LUDO - UTOPIA

PHYSICAL ACTIVITIES WITHIN A BUILT SPACE

Submitted by
KAILAS.S

**A dissertation submitted in partial fulfillment of the requirements
For the Degree of Bachelor of Architecture**

Holy Crescent College of Architecture

Mahatma Gandhi University
Kottayam

2016

Holy Crescent College of Architecture, S.Vazhakulam,
Alwaye

CERTIFICATE

This is to certify that the dissertation work titled "**LUDO-UTOPIA :Physical activities within a built space**" is a bonafide work of **KAILAS.S**, under my guidance, submitted as Semester VII & VIII subject for the award of "**Degree of Bachelor in Architecture**" during the term of 2012-2017 through Mahatma Gandhi University, Kottayam.

Prof. Ar.Kenny P Joy

PRINCIPAL
HOLY CRESCENT COLLEGE
OF ARCHITECTURE
SOUTH VAZHAKULAM, ALUVA - 5

Dean

HOLY CRESCENT COLLEGE OF ARCHITECTURE

Holy Crescent College of Architecture, S.Vazhakulam, Alwaye

DECLARATION

I, **KAILAS.S**, hereby declare that this dissertation entitled "**LUDO-UTOPIA : Physical activities within a built space**" is the outcome of my own research study undertaken under the guidance of **Ar. Kenny P Joy** Professor at Holy Crescent College of Architecture, Cochin. It has not previously formed the basis for the award of any degree, diploma, or certificate of this Institute or of any other institute or university. I have duly acknowledged all the sources used by me in the preparation of this dissertation.

Name of the Student : Kailas. S

Date:

Place:

TABLE OF CONTENTS

Acknowledgements..... 05
Abstract..... 06
List of tables / Figures 07-08

Chapter 1 Introduction.....09
1.1 Background of the study.....09
1.2 Need for the study..... 09
1.3 Outline of the study.....10
1.4 Rationale.....10
1.5 Aim.....11
1.6 Objective.....11
1.7 Research Question.....11
1.8 Scope and Limitations.....12
1.9 Research Methodology.....12

Chapter 2 Research..... 13
2.1 Health.....13
2.2 Physical activity.....13
2.3 Benefits.....14
2.4 Health hazards due to Physical inactivity.....15
2.4.1 Overweight.....16
2.4.2 Sedentary lifestyles.....17
2.5 Physical activity at workplaces.....18
2.5.1 Limitations.....18
2.5.2 Inference.....19
2.6 History of office spaces.....20
2.7 Evolution of office spaces(time line).....21

Chapter 3 Case Studies / Analysis.....22
3.1 Live studies.....22
3.1.1 Bodhi Professional Solutions. Pvt.Ltd.....22
3.1.2 Anthem Biosciences. Pvt.Ltd.....26
3.1.3 Analysis.....33
3.2 Literature study - Medibank.....34

Chapter 4 Strategies / Conclusions 39-56

Bibliography / References 57

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude towards **Ar.Prateek Sudhakaran**,Dean and **Ar.Neetha Mohan**,H.O.D of Holy Crescent College of Architecture for providing me an opportunity to do my report on "LUDO-TOPIA : Physical activities with in a built space". This project bears the imprint of many people.Most importantly, I would like to express my deepest appreciation to my project guide **Ar.Kenny.P.Joy** for his guidance and encouragement in carrying out this Dissertation report.I also wish to express my gratitude to the officials and other members of the Holy crescent college, who has rendered their help during the period of my work.

I thank **M.G university**,kottayam for their permission to include copywrited pictures as a part of my dissertation report.In addition, i would like to thank **Mr.Satish** and **Miss.Letha** for their kind support and opportunity given to successfully complete my case studies at M/S Bodhi pro. Pvt Ltd and Anthem Biosciences Pvt Ltd respectively.

Last but not least I wish to avail myself of this opportunity, express a sense of gratitude and love to my friends and my beloved parents for their manual support, strength, help and for everything till the last minutes of printing.

This report is dedicated to all of you.

ABSTRACT

Obesity and sedentary lifestyles are increasing becoming linked as contributing factors to a range of health issues worldwide. Technology has played a crucial role in making Homo sapiens into a sedentary animal from an erstwhile hunter or a civilised animal who earned his bread through hard labour in agriculture. Advent in technology made him lazy as modern day gadgets and instruments met his daily requirements without moving out of his seat. Most of his daily jobs can be accomplished through the labour of just pressing a button or some cases even giving vocal instructions.

However we have not reached a stage where the vast majority share such a lifestyle and fortunately but lately there has been an upsurge of message sent across various media to the society regarding the importance of physical well being and ways to achieve it through physical movement. Yoga, exercise, dance etc is increasingly getting popularised for this reason.

It is estimated many of us spend up to 90% of our days within a built environment. As the famous words say, Built Environments (from a building to a city scale) are shaped or designed by us, which in turn shape our lives. The built environments control the way we move and do our activities. Architects who shape the spaces we all move in, can thus play a role in determining the way people move and thereby influence the health levels through activity controls especially within our dwellings and work places. The study aims at an investigation into this aspect of an architect's role to the society health through various possibilities of 'Designing for a Healthy Living'.

LIST OF FIGURES

No.	Name & Resource	Page
1.1	Research methodology wheel	12
2.1	People participating in sports - www.bitscience.com	14
2.2	People participating in vigorous physical activity- www.westlake.school.nz	15
2.3	People participating in moderate physical activity- www.istockphoto.com	15
2.4	Graph showing the worldwide Overweight report on 2010- www.who.int	16
2.4.1	Image showing increase in obesity rate	17
2.5	Graph showing the worldwide BMI report on 2014- www.who.int	17
2.6	Change in office layout for the past few years- www.ehow.com	20
2.7	Time line showing the decline in physical activity level in office spaces	21
3.1	Circulation pattern at Bodhi-pro.	23
3.2	Circulation diagram showing the amount of distance covered by two users	24
3.3	Schematic plan showing the circulation inside the administration wing.	33
3.4	Medibank-Atrium stairs (top view)- www.archdaily.com	34
3.5	Location map- www.archdaily.com	34
3.6	Medibank- external cityscape view- www.archdaily.com	35
3.7	Lobby interior with atrium stairs on top- www.archdaily.com	35
3.8	Medibank interior- team meeting space- www.archdaily.com	36
3.9	Medibank central core- stairs- www.archdaily.com	36
3.10	The ramp connecting lobby- www.archdaily.com	36
3.11	Medibank park floor space planning- www.archdaily.com	37
3.12	Medibank typical work space planning- www.archdaily.com	37
3.13	Open cafe for informal meetings- www.archdaily.com	38
3.14	The multi-purpose court- www.archdaily.com	38
3.15	Ramp going from the park floor- www.archdaily.com	38
3.16	The heart shaped atrium- www.archdaily.com	38
3.17	Exterior glass facade with green wall- www.archdaily.com	38
4.1	Pie chart showing the time spent inside workplace- www knoll.com	39
4.2	Work space planning concept- www knoll.com	41
4.3	Activity spaces - According to the no. of users- www knoll.com	42
4.4	Sketch showing the one on one focus demanding work space.	43
4.5	Small discssion space which can be enclosed or open.	43
4.6	A typical type of team meeting space with a moderate level of privacy.	43
4.7	Large formal type of meeting spaces.	44
4.8	Interactive spaces for formal and informal use.	44

LIST OF FIGURES

No.	Name & Resource	Page
4.9	Plan showing various types of activity spaces -scheme 1	45
4.10	Plan showing various types of activity spaces -scheme 2	46
4.11	Plan showing various types of activity spaces -scheme 3	47
4.12	Plan showing various types of activity spaces -scheme 4	48
4.13	Othe activity sapces which can be added to increase the movement inside	49
4.14	A play with levels and stairs to promote physical activity.	50
4.15	A poster image advocating stair use.	51
4.16	The skip-stop circulation system inside a building.	53
4.17	Piano stairs - Stairs that produces music on stepping on it- Funtheory.com	54
4.18	A man at work even though his body is idle.	55
4.19	An active architectural context- Hatter prichard architects	56

LIST OF TABLES

No.	Name & Resource	Page
3.1	Anthem biosciences Questionnaire	27 - 32

*Unless otherwise stated all images, photographs, tables and sketches by Kailas.S, 2016

CHAPTER 1 : INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Activity, it is the state or quality of being nimbleness,vigorous,active or pleasure of doing something which can be purely **physical**. A persons life is imbued with many kinds of activities from his/her day to day life, and each of these activities that we tend to do has a huge impact on our whole body as well.In short, the activities of a person plays an important role in maintaining his **health** as well.

And each of these activities irrespective of their users, 90% of them occur with in an **architectural context**. So it only seems imperative that architecture itself can be designed to limit the issues caused from these inactivities which tends to occur in that particular **space**.

