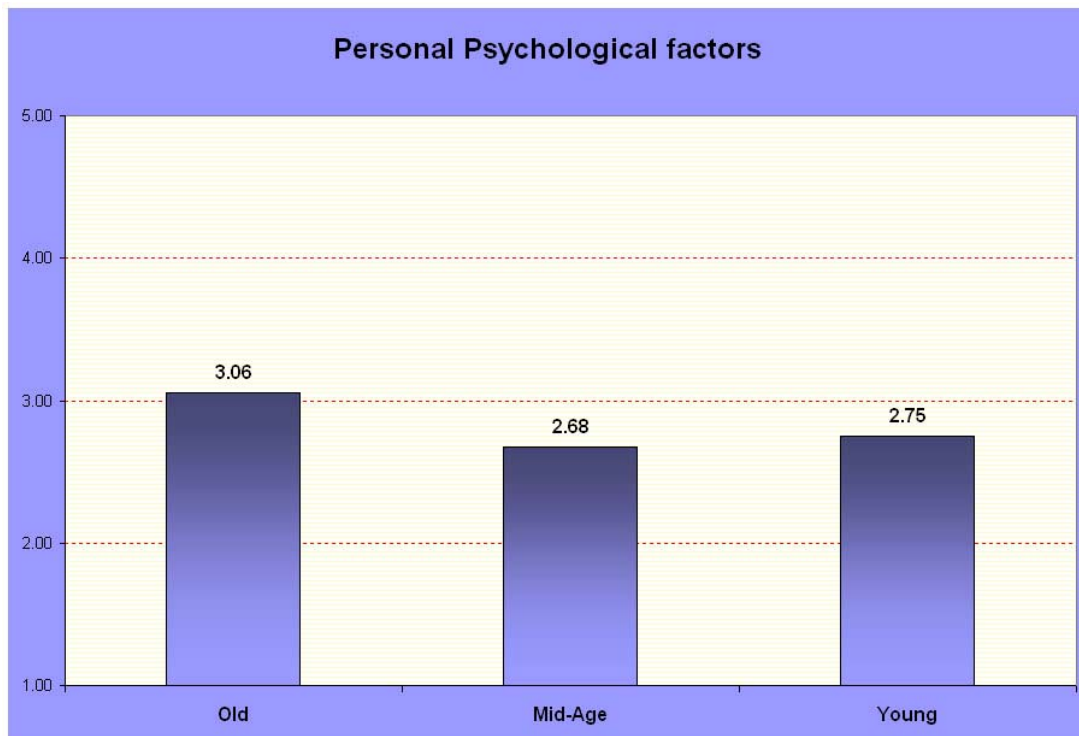
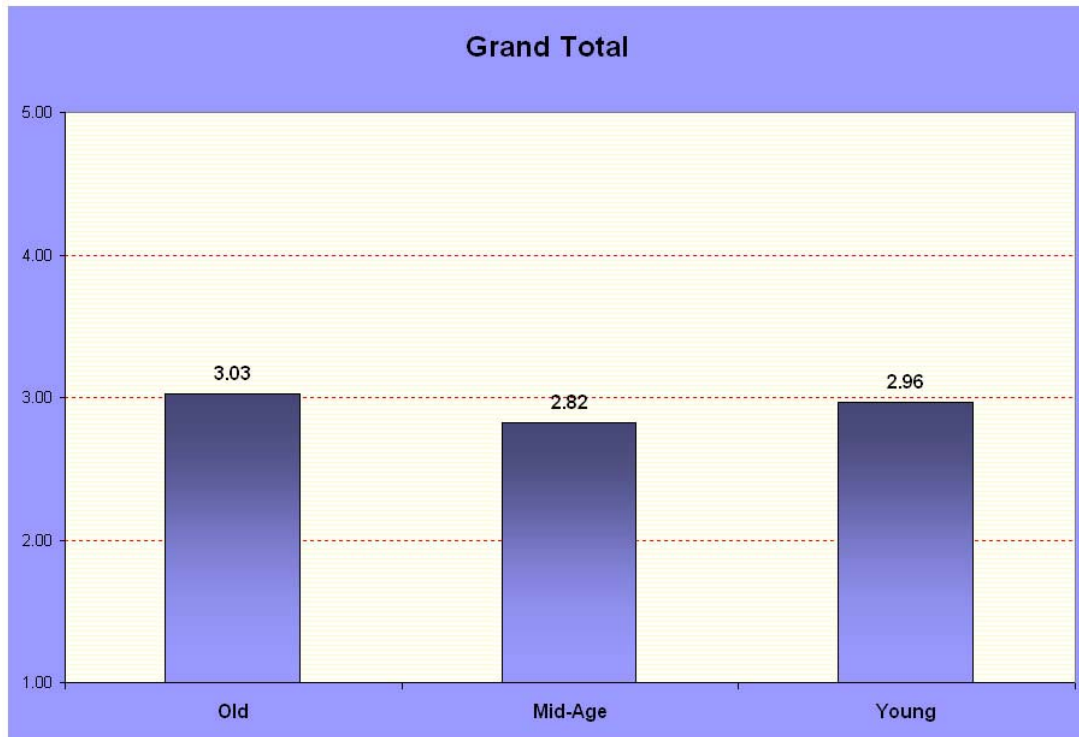


Appendix H: SCALE & SUBSCALE TRENDS OF DIFFERENT JOB LEVELS



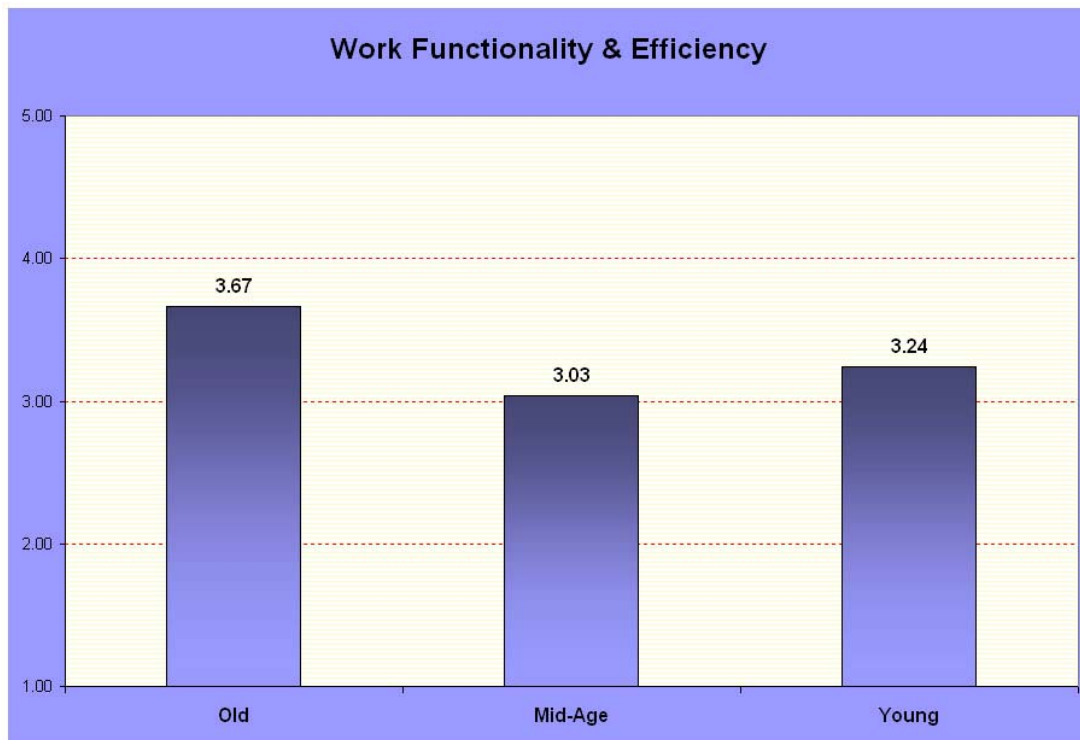
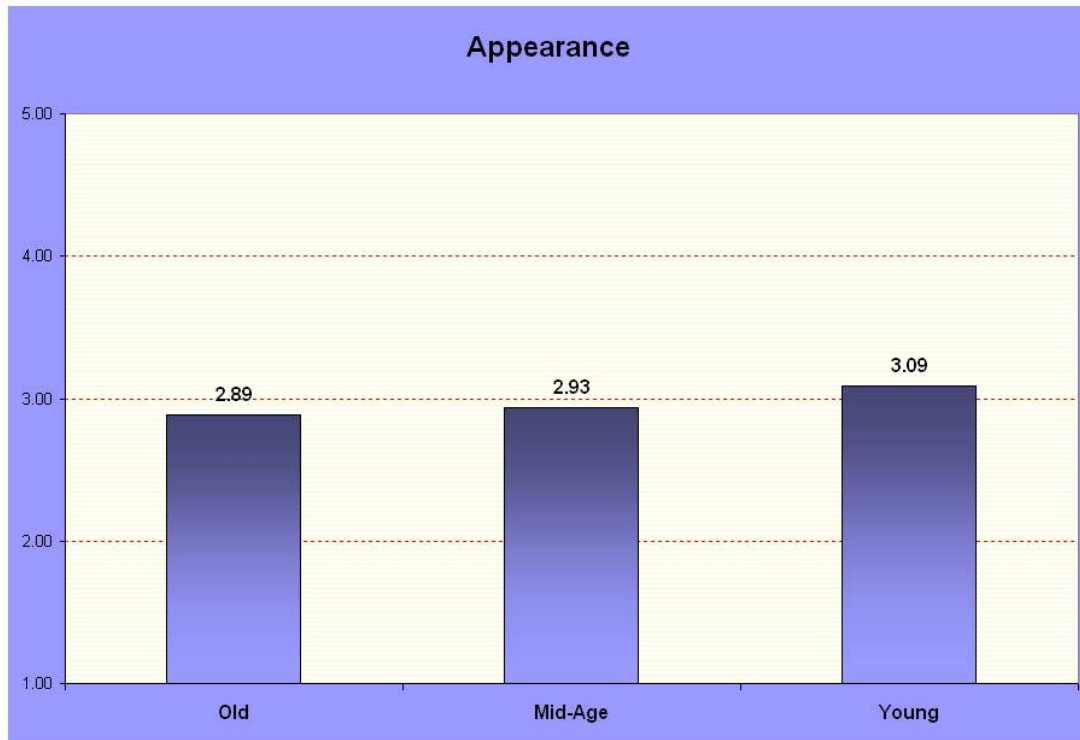
Appendix I: SCALE & SUBSCALE TRENDS OF DIFFERENT AGE GROUPS

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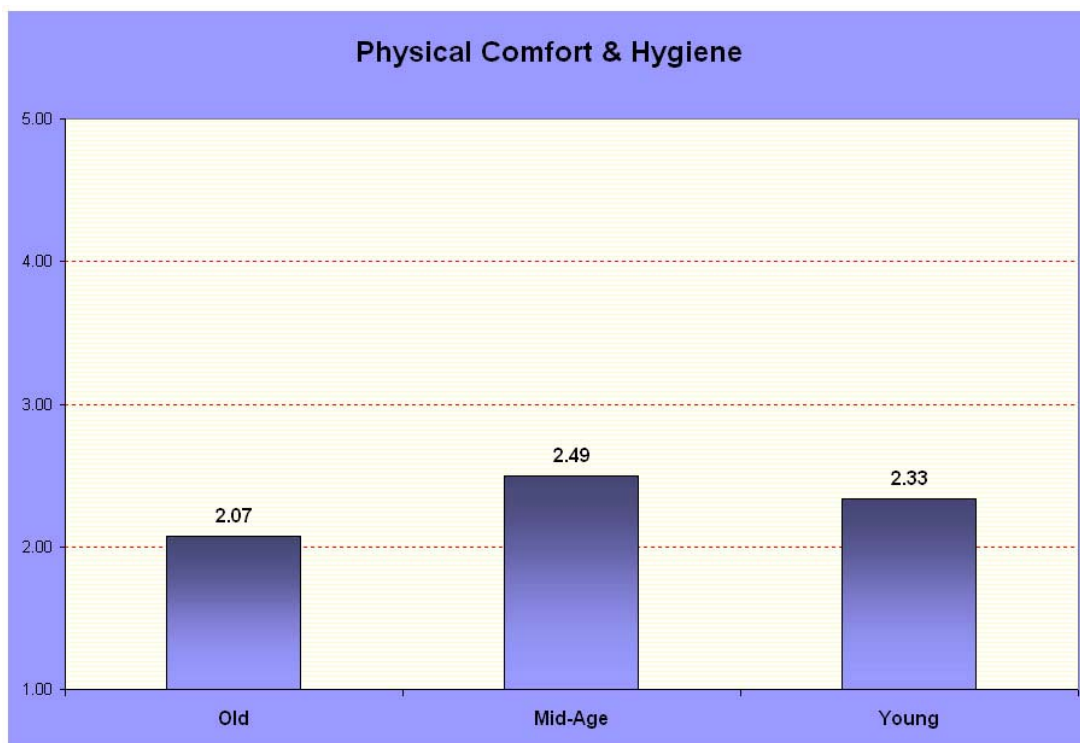
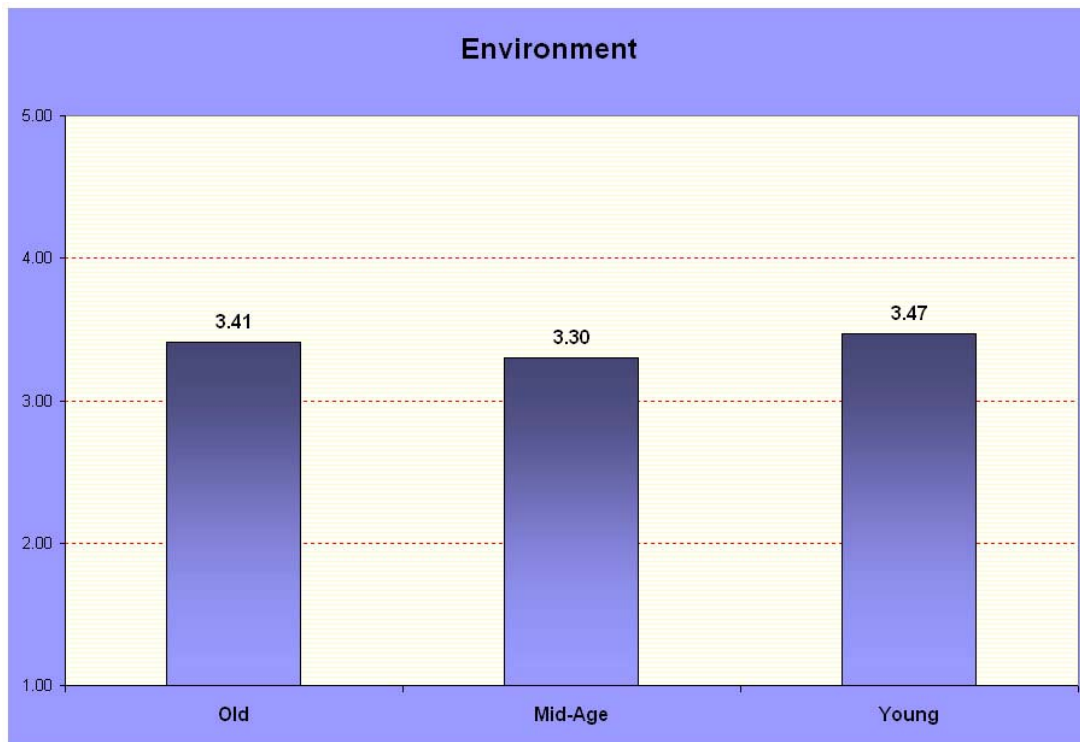
Appendix I: SCALE & SUBSCALE TRENDS OF DIFFERENT AGE GROUPS

