Inside Architecture

Re-asserting the user in a context of technology to humanize and inspire the future officescape.

by Daniel Aarons
Abstract

The last century has given rise to tremendous technological advancement in the built environment. This has facilitated a shift in building design from architects further into the hands of specialists, and with it, has come a level of sterility and a fracturing of personal experience and sensation for building users. Too readily architects appear to be negating their affiliation with the daily comfort and sensory perceptions for an ocularcentric, spatial and formalistic approach. It would seem that in this way technology has brought freedom to architects, but with it, so too has it brought neglect.

This thesis argues the need for the architect to give greater consideration of the user, by creating cohesive, stimulating and experientially rich workplaces, thus asserting the role of the user, to play a dominant and active role within the design process. Creating a framework for an ‘inside-out’ approach to architecture. From this perspective it assesses notions of user experience, comfort, technology, physiology, psychology, while seeking solutions through predominantly sustainable means.
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Daniel Aarons

This document is submitted in partial fulfilment for the degree:
Master of Architecture [Professional] at the University of the Witwatersrand, Johannesburg, South Africa, in the year 2010.

Johannesburg South Africa, 2010
I, Daniel Marc Aarons [0508405W] am a student registered for the course Master of Architecture [Professional] in the year 2010. I hereby declare the following:

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Daniel Marc Aarons

Date
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And finally to my friends along the way ... you are my inspiration.

Dedicated in loving memory of the late Harry Aarons
Whose dreams have no doubt been a keystone in mine.
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Akademie Mont-Cenis
Herne, Germany.
(by Author, 2010)
1. **Introduction**

1.1. **Premise**

Architects have tended to involve themselves with issues of aesthetics, form and space in the larger sense of user experience. Conventionally it would seem that technologies and systems are left to engineers, specialists and consultants. But in contemplating this, what impact does it have on the users’ experience, interaction and functioning within the building? What risks being lost in architecture through this handover, and what stands to be gained? Furthermore, what effect does a user’s integration and acceptance of these systems have on the design of buildings?

The ‘conventional’ notion presented above prevails as a predominantly ‘outside-in’ approach to design, a scaling down from grand vision to implementation. Therefore architects normally design for the larger qualitative objectives of form and space. Their primary influence on a broader outline of the user’s interaction. The user’s experience of “everything remotely scientific and quantitative” SAUNDERS (2005) suggests has been handed over to consulting engineers who he further implies are rife with ignorance on architectural phenomena. What appears to be forgotten however is that these quantitative demands ultimately influence the user’s qualitative experience, one does not experience quantity but senses its effect qualitatively.

“deliberately engineering our indoor environments to minimise thermal stimuli, we may be making them increasingly enervating and soporific.” BRAGER & DE DEAR (2003) in HEALY (2008:319).

It seems logical to question the integrity of the integration of the two modes of working, in relation to the dynamics of those who use them. As BRAGER & DE DEAR’s (2003) assessment illustrates, while the concerns of both architect and the specialist may plausibly be seen as engaging the demands of the user, they hold different agendas. The failure to acknowledge either can be to the detriment of the user.

In questioning the prevailing status-quo this thesis calls for us as architects to reconsider the user through an exploration of what one might term an ‘inside-out’ approach. An ideology in which the user reasserts themselves as the centre of our design intent. Considering with more rigor their experience, comfort, physiology and psychological perceptions in light of their interaction with the building, its technologies and its systems. As such, it seeks to explore more closely the interaction of the user in the context of the building, while assessing the considerations and design potential.
1.2. Defining the user

When I began to explore this topic I dabbled countless hours in contemplation of “what exactly a user defines?” Playing with notions of what impact they would have on architectural process. However, with the development of my thoughts I began realising that rather the question for architects is “what defines a user?” What is the experiential relevance of architecture for the user? The founding difference I discovered is that this approach expressed not only the effect of the internal spaces on the inhabitants, but that it started much deeper within the inside of the user him/herself.

A user has the presence of individuality and the perception of distinct experience. The potential for both positive action as well as the potential for misuse. The user is a sensor with a perceptive experience of architecture, generating and sharing emotion. They actively engage with the building whether we cater for it or not. This point is avoided by many engineers, and more surprisingly for me, numerous architects. The user exists in the building now and differently in the building’s future. They mould to their environment down to a biological level, when the building is sick, so too is the user.

Through this complex nature of the user, they begin to have life above an abstract notion which can be simplified to the term occupant. It is this expanded notion of the user for which we must design.

1.3. Finding a medium

DRAKES (2006), points out the close association between design, activity and product failure in other fields such as industrial design. He comments on the loose-fit nature of built space and activity which means that even spaces which are poorly designed go unnoticed as we are still able to fulfil our tasks in them. It appears that this has to a large extent been a credo of an excessive amount of office buildings. Where, provided extreme levels of discomfort are not reached complacency is able to prevail. This seems ironic since, as HERZBERGER (2000:92) identifies; we spend half our waking hours five days a week at work, more time on average then we spend at home.

While both modes of thought ring true. The incompatibility is obvious. Surely, the office, based on the time we spend there, should provide a greater level of comfort? However, office environments too often show a tendency to leave inhabitants feeling removed from the space. With the majority of users in conventional office complexes feeling they have inadequate control over their internal environment. This suggests that users are further nudged into complacency. It is for these reasons, amongst others, that have led to office developments forming the typology of focus in this study. Through this medium, the thesis explores the progressive notion of discovering the office of the future from the ‘inside-out’.

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1.4. Statement

This thesis explores the need for greater consideration of the user, to be given by architects in the creation of cohesive, stimulating, and experiential workplaces. It creates a framework for an ‘inside-out’ approach to architecture which reasserts the user as the dominant and active consideration to design. From this perspective it assesses notions of user experience, comfort, technology, physiology and psychology, while seeking solutions through predominantly sustainable means.
Figure 002  Topic Outline: Initial Theory Mapping.
(By Author, 2010)
2. Relationships

2.1. Inside architecture outside design: an architect’s architecture.

To begin to contemplate an architecture derived from the ‘inside’, it is essential to gain a brief understanding of the relationships between the parts that govern it. I begin with the architect and his design, as a bridge between a more ‘conventional’ approach and that which I am proposing.

As architects, there is a tendency to position ourselves as outside our designs, creators and spectators, negating the mindset of the user or occupant. Largely our approach to design and education reinforces these values. We view and contemplate our buildings through plans and models, both physical and virtual, as objects under the scrutiny of us as external spectators. This is opposed to the way in which our buildings are actually inhabited and experienced, as a subject within the object (FRANK & BIANCA LEPORI, 2007).

To establish an architecture which considers the user not as still form but as an internalised subject experiencing and interacting with stimuli, both physical and mental, we need to reconsider our architectural approach. The relationship needs to include an envisioning and understanding of the space from within.

Japanese architecture may shed some light on how we might achieve this, “Bruno Taut said that Western architecture is about shape and form and Asian architecture is about relationships” (Kuma, 2010). Kuma (2010) proceeds to emphasise the importance of physical models for understanding relationships within our designs. He claims that the only way he teaches is with a physical example by his side, referring to computer images as ‘thin’ representations. With large models or real objects he states “You can feel the relationships. And that is essential for our design process”. This approach may be seen as beneficial in the understanding of a more tactile presence in architecture. It additionally presents a clearer understanding of relationships between the parts. However, it remains as an objective view and can be seen as forming only part of the solution.

Analysis of Centraal Beheer (Section 5.1) indicates that it is not sufficient to only consider the spatial or tactile relationships in our architecture. Envisioning ourselves from the perspective of the user, a first person perspective, we may realise that we do not experience in a manner which isolates the parts. Rather we perceive the effect as an integration of all our experiences. It is this relationship which we need to constantly nurture within our design process, guided by an understanding of what makes up these experiences and the placement and relationship which technologies hold within this.
2.2. Users, technology & expectations

But what of the current expectations and relationship which users hold about the spaces they inhabit? And how do technologies affect this relationship?

Over the course of my research I distributed questionnaires in order to better understand the current situation around these questions. The questionnaires were distributed to various corporate offices around Johannesburg revealing some alarming situations. More than 50 percent of employees who responded felt that the space which they occupied had not been designed with their wellbeing in mind. More alarming perhaps is that more than 65 percent felt that they did not have adequate control of their indoor environment. This feeling of lack of control it seems reinforces their disconnection with the spaces they inhabit.

Further it can be interpreted from these findings that the majority of building occupants feel some degree of discomfort within their work space. As it is unlikely that they would feel the need to change a space in which they felt comfortable. The significance of this is to demonstrate a level of fragmentation between the relationship of user and the intent of the indoor environmental technologies we employ. The relationship between these technologies and users is a complex one, perhaps best contemplated through the thought of balancing. The architect must constantly play the effect of one against the other. Establishing a middle ground of mutual benefit, in which the needs of the user are met in a manner in which the system is most effective.

Figure 004_ Tactile Pattern Display (TPaD) creates the illusion of texture on an unadorned piece of glass. Giving the potential for tactile feedback from touch screen devices, and elaborating the dialogue between user and technology. (UNKNOWN, ----)
above aspects of efficiency and economy. Motivated largely by this consideration, the project re-considers the generally accepted ‘rabbit hutch’ cellular offices with their rows of corridors and the conversely extensive open plan option, to arrive at a solution appropriately described by him as “a workplace for a 1000 people”. A sort of workers village in which occupants “would feel part of a working community without the feeling of losing their individuality in the crowd” (CARUSO ST JOHN:---- & HERTZBERGER, 1993:26)

In achieving this objective, Hertzberger produces balcony-like working platforms to be shared by up to four occupants, each of these is taken care of by the users. The balconies overlook one another across shared voids, creating tower like structures set out in gridiron generating a honeycomb of spaces, in which each individual has their own space. This layout of spaces creates an internal environment more reminiscent of a city, than a conventional building, through the envelopment of these “buildings” within the building. However, in so doing it creates a confusing paradigm between inside and outside

“...We have to build a workplace. This workplace is to accommodate a thousand people for five days a week, eight hours a day. This means that for five days a week they are spending half their waking life in the work place; they are, on average, longer at the office than at home. This means that the ‘builders’ are obliged to make a place of work where a thousand people can feel at home. They must have the sensation of being part of a working community without the feeling of sheer numbers taking over.”

– HERTZBERGER (2000:92)

In this project the architect Herman Hertzberger presents an intriguing notion of the office block which more closely considers the user’s dignity and requirements (not only from the companies perspective but the individuals) in its built form. HERTZBERGER (1993) identifies a tendency of offices to dehumanize and expresses that the original concern of this building was as “a spatial expression of the need for a more human environment”. This has been driven by the company’s decision to place their staff’s wellbeing above questions of efficiency or economy. (CARUSO ST JOHN:----)

Built for the client Centraal Beheer Insurance, the building by the same name provides an interesting look into the design of office complexes. This, in light of the dramatic change which has occurred over the last 40 years in terms of their requirements, functioning and the attitudes of their clients. Nonetheless, it provides insight into an enlightened mode of thought that challenged convention and is examinable now under the lens of time. The driving force behind the building is the Company’s decision to place the human resource of their staff above questions of efficiency or economy. (CARUSO ST JOHN:----)

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Figure 005 _
Centraal Beheer Arial Photograph (UNKNOWNa., 2007)

--At the time of its construction these types where prominent however it should be noted that many of these cases still exist to some extent..
relationships, resulting in occupants to some extent feeling as if in constant transition. An additional problem that occurs in this planning resolution is the labyrinth like nature of the combination of the towers, which fail to provide large public spaces in its organisation. Thus making it very easy for an occupant to become lost within the deep plan. (CARUSO ST JOHN, ---- & HERTZBERGER 2000)

The architect through analysing previous solutions, their drawbacks and their successes, is able to determine the implementation of his platform approach, creating a large space without many of the disadvantages. These considerations included: flexibility; better contact; the sense of togetherness; anti-hierarchy; preventing noise nuisance; acceptable artificial lighting; sufficient views out; environmental control; “massification effect” and “sardines-in-a-tin syndrome” (for further explanation of considerations refer: (APPENDIX B). (HERTZBERGER, 2000) In today’s times many of these considerations seem simplistic and/or outdated. They represent however a step in the direction of an office designed with the users needs in mind. Through this approach Hertzberger was able to reduce discomfort and psychological loss of identity in users, and solve many of the concerns still facing users today.