1.2 NEED FOR THE STUDY

It would be a fair description that architecture provides the **context** in which a user can operate to achieve his or her aims and goals found in day to day life. With the invention of modern technology more mechanical and digital technologies came into architectural design, thus resulting in rapid increase in the **comfort level** which later effected the **living** style. Sensor based doors that open automatically, the inclusion of escalators and lifts to replace stair climbing for vertical circulation and the partial decline of face to face interaction taken by social networking - all may provide faster and more efficient way of achieving things, but subsequently play a major role in reducing the physical **activity rate** from our daily lives.

This **reduction** in the physical activity levels from the users within the built environment can have a direct link to the increasing statistics of obesity and subsequent chronic diseases seen worldwide.It is essential that architectural design should be **re-thought** to **increase** the physical activity levels within the built environment.

This Dissertation shows an alternative approach to design which is focused **less** on the **convenience** but rather on the effort, yes an "**effort** based design".

1.3 OUTLINE OF THE STUDY

Ludo - To play (physical activity)
Utopia - An ideal place
This Report is titled 'Ludo-topia : Physical activities within a built space' and it shows the possibility of architecture which can play an important part in **lessening** the increasing risks of chronic diseases and physical **inactivity** for inhabitants with in the built environment. Obesity and sedentary **lifestyles** of humans are increasing and are becoming linked as the most contributing factors to a wide range of **health issues** world wide.

Over time **architects** have had many influences, such as religion, art and more recently environmental awareness to consider when **designing** their buildings. More recently, study on-sedentary lifestyles and increased long term health risks has emerged due to architectural conveniences such as self-opening doors and machine operated vertical circulation are providing occupants with a better and more **comfortable** lifestyle. Perhaps it is time that architecture itself, becomes inspired by issues of obesity, physical inactivity and an increasing risk related to a sedentary lifestyle currently present within the built environment.

1.4 RATIONALE

We spend 85% of our lives inside, but have we ever stopped to think, have the design of a building is effecting you? Architecture can change the ways you feel, you behave and can even change the brain of a person considerably. Architects are impacting the structure of our brain, but are they taking the considerations of the brain and the body why?Are we so obsessed with the shiny iconic structures, that we stopped to think about the people inside them? Its time to rethink our relationship with the most important buildings in our life.The places where we live,work and play.

In this modern world, an average human adult spends almost 90% of their day inside his/her office space(work places).So for this global issues of obesity and sedentary life styles, we must look into the space where people spent most of their time or in other words a work place is ideal for this study.The place where we work should motivate us, should bring out the best of our abilities.This is the link between space and how it make us behave. Is it possible to design a work space that can make us physically active and more productive?

Today, the world's most architectural icons are office buildings. Brilliant architecture should inspire us, bring out the best in our potential as we work.But what are these buildings actually doing to us?

We have become obsessed with what buildings look like on outside and forgot the people who are inside.Most of us work in places like open plan offices with few windows, fluorescent bulbs glaring above us, a low ceiling and the boss watching off your shoulder and probably a fake picture or paint ing of nature to compensate the miserism.These open plan offices are generally cost effective and says to bring out a sense of togetherness or equality.But how does an open plan office generally effect us?
Building environment that optimise our performance, optimise our abilities and that can happen. By reshaping spaces, provides an extreme effect a design can have on our behaviour.So there is a clear relationship between buildings and our health.

1.5 AIM

"A quantitative and qualitative study on influence of **space design** in promoting physical activity, to achieve a **healthier lifestyle**".

1.6 OBJECTIVE

1) Examination of existing architectural space design logics in restricting movement within the work space.

2) Analysis of major activity patterns inside the workplace for their physical activity intensity and movement level.

3) Exploration of various possibilities of arriving better models of space programming to achieve larger physical activity especially through movements – horizontal and vertical.

1.7 RESEARCH QUESTION

Can **architecture** promote and encourage the **physical activity** needed to live a **healthy** and sustainable life?

1.8 SCOPE AND LIMITATIONS

This Dissertation report does not propose the removal of technology based additions entirely but instead proposes a balance between the "wants" and "needs" for convenience in architecture. It is understood that the scope of this report cannot change the entire worldwide issue of chronic diseases and illness due to physical inactivity but instead proposes a range of considerations to meet the minimum requirement of physical activity to produce energy expenditure by an individual so as to lead a healthy life.

Scope : The study is aimed at linking space design with health which is highly unexplored. This study aims at contributing to the field of health science in a context where healthy lifestyle is popularised by media and other agencies.

Limitations : The study will be limited to a specific lifestyle based on a cultural context which might be restricted to a geographical region. Universalistic outcomes of the study is thus not possible as lifestyle and cultural definitions of spaces vary largely from region to region.

1.9 RESEARCH METHODOLOGY

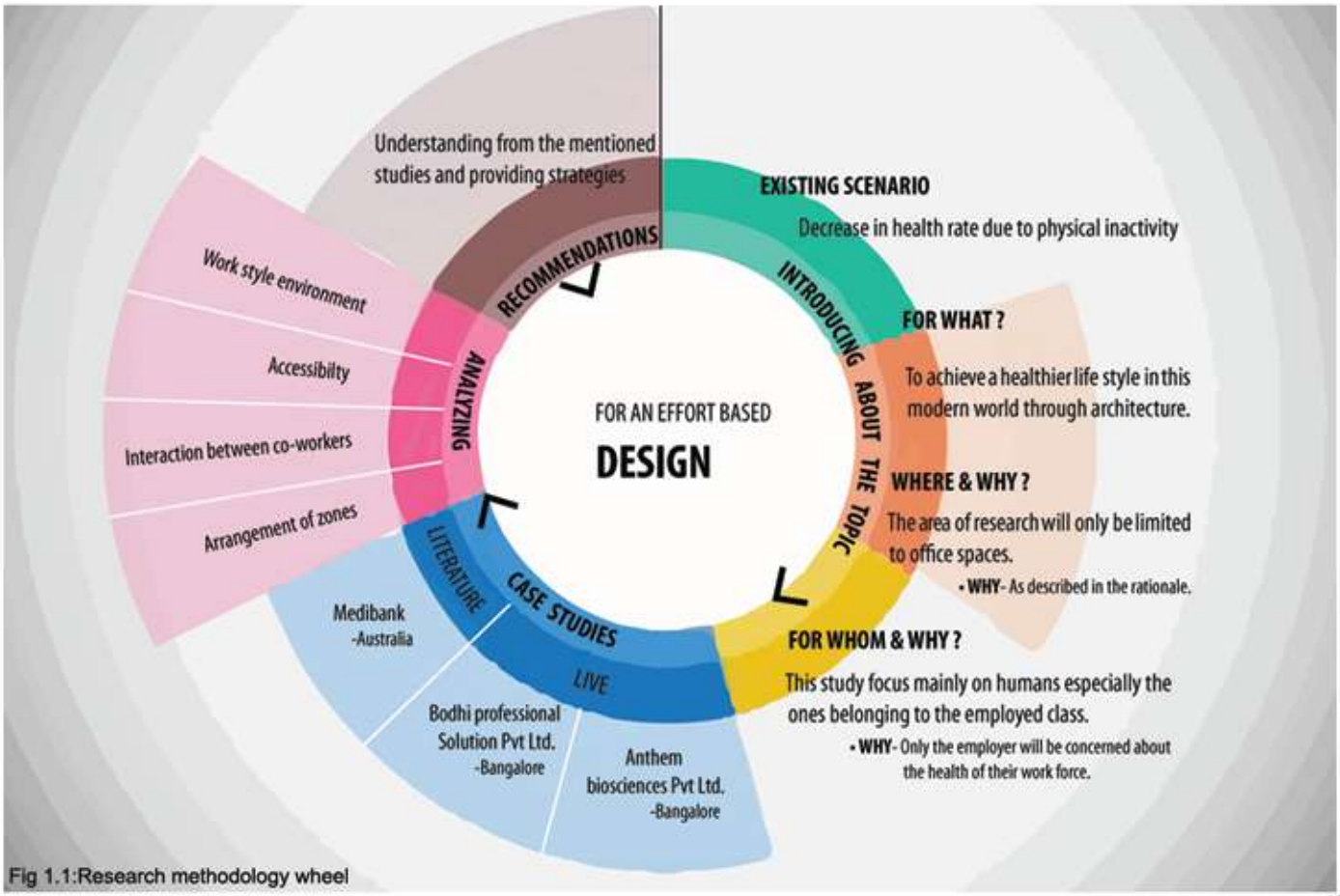


Fig 1.1:Research methodology wheel

CHAPTER 2 : RESEARCH

2.1 HEALTH

Being healthy is one of the major concern to all individuals.It may seem generally understood that the desire to stay fit and healthy results for the successful achievement of a physical work-day routine. If the routine is broken by illness then, usually, short term medical treatments are used to combat, and somewhat reverse the illness.