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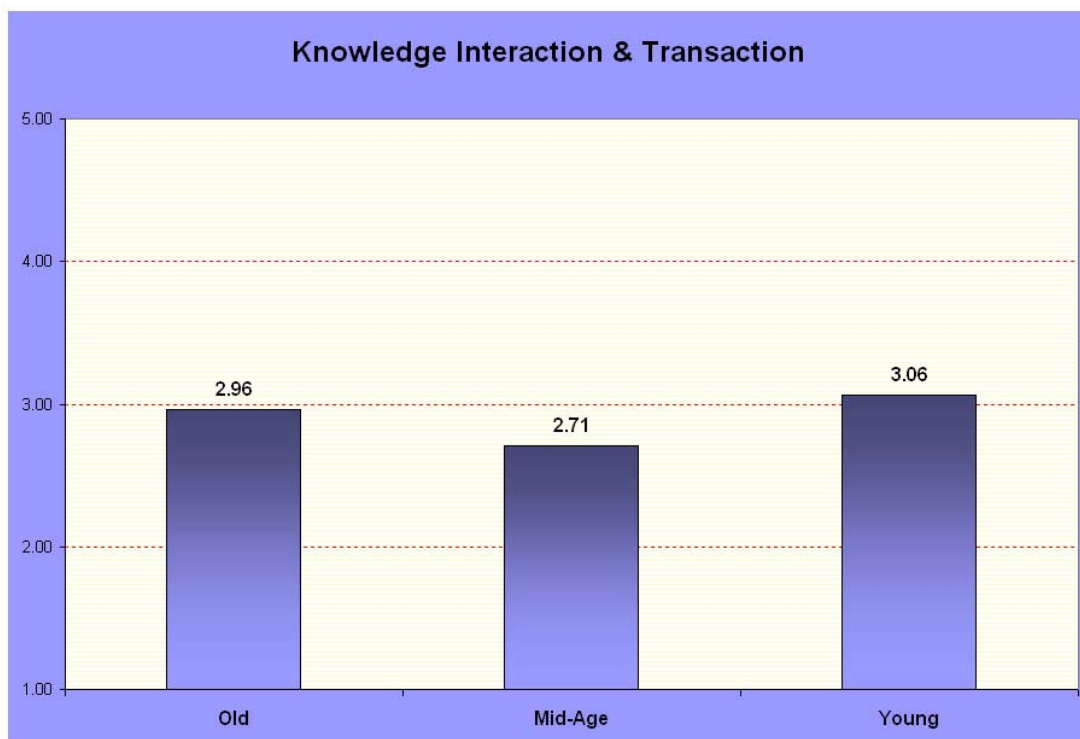
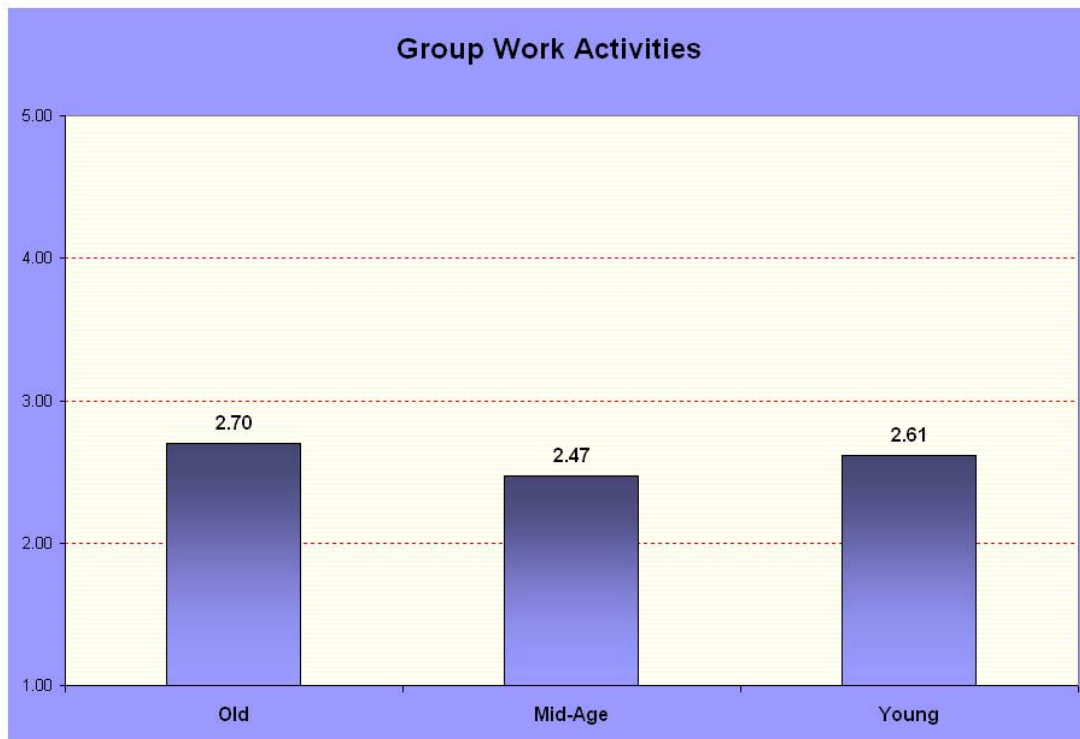


Appendix I: SCALE & SUBSCALE TRENDS OF DIFFERENT AGE GROUPS

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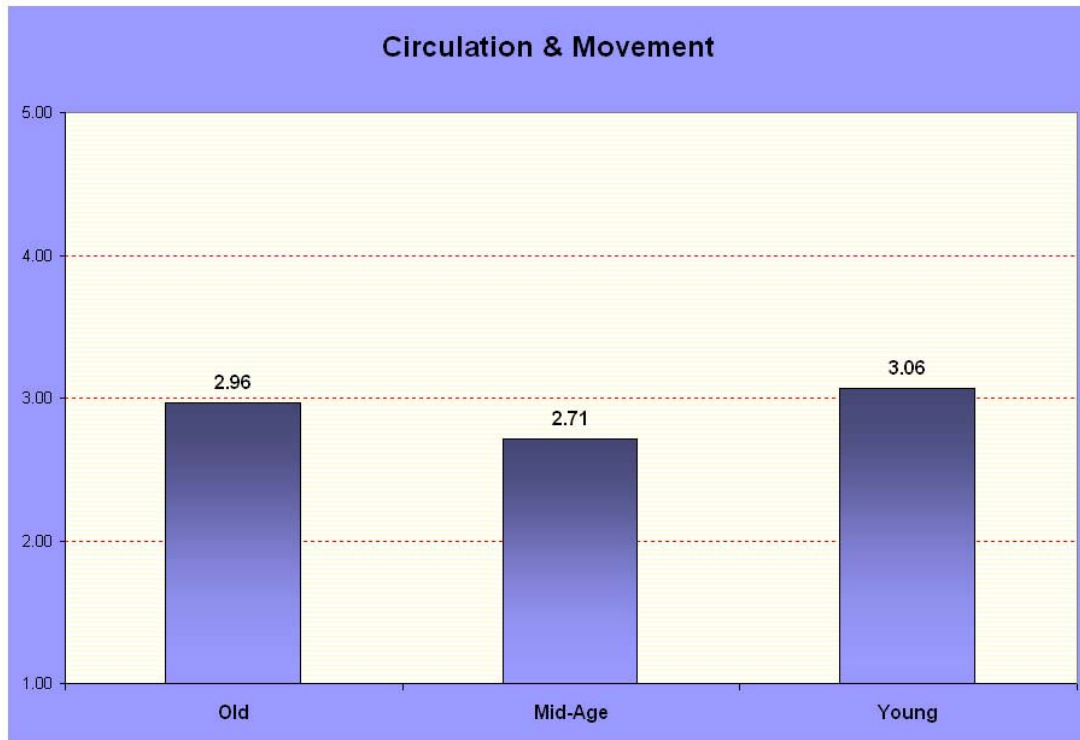
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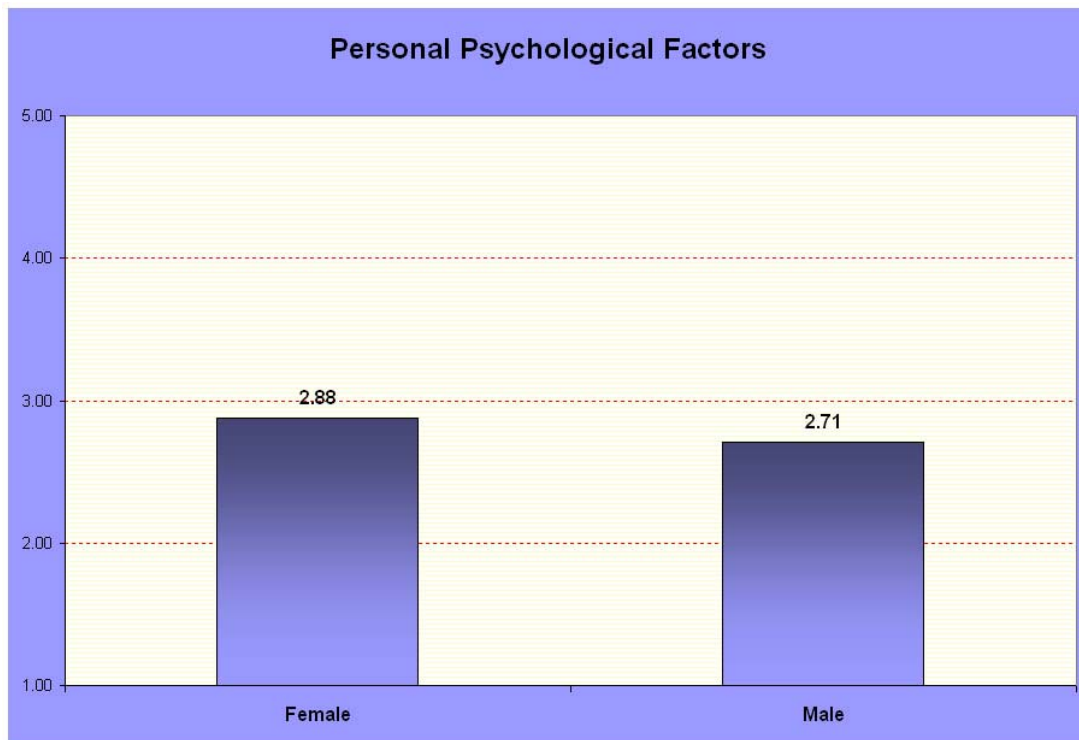
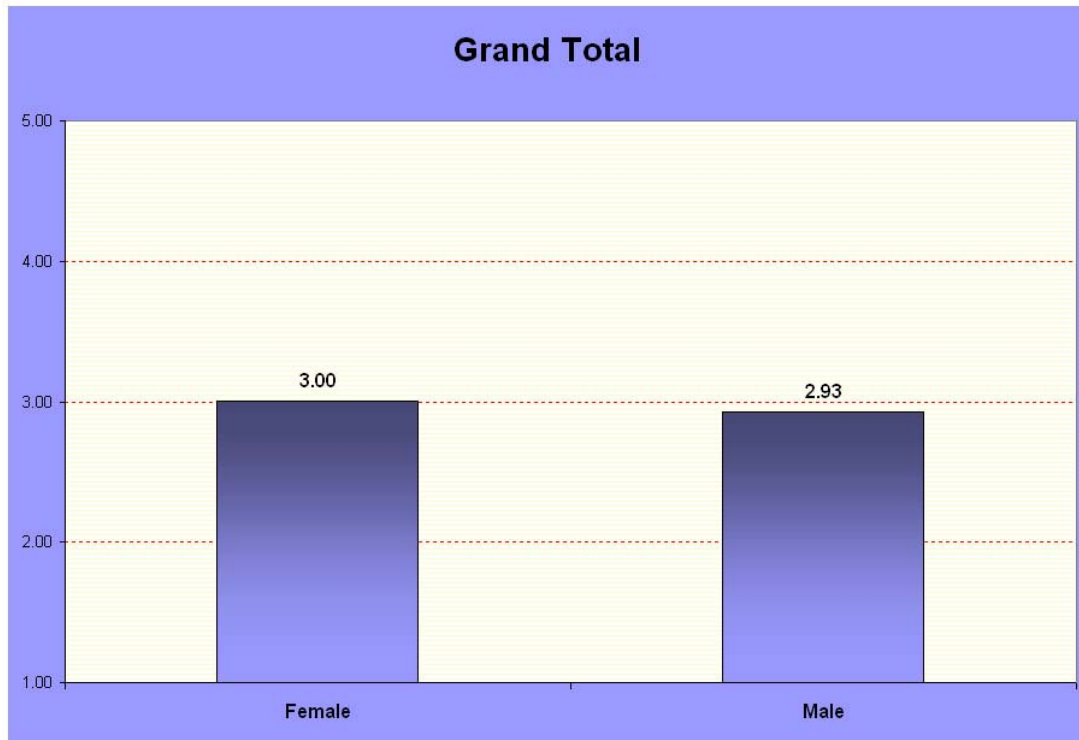
Appendix I: SCALE & SUBSCALE TRENDS OF DIFFERENT AGE GROUPS