The cruciform voids between the ‘platformed’ towers give a strong sense of alliance between and across floors, while negating the possibility of over-crowding and ensuring employees more adequate ‘breathing space’. This negative space then takes on the role of glazed streets, thus further ensuring the filtering of light deep into the plan. (CARUSO ST JOHN, ---- & Hertzberger, 2000)

Herzberger encourages personalisation of the spaces by users, through the unfinished qualities and representative nature of the platforms. In this way they are able to create a homely environment within the workplace, where the character and resulting atmosphere will depend largely on the person that feels responsible for it. This is due to the individuals determining its furnishings, and their being in charge of their particular space. Furthermore, the repetition of the space removes typical hierarchical structures with rank hardly ever being represented in spatial terms. Executives, rather than enclosing themselves from the rest of the office, simply have nicer furniture and greater floor area, which could be seen as creating a closer sense of community by removing barriers. (CARUSO ST JOHN, ----; Hertzberger 1993:22 & Hertzberger, 2000)
Outward appearance and inward spatiality are the transformation of each other. Illustrating a metamorphosis from volume to space and visa versa.” - HERTZBERGER (2000)

But the concept of the individuality of the occupant does not translate through the design. Implementation of many of the main elements of the project’s indoor climate systems, such as those for heating and air-conditioning, are based on a centralised scheme across the entire building. This is in contradiction to the central intent of the architect, which was to humanise the space and indicates that the architect’s concern for the self determination seems limited to the standpoint of space. This is further evident in the noise conditions and the drone of users which is propagated by the open spaces and planning of the structure, causing a level of discomfort to its staff. (CHÁVEZ, 2002)

“Outward appearance and inward spatiality are the transformation of each other. Illustrating a metamorphosis from volume to space and visa versa.” - HERTZBERGER 2000

Despite the exceptionally thorough rethinking on internal organisation, the external appearance seems to be given
less thought, and left rather to occur as a result of internal concerns. Uninterested on many fronts to acknowledge its surroundings. This derives a building form which is visually unpretentious and deliberately plays down the notion of ‘building as object’, in favour of the notion of ‘building as system’. The resulting building envelope as described by HERTZBERGER (2000) is “in a perpetual state of emergence and yet is always complete”.

The lack of the representation of urban face on the outside, results in the hierarchy of internal space not translating through private and public realms on entering the building. Perhaps this is not due to negligence, but rather retaliation against the separation of public and private, common in institutional architecture. (ANDERSON, 1994 & TZONIS, HERTZBERGER, 2000 & LEFAIVRE, 1992)

Centraal Beheer provides an interesting perspective of a building designed from the ‘inside-out’ allowing the users spatial requirements to derive the form, and inherently the functioning of the space. This has resulted in a progressive building for the expanding company. However it points to two main problems which should be considered in approaching the typology from this perspective. The first is what has manifested itself in the labyrinthine nature of the space, in which the users’ individuality has been insufficient in its definition. The second, is what needs to follow this approach beyond its spatial implications, and into all aspects of indoor environment in including technological systems, in order to create a cohesive product for all aspects of individuality within the architecture.

Figure 008_ The exterior “in a perpetual state of emergence and yet is always complete”. (APDENCY, 2009)
There remains however one pressing relationship not yet mentioned, that of the relationship between the user/participant and their experiential perception.

Gothic cathedrals often produce an almost unequivocal sensation of amazement and awe, so relevant to its purpose. (SAARI, ----)
3 Experience from the inside-out

3.1 Sensing architecture.

What is it that makes space more than void but adds beauty to it? Contemplate for a moment the gothic cathedral as a typology. It may be said that perhaps the most astounding architectural feature is the quality of the internal space. A poetic quality which has stood the test of time and is still able, even in modern times, to evoke an almost unequivocal sensation of amazement and awe, so relevant to its purpose for those who find themselves within it. Yet the same cannot be said for many modern buildings. What is it that allowed gothic architects to achieve this? Surely, to a large extent, it spawned from the development of the pointed arch, a new technology embraced and utilized to magnificent effect. Further, it may be said that this was in combination with a knowledge and understanding of almost all facets of the building, the work of a master-builder not yet diluted. What ‘divine’ inspiration led them to make spaces according to those stimuli and sensations, what inspires us to make office spaces? While efficiency and productivity no doubt play a key role in the production of these spaces, a building only based on these criteria is exceedingly lacking in human requirements. Especially if one considers the proportion of time which we spend in them.

If we consider our buildings from the inside-out they become less about a single function and more about how the fulfilment of that function exists in our experience of space. To understand this, one needs to identify how a participant experiences space from the ‘inside-out’. Acknowledging both the inside being the person and outside the architecture, and in the sense of the inside being placed within our physiological self.

PALLASMAA (1996) explains western culture as enforcing the dominance of an ocularcentric perception, a perception which has been reinforced by technology reproducing space as visual entities. The overwhelming dominance of this sense he explains, is weakening our capacity for empathy and participation within the world and detaching us from architecture. The sterile nature of modern materials devoid of qualities such as age, the self-cleaning glazed facades of offices removing our mental need to experience in a reality rooted in time. Furthermore, artificial lighting systems exemplified by large offices have created homogeneous bright light which paralyze the imagination.

“\textit{In our time light has turned into a mere quantitative matter and the window has lost its significance as mediator between two worlds}” (PALLASMAA, 1996).

The experience of our environment is the mind and body’s interpretation of all of our senses in unison and balance, a situation where none can be negated. On this PALLASMAA (1996) states that “the inhumanity of contemporary architecture and cities can be understood as the consequence of an imbalance in our sensory system”, thus to restore humanity in architecture we need to bring a balance back to senses. The often forgotten touch as the sense of intimacy, nearness and affection which vision only reveals. Unpleasantness and agreeableness determined by unconscious tactile sensation. (PALLASMAA, 1996)

Sound too is of importance, giving us a 360 degree ‘vision’ of the world and placing us within our context. As designers today with the technological capacity to further contemplate sound, devices like white noise systems should no longer be an end of the line process from which we are traditionally detached, leaving it to the bounds of engineered performance enhancers. But rather we should embrace our connections to our audio perception. Contemplating not only where sound is a distraction from work, but how it can be used to enhance it. The tranquil rustle of a light breeze across the leaves outside our office window, soothing and inspiring our creative and focused performance.
Architects further tend to negate the rest of our sensory body, forgetting smell which PALLASMAA (1996) deduces as our most persistent sense. If this is so, it forms a great part of our memory of space. Consider a client or employee leaving the workspace, with the pleasant remembrance of a sweet scent carrying them home rather than the humid stale air produced by the system we negated to involve ourselves with. Would this not be more encouraging of their return?

The skin in particular is our sensor of temperature which associates us further to our needs to consider the space from a users’ physiological perspective.

Figure 010
Diagrammatic mapping of sensorial perception, within the context of psychological and physiological being.
(by AUTHOR, 2010)
3.2. More than “Comfort”

From inside a building your experience, engagement, and enjoyment of environmental conditions are shaped by numerous physiological, psychological, cultural, behavioral, and contextual factors. (COLE, et al, 2008) However, while inhabitants’ experiences of social and cultural contexts have enjoyed extensive exploration in the past. Comfort research has been guided by a search for a universal model for optimal comfort which finds basis on a primarily physiological model.

Physiology concerns itself with the science of the functioning of living things, (Collins Colour Pocket Dictionary, 2004) for architects we derive that building occupants have physiological needs. The fulfilment of these needs is essential to inhabitants’ experience of the buildings indoor environment and manifests in occupants perception of comfort within the building. In this way we see that an effective ‘inside-out’ ideology considers experience not only of the inside of the building but within our provision for the user’s internal wellbeing. How is this rethinking beneficial to our current experience of comfort?

Conventional comfort provisioning evolved within a time of technological advances, resulting in a shift of responsibility for this provision from architects to mechanical engineering consultants, and the responsibility of comfort control from occupants to technology. Environmental control was no longer dependent on the building fabric and in this way largely removed itself from the architect's concern. This development has happened under several assumptions. These assumptions included a perception of building occupants as being passive receivers; that the primary mechanism for comfort is physiological, although psychological and behavioural issues play a role; that internal environmental conditions should remain within narrow margins⁴ and that optimal comfort conditions should be incorporated into national standards. (COLE, et al, 2008 & DRAKE, 2006) In addition the field of comfort provision is one which appears dominated by a scientific approach attempting to engineer a quantitatively optimum comfort level. This largely quantitative approach to the procurement of a comfortable indoor environment, and the assumptions which have guided it, however, are highly questionable. For example, as pointed to by COLE et al, (2008) there is a growing recognition that variation in environmental conditions is favourable, nonetheless current design ambition (for thermal comfort) is of an optimal temperature. Or that the globalisation of comfort conditions undermines many of the contextual social and cultural dynamics essential to the success of our designs. It seems the shift mentioned above has led our buildings to confront dynamic situations in a surprisingly static manner, a “thermal monotony⁵” which as HEALY (2008) notes is reducing diversity in thermally influenced behaviours of users in buildings.

HEALY (2008) further assesses that quantitative methods regardless of how accurate or rigorous, by their nature, reduce the complexity of real-world experience when applied to the fulfilment of thermal comfort. This inevitable simplification occurs due to understating, overstating and omission of relative factors, and leads to a diminished experiential quality for building occupants. Additionally, BRAGER & de DEAR (2003) note that ideal comfort conditions are often associated with only a feeling of neutrality or of being unnoticeable to the participant. From this it can be surmised, for example in the case of thermal comfort, that quantifiable “comfort” is to an extent reduced or even non-

⁴ According to research conducted by ASHRAE, most people are comfortable at an average temperature of 23-24oC and a relative humidity of 65% (STENGERS, 2008:383)

⁵ HEALY (2008) contemplates what he terms as “thermal monotony” being caused by the trajectory of science subsuming the “often deeply cultural and symbolic, thermal sensibility of various cultures.
experiential comfort. Perhaps this is an indication of the thinking driving the sterility of many of our office spaces? However the situation is more complex than this sheer neutrality. As COLE, et al. (2008) observes “a number of design strategies may deliver the same prescribed temperature or illuminance, each may offer qualitatively different opportunities to support broader psychological and behavioural aspects of comfort”. Thus to achieve these quantitative standards does not ensure qualitative comfort. If we as architects wish to strive for designs which enhance thermal experience and enjoyment rather than neutralise it, then indeed we need to question current approaches and re-establish stimuli which add to the dynamic and psychological experiential quotients.

“I walk toward my desk feeling the warm glow of sunlight soothing my skin. A sense of calm falls over me as I hang up my coat and open the laptop to begin working. But before I begin, as has now almost become ritual, I pause and gaze out from the window. Taking a deep breath of the fresh air, just slightly chilled by the morning breeze. It feels cleansing and comforting as I sit to begin my day.”