Short term health issues - such as common flu symptoms are of major importance and concern to us. Our health and well-being impacts economically, socially, and most importantly to each of us physically. It is, however the long term risk factors such as obesity, diabetes, and the onset of cancer, that seem to be overlooked and are of a much more concerning character.Everyday life consists of routines, mentioned above, and the busy rush of daily tasks that living and working in this modern world demands.

Long term health hazards such as obesity, and physical inactivity (alongside the more publicly recognized smoking and alcohol consumption) can increase the risk of poor health and have significant long term effects including heart disease, high blood pressure and cholesterol, and can even cause some forms of cancer.

2.2 PHYSICAL ACTIVITY

Physical Activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure beyond resting expenditure.Before further analysis of the dilemma of physical inactivity, it is important to understand quite what a “physically active” lifestyle might be.The Ministry of Health recommends that adults do at least 30 minutes of moderate-intensity physical activity (such as brisk walking or equivalent vigorous activity) at least five times a week and doing more than this amount of daily activity (or at a higher intensity) can give additional health benefits and help people lose weight.To become physically active you have to give one half hour out of 24 hours of your day to doing moderate level physical activity. That’s 2% of your day and only 54% of people are doing it.

Fig 2.1:People participating in sports- an example for physical activity.

• A moderate amount of physical activity is roughly equivalent to physical activity that uses approximately 150 Calories (kcal) of energy per day, or 1,000 Calories per week.

• Some activities can be performed at various intensities; the suggested durations correspond to expected intensity of effort.

2.3 BENEFITS

Regular physical activity that is performed on most days of the week reduces the risk of developing or dying from some of the leading causes of illness and death in the United States. Regular physical activity improves health in the following ways:

- Improved self-esteem and confidence
- Reduction in stress, anxiety and depression
- Improved mood and sense of wellbeing
- Improved concentration
- Reduced feelings of fatigue and depression
- Improved psychological wellbeing and mental awareness
- Increased community cohesion
- Reduces the risk of dying prematurely.
- Reduces the risk of dying from heart disease.

- Reduces the risk of developing diabetes.
- Reduces the risk of developing high blood pressure.
- Helps reduce blood pressure in people who already have high blood pressure.
- Reduces the risk of developing colon cancer.
- Reduces feelings of depression and anxiety.
- Helps control weight.
- Helps build and maintain healthy bones, muscles, and joints.
- Helps older adults become stronger and better able to move about without falling.
- Promotes psychological well-being.

Fig 2.2 :People participating in vigorous physical activity.

Fig 2.3 :People participating in moderate physical activity.

2.4 HEALTH HAZARDS DUE TO PHYSICAL INACTIVITY

Obesity is one of the categories defined as of growing concern to health organisations worldwide. According to the data collected, worldwide obesity has nearly doubled since 1980, and in 2008 more than 1.4 billion adults, 20 and older, were overweight. Of these over 200 million men and nearly 300 million women were obese.

Obesity is defined as a body mass index (BMI) of 30 or more -calculated by dividing a person's weight in kilograms by the square of their height in metres. Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese.

2.4.1 OVER WEIGHT

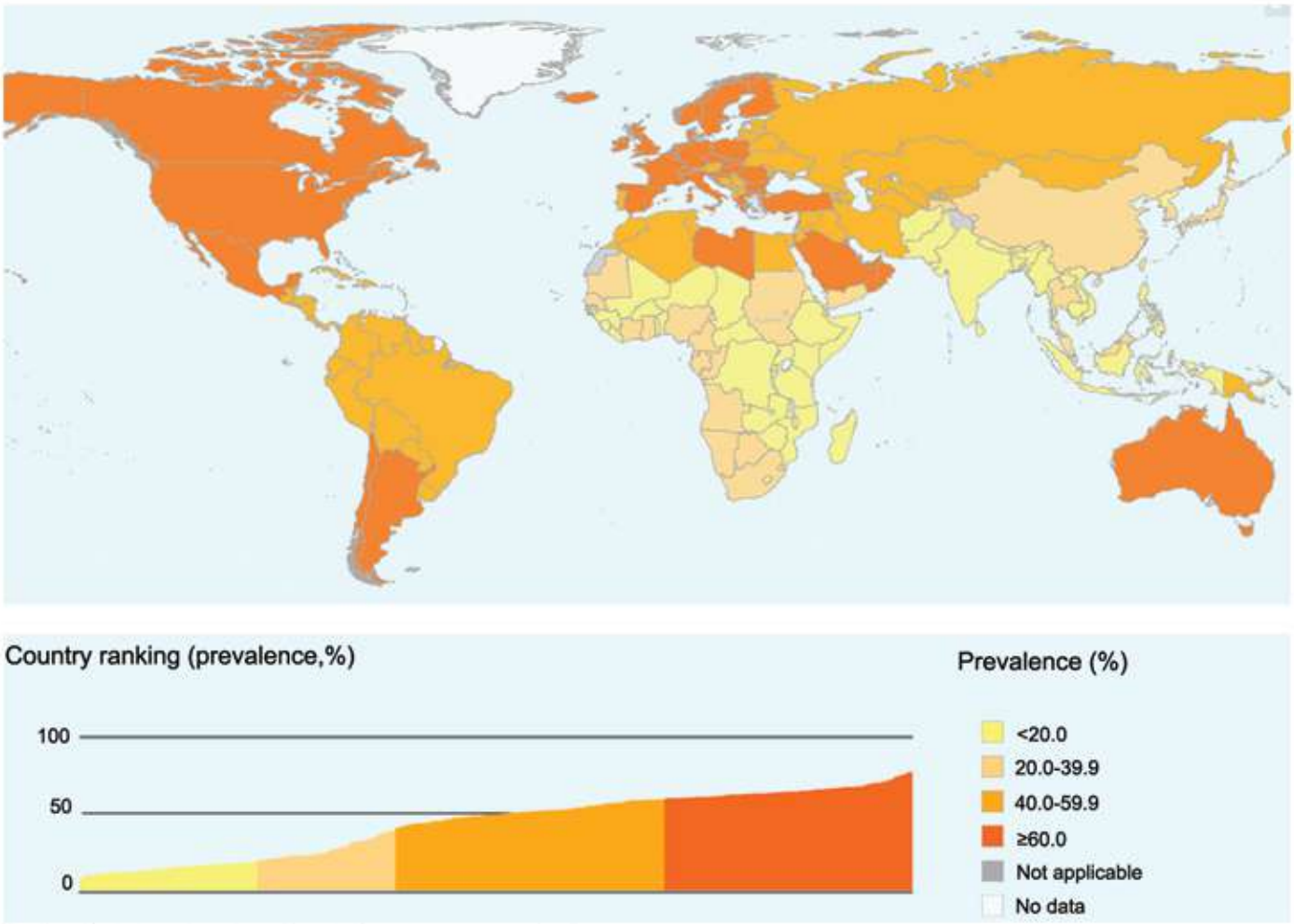


Fig 2.4 :Graph showing the worldwide Overweight report on 2010.

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories burned. An increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization also has a major role to play in making of this unsustainable method of day to day living.

A high body mass index is a major risk factor for the beginning of chronic diseases such as cardiovascular diseases (mainly heart disease and stroke), which is a leading cause of premature deaths worldwide.

2.4.2 SEDENTARY LIFESTYLES

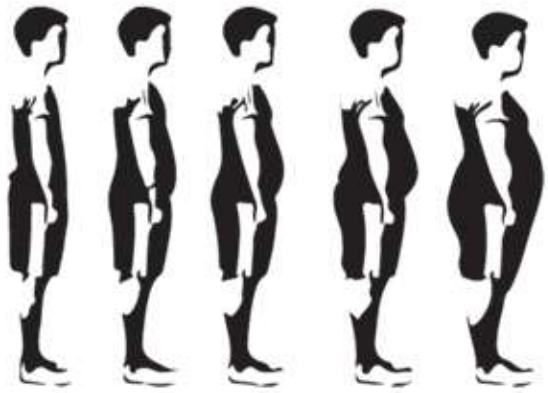


Fig 2.4.1 :Image showing increase in obesity rate.

Sedentary lifestyles are defined as "requiring sitting or little activity." The definition categorises a developing trend that sees the majority of one's day sitting down, whether it be at the workplace or in leisure and/or travel time. A combination of these factors has produced statistics revealing some people sit for an average of sixteen hours a day.The desire to increase the convenience and lifestyles of our lives has implemented a change in which the norm of routine has developed. The increase in motorways and suburban developments results in us living further and further from work and requires longer periods of our day spent in vehicular modes of transport.