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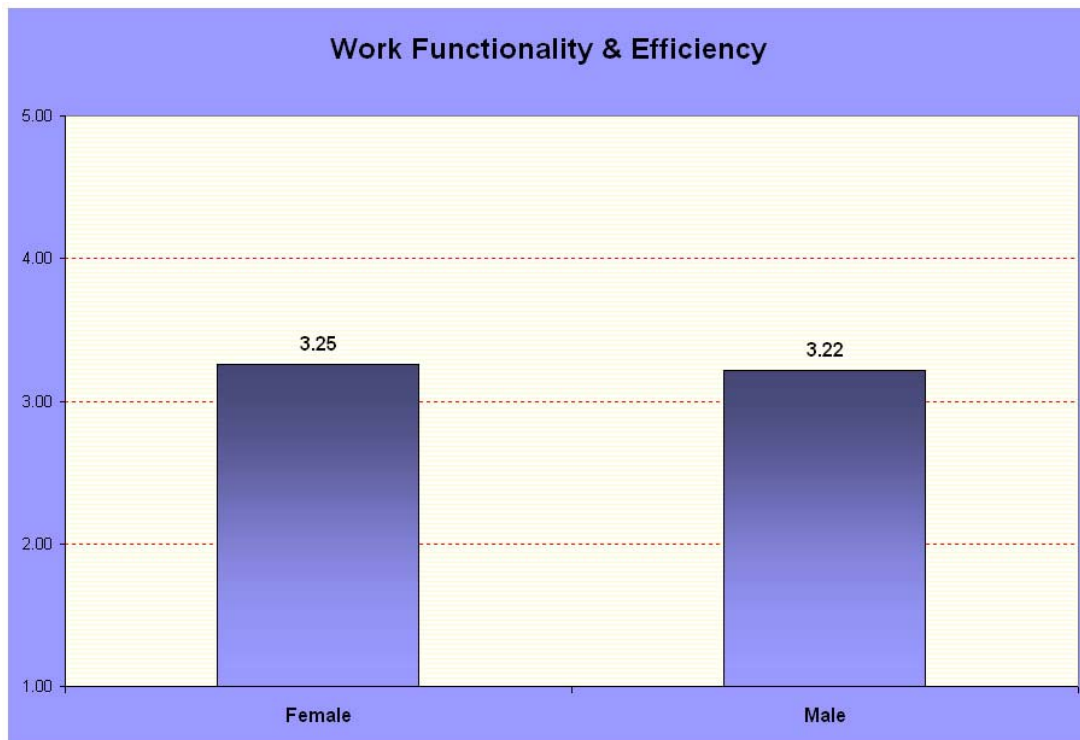
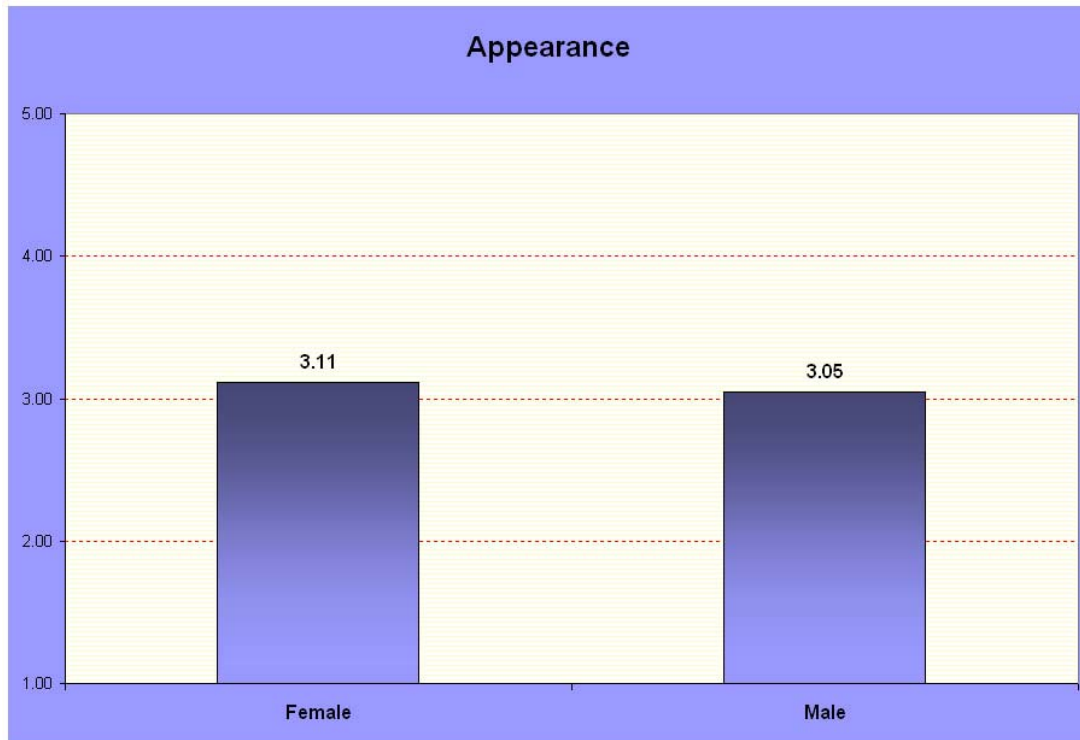
Appendix J: SCALE & SUBSCALE TRENDS OF DIFFERENT GENDER

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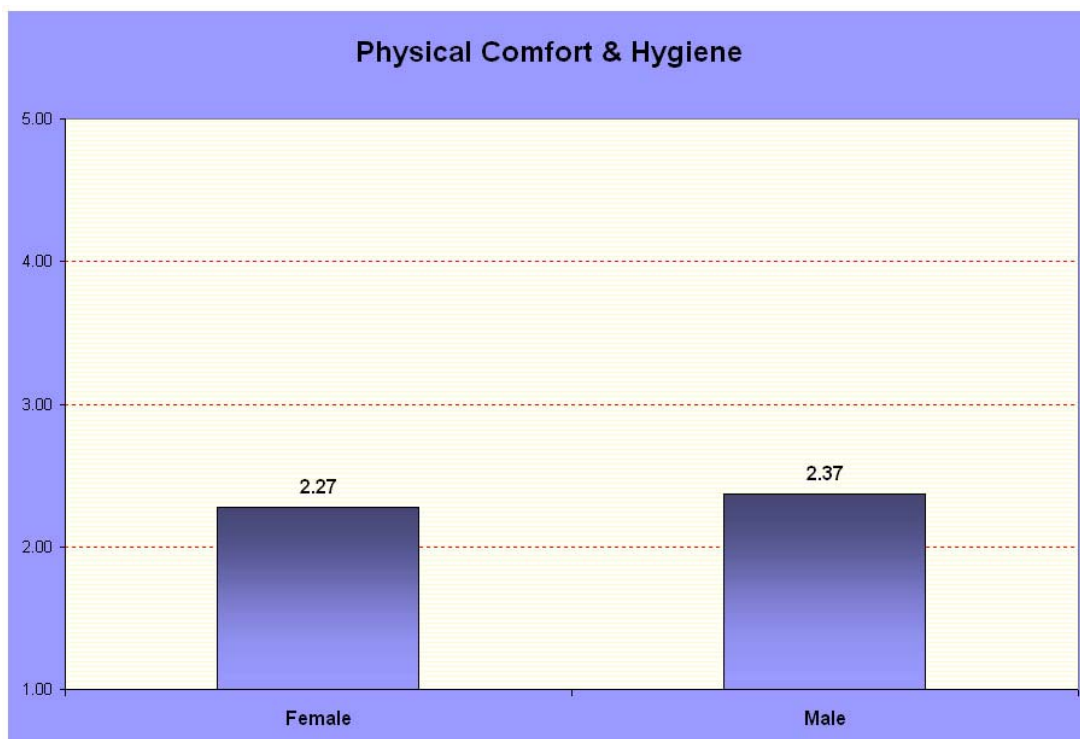
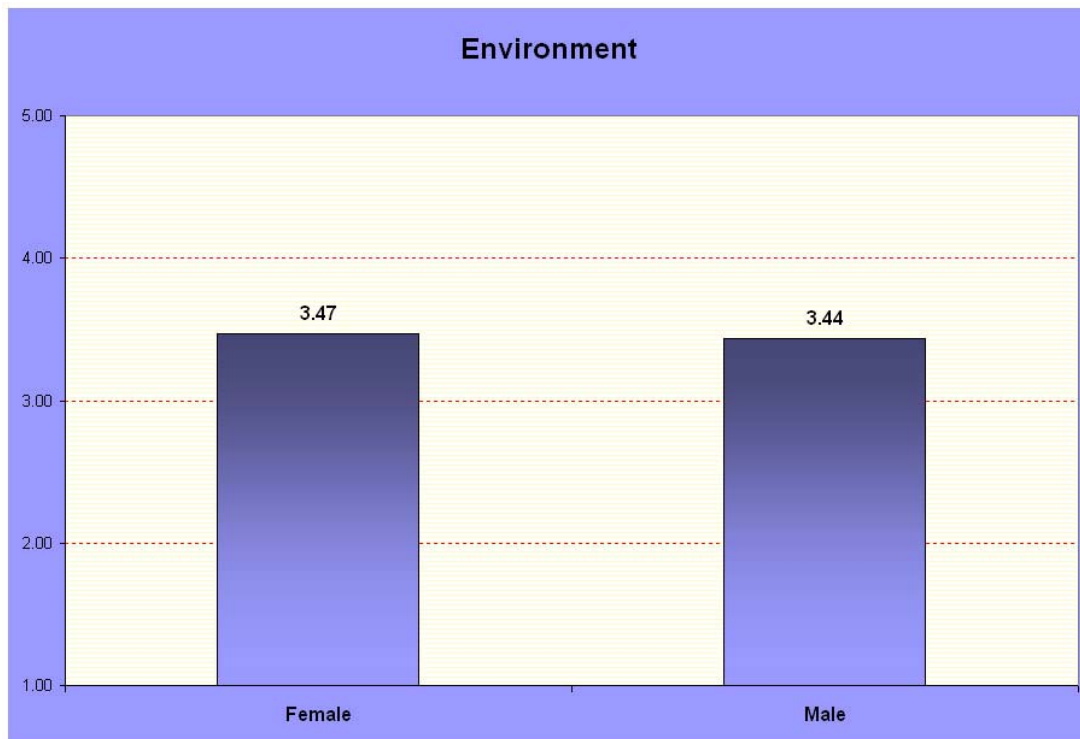
Appendix J: SCALE & SUBSCALE TRENDS OF DIFFERENT GENDER

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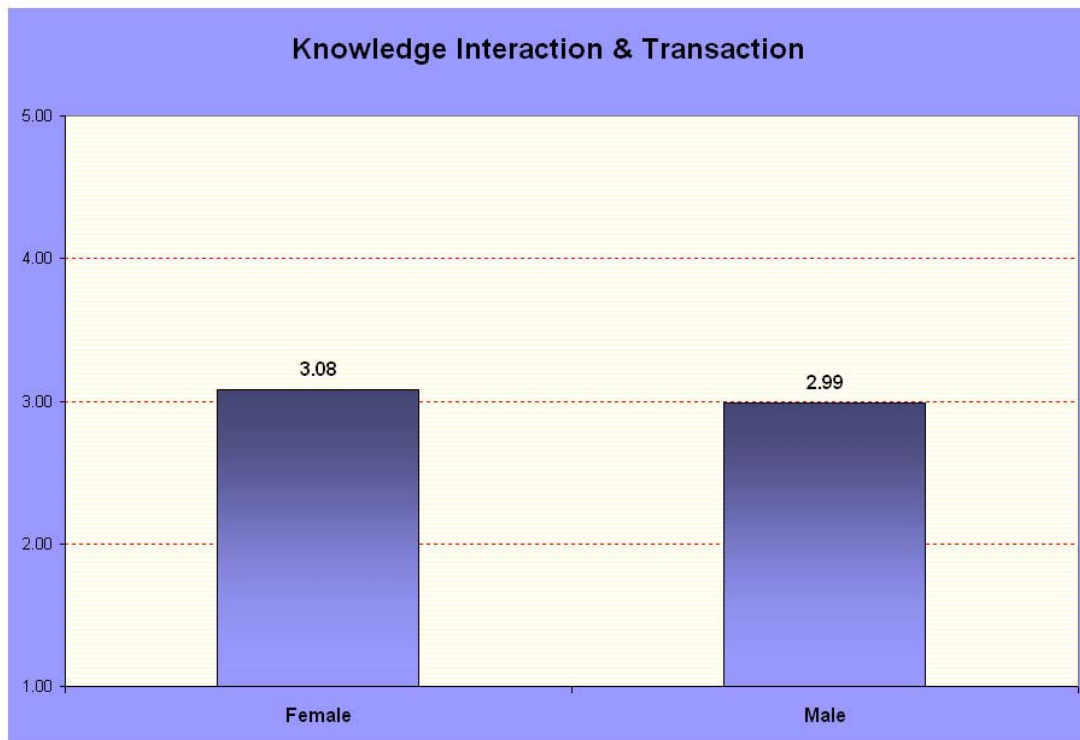
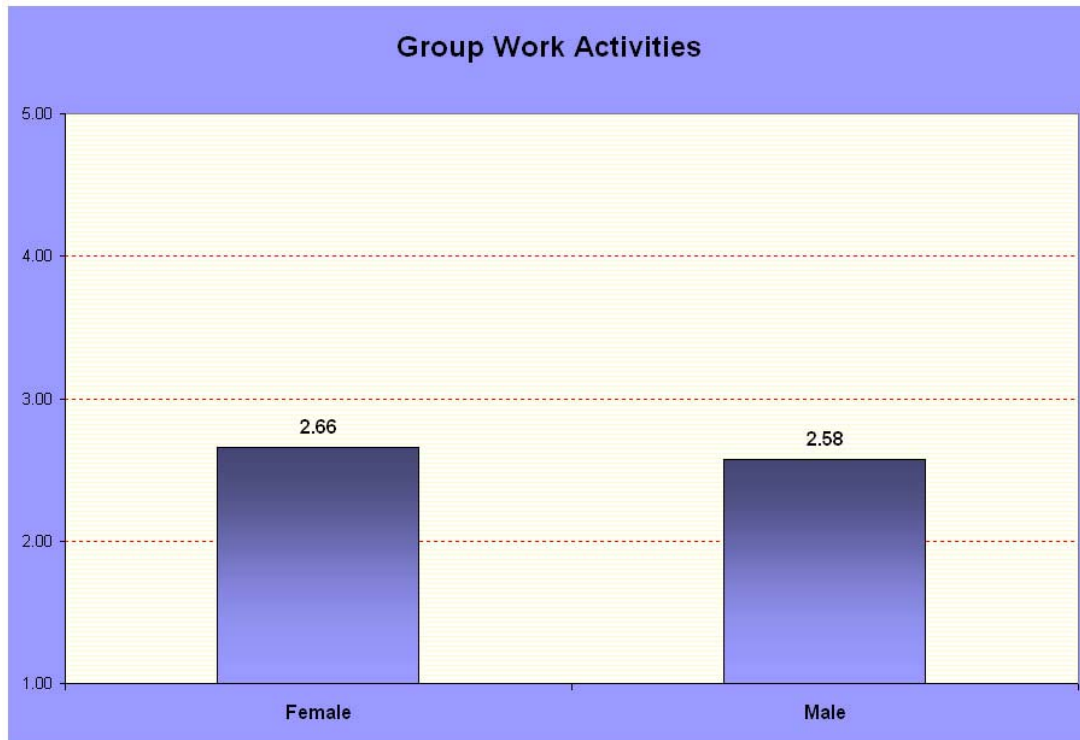
Appendix J: SCALE & SUBSCALE TRENDS OF DIFFERENT GENDER