“The occupant walks toward his/her desk, hangs up his/her coat and opens their laptop to begin working. But before they begin, as has now almost become ritual, they pause and gaze out from the window, taking a breath before they sit to begin their day.”

Conventionally it appears that we design our experience of comfort as text with no adjectives and narrated from the third person.
Until this point I have indicated several of the problems with the way we conventionally deal with physiological aspects of comfort and their reduction of the experiential possibilities which may be allowed for by them. What possibilities exist to improve this situation and what is their implication on design?

COLE, et al, (2008) comment on recent literary explorations which suggests the future outlook of comfort is one which is fluid, contested and controversial in comparison. Creating a notion of comfort that embraces new experiences, new conditions, and new interactions between building systems and unfamiliar technologies. HEALY (2008) sees the solution to thermal monotony as one which is “socially worthy, statistically average, scientifically healthy and personally desirable”. While these do not necessarily offer extensive guidance to a possible solution they do indicate a changing dynamic for the face of comfort. This new outlook presenting a more well rounded experience for the users which it serves.

“while people tend to be thermally malleable, the character and content of the built environment, and the forms of life it sustains, are more obdurate” – HEALY (2008)

From an ‘inside-out’ perspective if comfort relates to wellbeing, then it should be seen to satisfy human needs and stimulate pleasant experiences. Stimuli are negated by monotony and as such a varying/adaptive model should be adopted. To promote contextual and cultural relationships this variability should surely take its cue from local social and climatic conditions. In this way it would promote recognition and not isolation from the natural world, a world from which, as studies into biophilia teach us, our evolutionary perception of comfort has developed. This inherent perception should lay the foundation for our changed sensations of comfort.

With this in mind, the current global environmental situation and the affiliated rise in ‘green’ buildings have prompted new consideration of many prominent indoor environmental controls such as air-conditioning and artificial lights. This is especially so in the case of naturally conditioned buildings which as COLE, et al, (2008) provide an interesting reference point in achieving the now expanded dynamic and adaptive notion of comfort. The works of architects such as Mick Pierce and Ken Yeang stand testament that these buildings are still capable of achieving traditionally acceptable comfort levels in internal environments through bioclimatic design principles. However, because the success of these passive buildings is largely dependent on variation and diversity in environmental conditions, contextual links are ensured.

The increase of satisfaction of users derived through this less mechanical approach is multifaceted and includes the following points.

- Occupants are more directly involved with building systems and operation. The more users feel in control of their environments the more tolerable they are of their indoor environment. (COLE, et al, 2008) This illustrates that the increase in control may be of more influence to comfort satisfaction, than the narrow quantitative margins of imposed mechanical systems.
- Increased pride in work space brought through visible sustainable solutions. Pride may result in users feeling more connected to the space and therefore more comfortable within it.
- Functioning passive systems are less at risk to sudden failure than mechanical systems resulting in occupants being less prone to sudden extremes resulting from failure.
- Strengthening of contextual relationships and connection to dynamic natural stimuli. “quality of life is inherently improved in environments that are enriched by a more variable sensory palette of thermal and other experiential qualities.” COLE & LORCH, 2003:179)
In considering this approach let us look at two dominant components of comfort for their physiological and psychological effects on building occupants from a more sensorial approach, and in this way begin to ignite the architectural advancement of these considerations. The first is that of visual comfort. Visual comfort provided by predominantly natural light and merely supplemented for varying tasks by its artificial counterpart, can provide a rich spectral composition and consistency. The sensory rich environment provided by natural light is about more than simply adequate visual conditions and holds the potential to create rich experiences, derive emotion, and set appropriate moods as well as substantially benefitting personal well being. As Goulding & Owen Lewis, (1997) illustrate, lighting regulates metabolic processes, affects immune system, psychological and emotional states and is involved in the setting of our biological clock and rhythms. It also provides inhabitants with spatial and time orientation. Additionally the relationship of daylight and window area would ensure that one is permanently visited by views of the outside. Thus, we as architects need to consider the potentials of daylight on the occupants of the buildings we design, beyond the narrow definition of visual performance, considering the possibility for biological stimulation in our quest for comfort.

The second is thermal comfort, and like visual comfort is linked to metabolic principles which again respond better to slight variations. Essentially thermal comfort can be found when there is a balance between internal heat loss and gains within the body. When dealing with temperature the potential is greater than only striving to eliminate discomfort. Temperature changes can additionally stimulate psychological sensations such as that of its soothing nature of subtle warmth. If comfort is more about pleasant experience, then stimulation of heat sensations is a welcoming thought. The warmth of the sun’s rays on the skin holds a different fascination to that of optimal mechanical heating. So too, the chill of a light breeze holds more experiential value than the regulated performance of automated systems. Viewing thermal relations in this way shows more support for the essential need of the architect in establishing them. Mechanical thermal systems, like artificial lighting, should not be discarded but rather seen as a potential supplement to passive strategies arranged in a hybrid system.

As such indoor environmental quality (IEQ) and comfort form an important aspect of architecture, not only for ensuring satisfactory quality of air, light and temperature but at a deeply experiential and psychological level. Comfort can be seen as providing an interesting gateway for architects and users to actively engage with the design, operation and experience of the buildings. This calls for an approach which is adaptive, encourages active participation and engages with natural, physiological and psychological phenomena to create more than simple comfort but inspiring internal experience for participants. Additionally, it calls for more interaction on the architect’s part in achieving this, leaving engineers and specialists to assist in our hybrid solutions.
Figure 012
Graphic representation of the disorienting sensory juxtaposition between ocularcentric perception and thermal comfort.

Adaptation by AUTHOR
1. (THERMAL COMFORT LTD, 2010)
2. (ARCHITECTURAL GREEN DESIGN GROUP, 2010)

Experience from the inside-out | 19
Experience from the inside-out
4. The reality of experience

4.1. Bringing the outside in

Humanity evolved in the sensorially rich world of the natural environment. This remains critical to our health, productivity, intellectual, emotional and even spiritual well being. A growing bank of knowledge recognises this positive role which contact with nature plays in human health and productivity. (KELLERT, HEERWAGEN & MADOR, 2008) However this finding is contradictory to what much of architecture appears to be producing especially within the dense urban environments which we have created. Our buildings too often remove us from this inherent requirement, therefore undermining the very well being we claim to be creating. In an architecture which would benefit occupants from the inside-out, it would be required to bring the outside in.

“Office settings with natural lighting, natural ventilation and other environmental features result in improved worker performance lower stress and greater motivation.”
- KELLERT, HEERWAGEN & MADOR (2008)

With this in mind, I wish to touch on the topic of Biophilic Design for the elements, aspirations and applications which we might draw from it. KELLERT, HEERWAGEN & MADOR (2008) derived six elements, each one with several attributes which should be present and considered in its physical ramifications (APPENDIX C). Some appear inherently obvious by nature of its topic such as that of “environmental features” which considers aspects such as colour, air, sunlight and facade greening amongst others. However, many attributes provide more interesting insight into this topic, such as sensory variability which identifies human satisfaction and well being as reliant on perceiving and responding to a variability of sensory perception. From this, one may infer that sterility of space contradicts our very nature. Others begin to explore concepts such as information richness, the importance of perceptive ageing and time in the users’ familiarity and connection with the space. Biomimicry appears as another providing a new inspiration for both architecture and technologies while providing a natural base to which humanity can relate.

Figure 013. Comparative analysis physiological conditions and recovery time. Indicating significant benefit in the relationship to nature. (KELLERT, HEERWAGEN & MADOR, 2008)
The reality of experience
The book argues for a holistic approach to these aspects in creating so called ecosystem within the building, a man made internal environment not disconnected from nature but inclusive of it. In which parts are not isolated but integrated, combining to benefit the wellbeing of those inside. KELLERT, HEERWAGEN & MADOR (2008:247) contemplate the building facade as a biophilic component, using the term ‘skin’ for its biological association. This skin acts as a filter and not as an envelope, which accepts and rejects aspects of the environment based on the body’s requirements (user requirements). Essentially the skin becomes a product of the inhabitants’ needs and in so doing, it becomes an integral part of the system, more than a mere ‘facade’. It is modern technologies which are allowing new potential for ideas such as this one. An adaptive building where sensors make it aware of its surroundings and BIM and building automation allow it to react appropriately, as the building breathes in the natural world, so the occupants are able to.
Designers are faced with a wealth of available technologies, each offering its own solutions to the design problems at hand. These technologies include both active and passive systems, as well as systems with both green and non-green agendas. Although the integration of these choices affects so closely the relationships of a user’s experience, interpretation and interaction, conventional design processes appear to repeatedly sideline the extent of their value.

In interpreting technologies for the benefit of this essay, I wish to derive two groupings. The first relates to those generally perceived to be of an architectural nature, categorizing items from material technologies to systems technologies such as HVAC systems, as well as technological design aids (Digital Building models, Building Simulation Software).

The second is that of technological systems not generally associated with architectural design but which serve as tools to those using the space, for example wireless communication and electronic file storage.

While the second category is too often forgotten by architects, they impact on the way occupants use the space and in this way create, remove and reinvent the parameters
which we designed within. Thus, warranting new design responses from which both the technology and architecture may derive benefit.

Consider the potential provided by wireless connection and electronic file sharing which are allowing architects to reconsider how we design office space in terms of flexibility. No longer are we limited to traditional cubicles and service points. The new cubicle has the potential of becoming a bench, cafe, or even the beach, as illustrated in the success of the Telenor Headquarters in Oslo, Norway. The space can now be defined by the inhabitant, moulded to our favourite view, a building contorted to compliment this. (Alvarando, 2007 & WEBB, 2003) But if the use of the space has changed, the building itself must surely be re-examined. The office need no longer be affiliated with ‘office-block’ but rather with a new expression defined by new parameters, thereby allowing technology to assist in defining the poetics of the architectural expression.

For the purpose of enhancing architecture for the user, it is not simply the use of specific technologies which offers fantastic results, but rather from how we implement, adopt and adapt them in design. While enormous potential exists in this notion, inappropriate or inadequate consideration can present distressing negative results. The assumption that technological solutions provide opportunities to disregard basic design principles, or the failure to satisfactorily integrate them into the overall user experience can plague users’ sensory perceptions and comfort. One needs only to look at the effect that the advent of air-conditioning systems had on office architecture, to find some foundation for this. Energy consumption aside, the induction allowed architects, with the incorporation of artificial light, to create excessively large open plan spaces since the occupants basic needs were met. However, this came without consideration for basic human needs such as a connection to the outside natural environment or the expression of individuality.

"Office workers may adjust to spaces that have been built on the assumption that they can be treated like machines, but this does not mean that spaces suitable for machines are therefore what should be provided." - LANG, et al, 1974
4.3. Case study 002
Telenor Headquarters
Oslo, Norway (1991-1996)
Architect: NBBJ, HUS, PKA

The reality of experience
The new Telenor headquarters began as a design competition, aimed at producing an ‘office of the future’ to house the consolidation of its 40 previously scattered offices on a site at Fornebu. It was the production of a new workplace culture, focused on innovation which would be the manifestation of the company’s vision to create the foremost creative working environment in Scandinavia, a highly aesthetic environment that would stimulate creativity, the exchange of information, and the processing of ideas. The brief called for an “inspiring symbol” which made use of open planning, in a wireless and paper free solution. This allowed employees to freely interact and perform their work individually or in constantly changing combinations, made possible by the technological solutions such as laptops and cellular telephones. Providing inspiring new ways for people to interact with technology and their surroundings. (AIA SEATTLE, 200?; Webb, 2003 & NBBJ, 200?)