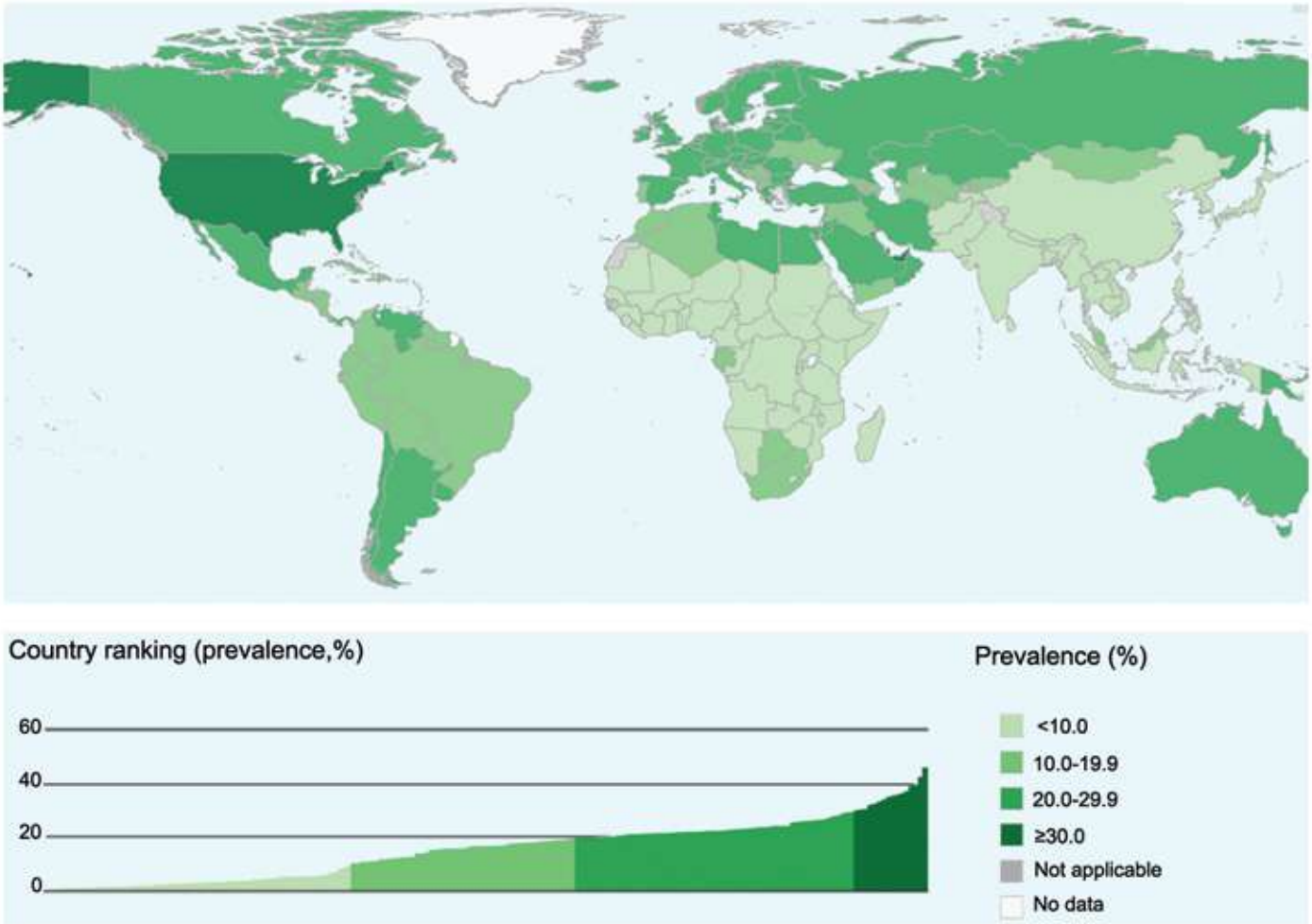


Fig 2.5 :Graph showing the worldwide BMI report on 2014.

2.5 PHYSICAL ACTIVITY AT WORKPLACES

The sedentary trend continues with development in the working environment resulting in the adults sitting for longer and longer periods of the working day. This subsequently increases the chance of developing certain types of chronic disease related to the inactivity of their daily routines. As the accumulative figures of sedentary based employment rise, it is imperative to understand the dangers related to jobs where sitting is the primary action of the day. When one sits down at a computer or desk the electricity activity in their legs shuts off, fat reducing enzymes drop by 90%, and calorie burning slows to nearly 1 calorie per minute. People who sit down all day have twice the rate of cardiovascular disease than those who stand, and again to state it directly, people with sedentary jobs are twice as likely to die from heart disease as people with active jobs.

Simply put, a workplace that supports physical activity provides and enhances quality of life for employees, both inside and outside of the workplace. When employees are encouraged to be active, there can be benefits for both the employee and the company, such as:

- Gains in productivity,
- Decreases in absenteeism and turnover,
- More positive and happier employees and workplace culture,
- Lower medical costs and fewer injuries,
- Enhanced corporate image,
- Reduction in stress and increase in relaxation,
- Improved employee health / wellness.

It is important for organizations not only to analyze the cost of running a physical activity program in the short term, but also to see how it will benefit the organization in the long run.

2.5.1 LIMITATIONS

Limitations on involvement in physical activity experiences can be broken down into five main categories.

1. Personal ability (skills and experience, fitness and tactical knowledge)
2. Individual factors (age, gender, body shape and culture)
3. Resources (money and time available to spend pursuing activity)
4. Health considerations (heart conditions, asthma or special needs such as being hearing im paired)
5. Social support (ability of friends, family and significant others to offer encouragement)

2.5.2 INFERENCE

The majority of sedentary behaviour happens within the built environment(whether its work, school, or at home) architectural design considerations can play a ceaseless role in minimizing the "lack of time" barrier by integrating various levels of activity into ones daily routine.

2.6 HISTORY OF OFFICE SPACE

A brief history of how the seating arrangements have refelected our changing attitudes towards work.

• TAYLORISM (ca. 1904)

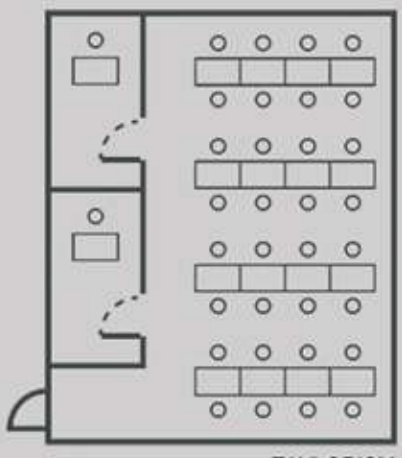
American engineer Fedrick Taylor was obsessed with efficiency and oversight and is credited as one of the first people to actually design an office space.Taylor crowded workers together in a completely open environment while bosses looked on from private offices, much like on a fatory.

• BUROLANDSCHAFT (ca. 1960)

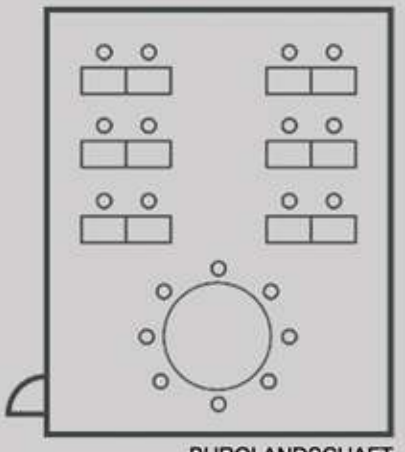
The German "office landscape" brought the socialist values of 1950s Europe to the socialist values of the 1950s Europe to the workplace: Management was no longer cosseted in executive suites.Local arrangement might vary by function - side by -side workstations for clerks or pinwheel arrangements for designers, to make chatting easier - but the layout stayed undivided.

• ACTION OFFICE (ca. 1968)

Burolandschaft inspired herman miller to create a product based on the new european workplace philosophy.Action was the first modular business furniture system,with low dividers and flexibele work sufaces.It's still in production today nad widely used.In fact, you probably know Action by its generic, more sinster name-Cubicle.



TAYLORISM



BUROLANDSCHAFT

• CUBE FARM (ca. 1980)

It's the cubicle concept taken to the extreme.As the ranks of middle managers swelled, a new class of employee was created: too important for a mere desk but too junior for a window seat.Facilities managers accommodated them in the cheapest way possible, with modular walls.The sea of cubicles was born.

• VIRTUAL OFFICE (ca. 1994)

Ad agency TBWA\Chiat\Day's LA headquarters was frank gery masterpiece.But the interior, dreamed up by the company's CEO, was a fiasco.The virtual office had no personal desks, you grabed a laptop in the morning and scrambled to claim a seat.Productivity nose-divided, and the firm quickly became a laughing stock.