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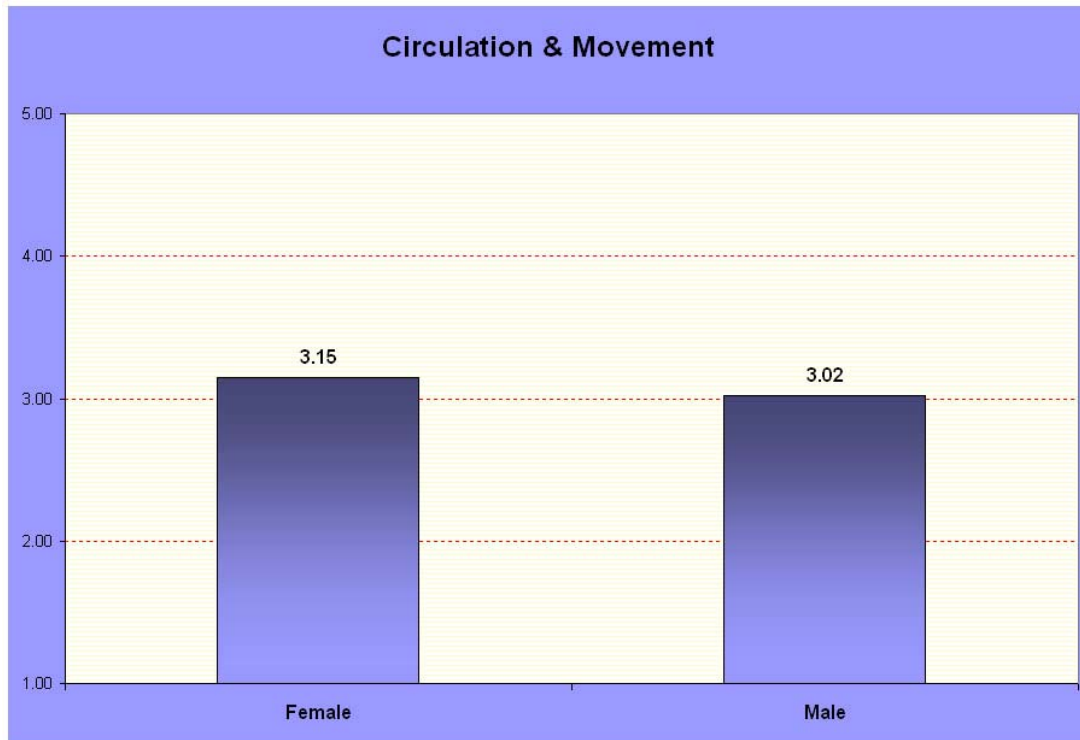
Appendix J: SCALE & SUBSCALE TRENDS OF DIFFERENT GENDER

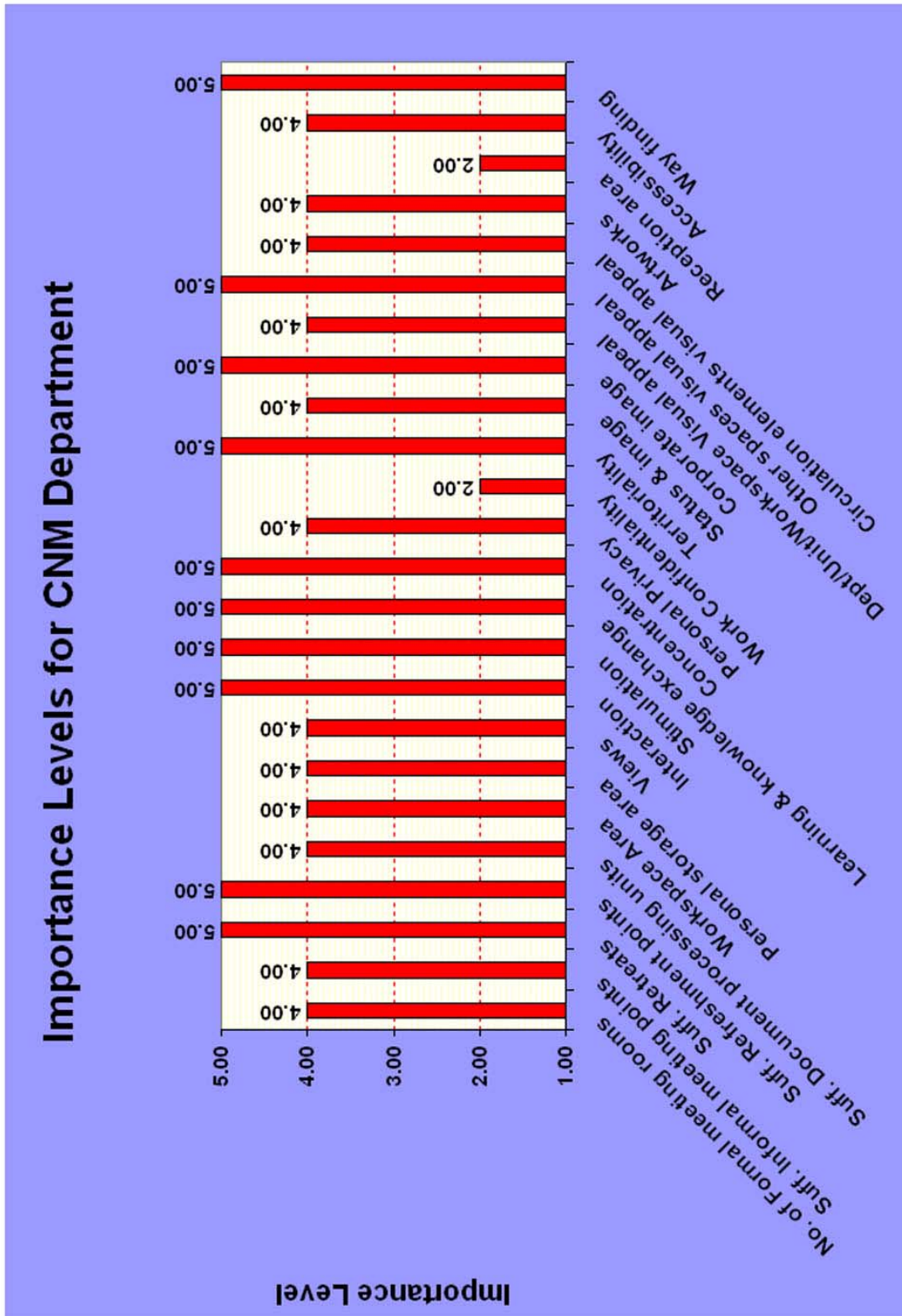
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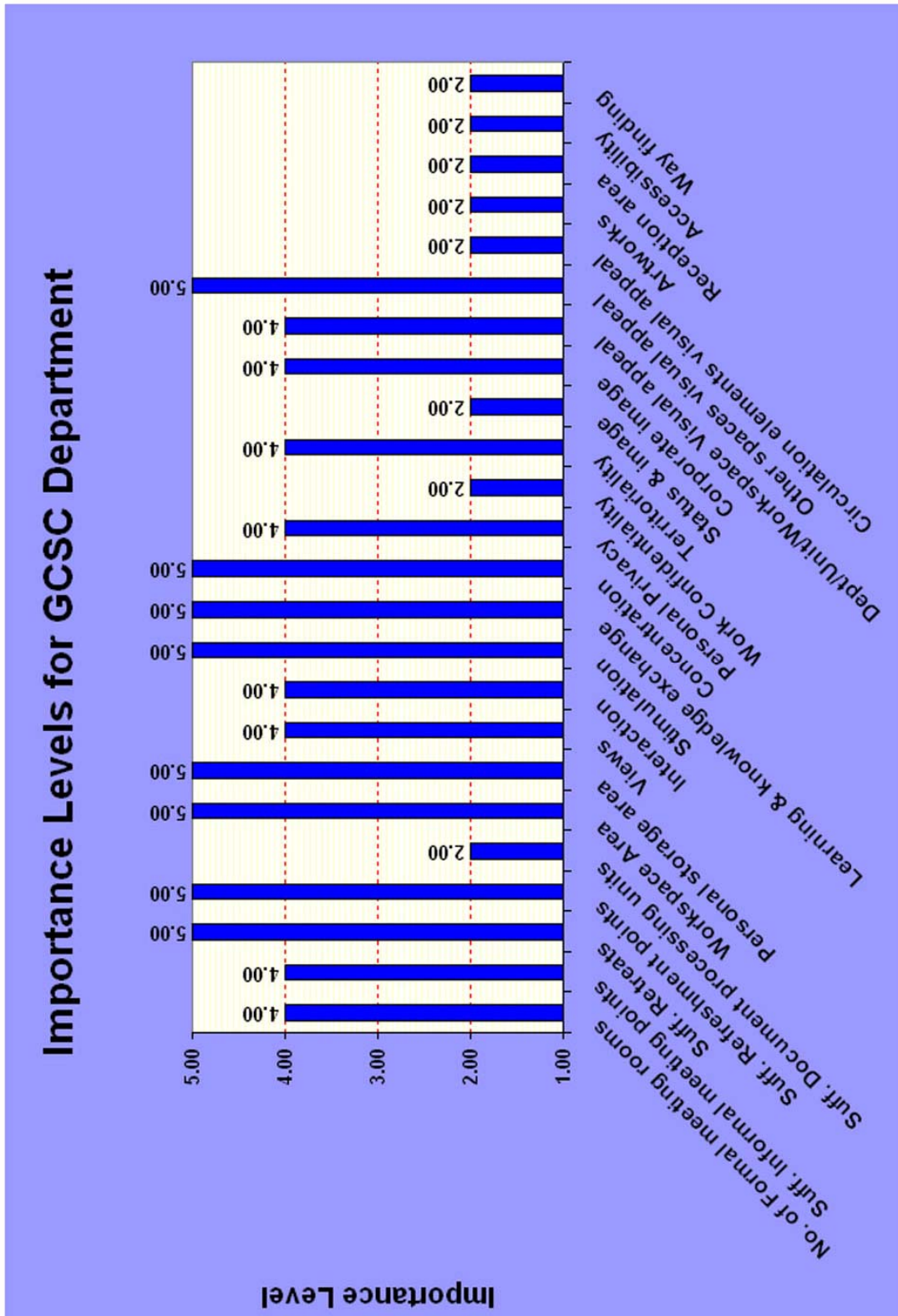


Appendix J: SCALE & SUBSCALE TRENDS OF DIFFERENT GENDER

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## Appendix L: REPLIES OBTAINED FROM THE ATTITUDE SURVEY

If you think that there are OTHER issues that you would like to add and relate to your workplace satisfaction – whether having a positive or negative impact on you or your department – please feel free to express them in the following text box	Department Name	Job Level	Gender	Age Group
We need a way to reduce the noise, give more privacy to the team leaders and managers even if not offices	Revenue Assurance Data Integrity	Head of Department/ Senior Manager	Male	31-40
Remarks above are concerning no windows on closed offices, which are not healthy; also space limitation is affecting the refreshment points, meeting points as well as the Toilets. Some soundproof partitions can be used to limit cross talk in work area, while some artistic touch could be used to add an appealing view for Staff	GCSC – CSP Extended	Head of Department/ Senior Manager	Male	41-50
the most common problem that there are no enough toilets for the agents ... also tissues always not available ... no place for praying in the whole floor .. beside the issues in the above survey	GCSC – CSP Extended	Professional / Agent	Male	22-25
I am complaining mainly about the NOISE... NOISE everywhere and truly very hard to focus. There's a kind of cubicles that extends to 100 to 120 cm height. This design of cubicles provides both privacy and noiseless environment. Please negotiate with the consultant whether it's possible for us to change our office design to that other design.	CNM- Customer Network Management	Professional / Agent	Male	22-25
Talking people usually in working area is the most problem I face, and my concentration is decreased by 70 % during morning working hours so sometimes i used to stay after 8 PM to 11 PM or after so noise is less and my working efficiency is higher	Other	Other	Male	26-30
WE need to create the following: 1 - A Rest Room for ppl with a seats, and refreshments, like old days in Zamalek. But with a larger space room. - Creating a Room for Prayer with better facilities (a dedicated bathroom) - Creating a Room for GYM like that being followed in other companies.	GCSC – CSP Customized & Expert Support	Team leader	Male	22-25
1- need more green space 2- need some refreshment places	CNM- Customer Network Management	Professional / Agent	Male	22-25
I think we need some green planets indoors which makes the employee more productive	Voice Service Management	Professional / Agent	Male	26-30
I prefer to Keep the related teams together and also prefer to make open areas where we can enjoy fresh air or open views during the breaks or the lunch time	Voice Service Management	Team leader	Male	26-30
Please help, we need a cleaner environment. Everyday, we come in the morning; we find trash all over the place and full garbage bins. Also the toilets are rarely clean.	GCSC – CSP Standard CEMA	Professional / Agent	Female	22-25
Need regular maintenance & periodic check to ensure every thing is all fine.	GCSC – CSP Extended	Professional / Agent	Male	22-25
It might not seem too important, but a smoking area within the floor would be appreciated. Also, a fridge would be nice to have for cold refreshments.	OTB- Order to Bill	Other	Male	22-25
The tables are very small and the PC screens are too close while seated. Also the chairs are uncomfortable and cause me and a number of colleagues neck and back problems. Also the kitchen area which is the only place to eat and drink only supports 4 seated people, while we are over 100 using the space.	OTB- Order to Bill	Other	Female	22-25
Amazingly noisy place to work at, the windows should be at least designed to prevent us from the noises outside the building, not least the colleges around you who always raises their voices while you are in a conference call or speaking on the phone.	OTB- Order to Bill	Other	Female	31-40