After winning the competition NBBJ in collaboration with HUS and PKA began working in a highly involved collaborative design process, involving the three architecture firms, expert consultants and the active visionary client, a process that was to prove vital in the production of the 138 000m² (net) building. But the concept of collaboration was not limited to the design process. A key focus of the project was in the creation of a collaborative workplace conceived to increase productivity, and speed up decision making, rethinking the institution itself in a way which was unprecedentedly flexible through focus on mobility, teaming, and interaction. It is for this reason that the building contains no private offices, rather an individual might have the daily opportunity to decide his/her requirements. “Do I need a workspace to myself, am I going to be in a room with a few others, or in one of the work stations with my team”. The workplace here is seen as the entire compus, conceptualised from the individual to the overall integration of the occupants. The design contemplates and reacts to how three people collaborate or how this collaboration might be provided for in terms of a team of thirty, three hundred or even three thousand people. (AIA SEATTLE, 200? & COLLABORATION DESIGN, 200?)

The above concept becomes apparent in the planning of the building which is reminiscent of a tree, creating a flow of interior and exterior spaces, and of people and ideas. Forming at an elliptical piazza evocative of the trunk, from which the eight wings extend as if the branches each containing multi-level atria. The wings stem some two hundred, thirty person work pods, perceived as the leaves. This notion identifying both the organic quality and the manner in which it alters in scale from expansive...
and winter gardens. The view from this point up towards the sky or to the fjord, which WEBB (2003) describes as instilling the dominant feeling of exhilaration. (CORPORATE CONNECTIONS, 200? & WEBB, 2003)

Employees are enticed to conduct their work freely in one of the coffee shops or even on the beach, but the complex includes a generous amount of work spaces (6000 work spaces for the companies 7500 employees) which make use of technologies to provide flexible solutions. Floor layouts of specified work areas can be reconfigured in two hours by installing and demounting panels to provide gradients of flexible privacy. This flexibility extends further within this ‘virtual office’ in the grouping of divisions only, and

The effects of this planning become further apparent externally, on approaching the building from a distance. It appears as a fragmented composition rather than reading as a singular/unified form. This is perplexingly understated considering the enormity of the structure. It is on this matter which, Webb (2003) surmises as “the inevitable consequence of designing from the inside out and candidly expressing the product of that strategy”. (AIA SEATTLE, 200? & WEBB, 2003)

From the piazza, one is encapsulated by the arcing three story primary facade of the southern block, and that of the five floors of the northern arc. The northern face which tilts forward into the space to reduce internal glare, is penetrated

by customer service centre and auditorium, creating an encompassing and somewhat dynamic appearance within an area which is part boulevard, part gathering space. Beyond this steel and glass composition of the translucent facades, lie the circulation spines which tie the offices spaces together, and are the most prominent architectural form with light rushing through the light structure. Cafeterias and major meeting areas are placed along them. They are able to concentrate traffic, which increases the possibility of interactions. Thus for the individual, a walk to lunch may become a more social and integral part of the experience.

Upon entering one of the eight wings at an intermediate level one is faced with one of the dramatic glazed vertical atriums, which provide vibrant spaces, vertical circulation and winter gardens. The view from this point up towards the sky or to the fjord, which WEBB (2003) describes as instilling the dominant feeling of exhilaration. (CORPORATE CONNECTIONS, 200? & WEBB, 2003)
not specifically of individuals. Private conference areas are visually open, connecting people and not excluding, however they remain acoustically private for practical reasons. The translucency of the work spaces allow further for the increased flow of natural light, benefiting employees’ physiological being, in addition to complementing sustainability principles by creating ample daylighting and ventilation. (COLLABORATION DESIGN, 2007 & WEBB, 2003)

Computer activated woven synthetic blinds have been installed behind frosted glass rain screens in order to reduce glare. Air conditioning has been replaced by a convection system, for use over the brief summer. This system uses chilled ceilings to move hot air upward, by cycling cool water through the ventilation ducts, warm water is then re-cooled by means of a heat exchange system. Heating in winter is achieved through the electrical heating of sea water, and its compression into high pressure vapour which is cycled through the radiators. These internal climate systems as well as lighting are centrally controlled through an energy management system. However users are able to make minor adjustments through their computers. The project strives for sustainability familiar to Norwegian culture, which aims at giving value not only to energy saving, but additionally to the benefit of human inspiration and productivity. (ENERGY EFFICIENT, 2007 & WEBB, 2003)

Webb (2003:62), interestingly describes the building as a place “where 6000 people come together to work and socialize, indoors and out, in free-floating groups”. This thought indicates that this project is seen as more than just a standard workplace, but as one which provides a comfortable environment by social standards. The optional nature of social spaces may perhaps be seen as more competitive than the grudging complacency, which could occur in office spaces.

This innovative office block explores new ways to embrace, guide and induce collaboration and integration of its occupants through considered planning of how they work together, or as individuals. This resulted not only in increased operational efficiency but in overwhelmingly positive employee and client responses. (NBBJ, 200?)

“This humane and environmentally responsive complex of work spaces for Norway’s leading telecom company is an inspiring and enlightened vision of corporate life.” --Webb (2003:62)
4. **New Possibilities**

4.1. **Rethinking and Reinterpreting**

The progression of this paper has evolved through exploration, and interpretation, of numerous enquiries into factors which together contribute to the holistic evolution of the ‘inside-out’ approach to architectural design. Case studies have provided additional insight into physical possibilities and repercussions for some of these ideas.

This section strives to explore, compose and re-interpret these factors and characteristics. In terms of an architectural dialogue which will provide insight into the new architectural possibilities provided by them.

Key themes which can be seen as the characteristics of the ‘inside-out’ ideology are summarised in the table opposite. For this there are eight primary and twenty nine sub-themes. While this format helps to elucidate the complexity of ideas, it is important to note that all themes are interrelated.

<table>
<thead>
<tr>
<th>PRIMARY THEMES</th>
<th>SUB-THEMES</th>
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<tbody>
<tr>
<td><strong>ACTIVE ARCHITECTURAL APPROACH</strong></td>
<td>Establish a narrative design method focusing on experience and interaction Pre-empt user expectations Of space</td>
</tr>
<tr>
<td><strong>ADAPTABILITY, MOVEMENT &amp; FLEXIBLY</strong></td>
<td>Additive and dynamic comfort Cater for future needs Of the building skin</td>
</tr>
<tr>
<td><strong>HOLISTIC APPROACH</strong></td>
<td>To acknowledge aspects in relation to each other. Encourage human interaction Consider quantity for its qualitative effect.</td>
</tr>
<tr>
<td><strong>SENSORY CONCERNS</strong></td>
<td>Sensory balance. Differentiate space through sensory experience. Sensory variability. Actively enhance positive and reduce negative stimuli.</td>
</tr>
<tr>
<td><strong>DYNAMIC NOTION OF COMFORT</strong></td>
<td>Cater for physiological needs while considering Psychological ones.</td>
</tr>
<tr>
<td><strong>HUMANIZED SPACES</strong></td>
<td>Reduce sterility. Promote sensory tactility. Introduce user friendly technologies. Acknowledge the active participant and encourage their responsibility in operation.</td>
</tr>
<tr>
<td><strong>KEY PHYSICAL ATTRIBUTES</strong></td>
<td>External appearance as a reflection of internal human needs and behaviour. Movement of form Division without isolation. Promotion of medium sized workspaces. Large communal areas and collaborative spaces. Emphasised importance of building ‘skin’. Embrace “non-architectural” technologies for spatial implications.</td>
</tr>
<tr>
<td><strong>PREFERENCE FOR NATURAL SYSTEMS (BIOPHILIA)</strong></td>
<td>Promote natural stimuli.</td>
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</table>
4.2. Dialogue: The building the user—An example of an inside-out Experience.

It's mid-autumn around 6:30am, when I approach the building for work. There is a chill in the air and I know that winter is coming. The louvres are still closed from the night as if the building sleeps insulated under its colourful blanket. But I notice subtleties of light emerging, as people who have arrived before me begin to open its shaded eyes.

I walk up the textured ramp toward the entrance, as the automated doors open to welcome me with a hint of warm air, which has escaped the buildings grasp. On entering however I am not shocked by sudden temperature change but gratified by the subtle increase of an area enclosed but well ventilated. The space is large and welcoming filled by the scent of flora filtered through the glass and mesh facade of the atrium which I am approaching.

Today I will begin by working on my own. Walking up the staircase to my division the air gradually warms, comforting me as I enter deeper into the building. I cannot help but notice as I approach my desk that the space to the far end is reconfigured today, in anticipation of a greater influx of colleagues. It’s the building envelope, which has shifted outwards, to make way for this.

Opening my notebook I begin to work. Seated comfortably in a rich ambiance of light which scatters the space. It has been assisted by a strip of daylight redirecting glazing strung across the soffit. The light filters deep into the space. I can see it even through the glazed wall of the conference room to my left. It’s reassuring to know my colleagues inside it are working hard too. But I am pleased that I don’t have to hear them.

The building warms as the day moves on, and the integrated facade filters in more fresh air to compensate. But the room is fuller today, and although the air is adequately fresh I decide to open a window. Its more than just the air I want, there is just simply something kindly about the honesty of an open window. I find it intriguing how the second layer of the building skin has changed over the course of the day. The integrated photovoltaic louvres are tracking the sun like a sunflower.

But it's not all “tech and spec” here, there is a familiarity of the tactility from the plasters finish, which reminds me of home. Additionally, the timber elements that articulate the structure and provide a gateway to the division’s atrium, also hold a tactile truth.

There’s a meeting with two of my co-workers now and I can see it’s warmed up outside. Perhaps we can conduct it in the piazza. We always enjoy working collaboratively.
outside, as there is something in the complexity of nature which I think we find inspiring.

As the afternoon begins to end, the air starts to chill slightly. It reawakens me assisting in keeping me alert and focused until closing. I think to myself on my way out as I pass the serene pond which guides one back to the street. Tomorrow, perhaps I’ll work downstairs.

Each person tells a different story, as does each day. But the building always seems familiar, recognisable by its shifting aesthetic, views, context smell and tactility of sight, of touch, and of emotion.
4.3. Conclusions

This study has explored a new methodology for architectural expression. It has made clear the potential which this notion holds for re-establishing and increasing the experience of users in architecture. The achievement of this ‘inside-out’ approach has been based primarily on three principles. (1) That while specialists provide a valuable service to the built environment, they do so with limited perspective of the intent of the architect. (2) The reassertion of user as a key influence on building design, is a valuable and diverse method which can enhance architecture. (3) The embracing of technologies under informed thinking by the architect, for application to achieve objectives which are of benefit to occupants.

It has concluded that these principles align to an active, flexible, adaptive and holistic architectural approach focused toward the user. Through which the creation of a sensory and experientially rich architectural expression can be achieved. Linked to the nature, and always striving to exceed comfort expectations.

“The human mind is not some otherworldly essence that come to house itself inside our physiology. Rather, it is instilled and provoked by the sensorial field itself, induced by the tensions and participations between the human body and the animate earth... By acknowledging such links between the inner, psychological world and the perceptual terrain that surrounds us, we begin to turn inside-out, loosening psyche from its confinement within a strictly human sphere, freeing sentience to return to the sensible world that contains us.” - David Abram (1996) in FRANK & BIANCA LEPORI, (2007)
Figure 024
Conceptual composition incorporating several aspects of preceding text. A adaptive environment stemming from the user.
Section B

Site
Figure 025
Aerial Photograph of Johannesburg _ Braamfontein, Newtown, Inner City and surrounds.
5. Site Selection

5.1. More than space, making place

In a city as diverse, and on many levels comprehensive, as Johannesburg, the potential for a site which facilitates corporate buildings with their financially orientated objectives appear equally numerous. The selected site should serve as a medium in which to explore, demonstrate and interrogate the ‘re-considered’ architectural ideology presented in this thesis, in its relation to the local context, its dynamics, and its resources. In this way introducing and re-addressing new criteria for corporate site selection.