• NETWORKING (present)

During the past decade, furniture designers have tried to part the sea of cubicles and encourage sociability without going nuts. Knoll, for example, created systems with movable, semi-enclosed pods and connected desks whose shape separates work areas in lieu of dividers. most recently, Vitra unveiled furniture in which privacy is suggested if not realized.Its large tables have low dividers that cordon off personal space but won't guard personal calls.

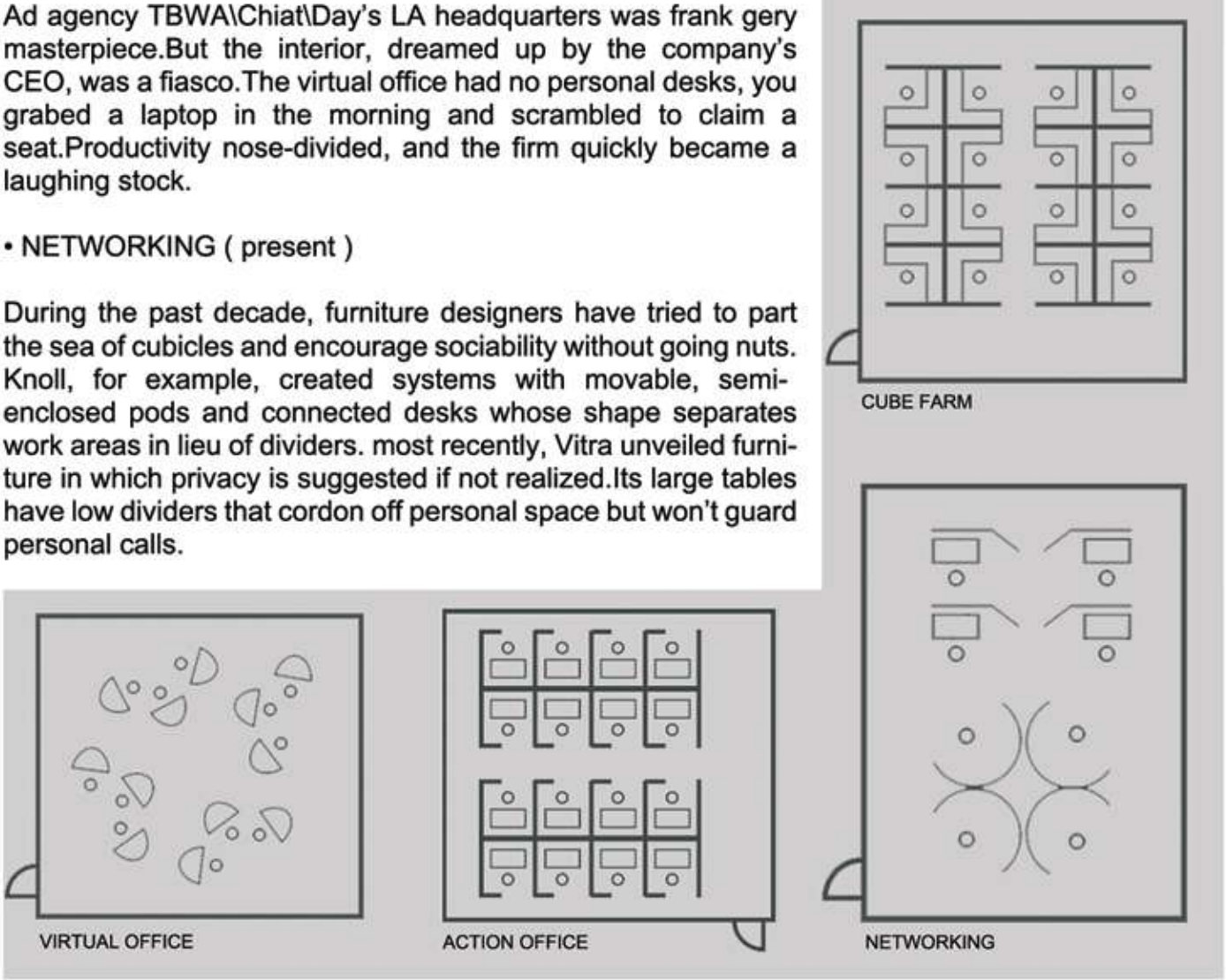


Fig 2.6 :Change in office layout for the past few years.

2.7 EVOLUTION OF OFFICE SPACES
- TIME LINE REVIEW

The silent generation at work.As you can see here,the office structure was pretty basic back then.In fact, doesn't it kind of ressemble a class room set up?The workplace in 1920 was occupied by the silent generation.Even though they didn't have the tech we do today, they believed in "doing more with less"and being task oriented very much defined these workers.

Further through 1970s we see the rise of the dreaded cubicles.The felt covered grey walls didn't do much to encourage collaboration between co-workers.Today, open plan office design gives us the freedom to socialise with our colleagues and bounce ideas off one another more proficiently.

1920

1970

19TH CENTURY

1960

1980

Another snapshot of a busy office in 1960.Where are all the computers and gadgets?And is that a rotary dial phone?How retro.Compared to today's standared office, this one lacks privacy and the environment is very monotonous.No breakout spaces or quiet areas make for a very crowded workspace.

Office PC's goes main stream introducing many business people to spreadsheets for the first time.Internet access becomes the norm as workers began to benefit from the power of email as business communication tool.

1990

The dawn of the digital age.Computers are common everywhere in the workplace and their capabilities have advanced quickly.We are now using machines that can do a lot more than merely input words digitally.

21ST CENTURY

Fig 2.7 :Time line showing the decline in physical activity level in office spaces (1920 to 1990)

CHAPTER 3 : CASE STUDIES / ANALYSIS

3.1 LIVE CASE STUDIES

3.1.1 BODHI PROFESSIONAL SOLUTIONS PVT LTD.

Bodhi
Our knowledge. Your future.

LOCATION

#77/78, SudhindraBldg, 8th cross, Malleshwaram, Bangalore 560003, Karnataka, India

Established in 2001 with the objective of providing an unmatched range of product solutions and technical support services for companies throughout the printing industry.

Head quartered at bangalore with a state of art technical demo centre.

Serving all across India, sri lanka, Bangladesh and middle east.Bodhi-pro focuses on bringing the best technology to the industry.It endeavours to be the best innovators, who take dignity in their contributions, rising to many challenges and striving to enhance as a solution providers.

Backed up by a rich experience this industry proves to be the best team players and introduce new concepts and technologies to the whole of graphic arts segments.This strong knowledge base provides opportunity to share worldwide learnings, insights, and understanding in order to create unique solutions for all their customers.

MISSION

To offer innovative and reliable services and products globally to foster a printing environment that transforms companies into effective leaders who deliver excellence consistently.

CASE STUDY AIM

To study the physical movement of employees inside a workplace that come across their daily routine.Identifying the major activity spaces that they tend to visit like cafes.Arrangement of basic necessities like wash rooms.Distance from their workstations to print pools.Location of stairs and lifts which act as the major circulation system in office spaces.