## Appendix L: REPLIES OBTAINED FROM THE ATTITUDE SURVEY

would like to have more space/area for refreshing with TV set ( at least to be used for NEWS ),we can also have a GYM/to be used for refreshment, should be there drinks other than the vending machine, should have Plants around the workspace, should have paintings, should have more restrooms esp. 4 girls, same for prayer-rooms, need snacks/soft drinks to be available at refreshing area, need to have magazines/newspapers available up-to-date, also the balconies could have PLANTS and be decorated and be used for refreshment	CNM- Customer Network Management	Professional / Agent	Female	26-30
Air condition outlets in my place ( tower 3, floor 2, Door 8, partitions close to windows )are badly designed as some outlets are faraway from its original fans which causes only closed outlets to have conditioned air.	CNM- Customer Network Management	Professional / Agent	Male	26-30
I recommend the following: Having dedicated premises for Equant outside the crowded Cairo towns like smart village. Having a suitable car parking. Assigning areas for test environment to host different test equipments because currently we could not find a suitable place for our test environment. Cleaning toilets every hour not every 3-4 hours. Having closed offices for the engineering teams because the open area is not suitable to their tasks.	IT Services Operation	Professional / Agent	Male	26-30
The prayer place for girls is too small and very few toilets for girls	OTB- Order to Bill	Professional / Agent	Female	22-25
Closed spaces must be provided to managers not just based on their level but also based on their function, some positions require more confidentiality than others.	IT Services Operation	Supervisor	Male	31-40
I hope if there is a small refrigerator in the rest room. Thanks.	CNM- Customer Network Management	Professional / Agent	Male	31-40
It is not easy to stick any note or paper in my desktop. Teams should be separated and distributed in better way.	OTB- Order to Bill	Professional / Agent	Male	26-30
Please Provide free parking place for Employees as parking in the street is really a bad issue.	CNM- Customer Network Management	Manager	Male	26-30
I think that dept. appearance should be more appealing and indicating what this dept. is all about	GCSC – CSP Extended	Team leader	Male	26-30
Too little huddle / meeting rooms + shortage in availability + privacy is not an option (especially for jobs which require confidentiality and consecutive meetings)	OTB- Order to Bill	Manager	Male	26-30
Noise is the main problem in my work area. This is causing lack of concentration and a lot of problems while talking on the phone which is part of my job ( as part of a call centre) the second problem is that I feel exposed while working, although it is easier to communicate with my colleagues that way	GCSC – CSP Customized & Expert Support	Professional / Agent	Male	22-25
require other meeting room and praying room in capital 3	CNM- Customer Network Management	Professional / Agent	Female	26-30
Dear sirs, I suggest to make a renovation in the ventilation system as we are working 24/7, that means the office is always manned, always there is a way to diseases propagate in the office, to propagate in the ventilation system, which make us spend so much money on medicines especially cold medicines, why the air is not purified? This causes a lack of motivation for sensitive people to that atmosphere, I have a suggest, to purify periodically the office by insecticides and disinfectants also to purify periodically the ventilation and / or the air conditioning system. Thanks and best regards Hussein Said Equant CTS2 Specialist Equant, Customer Service & Operations City Stars Complex - Star Capital 2 - 9th Floor -AT&T Heliopolis/Cairo CVS	GCSC – CSP Standard WE & NAM Corporate Services	Professional / Agent	Male	31-40
Concerning temperature, appreciate if it can be fixed between 20~24	Services	Other	Male	26-30

## Appendix L: REPLIES OBTAINED FROM THE ATTITUDE SURVEY

degree (upon another survey, or the management requirement), cancelling all the internal controllers, as they're badly used by staff. (Either switched off, or on very high/low temp.). That could be handled among the building management system providing the required temp.	Corporate Telecom - EUMA			
More Plants and flowers	IT Services Operation	Professional / Agent	Male	26-30
I think Plants, should be more present in the workplace, as it adds relaxing sense, and help in purifying the air. Open air Break Areas should be provided in a way or another to help getting fresh air, and relaxing the eyes from the monitor radiations, help keeping the agent healthy and focus all over his shift, Restrooms, should be cleaned on an hourly basis, and there must be a night shift Office boy for the cleaning work in the night shifts	GCSC – CSP Standard CEMA	Professional / Agent	Male	22-25
rest rooms and retreats does not exist	IT Services Operation	Professional / Agent	Male	31-40
====>> There are no tissue boxes most of the time!! =====>> Bathroom is not always clean and most of the time it's busy!	GCSC – CSP Extended	Professional / Agent	Female	18-21
No privacy No privacy No privacy	IT Services Operation	Professional / Agent	Male	22-25
We need plants in the area to give life to the place.	OTB- Order to Bill	Other	Female	22-25
MOSTAFA MEGAHED	GCSC – CSP Customized & Expert Support	Head of Department/ Senior Manager	Male	41-50
1) The Toilet always smells bad and the cleaning needs to be upgraded. 2) A need for a larger area for foods and refreshments since we are large in numbers compared to the size allocated. 3) A need for prayer room for men since there is only one prayer room for women and it is always busy and very hard to book for men.	OTB- Order to Bill	General Manager	Male	26-30
There is a problem in air condition, few people want to adjust it to 16 degrees, High fans all the time, while many others want it normal 22 or 23 degrees and this cause disagreement, so there should be a standard. Comment (as no designated area): I had the privilege to visit other Equant worldwide sites (7 sites - in FR, US, UK), & out of question; our site is far away from Equant Standards or even any other reputed corporation standards. I'm not being a negative person, but i tried to visualize the fact about our negative status quo!	IT Services Operation	Professional / Agent	Male	31-40
It is very noise around and sometimes you can't concentrate in your work!!!	Finance	Professional / Agent	Male	26-30
Prayer, relaxing, refreshing, eating, chatting, entertaining rooms are insufficient	OTB- Order to Bill	Professional / Agent	Female	26-30
1-Higher partitions will provide more privacy 2- Shelves in partitions is required 3- Paging system to be added to offices 4- Moving to a new private building in a place like smart village is better for the company view and to justify the office according to Equant needs.	GCSC – CSP Standard CEMA	Professional / Agent	Female	22-25
No Stationery or Office tools given to Cairo Staff to support tasks and work activities	IT Services Operation	Professional / Agent	Male	31-40
this is a wonderful survey & hope that Equant Cairo doesn't think another way in re-organizing offices in Boutros Ghaly site, as it's really tight & can't bear ore than 3 persons per office (20 meter square), Thanks...John	CNM- Customer Network Management	Professional / Agent	Male	26-30
	Other	Professional / Agent	Male	31-40
	IT Services	Team leader	Male	31-40

## Appendix L: REPLIES OBTAINED FROM THE ATTITUDE SURVEY

I am not sure that Car parking is related to that survey. But we suffers a lot of finding place to park our cars..	Operation			
More privacy should be offered, quality of chairs should be increased. Thanks	IT Services Operation	Professional / Agent	Male	26-30
- We don't have any office equipments like pens pencils, papers, block notes, so I think this should be considerable. I think it would be better if we could have wider food area. and variety of food products within the company -it would be more comfy	OTB- Order to Bill	Professional / Agent	Male	26-30
lockers are needed strongly	OTB- Order to Bill	Other	Male	22-25
The kitchen needs to be roomier.	OTB- Order to Bill	Professional / Agent	Male	22-25
1-I think we need a fixed food and beverage (snacks) staff or equipments, the one we have is not stable, and he is going through all floors. 2-i think it is useful if we add a central Music system, slow music for relaxing. 3-i don't know how it can be, but I think air fresheners can make the working area more acceptable. 5-The chairs are not comfortable which leads to Backs aches especially that our work is sitting all the time.	IT Services Operation	Team leader	Male	26-30
I need a space to attend the conferences specially. Surrounding noise varies but anyway it doesn't support the needed concentration and it has negative impact for the person(s) on the other side of the call.	OTB- Order to Bill	Professional / Agent	Male	22-25
I think some teams need to be relocated or have separators between them to reduce the noise as there some team who are very noisy and this stops our team from concentrating in work	OTB- Order to Bill	Professional / Agent	Male	22-25
places for Praying is required	Revenue Assurance Data Integrity	Professional / Agent	Male	22-25
I have complained numerous times about Smoking in the floor and outside. Its killing me big time. Also there are lots of dust and no matter how many cleaning crew there is, they are not aware how to clean. People play music which during the night which is disruptive, others socialize with loud noise for long periods of time. Last but not least, AC operates and generates consistent noise that gives chronic headaches + windows are not designed to ventilate the Floor properly.	GCSC – CSP Extended	Professional / Agent	Male	31-40
As our job is an office job or desk job, we sit for long hours, 1st we need comfortable chairs to sit on, 2nd we need like a small gym or a room where we should make exercises during breaks	Other	Professional / Agent	Male	22-25
A Relaxation Area would help a lot, since the 12hrs shifts are pretty tiring	GCSC – CSP Standard WE & NAM	Professional / Agent	Male	22-25
There should be a relaxation area or restaurant maybe just tables or big chairs where we can eat I always eat on my partition in front of the PC because there is only one kitchen for my floor which has like 200 employees at least on duty during the business hours. So we do all eat in front of the PC also no place to relax or take a break which is really irritating. Also the Printer is most of the time out of paper or ink. that is in 9th floor Cairo City stars capital 2	GCSC – CSP Standard WE & NAM	Professional / Agent	Female	22-25
- The scientific studies approved that, hearing a soft quite music will help the workers to be in good mode and arise their spirits, why don't we add a sound system with soft music where the volume can be controlled by each area.	Revenue Assurance Data Integrity	Professional / Agent	Male	22-25
parking spaces	Other	Professional / Agent	Male	22-25
we need a rest area to eat or smoke , it is very irritating to go smoke down stairs , and we need a place to eat instead of eating in front of the computer	GCSC – CSP Customized & Expert	Professional / Agent	Male	31-40

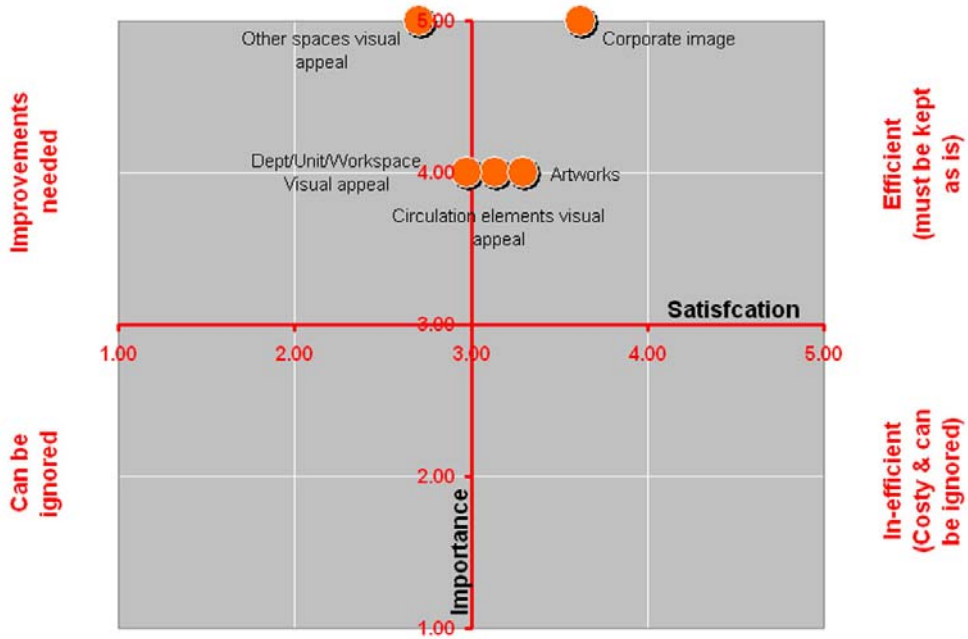
## Appendix L: REPLIES OBTAINED FROM THE ATTITUDE SURVEY

	Support			
-Kindly check the following two points: 1- We Strongly need a prayer room. We had one - but taken for one of the supervisors - IOC / LCM area - Capital 3 door 2. Now we pray at ground between offices - Is that acceptable?? 2- We need a refreshment room.	Other	Professional / Agent	Male	26-30
If there is a problem or complain regarding any issue of the working environment like unavailability of handkerchiefs, broken doors and lack of cups. I find so hard to declare on that, and find the only solution for me is to be silent... it should be a department or one who is unique to solve these kinds of problems.	CNM- Customer Network Management	Professional / Agent	Male	22-25
I think too much communication has same impact as too little communication so workplaces should not be too dense. Also I think that teams that have related job functions should better be located in adjacent as possible locations to motivate communication between teams that have to work together. Also as the conference calls should be really quiet and private, a small room that can sometimes be used for this purpose, can help.	OTB- Order to Bill	Professional / Agent	Female	41-50
Separate each team for the other so each team has its own space and privacy.	IT Services Operation	Professional / Agent	Male	31-40
Seats are extremely unhealthy, though seemingly well designed and adjustable, but lack right back support which is most important.	IT Services Operation	Professional / Agent	Male	26-30
We want an outdoor area, a space that is in the open air.	IT Services Operation	Professional / Agent	Female	26-30
A smoking room is seriously important as there are no smoking rooms in the whole building. Privacy is very important whether for personal issues or business issues.	OTB- Order to Bill	Other	Male	22-25
we strongly need RETREATS (rooms or spaces used for refreshing, eating, chatting, entertaining, smoking...etc) cause we don't have smoking area and eating place and a good source of food and drinks (hot & cold)	GCSC – Case Management	Professional / Agent	Male	26-30
I can see that the safety in the office is not applied like the Fire Alarms that are not working, the Chairs used that cause pain and not comfortable for Body, and the monitors that cause reflect on eyes and cause problems for health	IT Services Operation	Professional / Agent	Female	26-30
we need a place to be dedicated as a nursery	OTB- Order to Bill	Professional / Agent	Female	26-30
1-yes the chairs really are bad; I am getting pain from it. 2-the monitors of the PCs need filters as we are sitting on it for hours and it's not sufficient to be low radiations 3-please give us instructions about how safely we can sit during works and also how to reduce the monitor radiations hazardous	IT Services Operation	Professional / Agent	Female	26-30
you must provide a place of praying	IT Services Operation	Professional / Agent	Female	22-25
We need urgently a good place for women to pray in, it is not acceptable at all from such a big company like Equant have a 2 x 1 meter place for women to pray in !!	OTB- Order to Bill	Other	Female	22-25
The air condition needs adjustment... As the same control unit affects different locations, so u can find one cold and the other hot.	OTB- Order to Bill	Team leader	Male	26-30
Currently our Office is Located in Boutros Ghaly Branch, meanwhile I have been working for 2 years in the City Stars Building and my opinion refers to both Locations	Other	Manager Assistant	Male	31-40
Why we don't have a real cafeteria for all Equant staff?	GCSC – CSP Customized & Expert Support	Team leader	Female	31-40
The Chairs is too bad and uncomfortable	Other	Professional / Agent	Male	22-25