By introducing the user as a role player in these criteria, one may consider locality as more than simply adequate space, but in terms of occupants daily routines, such as their journeys to and from work each day; proximity to services and their social wellbeing; Climatic conditions (to assist internal climate and comfort) and cultural dynamics, these amongst others, and in addition to the outlying financial objectives.

5.2. Criteria

Densification

A site in a dense urban framework provides several advantages to both users and the building itself;

- Accessibility and public transportation
- Proximity to a range of associated services.
- Proximity to social and cultural precincts.
- Compact urban form is encouraged within Council’s strategy. This is in part to ensure strong viable nodes. (CITY OF JOHANNESBURG, 2008)
- Potential to be more beneficial to those in the immediate context. Providing social upliftment to locals and therefore building users.

Proximity to Public Transportation network

On a daily basis the work day may be seen as beginning before one enters the office. Rather, it may be said to begin and end rather with the journey to and from the workplace.

- Acknowledging the user as part of the architecture, infers that a building which necessitates unsustainable methods of transport for those using it, is essentially passing its ‘Carbon Debt’ to the very people it is built to sustain.
- Public transport reduces the need for the excessive amounts of on site parking which tend to inhibit users contextual relationships to the building and its surroundings. It additionally holds the potential to rectify the ‘parking and traffic problem’. Which to a large extent has motivated clients to build out of denser urban fabrics such as the Johannesburg CBD.

Green Space

The site should be able to facilitate the all too often missing element within dense urban frameworks of natural relations. Or, to draw upon and enhance existing green spaces, so as to facilitate the beneficial interplay of the natural environment to both buildings and users.
Current major trends in the siting of larger scale office developments.

(Examples identify four different major trends in the siting of larger scale office developments.)

1. Large scale office park developments such as the Fairlands development.
   Sprawling and isolating themselves from the convenience which denser urban fabrics provide.

2. "Highway edge" office parks, expanses of offices along the edges of highways, often forming a buffer to suburban neighbourhoods.

3. Internalised low rise office park developments, walled, multi-office, low rise developments.

4. Urban high-rise office blocks- Dense multi-storey office blocks within the urban fabric.
Figure 026 Diagram showing interrelation of criteria for site selection.
(by AUTHOR, 2010)
In line with the RSDF and SDF (2008-2009) the site is to be selected within one of the development nodes. These nodes signify locations in which the government wishes to encourage growth, and have the adequate services to support intensification and densification within. Nodes additionally have a focus on public transport systems. Thus making them highly suitable to meet selection criteria. (CITY OF JOHANNESBURG, 2008)
Corridor development has been noted by the city as a potential instrument to restructure and connect the City as well as to contribute to citywide economic growth and job creation. There are two corridors, one running east-west, and the second along the north-south axis of the city. Strengthening these corridors, will aid key economic centres and balance potential growth. As such they are designed to promote economic growth and development as well as supporting the new transport system. (CITY OF JOHANNESBURG, 2008)
In parallel to these corridors and the objectives of the city, eight nodes have been selected which fall within these development corridors. These nodes have been assessed via tabulation of their facilities and as such opportunities as well as in line with the main criteria previously defined.

<table>
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<tr>
<th>RSDF Region</th>
<th>Nodal Hierarchy **</th>
<th>Transportation</th>
<th>Gautrain Station</th>
<th>Guatrain Feeder</th>
<th>BRT Line (Phase 1)</th>
<th>Taxi Rank (Formal)</th>
<th>Rail Station</th>
<th>Health, Safety and Security</th>
<th>Police station (&gt; 5km - 10km)</th>
<th>Fire Station (&gt; 5km - 10km)</th>
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<th>Art Gallery</th>
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<th>Retail Malls</th>
<th>Banks</th>
<th>City improvement Districts (CID)</th>
<th>Potential for High Rise</th>
<th>Total</th>
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*Distances are taken from main centres/precincts

**Nodal Hierarchy Key: C-CBD / M-Metropolitan / R-Regional / D-District / N-Neighbourhood
5.5. **Top three**

Results from questionnaires *(APPENDIX A)* indicated that offices workers in the Johannesburg CBD tend to have greater user dissatisfaction than those in newer areas such as Sandton. This is assumably due to the age of the buildings and the scale of the refurbishments and upgrades which they have undergone. The need then is to re-establish an inner city work environment which begins to reverse these negative perceptions and re-ignite the urban fabric for private investors.
This process led to the selection of a site situated between Joubert Park and Park Station. Joubert Park was identified as it is one of the biggest inner city public green spaces. While Park Station provided a substantial connection into the public transport network of the city. For these reasons this site seemed ideal in the fulfilment of the aforementioned criteria. After a process of mapping however, I discovered that while this site and its immediate surrounds fulfilled all of the criteria placing the my building here remained questionable predominantly for two reasons. The first was that of the need and potentially greater benefit deriving from the stands retaining their residential function around the park. The Second was that of the lack of suitable and available stands, this due to the heritage status of many of the buildings as well as the scale of demolition which would need to be achieved, both in the relocation of existing residents as well as the size of the buildings.

For these reasons the decision was made to relocate to a near by stand closer to Braamfontein which remained in comfortable walking distance of both the park and the station. The new site (identified in the proceeding mapping) while better fulfilling the now broader range of criteria, lacked the direct connection to green space identified by the criteria. This produced an interesting design objective in which the building would have to introduce this relationship and thus bring about user benefit both to my building’s occupants as well as those of the buildings surrounding it.
6.1 Macro Mapping
6.1.2. Map 002_ Figure Ground
(by AUTHOR, 2010)
6.1.3. Map 003 Inverted Figure Ground (by AUTHOR, 2010)
6.1.4. Map 004_ Height Intensity
(by AUTHOR, 2010)
6.1.5. Map 005_ Mobility Routes
(by AUTHOR, 2010)
6.1.7. Map 007_ Landmarks
(by AUTHOR, 2010)
6.2  _Micro Mapping
6.2.1. Map 008_ Physical
(by AUTHOR, 2010)
6.2.2. Map 009 _ Vehicular Movement
(by AUTHOR, 2010)
6.2.3. Map 010_ Pedestrian Movement
(by AUTHOR, 2010)
6.2.4. Map 011_ Links

(by AUTHOR, 2010)
6.2.5. Map 012_ Cumulative Overlay
(by AUTHOR, 2010)
6.2.6. Map 013_ Noise
(by AUTHOR, 2010)
6.2.7. Map 014_ Pollution
(by AUTHOR, 2010)
6.3 Photographic Mapping
*Original photographs from google maps (Cited 2010.10.15)
6.4. Solar Mapping
6.4.1 Shadow Angles Mapping

12:00pm _ Autumn Equinox

12:00pm _ Spring Equinox

12:00pm _ Winter Solstice

12:00pm _ Summer Solstice
6.4.2. Solar Radiation

Cumulative Summer Solar Radiation

Cumulative Winter Solar Radiation

Cumulative Summer Solar Radiation

Cumulative Winter Solar Radiation
### 6.5 Climate Data for Johannesburg

Source (HOLM, 1996)

#### Yearly Climate Data

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Section C
Design
7. Programme

7.1. Programmatic Breakdown - Balance - Personal benefits, Private Gains, and Urban upliftment

The office - Floor area 68% of bulk*

The office spaces form the primary programmatic function of the development. Guided by the location of the site within its urban fabric, between the large corporate to the west and Braamfontein’s current upliftment and residential component to the north-east. These office facilities seek to bridge the business divide by providing opportunity for business expansion and promoting the potential for individual growth.

Designed to flexibly facilitate a range of company sizes, from those with just an individual staff member to multi-level office areas of 1500sqm and everything in between. The office facilities are to provide state-of-the-art workplace for each individual.

The Collaboration interchange - 10% of bulk*

The collaboration interchange explores the notion of human interaction. This provides a crucial component to individual perception and experience, by encouraging it between the various different users within the building. This area houses shared facilities which include printing nodes, kitchenettes, ablutions, open-air seating and additionally houses the shared meeting and boardrooms. Through providing these common areas, a sense of community within the building is enticed. Simultaneously, this acts to provide a host of advantageous facilities to the smaller businesses and reduces the need for individual larger companies to each require their own.

‘Rent-A-Desk’ - 7.5% of bulk*

This feature provides rentable desk space to individuals, inclusive of facilities such as Internet access, printing and meeting rooms. It aids the businessman on the move or those with limited need of a private office. Additionally, it acts as a place to study for students in the surrounding areas, thereby beginning to integrate their education into the workforce.

The gym - 5% of bulk*

A central feature of the complex, it serves to enhance the users psychological and physiological wellbeing. While it focuses on the buildings occupants, it is envisioned as opening its doors to the public, and thereby assists in activating the site, and encouraging worker networking beyond the site’s employees.

Parking - 200 bays

While the development encourages the use of the extensive public transportation facilities in close proximity to the site, the provision of 200 on-site parking bays is accommodated. This provision may be further assisted by the existing street parking around the site.

*Site area -3000sqm _ FAR-6.1 _ Bulk- 18 300sqm

Staff Canteen - 1% of bulk*
Rec Area - 1% of bulk*
Retail - 2.5% of bulk*
Restaurant - 3.5% of bulk*
Day-care Centre - 1.5% of bulk*
Service - 10%
Primary Programmatic Features

- Absorb
- React
- Refresh

Flexibly Facilitate:
- Private pods
- Open pods
- Hot Desking
- Enclosed Workspaces
- Collaboration Stations
- Collaboration Nodes
- Meeting Rooms
- Integration Spaces
- Print/Tele/Update Nodes
- Rent-A-Desk

Lobby / Reception
Staff Canteen
Restaurant / Coffee shop
Gymnasium
Rec Area
Street Edge Retail
Daycare Centre

Tranquility spaces
Pause areas
Contemplation Spaces
External Relaxation Spaces

- Roof Gardens / Courtyard
- Collaboration Nodes
- Balconies
- Roof Gardens / Courtyard

Primary
Secondary
Tertiary
8. **Design Development**

8.1. **Initial Thoughts and Concepts**

In the fulfilment of the user based architecture proposed by this thesis, I began to consider what it meant to practically align the design process to one which is inherently ‘inside-out’. It inferred that in prioritising the user as the primary design driver, the process was one which needed to begin on a micro scale, examining and interrogating the building from the ‘inside-out’. Thereafter expanding outwards towards the finished product. The building form was from the start to be a product of its internal needs. It’s programmatic placement was an interplay of more than mere logistics, but rather one considering the interplay of daily routine, and the transfer of sensorial stimulation.

Additionally, the process needed to precede the site based method which I had become accustomed to as an architectural student. Rather it needed to begin with questioning the logics which have become the norms in which we design.
The Hexagon

With a conceptual mapping of a user’s sensorial experience, I began to question the logic defining the rectangular spaces to which we have become accustomed. The question, conceptual as it was, put practicality aside for a moment to examine the benefits of a space which was moulded to our perception of it.

The diagram below, indicates the progression from the sensorial perception of a user within a rectilinear space, to that of a hexagonal one. This space potentially deriving its scale in part from the vehicular grid on which it may all too often sit. The rectilinear basement grid thus presumably impacts on the spaces above, raising questions of the effect of fitting people into spaces in part defined by vehicles. In light of this, I arrived at the notion of a person within a hexagonal space, the hexagon fitting more closely to our sensorial perception.