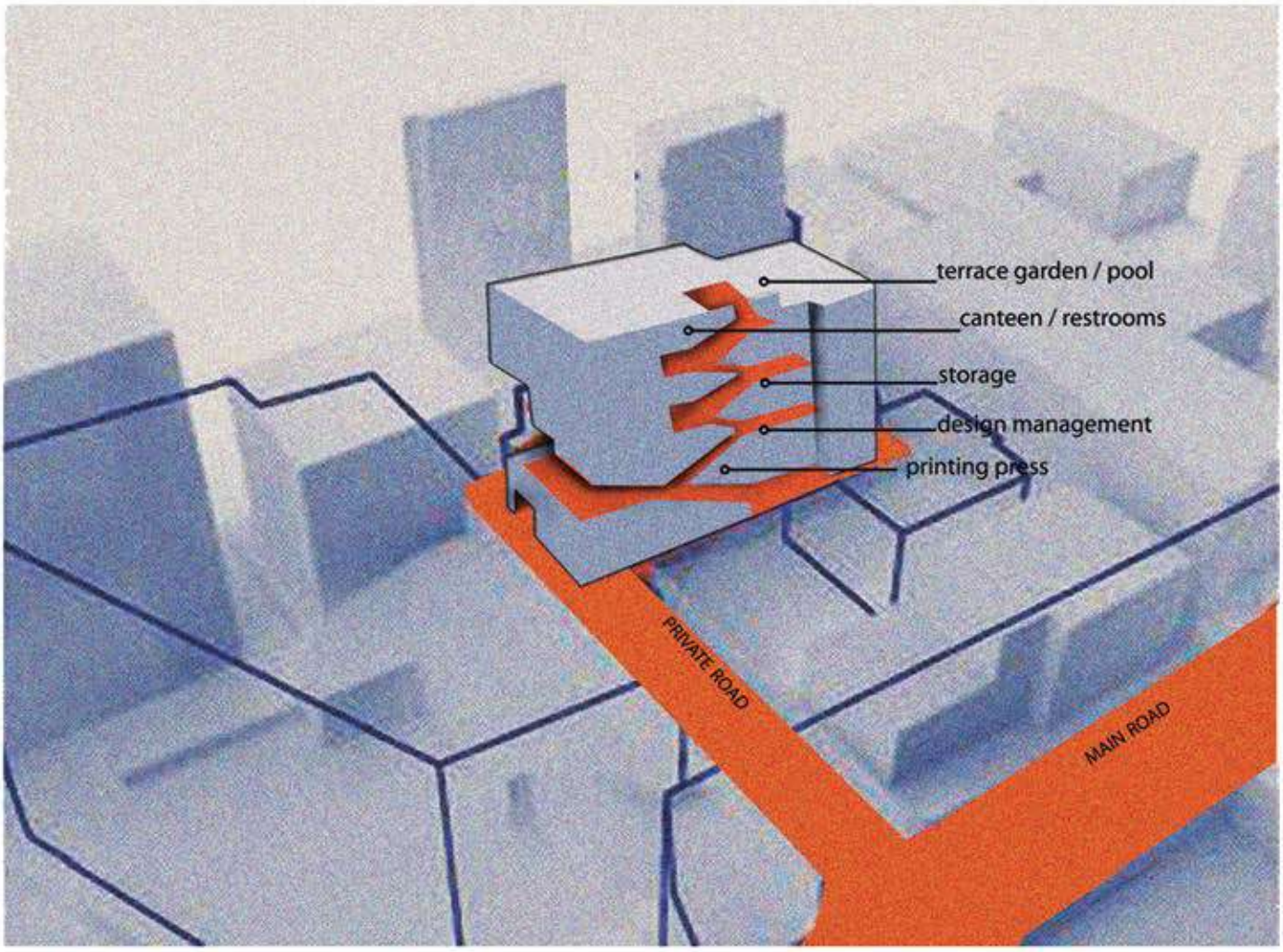


Fig 3.1 :Circulation pattern at Bodhi-pro.

PROCESS

Identifying the main circulation pattern at the macro level such as accessibility towards the site with respect to its neighbouring context and from the road so as to confirm the movement of people-through the specified entrance.The macro level movement is highlighted in the above figure to denote that the circulation inside the building is integrated along with the circulation outside.

The micro level circulation of employees inside each floor is also shown along with the activity spaces they use inside the work place.Since it is a vast office space, separate divisions will be there to undertake certain other activities for its proper functioning.So in order to know more about the physical activities inside its better to study two divisions working in the same office simultaneously.

An activity based circulation of a high level employee and a low level employee is represented in the figure below.

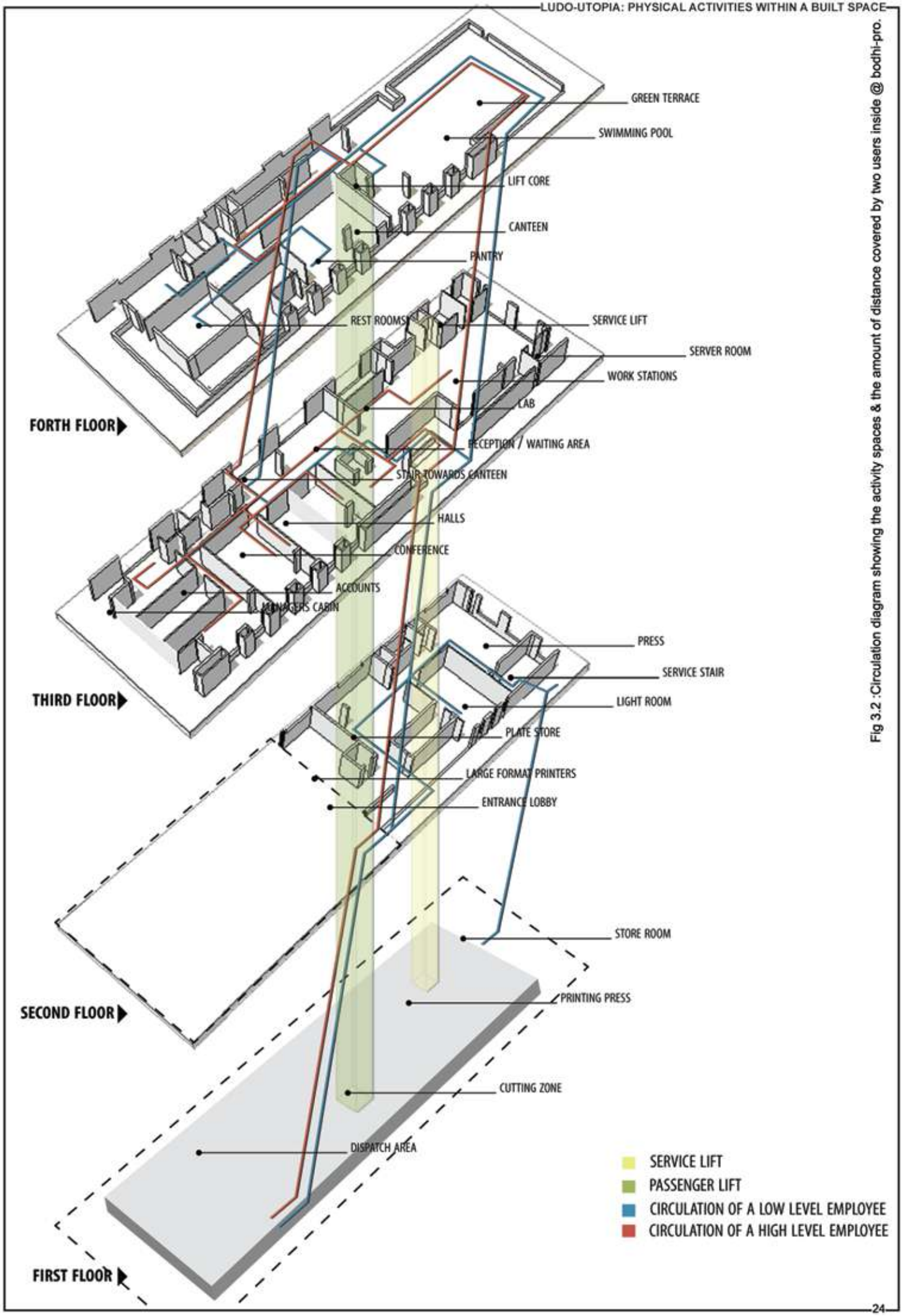


Fig 3.2 :Circulation diagram showing the activity spaces & the amount of distance covered by two users inside @ bodhi-pro.

INFERENCE

The above study shows that the amount of physical activity attained by each individual in M/S Bodhi pro differs from people to people, according to their job designations or to which division they belongs to.Each of their physical movement as mentioned in the circulation diagram, depends on their hierarchy.

From the above illustrated figure, a high level employee attains relatively less amount of physical movement and interaction compared to a low level employee who is working at the same office.

Further more, there are few spaces where they both tend to spent interacting with other coworkers and also there are some other activity areas where the relative movement of both the individuals are same irrespective of their positions places such as cafes, smoking balcony, toilets etc. falls under this category.

3.1.2 ANTHEM BIOSCIENCES

Anthem BioSciences

LOCATION

#49, Canara bank road, bommasandra industrial area, phase 1, hosur road,Bangalore 560099, Karnataka, India

Anthem Biosciences is a bangalore based Contract Research and Innovation Service Provider (CRISP), currently located in an industrial park in bangalore with built up capacity to house over 500 researchers.The company employees over 350 people with plenty of room for adding extra capacity.

As a CRISP- Anthem offers a whole gamut of services dedicated to the enabling and sustaining global research efforts in the discovery of new compounds by pharmaceutical, biotechnology, speciality chemicals, agriculture chemicals and material science companies.

Infrastructure of Anthem can do GMP synthesis ranging from milligrams to kilogram, multi kilogram to multiple tonne scale.Apart from modern well equipped labs, the company has a cGMP kilo lab and a versatile GMP pilot plant.

In the ever crowding space of CROs, Anthem Biosciences distinguishes itself as a top tier organisation with highly skilled team and quality services.

CASE STUDY AIM

A survey was conducted to collect data on employee opinions about the their building, the elevator and stair design, employee attitudes and behaviours toward physical activity in general, and workplace physical activity habits.For this process Anthem administration wing was surveyed.

SL.NO	VARIABLES	QUESTIONS ASKED	ANSWERS GIVEN
1	Level of education	Whats your highest level of education? • School graduate • Associate degree • Bachelors degree • Post graduate degree	Bachelor's degree & higher
2	Age	What is your current age range? • 25-30 • 30-35 • 40-45 • 50-55 • >55	• 25-30 - 11 • 35-40 - 5 • 40-45 - 3 • 50-55 - 24 • >55 - 20
3	Gender	What is your Gender? • Male • Female	Male - 31 Female - 32

Table 3.1 :Anthem biosciences questionnaire.