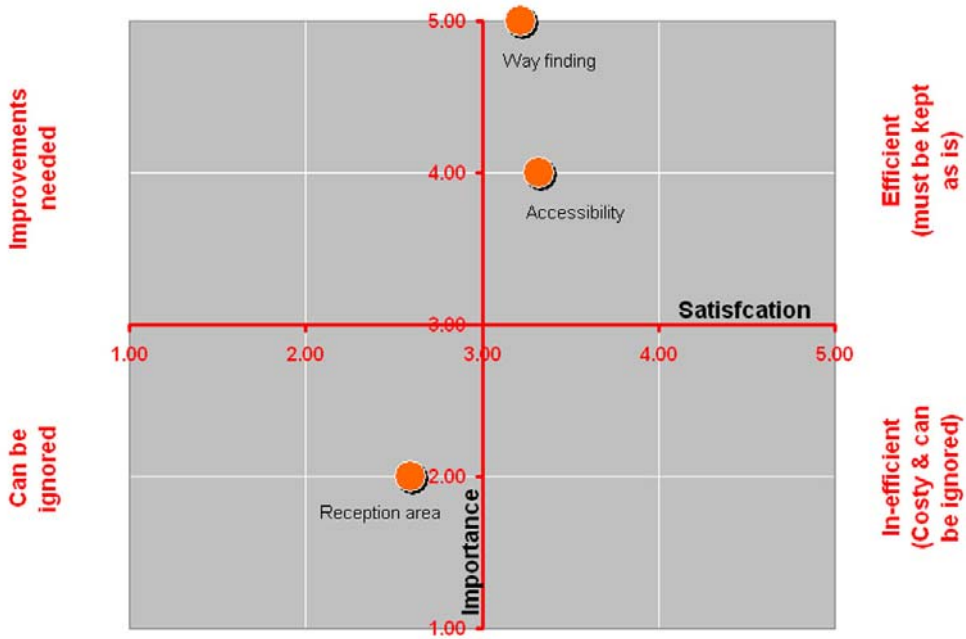
## Appendix L: REPLIES OBTAINED FROM THE ATTITUDE SURVEY

I believe that everybody in the company is suffering from neck ache because of the chairs. Toilets are not clean most of the time. Concerning the 9th floor, there is only one kitchen that takes 5-7 ppl (MAX) who can eat there and I think that the floor has more those numbers & the other kitchen is closed!! Work stations can't be relocated & should be clean at all time however sometimes it isn't. For food & beverage, on weekends there isn't any. Thanks for the concern.	GCSC – CSP Standard CEMA	Professional / Agent	Male	26-30
Cleaning is done in a none healthy way as they use a mop to wash the carpets which leaves it wet & fill the air with HUMIDITY, or they use a groom & fill the air with DUST, also the air is not fresh , no ventilation.	OTB- Order to Bill	Professional / Agent	Female	31-40
I don't know where I can find the teams in Equant (place), or what are the teams in Cairo	CNM- Customer Network Management	Professional / Agent	Male	26-30
Need a prayer space	GCSC – Case Management	Professional / Agent	Male	31-40
We should provide an open air space for the employees; also we should provide plants and flowers insider the working area.	IT Services Operation	Team leader	Female	26-30
We need more space around us, the floor can't be designed for a certain number of desks and then after we move to the floor you keep on putting more desks. The desks need to have bigger spaces between them, our privacy should be considered. The prayer room is a storage room that will be turned into a manger room soon. No other room other than the kitchen, which is relatively small, to do any activity.	Other	Professional / Agent	Female	22-25
Ventilation is very poor in the company. No good cleaning of toilets, windows, kitchenette.	OTB- Order to Bill	Manager Assistant	Female	22-25
I see that we have two major problems: 1. the Girl's prayer room in the 11th floor is totally unbearable 2. The restrooms are very small compared to the number of employees using this room!	OTB- Order to Bill	Professional / Agent	Female	22-25
we need to add live Plants and decorations to the offices	GCSC – CSP Standard WE & NAM	Professional / Agent	Male	22-25
most impacting for me 1 - Workstation size is small 2 - refreshing , chatting and smoking areas are way below standards	GCSC – CSP Customized & Expert Support	Professional / Agent	Male	22-25
Thanks to consider the amount of light in each place and also the air distribution.	OTB- Order to Bill	Professional / Agent	Female	22-25
privacy is not practiced here at all	IT Services Operation	Professional / Agent	Female	26-30
Overall the setup of the offices are good but decoration is neglected, thus it gives a sense of obligation, rather than a pleasant place to work in.	OTB- Order to Bill	Manager	Male	26-30
THERE IS NO REST ROOM, NO SMOKING ROOM , NO PHOTOS, NO RELAX ROOM.ONLY 1 SMALL MEETING ROOM USED FOR GIRLS PRAYING AND MEN NOW ARE PRAYING ANY WHERE. ALSO 1 SMALL REFRESH ROOM.	CNM- Customer Network Management	Professional / Agent	Male	22-25
The prayer room (one for the males and other for females) is very important to be provided, as it will save time during going to the mosque and back to work.	Revenue Assurance Data Integrity	Professional / Agent	Male	22-25
I guess having artworks of Nature would be better cause we already see a lot of people	OTB- Order to Bill	Other	Male	22-25