This exploration was then taken further through analytical studies exploring the potential of the hexagon as a basis for design. It raised several interesting potentials for the design to follow.

These included amongst others;
- The increased facade area generated by the space, would allow a greater percentage of users to have access to views, light and operable windows.
- The shape broke down the spaces reducing monotony such as that of a corridor.
- By way of its more circular form, the interaction between users could be enhanced, particularly in areas of collaboration such as meeting rooms. This is due to all users being closer to their counterparts’ perception.
- Due to the nature of the shape needing support at only 3 points, both hexagonal and rectilinear planning could be achieved if a common grid was to be used.
Inside inFORMant

It was not far into my initial design thoughts, that the question of building form and shape began to rear its head. The form of the building could not be ignored, however the driving factors could be realigned to better appropriate the user into the space.

I began by considering an over simplified model of an office block. Essentially an extruded rectangle, placed on a site defined by coverage, bulk and street front access. This would then be the footprint to define the floor plates above. The internal spaces were imagined as a sort of ‘retrofit’ to these floor plates, and in this way constrained by them, so too were the needs of the users. With this as a base, I began to play with the idea that each floor plate could be defined from the internal use pushed and pulled within structural parameters to best suit the needs of the occupants. In this way the building form could become a true reflection of the inside use without inhibiting it.
During the course of the theory component, I delved briefly into the concept of building ‘facade’ depicting a barrier to the outside. The discussion proceeded to the concept of building ‘skin’ acting as more than a facade, but rather more closely to that of biological skin. The skin was a major component in the building’s response to the environment, essentially providing a filtration system of light, fresh air, protection from the cold, heat, pollution and noise. Moving to design concepts, I viewed this idea as key in the production of the buildings physiological wellbeing, and as such that of the occupants. It was after all, the users main point of linkage to the outside world and the natural environment.
A Sensory Palette

For the phenomenological experience of the buildings users, both within and around it, I wished to achieve a greater sense of their connection and experience to the building. This was to be one which extended beyond the ocularcentric and even tactile perception, rather it was to a palette which took guidance from all the senses.

Through informal discussion with various people in my life, both at work and play, I began to derive a sensory pallet based on their input. I strived to find the little things which they held a sensorial connection to, specifically those around the workplace. From these conversations I began to derive a sensory palette, which would provide a constant reminder and source of information during the design process. The influence spanned so far as to inform programmatic relationships such as that between the restaurant and entrance lobby of the final design.
8.2. Design Charette Models

Conceptual Model 1_ Flexible Space: An Exploration into shifting, flexible office spaces.

Conceptual Model 2_ User defined space: explores the user based linkages to the theory outcomes, and the defining of space around these links.

Conceptual Model 3_ Defining the box: Exploring notions of defining environments around user based and physical parameters.
8.3. **Bulk Study**

Diagrammatic investigation into achieving maximum bulk for the development, indicating various building footprints, typologies and their related heights. This provided insight into the scale of the building and some of the possibilities to achieve it.

FAR 6.1
Site Footprint_ 3000 Sqm
Achievable Bulk_ 18300sqm

### FAR_6.1
Site Footprint_ 3000 Sqm
Achievable Bulk_ 18300sqm

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<td>9.5</td>
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(By Author, 2010)
8.4. Previous Design

The initial design produced many of the ideas carried over to the final design. However, the further I moved into the process the more I realised some of the logistical issues an inside-out design process would manifest. In turn the solutions needed to remedy these issues were in themselves to the detriment of the design concepts which I was trying to uphold.

Lessons from the design included:

- A greater balance between logistical and user experience issues was needed.

- The building was programme heavy and not taking full advantage of the rich urban fabric in which it was sited. For this reason several of the programmatic features were removed.

- The two east-west axis buildings were envisioned and located in order to optimise natural light for the user. The slenderness of the site and the building heights which would be required, however, would contradict this notion. This resulted in the overshadowing of the atrium and a daunting experiential sensation upon entrance, as one moved towards the internalised lobby spaces.
9. Final Design

9.1. Footprint

The building footprint is that of a large L-shaped plan across the southern and western edges of the stand. A smaller building, housing the gymnasium is placed on the opposing corner, and holds the space together. This progression from the previous design was the culmination of several factors.

Finding influence from a more typically northern European model, the building takes on a slender form. This is in order to increase natural daylight to building users, as well as access to views. The narrow building additionally assists in bypassing many of the discomforts which occupants may experience within very deep spaces.

The two buildings form a courtyard, removing it from the high traffic volumes along Smit Street and Wolmarans Street, and setting up links diagonally across the site from Park Station and the Gautrain Station towards Braamfontein. Additionally it connects into the quiet green avenue which Simmonds Street provides.
Programmatically the building centres around a spine of communal spaces, comprising of the collaboration interchanges and meeting rooms which alternate on each of the office floors. The leasable office component is arranged however, as three alternating floor plates. This 2-3 vertical relationship within the building maximises variability for the user, helping to establish a sense of place within the user by minimising sterility between floors. Additionally the variance allows a range of occupant needs to be met catering for a wider spectrum of users.

Programmatic locations
- Office Space
- Rent-A-Desk
- Gym
- Collaboration Interchange
- Canteen and Recreation area
- Retail
- Restaurant
- Daycare facility
- Service
- Parking
9.2. Ground Floor

One is welcomed off the street or up from the parking basements by the external courtyard. The open space sets up a transitional oasis from the hustle and bustle of the city, and the occupants entrance (or exit from the building). Flanked by retail stores this courtyard is shielded from much of the adjacent traffic noise and pollution. It serves not only as transitional space but also as the public face of the building. A place for employees of the building as well as those in proximity to meet, eat, relax or produce inspired work. With technology providing many of the keepsakes of modern office space, such as that of communications and security concerns.

The space is calm, yet sensorially stimulating water flows, birds chant, and smells mingle between nature and the restaurant as one enters the main building or moves up towards the gym.
9.3. **Basement Plan (B1)**

The Building houses three basement levels containing two hundred parking bays, disabled drop-off points, various services, machine rooms and storage areas.

9.4. **First Floor**

First floor forms a public-private buffer, housing the main gymnasium area, daycare centre, security and management offices, as well as a calmer business orientated restaurant mezzanine.
In considering the office spaces, a major driving factor was the derivation of the floor plates. The dilemma was in how to merge flexibility and individual needs. A narrow floor plate allowed a method to assist in preventing the ‘misuse’ of the space, which may lead to excessive overcrowding or an individual having limited natural light, ventilation or control of their space and indoor climate (orientated in this building around the ‘Bio-skin’).

In the consideration of circulation in such a space, and the anthropometric ratios which I used to generate viable limits on the size of an uninterrupted space. I began to shift the mass while retaining efficiency in circulation. At this point I introduced a hexagonal planning element which facilitated a greater surface area, resulting in more users gaining a view and contact with the outside. It additionally set up points of interest along the centralised corridor. The floor plate however guarantees that the seemingly central corridor (in the most relevant scenarios) is in fact continually adjacent to a window, which alternates along its path creating variance along its route. Negative spaces defined by this method derive the location of double volumes and balconies.
9.6. **Forth Floor**

Rent.A.Desk and Type C Office ([R]C/C)

View within one of the offices (by Author, 2010)
9.7. Section 001
9.9. Blowup of service core
9.10. The Skin

The building features a double skin (Twin Face facade system), the system provides users with operable windows and the level of occupant control which comes with this. This without fear of the excessive wind speeds which can be problematic in high-rise buildings. The skin, monitored by sensors, is able to act as a passive aid to both heat and cool the building, as well as a fresh air intake. Unwanted temperature peaks are further aided through the use of a Phase Change Material system held in the ceiling at points in each of the floors. The facades mullion spacing is dictated by the cumulative solar radiation to hit that piece of the facade. In this way filtering the radiation according to need and internal functionality.
9.11. Skin Detail

01. 2mm Thick aluminium coping with matt grey powder coated finish (refer Finishing Schedule)

02. 230mm Clay brick parapet, to be finished with 2 coats plaster 3 coats paint to architects spec.

03. Derbigum SP3 burnt on waterproof membrane with min 100mm overlap at joints by specialist. Applied as counter flashing with lift and turn over parapet as shown.

04. 75x75mm concrete fillet

05. 33x100x30mm deep galvanised mild 'Gripweld A100' walkway from 'Mentis', installed by specialist.

06. 22mm Thick shutter-board treated with two coats linseed oil and waterproofing sealant to architects approval.

07. 32mm Thick EPS insulating layer to achieve air tightness.

08. Custom extruded aluminium mechanical solar louvre system by Wispeco with white powder coated finish, profile as detailed (Refer: Colt international CHL250/40). (Sensors motors and electronics by selected specialist)

09. 76x38mm Galvanised mild steel hollow section louvre support mullion. Primed and Painted 'gun-grey' as per architects specification.

10. Toughened safety glazing by specialist (Glass thickness to be determined by specialist in accordance with wind loading requirements).

11. 115mm Clay brick parapet, to be finished with 2 coats plaster 3 coats paint to architects spec.

12. 2mm thick Custom aluminium spandrel panel system by specialist. With 'Gun-Grey' Powder coated finish.

13. Custom extruded aluminium mechanical remote operated louvre system by Wispeco. As per specialist detail.

14. 76x38mm Galvanised mild steel hollow section welded on 100x50x6mm galvanised mild steel flat plate. Primed and Painted 'gun-grey' as per architects specification.

15. 100x50x6mm galvanised mild steel flat plate fixed securely to 450x190mm galvanised mild steel I-Section by 4x16mm dia bolts. Finish to be approved by the architect.

16. Derbigum SP4 burnt on waterproof membrane with min 100mm overlap at joints by specialist.

17. Min 35mm Screed laid to fall min 1/70. On,

18. 255mm Precast concrete slab.

19. 450x190mm Galvanised mild steel castellated I-section beam primed and painted as per finishing schedule.

20. 311x165mm Galvanised mild steel castellated I-section beam primed and painted as per finishing schedule.

21. 600x600mm Access ceiling boards on 38x25mm aluminium hangers.

22. Phase Change Moderator unit. Temperature moderation system by specialist.

23. Drop down anti-glare screen by specialist.

24. Optional access floor.

25. Floor finish to be specified by end user and approved by the architect.

26. 50mm min Power-floated Screed, on 255 precast concrete slab.

- All Structural Steel Members are to be painted with intumescent paint. Paint to be applied as per manufacturers specification, and comply with local fire regulations.
9.12. Final Models
Section D
References & Appendices
10. _References

10.1. Reference list:

- FRANK, K & BIANCA LEPORI, R., 2007. Architecture from the inside out: From the body, the senses, the site and the community (2nd Edition). Great Britain: Wiley-Academy.
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(Cited 2010.05.15)
Available at: http://www.aivc.org/frameset/frameset.html?../Publications/Vips/vip12.htm~mainFrame


10.2. Video References:

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COLLABORATION DESIGN. 200? [ONLINE VIDEO] (Cited:2010.05.04)
Available at: http://www.nbbj.com/#work/client-stories/telenor

CORPORATE CONNECTION. 200? [ONLINE VIDEO] (Cited:2010.05.04)
Available at: http://www.nbbj.com/#work/client-stories/telenor

ENERGY EFFICIENT. 200? [ONLINE VIDEO] (Cited:2010.05.04)
Available at: http://www.nbbj.com/#work/client-stories/telenor
10.3. **Additional Readings:**

10.5. List of Figures

Cover Image and ‘Inside House’ Logo: by AUTHOR

Figure 001: Graphic composition and image manipulation by author.