SL.NO	VARIABLES	QUESTIONS ASKED	ANSWERS GIVEN
4	General health	How would you rate your overall health? • Excellent • Very good • Good • Fine • Poor • Don't know	Good-Excellent Don't know - 2
5	Your overall Job satisfaction	How would you rate yor satisfaction with your current job? • Satisfied • OK • Dissatisfied • No comments	Satisfied OK
6	Office cohesion	How would you rate your interaction with your co-workers? • More cohesive • Less cohesive • Nothing at all • Don't care	More cohesive - 19 Less cohesive - 32

SL.NO	VARIABLES	QUESTIONS ASKED	ANSWERS GIVEN
7	Office design	Current satisfication with your office layout, interms of how you & your co-workers work? • Satisfied • Could have been better • Neutral • Dissatisfied	Neutral - 65% Satisfied - 25% Could have been better - 10%
8	Other activities	How often do you suggest or act on a supplementry work place phisical activity? • Never • Seldom • Sometimes • Often	Sometimes - 25% Never - 75%
9	Taking lunch time or break walks	How often do you suggest or accompany co-workers on lunch time or break - time walks? • Never • Seldom • Sometimes • Often	Often - 50% Sometimes - 50%

SL.NO	VARIABLES	QUESTIONS ASKED	ANSWERS GIVEN
10	Achieving enough exersice ?	Do you fell that you get as much exercise you need? • As much as i need • Less than i need • I don't know	Not much - 25% Does other activites after office time - 35% I don't know - 45%
11	Achieving recommended levels of moderate activity	How many days per week do you achieve 30min of physical activity?(overall not continuous). • 0 days • 0-3 days • 0-7 days	Average 6 - 7 days
12	No. of days you walk atleast 10min at a time	How many days per week do you walk atleast 10min at a time? • 0-2 days • 0-5 days • 0-7 days	Average - 0-5 days

SL.NO	VARIABLES	QUESTIONS ASKED	ANSWERS GIVEN
13	Sedentry behaviour	How many hours per day do you spent sitting? • 0 - 10 hrs • 0 - 12 hrs • 0 - 20 hrs	0 - 10 hrs - 90%
14	Work hours	Is it necessary to spent the full time of your alloted work hour in a day,sitting at the same place continuously/does it comes necessary to complete the work?	Not necessary,no rule says to sit inside your cabin continuously for whole day Yes sometimes we does during deadlines without anyones compelling
15	Vertical circulation cores	Which mode of vertical cirulation do you prefer & why? • 0-2 days • 0-5 days • 0-7 days	Elevators They are fast n doesn't consumes time. Tiredness of coming all the way from traffic.

SL.NO	VARIABLES	QUESTIONS ASKED	ANSWERS GIVEN
16	Finally, Stairs	Suppose if you are taking stair as your circulation medium from one floor to another,how many flights can you go up/down comfortably??	Average - 0-3 flights

INFERENCE

The survey design was modular and used some questions to explore changes in employees' attitudes and perceptions about their work patterns and movement Most physical activity behaviours measured such as : including number of days of moderate or vigorous physical activity, employee perceptions of whether they participated in enough physical activity, and participation in physical activities such as exercise breaks, and the number of stair flights travelled. Only participation in lunchtime and break time walks was significantly associated with stair use. In addition, no statistical relationship emerged between the number of stair flights travelled and other variables such as age, gender, weight, level of education, general health, and level of job satisfaction, nor was any significant correlation between these variables indicated during the process.

3.1.3 ANALYSIS

Both these studies shows us two different scenario of wok places around us, each with their own spacial quality.The circulation inside Anthem's Admin wing differs from Bodhi pro clearly, because at bodhi all the modules are integrated as a single work space as a result the interaction between the coworkers and physical activity level is also higher compared to other.

While on the other case Anthem's Admin wing is divided into three blocks around a courtyard which says to act as the connection between the three i.e.,An interaction zone.As the admin wing of Anthem which has most of the reputed high officials of the company, it offers a wide range of facilities inside.Majority of the circulation through elevators and central aisle with everything at a considerable distance from their work station, the physical activity level has dropped down.

From the above studies, irrespective of their functional differences most of them have the same kind of spaces that dwells with in.But what depends is how these spaces are arranged effectively to meet the needs of people in a healthy manner.

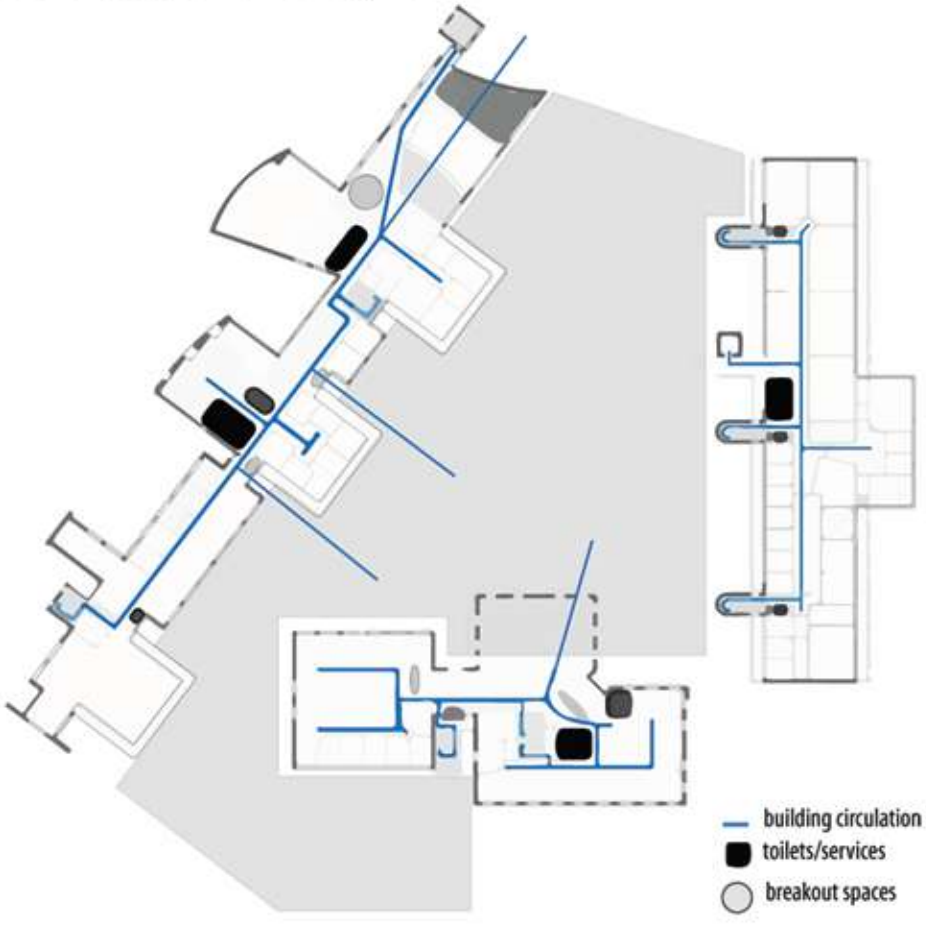


Fig 3.3 :Schematic plan showing the circulation inside the administration wing.

3.2 LITERATURE STUDY: MEDIBANK

Fig 3.4 :Medibank-Atrium stairs (top view)

ARCHITECTS : HASSEL
LOCATION : 720 Bourke Street, Docklands VIC 3008, Australia.
AREA : 47750.0 sqm
PROJECT YEAR: 2014

Fig 3.5 :Location map

Medibank - Australia's largest health insurence company took intiative for a major cultural change program to live its purpose to the core and create better health outcomes on its members, employees and the community. Which later drove medibank to create on of the healthiest workplaces in the world. A system that goes further beyond the conventional activity based working to create a health based working.

An approach that improves the physical health of people at its core.

Medibank employees have been given the choice to choose how and where they should work. With laptops and mobile phones in hand, Medibank's people can randomly select from more than 26 types of work spaces, ranging from indoor quiet spaces and collaborative hubs to wifi-enabled balconies and places to stand and work according to their wish. Employees who want a more vigorous workout during the day can also make use of a multipurpose sports court at ground level. Certain areas have been provided with circadian lighting which mimics the natural flow of daylight patterns supporting to people's biorhythms.

At the ground level near to the sport court, an edible garden sits near a demo kitchen that medibank uses to promote healthy eating to both staff for a wider community.The building itself is reffered as 'hard wired for health'.

A ramp spirals up from the main entrance of the Bourke Streets street level, allowing easy access to bike storage on their way to work.These practices are mostly done for encouraging employees health and wellbeing.

Fig 3.6 :Medibank- external cityscape view.