**CNM - Appearance**

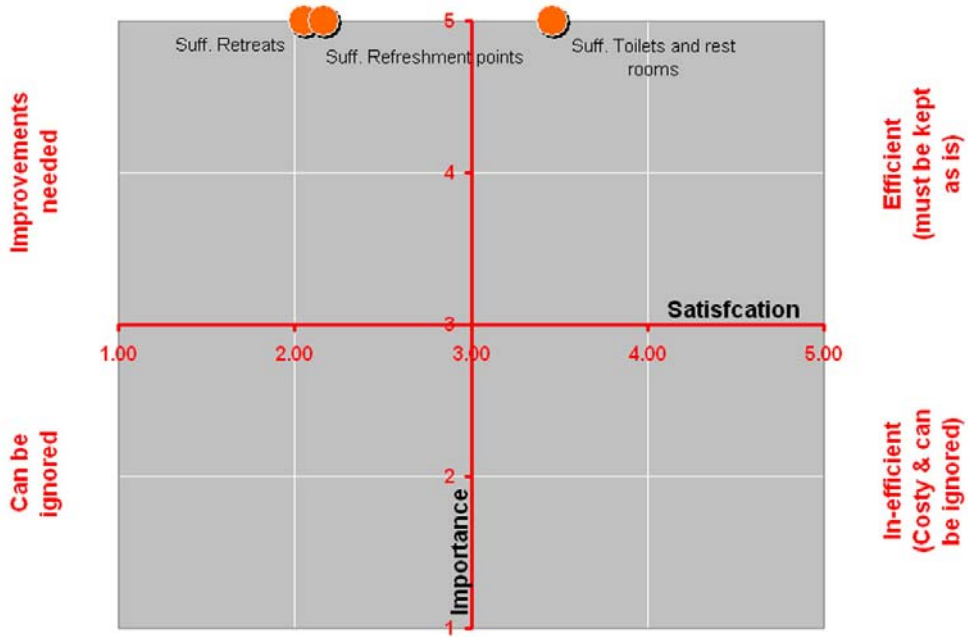


**CNM - Circulation & Movement**

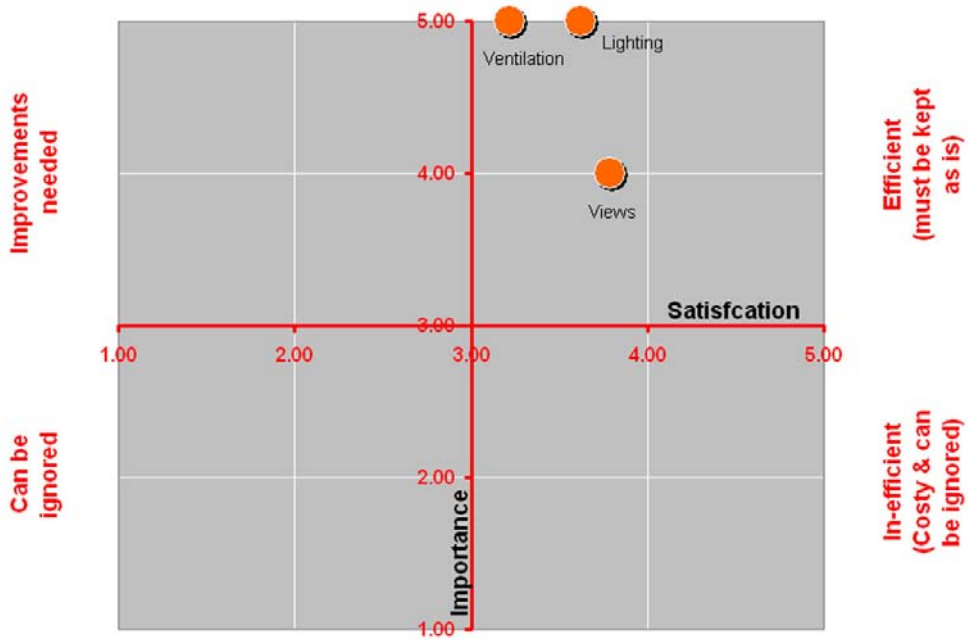




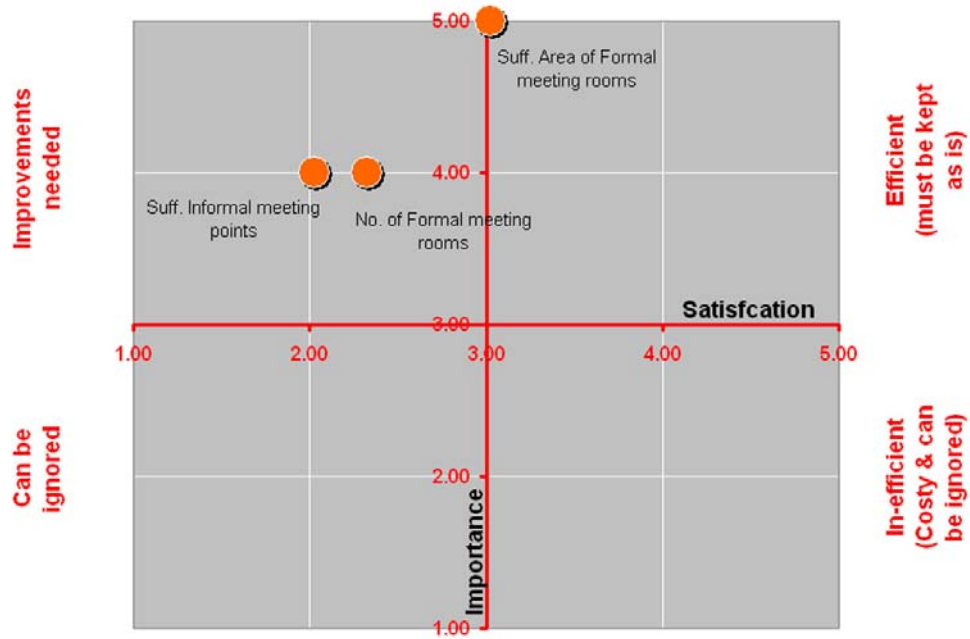
**CNM - Physical Comfort & Hygiene**



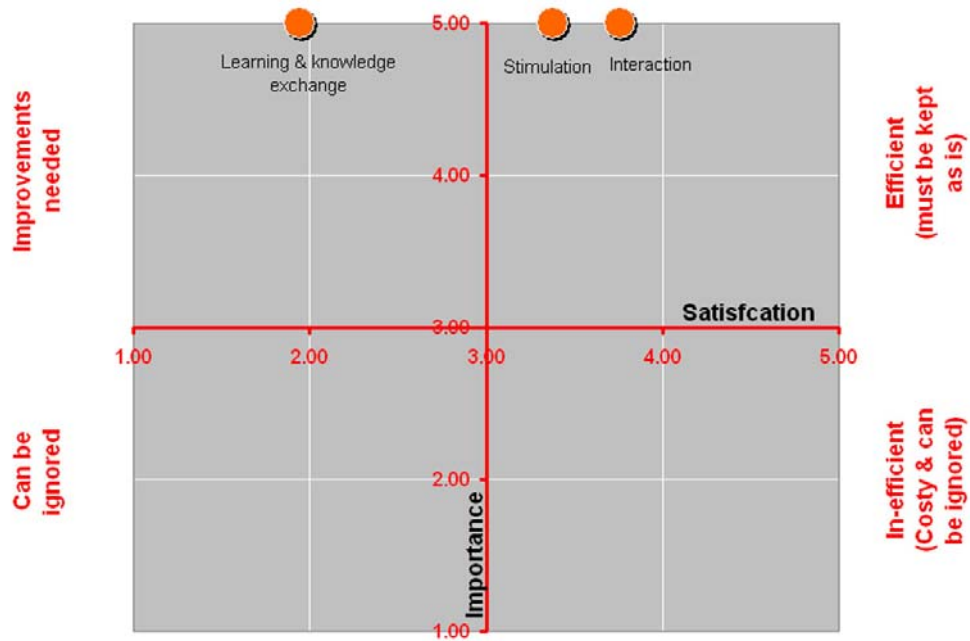
**CNM - Environment**



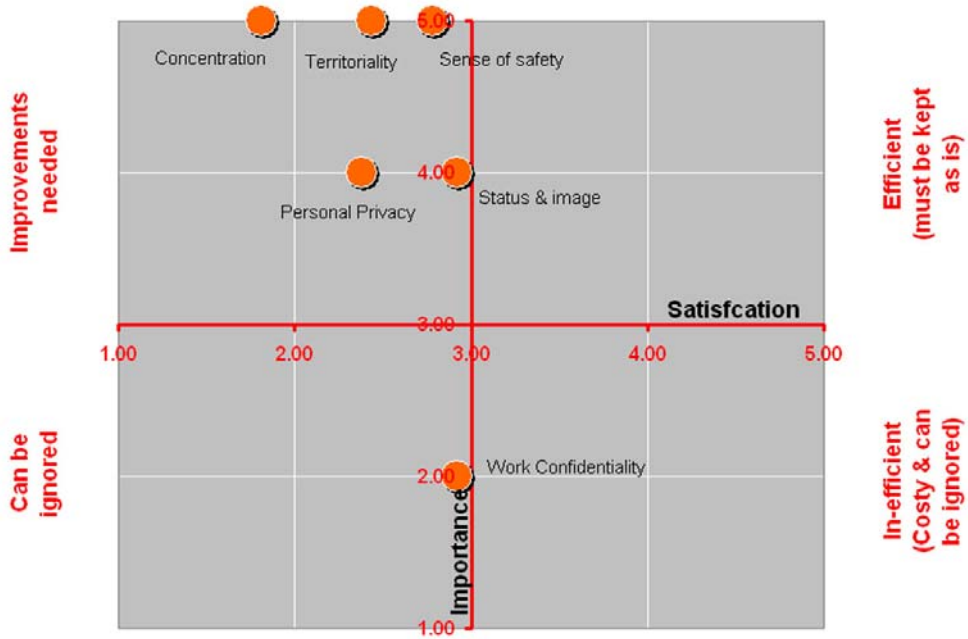
**CNM - Group Work Activities**



**CNM - Knowledge Interaction & Transaction**



**CNM - Personal Psychological Factors**



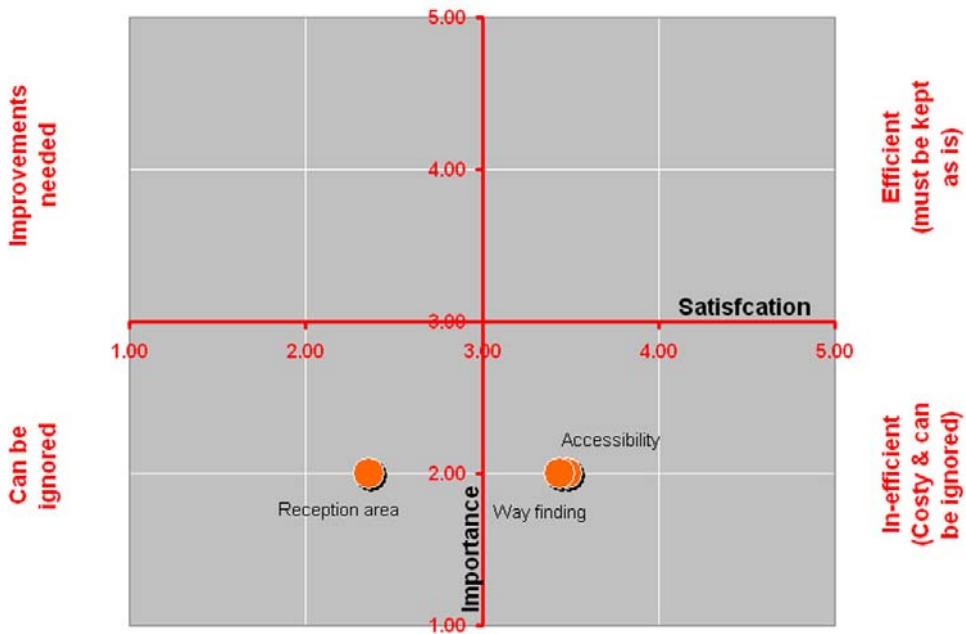
**CNM - Work Functionality & Efficiency**



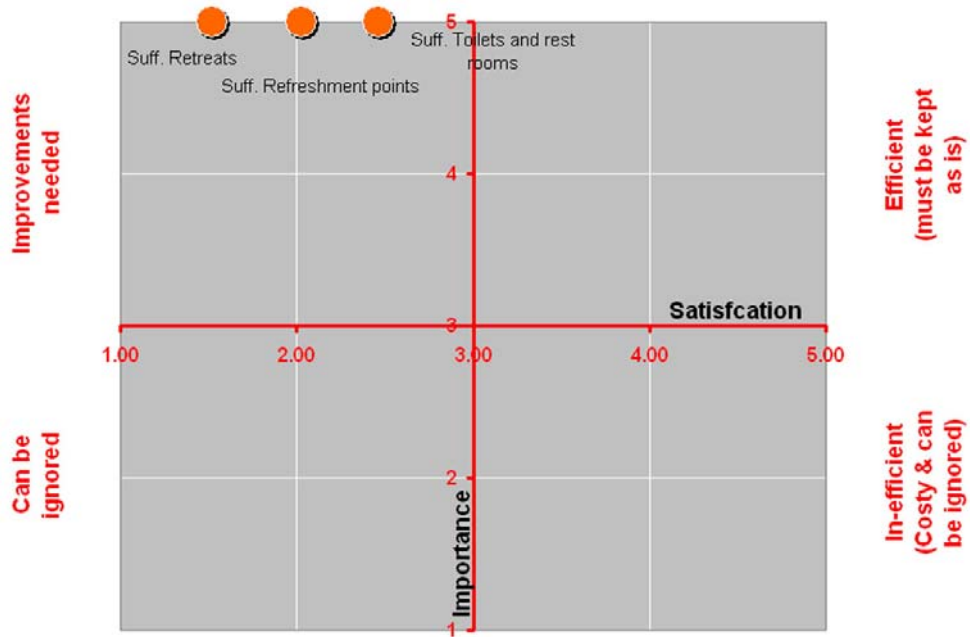
**GCSC - Appearance**



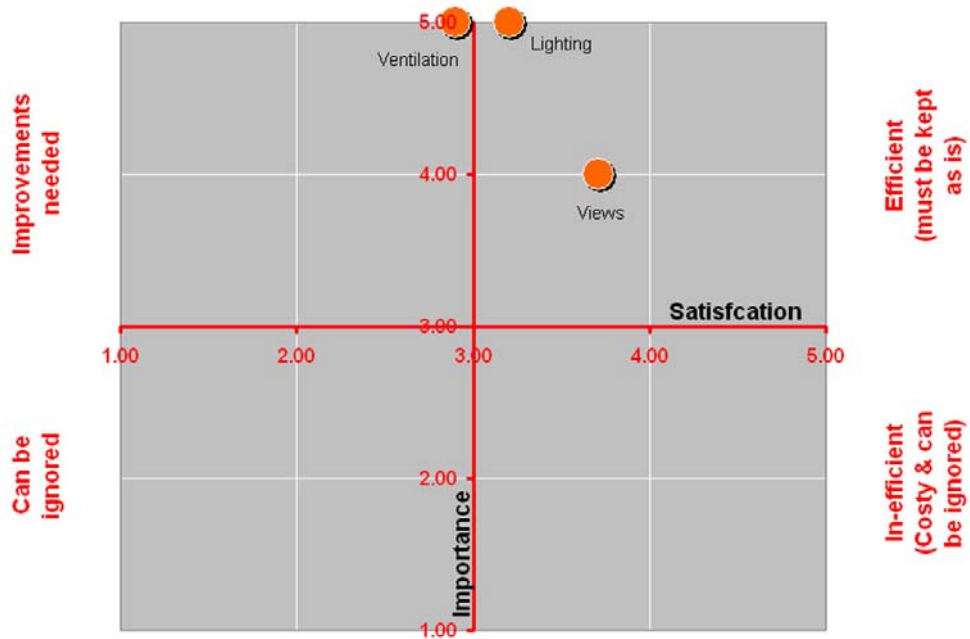
**GCSC - Circulation & Movement**



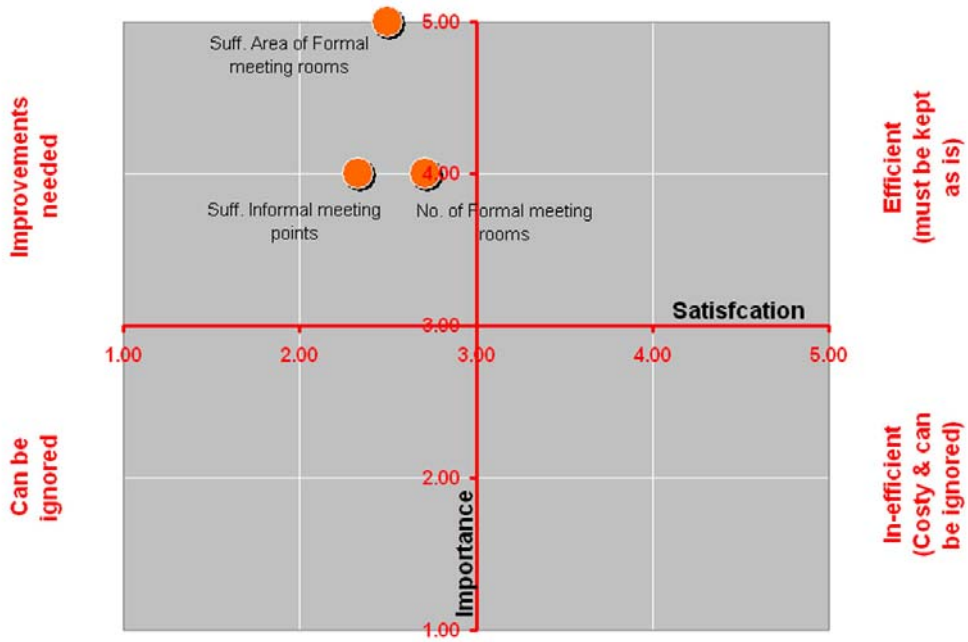
**GCSC - Physical Comfort & Hygiene**



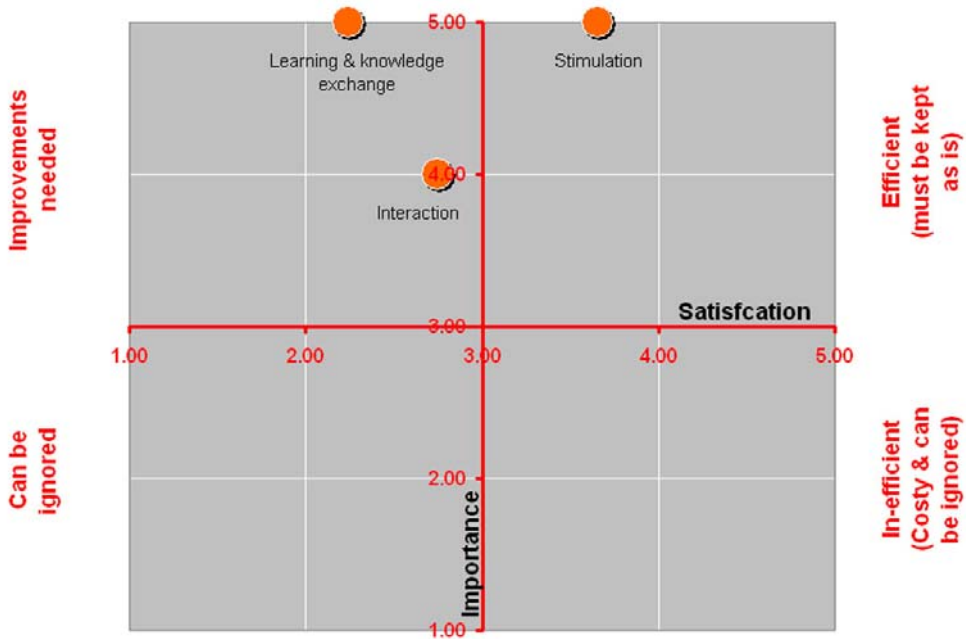
**GCSC - Environment**



**GCSC - Group Work Activities**



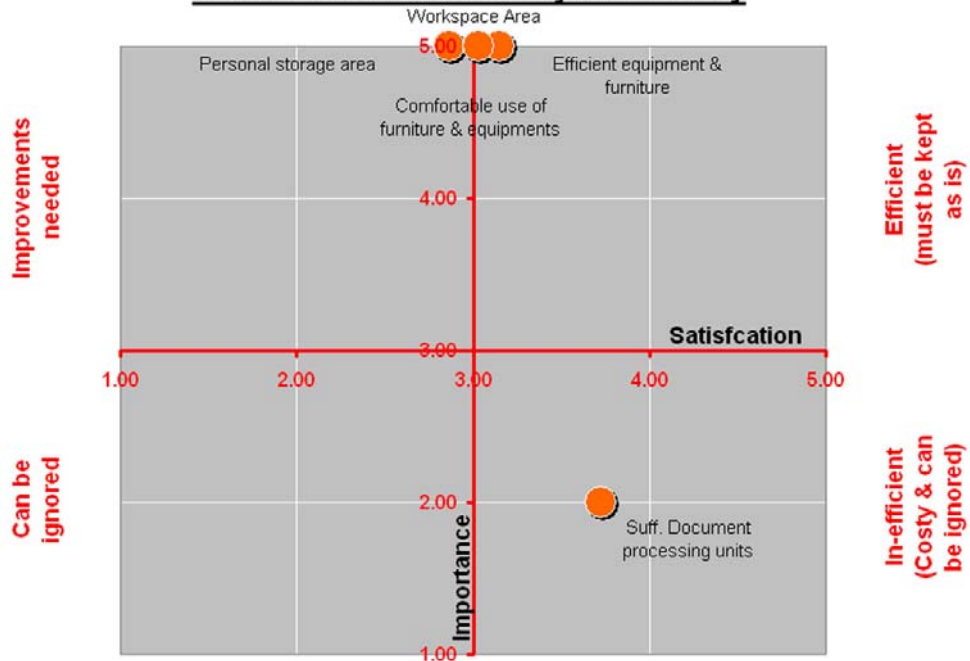
**GCSC - Knowledge Interaction & Transaction**



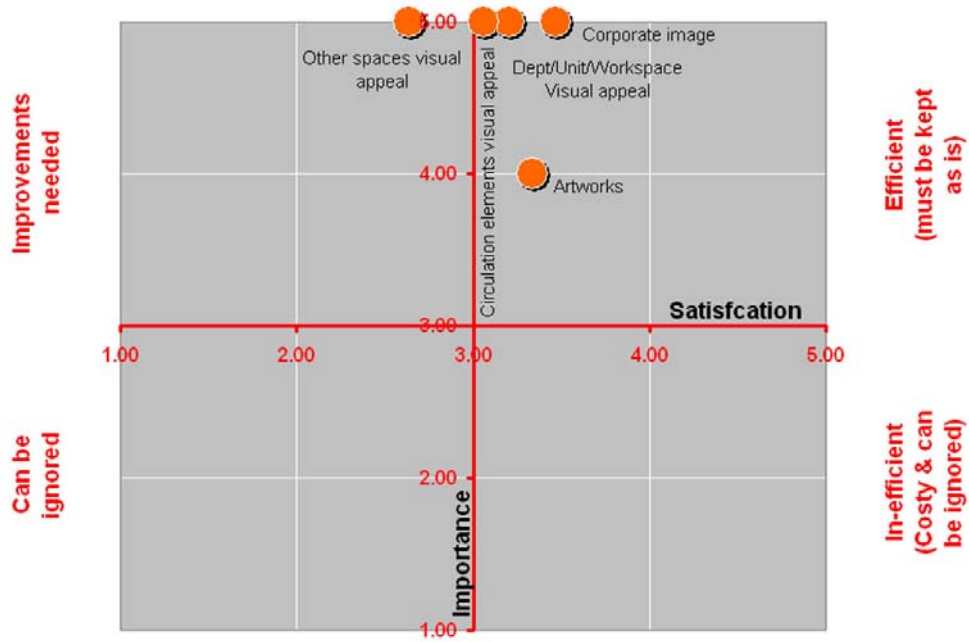
**GCSC - Personal Psychological Factors**