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Figure 004: UNKNOWN. ------. TouchScreen-Art-247x300. [ONLINE] (Cited: 2010.07.10) Available at: http://www.aygtecnologia.com/es/index.php/techmagazine/touch-screens-with-feeling/

Figure 005: UNKNOWN.a., 2007. The central administration building from the air. [Photograph] [ONLINE] (Cited: 2010.05.27) Available at: www.apeldoorn.nl/data/ter/docs/actueel/nieuws/images/2007/augustus/070828_centraalbeheer.jpg

Figure 006: LAGUNA.2008., Dutch Architects. [ONLINE] (Cited: 2010.05.27) Available at: http://www.laguna.pl/pl/content/index/read/id/149/title/Architekci_Holenderscy.html


Figure 008: APDENCY., 2009. Central Administration office, Apeldoorn. [Photograph] [ONLINE] (Cited: 2010.05.27) Available at: http://nl.wikipedia.org/wiki/Bestand:Hertzberger_Centraal_Beheer1.jpg

Figure 009: SAARI, RC., (----). Cologne cathedral interior. [ONLINE] http://www.ronsaari.com/stockImages/germany/CologneCathedralInterior.jpg

Figure 010: by AUTHOR., 2010. Diagrammatic mapping of sensorial perception.

Figure 011: COLE,RJ, et al., 2008. ‘Re-contextulizing the notion of comfort’, Building Research & Information, 36(4). Pg.326 [Diagram: Conventional approach to comfort provisioning]

Figure 012: Graphic composition and image manipulation by author.

**Figure 013:** Comparative analysis physiological conditions and recovery time. 

**Figure 014:** Access to Nature. [Photograph] 
From: KELLERT, SR, HEERWAGEN JH & MADOR, ML., 2008. Biophilic design. New Jersey: John Wiley & Sons Inc. (Figure 8-8)

**Figure 015:** Outdoor Kitchen/ Breezeway. [Photograph] 
From: KELLERT, SR, HEERWAGEN JH & MADOR, ML., 2008. Biophilic design. New Jersey: John Wiley & Sons Inc. (Figure 19-1)

**Figure 016:** Effective use of water and an indoor ecosystem. The atrium at the clubhouse, Huntington Lakes, Delray Beach, FL. [Photograph] 
From: KELLERT, SR, HEERWAGEN JH & MADOR, ML., 2008. Biophilic design. New Jersey: John Wiley & Sons Inc. (Figure 4-5)

**Figure 017:** by AUTHOR., 2010. Diagramatic analysis, exploring the potentials of build skins from conventional application to biological interpretation. [Diagram]

**Figure 018:** by AUTHOR., 2010. Interplay of factors in personal perception, in the context of a building. [Diagram]

**Figure 019:** Ree,K., 2007. Norsk (bokmål) : Telenors hovedkvarter på Fornebu. [Photograph] [ONLINE] (Cited: 2010.05.05)
Available at: http://en.wikipedia.org/wiki/File:Telenor_Fornebu.jpg

**Figure 020:** NBBJ., ----. Telenor’s new headquarters near Oslo. [Arial Photograph] [ONLINE] (Cited: 2010.05.27)
Available at: http://www.djc.com/stories/images/20011115/Telenor_rendering.jpg

**Figure 021:** Placebo Effects, ----. Testing a materials/ color scheme for a workspace unit at Telenor, Fornebu. [ONLINE] (Cited: 2010.05.27)

**Figure 022:** UNKNOWNB., 2007. Telenor headquarters in Oslo, Norway. [Photograph] [ONLINE] (Cited: 2010.05.27)
Available at: http://blog.kievukraine.info/uploaded_images/3226-721230.jpg

**Figure 023:** Tim Griffith, ----. Telenor Headquarters. [Photograph] [ONLINE] (Cited: 2010.05.27)
Available at: http://archrecord.construction.com/features/images/0406arch-13_sm.jpg

**Figure 024:** by AUTHOR., 2010. Conceptual Motif.

References | 107
11. Appendices
A.1. QUESTIONAIRES: LIST OF QUESTIONS:

1. LOCATION OF WORK PLACE (Suburb/Area)
2. TYPE OF COMPANY (Marketing, Insurance, Banking, etc)
3. TYPE OF POSITION HELD (Temp/Part-Time, Full-Time, Consultant, Etc)
4. TYPE OF OFFICE SPACE (Open plan, Cellular, Group, ‘Hot-Desk’)
5. APPROXIMATE NUMBER OF PERSONS SHARING THE SPACE.
   5.1. Approximate size of company (number of employees).
6. HOW WOULD YOU DESCRIBE YOUR FEELING TOWARDS THE SPACE/ROOM/OFFICE?
   (Comfortable, Connected, Removed, Separated Etc.)
   6.1. IF POSSIBLE PLEASE ELABORATE:
7. DO YOU FEEL YOU HAVE ADEQUATE CONTROL OF YOUR INDOOR ENVIRONMENT?
   (LIGHTING LEVELS, AIR-CONDITIONING, HEATING, FRESH AIR. ETC)
   7.1. PLEASE ELABORATE:
   7.2. ARE YOU CURRENTLY AWARE OF, AND HAVE ACCESS TO, THE LOCATION OF
   THE:
   7.2.1. LIGHT-SWITCH/DIMMER CONTROL?
   7.2.2. AIR-CONDITIONING/HEATING CONTROL?
   7.2.3. OPERABLE WINDOWS?
8. WOULD YOU PERCEIVE YOUR OFFICE SPACE AS BEING STERILE/IMPERSOINAL?
9. WOULD YOU SAY YOU ENJOY BEING IN THE ROOM ON A PHYSICAL LEVEL?
   9.1. IF NOT, PLEASE EXPLAIN:
10. DOES THE OFFICE AREA MAKE YOU, IN ANY WAY, FEEL AWKWARD/UNCOMFORTABLE?
   10.1. IF SO PLEASE ELABORATE:
11. DO YOU HAVE DIRECT SIGHT OF THE OUTSIDE FROM YOUR SEATED POSITION?
   11.1. WOULD YOU LIKE MORE OR LESS OF THIS VIEW?
12. DOES THE OFFICE ENVIRONMENT ALLOW YOU TO, AND/OR GIVE YOU THE
    OPPORTUNITY TO, EXPRESS YOURSELF?
13. DO YOU FEEL THAT THE OFFICE SPACE HAS BEEN DESIGNED WITH YOUR WELLBEING
    IN MIND?
14. DO YOU FEEL YOUR NEEDS AS A BUILDING OCCUPANT HAVE BEEN COMPROMISED
    IN PURSUIT OF COMPANY OBJECTIVES FOR THE SPACE?
15. WHAT DO YOU DISLIKE MOST ABOUT YOUR COMPANY’S OFFICES/BUILDING?
    (PHYSICAL ATTRIBUTES)
16. WHAT DO YOU LIKE MOST ABOUT YOUR COMPANY’S OFFICES/BUILDING? (PHYSICAL
    ATTRIBUTES)
17. IF GIVEN THE OPPORTUNITY, WHAT CHANGES WOULD YOU MAKE TO YOUR OFFICE
    ENVIRONMENT?
18. WOULD WORKING IN AN ICONIC BUILDING/OFFICE INSTIL A GREATER SENSE OF
    PRIDE IN YOU WITH REGARDS TO YOUR WORKSPACE?
19. WOULD WORKING IN A SUSTAINABLE/’GREEN’ BUILDING GIVE YOU A GREATER
    SENSE OF PRIDE WITH REGARDS TO YOUR WORK SPACE?
### A.2. QUESTIONAIRES: RESULTS

<table>
<thead>
<tr>
<th>Ux</th>
<th>Profile A [rev 1]</th>
<th>G</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Banking The City, London FT M OP 300 Removed N N N Y N Y N Y N Y N Y</td>
<td>Access controls not working properly all the time. Lack of street view.</td>
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<tr>
<td>002</td>
<td>Insurance Braamfontein CO F OP 2-4 DESK CLUSTERS Removed N N Y N N Y N N Y N</td>
<td>Lighting is poor and air conditioning is cold</td>
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<tr>
<td>003</td>
<td>Insurance Centurion -last office job FT M OP (very large area) Comfortable Y N Y Y Y Y Y Y Y N</td>
<td>It’s quite an awesome building but it would be great if they had a gym on site.</td>
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<tr>
<td>004</td>
<td>Design &amp; Printing Fourways FT F OP 3 3 Comfortable N Y Y N Y Y N Y Y Y N</td>
<td>Nothing really</td>
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<tr>
<td>005</td>
<td>Banking Jhb - Marshalltown CO F OP 10 Removed N N N Y Y M N N N N</td>
<td>Don’t really care because I’m not permanent</td>
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<tr>
<td>006</td>
<td>Banking Johannesburg CBD FT F OP 550 Comfortable N N N N Y O Y N ? O</td>
<td>Parking- very poorly designed in terms of entry/exit and very narrow lanes._ Not enough windows/light._ Elevators do not stop on each floor- not friendly to the disabled and a problem when escalators are not working._ Location- Jhb town</td>
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<tr>
<td>008</td>
<td>Banking Marshalltown Jhb A/C C M OP 500 Connected N N N N M Y N Y Y Y N</td>
<td>TOO BIG</td>
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<tr>
<td>009</td>
<td>Banking Johannesburg CBD ? F OP 5 Slightly disconnected N N N Y N N N N M N</td>
<td>The lack of sunlight</td>
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<tr>
<td>010</td>
<td>Banking Johannesburg CBD FT F OP 30 Comfortable but not personal Y N Y Y Y Y Y Y Y Y N</td>
<td>Not very green in design</td>
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<tr>
<td>011</td>
<td>Banking Sandton FT M OP 400 Connected N N N N Y N N N Y N</td>
<td>No</td>
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<tr>
<td>011</td>
<td>Mall media management Parktown ? F P 3 Comfortable Y N Y Y N Y Y N Y N N</td>
<td>Nothing. The building is a national heritage site. It is beautiful and inspiring.</td>
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<td>Largely functional.</td>
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<tr>
<td>Art on walls - Kitchen Redesign to reflect real lives - remove regimented seating and hierarchical notions of allocated space - Proximity to windows - Personal bins over central 'ecobins'</td>
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<td>The 2 central atriums that let in some light and give the coffee areas a feeling of space</td>
<td>N</td>
<td>N</td>
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<td>Do something other than white sound to make conversations private - Increase the amount of natural light in the building</td>
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<tr>
<td>It’s nice and open and has plenty of light,</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
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<tr>
<td>An escalator would help to get between floors as only certain people can access the lift - ironically I hate stairs if I’m late to get to my desk but would like a gym on site</td>
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<tr>
<td>Its’ small, well spaced and very modern</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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<td>1) More open windows_ 2) Change the tiles, they mark easily and always seam dirty</td>
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<tr>
<td>Look and Feel</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
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<tr>
<td>Big desks lots of space around us and between us</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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<td>1) more windows_ 2) more modern furnishing _ 3) less partitions between desks and sections</td>
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<tr>
<td>Modern, colours used, paint and wall finishes</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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<tr>
<td>18. IF GIVEN THE OPPORTUNITY, WHAT CHANGES WOULD YOU MAKE TO YOUR OFFICE ENVIRONMENT?</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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<tr>
<td>1) It's should consider the green approach. More sensors, less artificial lighting.</td>
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<tr>
<td>No comment</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
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<td></td>
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<tr>
<td>1) Desk Airconditions 2) Desk Heaters 3) Desk Lighting 4) Cubicles for privacy</td>
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<tr>
<td>As a natural heritage site, the age and design of the buildings, the slope of the land and The stunning old trees make it a welcoming, relaxing environment. The inside of the building is grand and opulent.</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
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Appendices|111
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<thead>
<tr>
<th>Code</th>
<th>Office Type</th>
<th>Location</th>
<th>F</th>
<th>FT</th>
<th>OP</th>
<th>Comfortable, but over</th>
<th>Connected</th>
<th>Company</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>012</td>
<td>Investment bank</td>
<td>Sandton</td>
<td>F</td>
<td>FT</td>
<td>+/-</td>
<td>Comfortable, but over</td>
<td>Connected</td>
<td>Company</td>
<td>n/a – not an unappealing building lifts are a nuisance. The brown carpets, but it is a god looking building from the outside.</td>
</tr>
<tr>
<td>013</td>
<td>Insurance</td>
<td>Sandton</td>
<td>F</td>
<td>FT</td>
<td>5</td>
<td>Comfortable, connected</td>
<td>Company</td>
<td>Company</td>
<td>The brown carpets, but it is a god looking building from the outside.</td>
</tr>
<tr>
<td>014</td>
<td>Business Consulting</td>
<td>Woodmead, JHB</td>
<td>F</td>
<td>FT</td>
<td>-1500</td>
<td>Comfortable, connected</td>
<td>Company</td>
<td>Company</td>
<td>Cant open many windows.</td>
</tr>
<tr>
<td>015</td>
<td>Recruitment</td>
<td>Braamfontein</td>
<td>F</td>
<td>FT</td>
<td>100</td>
<td>Comfortable</td>
<td>Company</td>
<td>Company</td>
<td>I am so used to it now so can't think of anything but if you had asked when I first arrived I am sure I could have answered better.</td>
</tr>
<tr>
<td>016</td>
<td>Information, technology &amp; consulting</td>
<td>Woodmead, JHB</td>
<td>F</td>
<td>FT</td>
<td>1000</td>
<td>Comfortable yet no call privacy</td>
<td>Company</td>
<td>Company</td>
<td>The distinction between the bottom floor (where I work) and the top floor – carpeting, size of offices, width of corridors etc.</td>
</tr>
<tr>
<td>017</td>
<td>Construction</td>
<td>Rivonia, Sandton</td>
<td>F</td>
<td>FT</td>
<td>150</td>
<td>Restricted</td>
<td>Company</td>
<td>Company</td>
<td>The fact that I am on the first floor and don't get to see the real outside.</td>
</tr>
<tr>
<td>018</td>
<td>Recruitment</td>
<td>Hyde park</td>
<td>F</td>
<td>FT</td>
<td>1</td>
<td>Comfortable</td>
<td>Company</td>
<td>Company</td>
<td>The canteen is the first thing you see when you enter which is not visually appealing. Also, waste is taken out via a service lift which is right next to the lifts used by staff / visitors and clients.</td>
</tr>
<tr>
<td>019</td>
<td>Consulting</td>
<td>Woodmead, Johannesburg</td>
<td>F</td>
<td>FT</td>
<td>2</td>
<td>Comfortable, connected</td>
<td>Company</td>
<td>Company</td>
<td>Don't really have a &quot;dislike&quot; about the building.</td>
</tr>
<tr>
<td>020</td>
<td>Management Consulting/ IT/</td>
<td>Woodmead, Sandton</td>
<td>F</td>
<td>FT</td>
<td>18</td>
<td>Connected</td>
<td>Company</td>
<td>Company</td>
<td></td>
</tr>
</tbody>
</table>