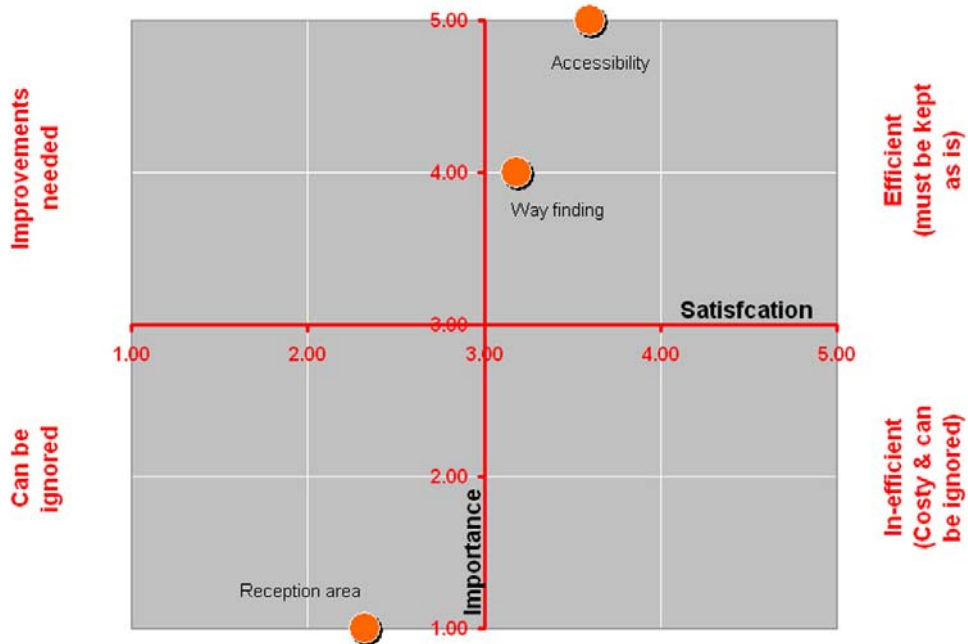
**GCSC - Work Functionality & Efficiency**



**OTB - Appearance**

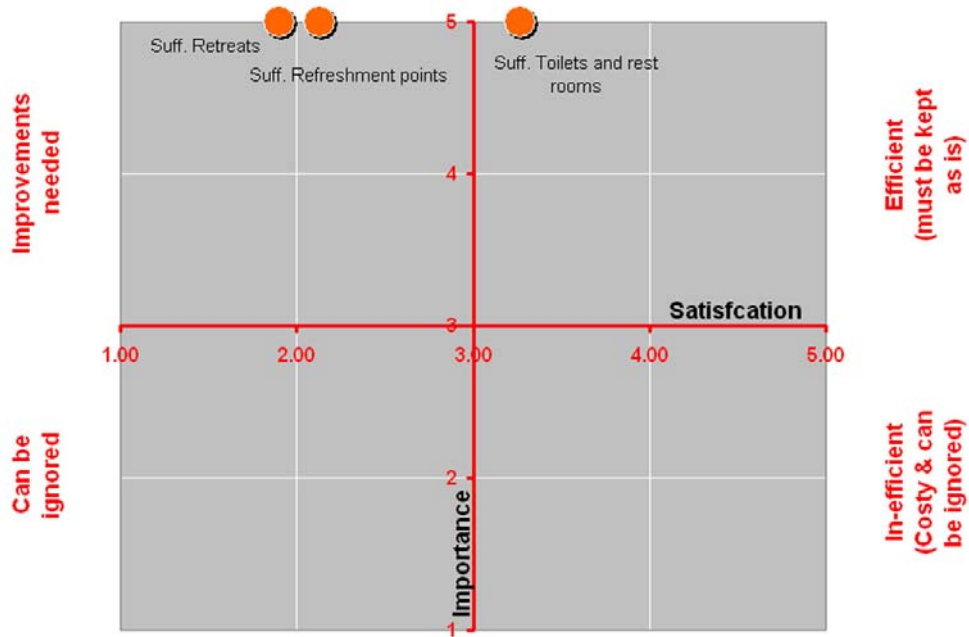


**OTB - Circulation & Movement**

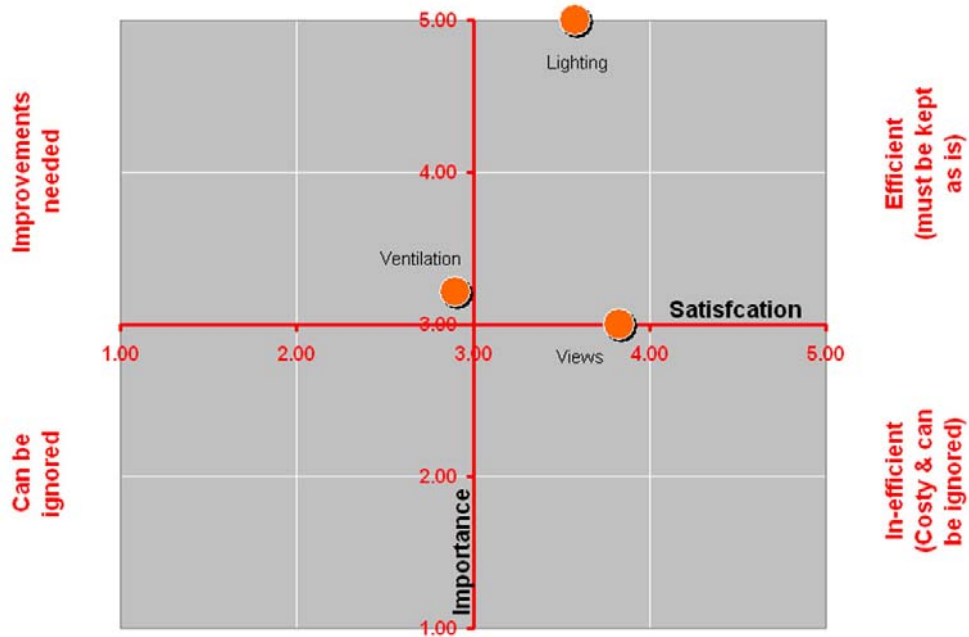




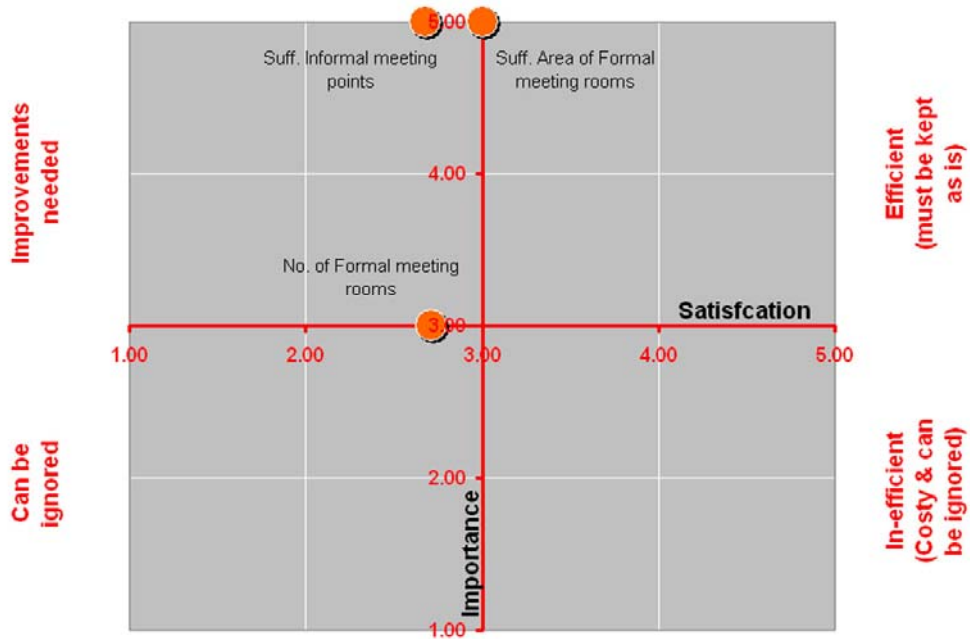
**OTB - Physical Comfort & Hygiene**



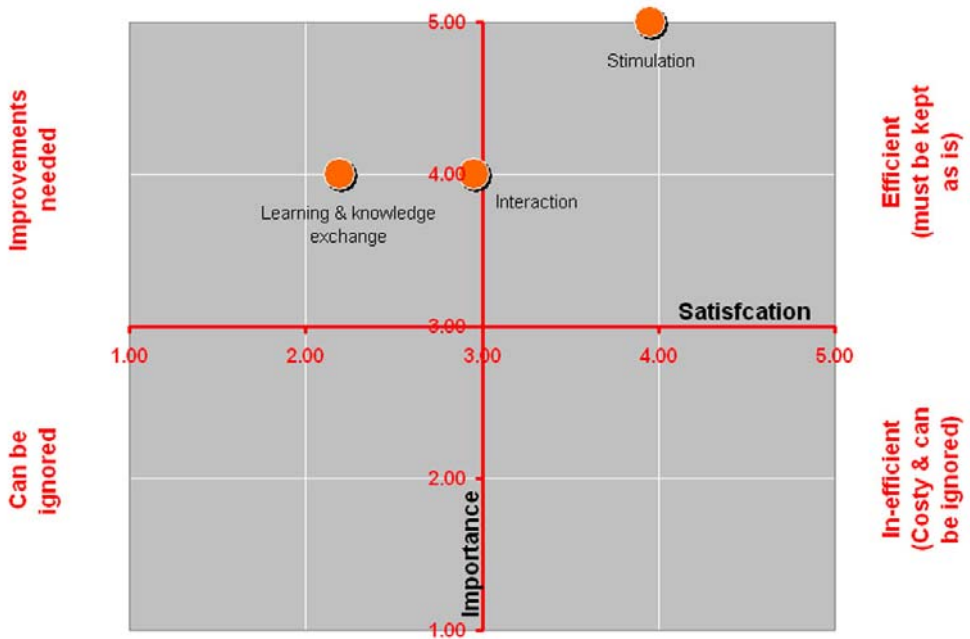
**OTB - Environment**



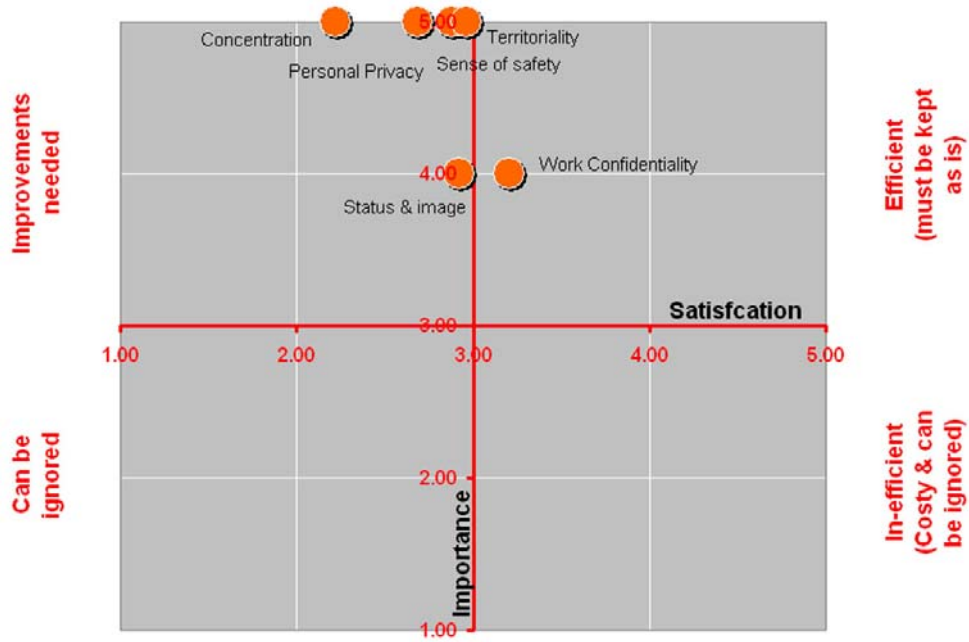
**OTB - Group Work Activities**



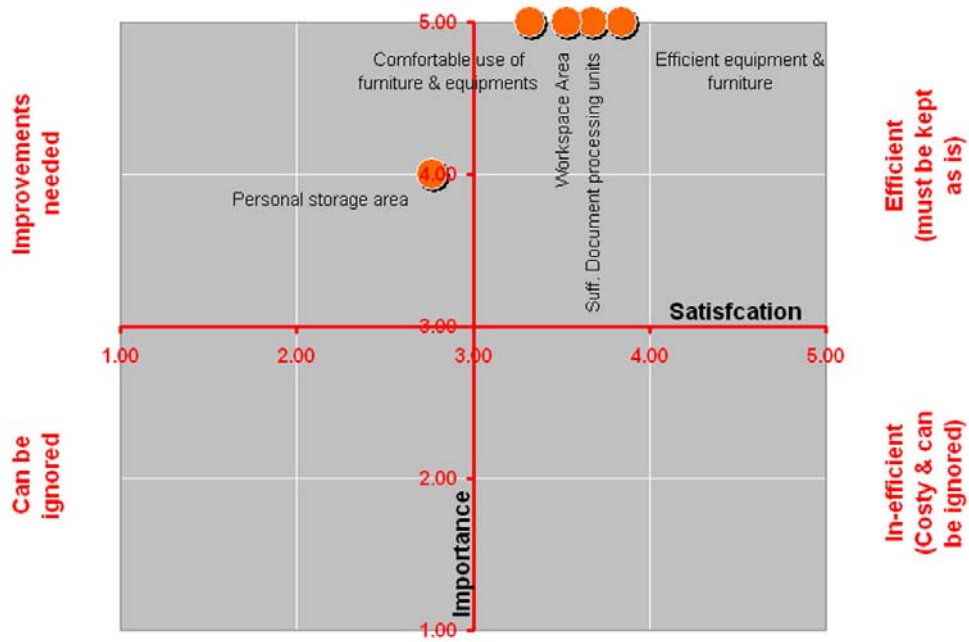
**OTB - Knowledge Interaction & Transaction**



**OTB - Personal Psychological Factors**



**OTB - Work Functionality & Efficiency**



## ملخص الرسالة

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مشرف رئيسي

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مشرف رئيسي

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