### Table Columns:
- **OP-OPEN PLAN**
- **FT-FULLTIME**
- **CO-CONTRACTOR**
- **HD-HOT DESKING**
- **C-CONSULTANT**

**Codes:**
- **YES**
- **NO**
- **OTHER**

**Numbers:**
- **6 2 6 6 8 7 5 # # 6 6**
- **# # # 9 8 # 7 7 9 #**
- **3 2 3 3 5 3 2 3 5 3**
<table>
<thead>
<tr>
<th>Location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>From outside, the building is very beautiful and majestic Office itself has a double volume ceiling, so there is an illusion of space, where there isn’t any</td>
<td>1) more space, personal space 2) access to aircons and air ventilation</td>
</tr>
<tr>
<td>They have plants located all around the building which is nice. I like the way you can see people walking on the corridors in the middle of the building. The toilets are clean and modern. There are some nice balconies and great views from the building.</td>
<td>1) Be able to see outside 2) More access to windows 3) Access to aircon and lighting</td>
</tr>
<tr>
<td>Airy, spacious, lots of light, balconies on each floor, canteen/coffee area has great view, building on top of hill so great viewsite</td>
<td>Enable personnel to open the windows</td>
</tr>
<tr>
<td>Windows, courtyard</td>
<td>1) Nothing really</td>
</tr>
<tr>
<td>Large windows along building and balconies that are accessible and you can clearly see out of Individual coffee areas for each section</td>
<td></td>
</tr>
<tr>
<td>I feel a sense of pride when I am outside our building. The fact that we have many kitchens throughout the building. We are working towards a greener environment – saving paper, measuring carbon footprint, not using water bottles for meetings. The Lapa is a great venue for functions. Free and secure on-site parking for all staff. Security inside the building. Our outside areas for lunch or coffee break. The fact that we are in a leafy suburb with lots of trees and not in town or in a high rise building. One of my bosses has a lovely patio outside his office with a birdbath – I would love to sit there!</td>
<td>1) I would have a canteen 2) I would do maintenance (carpeting, wallpaper and ceiling boards!) 3) I would reassess the office space allocation in the building and adjust accordingly 4) I would install dimmer switches in the offices to enable staff to adjust 5) If budget permitted, I would upgrade the furniture!</td>
</tr>
<tr>
<td>Near home. Easy access to bank, post office, shops, restaurants.</td>
<td>1) I would build an outdoor area which could be used by office staff during their breaks even if it means fake grass or put paving on the roof. 2) Change the furniture and layout – making it more modern.</td>
</tr>
<tr>
<td>Lots of natural daylight</td>
<td>1) More parking 2) More visually appealing, i.e. not so sterile and “functional” looking</td>
</tr>
<tr>
<td>The gardens and water features which have brought Egyptian geese here and they have had many little families.</td>
<td>Everyone would be able to look out - not facing other inside offices.</td>
</tr>
</tbody>
</table>

**Y-YES  N-NO  I-INDIFFERENT  O-ON OCCASION  M-MAYBE**
**Appendix B**  
Tabulation of office phenomena. (From: HERTZBERGER, 2000:93-94)

### Advantages of open plan over cellular office space.

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLEXIBILITY</td>
<td>The arrangement can be adapted to suit every conceivable reorganisation without recourse to hammers or even screwdrivers.</td>
</tr>
<tr>
<td>BETTER CONTACT</td>
<td>Communication is made easier because everything stays in one space. No psychological thresholds to cross and greater flexibility in conveying information.</td>
</tr>
<tr>
<td>THE SENSE OF TOGETHERNESS</td>
<td>A division into compartments as in the traditional system only tends to separate office workers. Being together in a single space rules out the feeling of being cut off from everyone else.</td>
</tr>
<tr>
<td>ANTI-HIERARCHY</td>
<td>The traditional system a hierarchy obtains around what it means to have one’s own room, the number of bays that room occupies, whether it has a rug and so forth. In point of fact all that these artificial differences do is create distance.</td>
</tr>
</tbody>
</table>

### Problems with open plan offices

<table>
<thead>
<tr>
<th>Problem</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREVENTING NOISE NUISANCE:</td>
<td>One discussion should not disrupt another. It should be as impossible to overhear others as it is to be overheard yourself.</td>
</tr>
<tr>
<td>MAKING AN ACCEPTABLE ARTIFICIAL LIGHTING SYSTEM:</td>
<td>As daylight is only able to enter extremely Large spaces at the periphery such a space is entirely dependent on artificial lighting. This will have a considerable bearing on the ambience in the space.</td>
</tr>
<tr>
<td>SUFFICIENT VIEWS OUT:</td>
<td>What holds for interior daylighting is equally true of views out. The general preference for a place at the window in a traditional type of office seems largely ascribable to the need for views out (contact with the outside world) so as not to feel shut away.</td>
</tr>
<tr>
<td>ENVIRONMENTAL CONTROL:</td>
<td>Extremely Large workspaces is still only possible with the aid of some or other form of air-conditioning, the main problem being that of the thermal load that complete dependence on artificial lighting brings.</td>
</tr>
<tr>
<td>THE ‘MASSIFICATION’ EFFECT:</td>
<td>Though the idea of massification is difficult to define and is often splashed about regardless, we all have some idea of what is meant by it. Everyone can be observed by everyone else: “You’re never alone for a second”. For most people it is difficult to be themselves in an environment which continually calls for adopting an attitude. The greater freedom of action inherent in a greater flexibility mainly concerns the organization, in other words the work. Whether this greater freedom has anything to offer the people who have to do the work is doubtful. They may have more freedom in choosing where they sit and the position of their desk, but there is no question of a genuine choice: the bill of fare has not changed essentially and will still taste the same! The problem we have touched upon here is — now that the social aspect clearly has the upper hand — that of our individuality coming under fire. The work is under threat too, for those who now have trouble concentrating are going to find themselves experiencing even greater difficulties in that respect.</td>
</tr>
<tr>
<td>The ‘SARDINES-IN-A-TIN’ SYNDROME :</td>
<td>There is absolutely nothing stopping us from keeping those desks and cabinets coming until the workplace is jammed solid, with suffocation a real option. We may well roundly condemn this as the wrong way to proceed. Yet when it comes to the crunch there is nothing more natural than to keep putting off that long overdue extension.</td>
</tr>
</tbody>
</table>
### Environmental features
- Colour
- Water
- Sunlight
- Plants
- Animals
- Natural materials
- Views and vistas
- Façade greening
- Geology and landscape
- Habitats and ecosystems

### Natural shapes and forms
- Botanical motifs
- Tree and columnar supports
- Animal (mainly vertebrate motifs
- Shells and spirals
- Egg, oval, and tubular forms
- Arches, vaults, domes
- Shapes resisting straight lines and right angles
- Simulation of natural features
- Biomorph
- Geomorphology
- Biomimicry

### Natural patterns and processes
- Sensory variability
- Information richness
- Age, change, and the patina of time
- Growth and efflorescence
- Central focal point
- Patterned wholes
- Bounded spaces
- Transitional spaces
- Linked series and chains
- Integration of parts to wholes
- Complementary contrasts
- Dynamic balance and tension
- Fractals
- Hierarchically organized ratios and scales

### Light and space
- Natural light
- Filtered and diffused light
- Light and shadow
- Reflected light
- Light pools
- Warm light
- Light as shape and form
- Spaciousness
- Spatial variability
- Space as shape and form
- Spatial harmony
- Inside-outside spaces

### Place-based relationships
- Geographic connection to place
- Historic connection to place
- Ecological connection to place
- Cultural connection to place
- Indigenous materials
- Landscape orientation
- Landscape features that define building form
- Landscape ecology
- Integration of culture and ecology
- Spirit of place
- Avoiding placelessness

### Evolved human-nature relationships
- Prospect and refuge
- Order and complexity
- Curiosity and enticement
- Change and metamorphosis
- Security and protection
- Mastery and control
- Affection and attachment
- Attraction and beauty
- Exploration and discovery
- Information and cognition
- Fear and awe
- Reverence and spirituality

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*Appendix C: Elements and Attributes of Biophilic Design*

This list is taken from Kellert, Heerwagen & Mador (2008: 15).
Inside Architecture

Re-asserting the user in a context of technology to humanize and inspire the future officescape.