Fig 3.7 :Lobby interior with atrium stairs on top.

A living, breathing building transforms its surroundings as well.

Both the building and the workplace incorporates an enormous amount of vegetation.There are 2,300 plants inside the building and 520 in modular planter boxes on the facade, as well as two 25 metre high street - facing green walls.

Within the workplace this helps relieve stress, improve internal air quality and transforms views from grey to green.With around 10 percent of the building's exterior is covered by native Australian plants.It's a 'living, breathing building' that also provides a welcome relief within its heavily concreted urban surroundings. The effort of the planting combined with the curves of the building itself is to convey a softer,more human character.The facade is tactile and unpredictable - a stark contrast to the solid and impenetrable nature of many city towers.More than just a building, Medibank is the new gateway to Melbourne's Docklands precinct.It succeeds in 'giving something back' to its surrounding community by creating a welcoming public precinct at ground level with a timber amphitheatre, cafes, shops and a public park.

Fig 3.8 :Medibank interior- team meeting space.

Fig 3.9 :Medibank central core- stairs

Fig 3.10 :The ramp connecting lobby.

Diverse design thinking creates character and meaning.

Achieving the kind of innovation Medibank wanted for its new workplace meant driving a highly-collaborative design process. Architects and landscape architects contributed to the workplace interiors, interior designers and architects to the park and all three disciplines were involved in the base building design.

HASSELL also invited three very different design firms to collaborate on the design for the plaza level which sits in the middle of the tower.This succeeded in creating layers of character and meaning to inspire people to connect in new ways with their workplace.Medibank is confident its new workplace will deliver cultural and financial value through improved productivity and efficiency and will help inspire costumers focussed innovation by creating breathing space for ideas to grow.

Just four months after Medibank moved in, 79% of employees reported they were working more corroboratively with their colleagues and 70% said they are healthier working at Medibank Place. What's more, 66% of employees said they were more productive at Medibank Place and the call centre saw a 5% reduction in absenteeism. Medibank's Executive General Manager, People and Culture, puts it, the building, workplace and surrounding public space "epitomises our purpose and value and all that we stand for."

BUILDING SPACE PROGRAMME

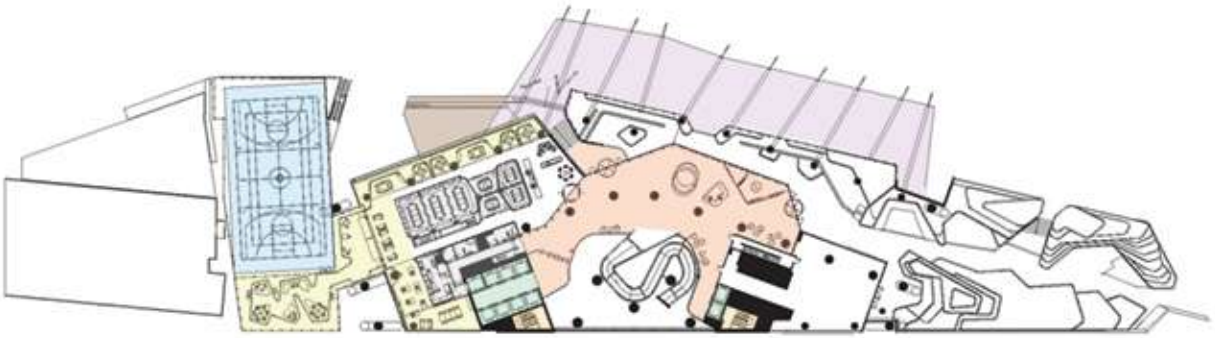


Fig 3.11 :Medibank park floor space planning.

lobby
cafes/shops
meeting rooms
stadium
multi purpose court
lifts
pedestrian canopy
fire stairs

0 20 40 80m

PARK FLOOR

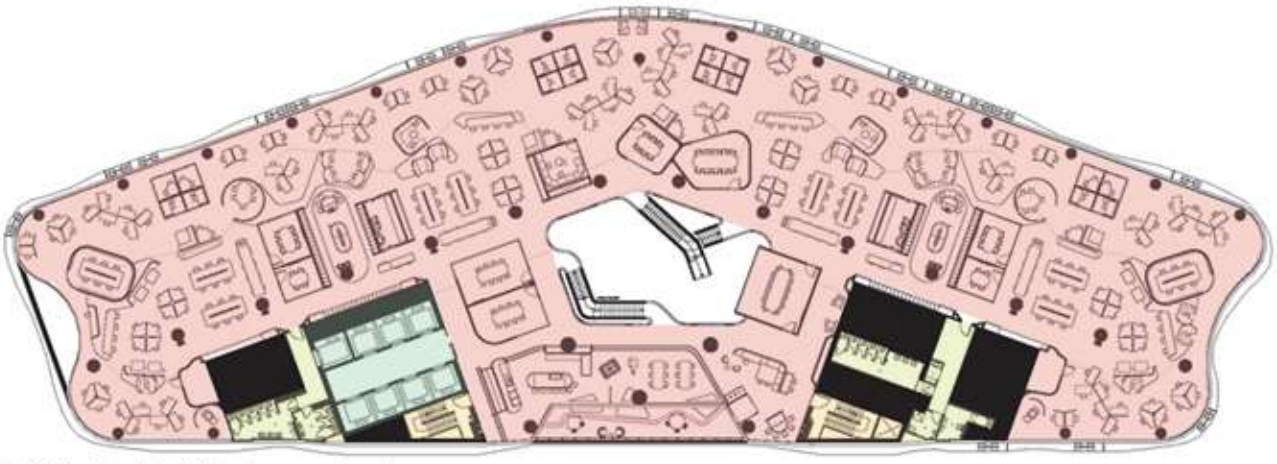


Fig 3.12 :Medibank typical work space planning.

toilets
26 types of workspaces
lifts
fire stairs

0 10 20 40m

TYPICAL WORKSPACE

Medibank employees who arrive to work via southern cross stations are treated to views of lush landscaping and cafes on their way into the building.

Fig 3.13 :Open cafe for informal meetings.

The multi-purpose court conveys the company's commitment to wellbeing.

Fig 3.14 :The multi-purpose court.

Fig 3.15 :Ramp going from the park floor.

A spiralling ramp provides bicycle access to the end of trip facilities on level one and continues up to medibank's reception and lobby level.

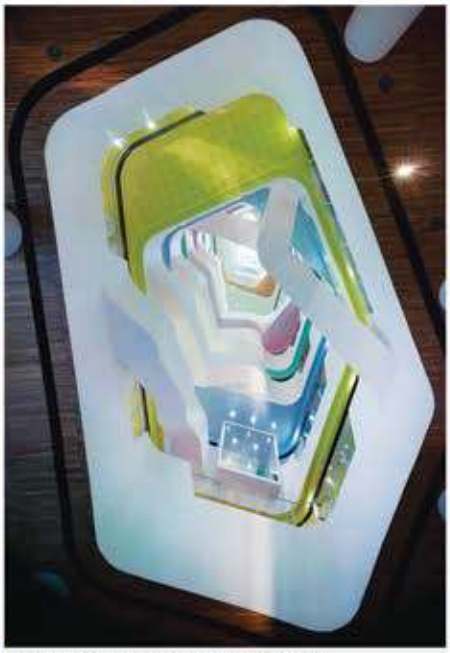


Fig 3.16 :The heart shaped atrium.

The central atrium redefines the height at which a vertical void can be used to a work-place while remaining humane and legible.

Fig 3.17 :Exterior glass facade with green wall.

The glass facade facing Bourke street offers glimpses through the atrium, while green panelled walls indicate public links through the building to the new concourse and stadium beyond.

CHAPTER 4 : STRATEGIES AND CONCLUSION

4.1 AN ACTIVE DESIGN CONCEPT

The concept of 'An Active Design' is deliberately in contrast to sedentary forms of transportation and circulation. It questions the aim of most designers, building owners and urban planners that have been designing buildings and cities with the aim to make them as effortless as conveniently possible to get around. Lifts, motorways, fast food drive "throughs", and large numbers of car parking have encouraged sedentary and car centred lifestyles, while stairs in building design are often relegated to the remoter circulation plan positions, where they are seldom used. Together these elements have encouraged sedentary rather than active lifestyles and contributed to growing trends of obesity and chronic disease. The design of buildings provides an excellent opportunity to promote regular and important instances of physical activity. Most people spend as much as 90% of their days indoors often engaged in sedentary occupations.The integration of the 'Active Design' philosophies can be strongly centralised around two key elements of the building's design :

- Building programme / planning.
- Circulation.

4.1.1 BUILDING PROGRAMME / PLANNING

Careful organization of the buildings programme can encourage people to walk around the building to different environments or destinations.Physical exercise could be achieved by walking from ones work station to the bathroom or cafeteria space.

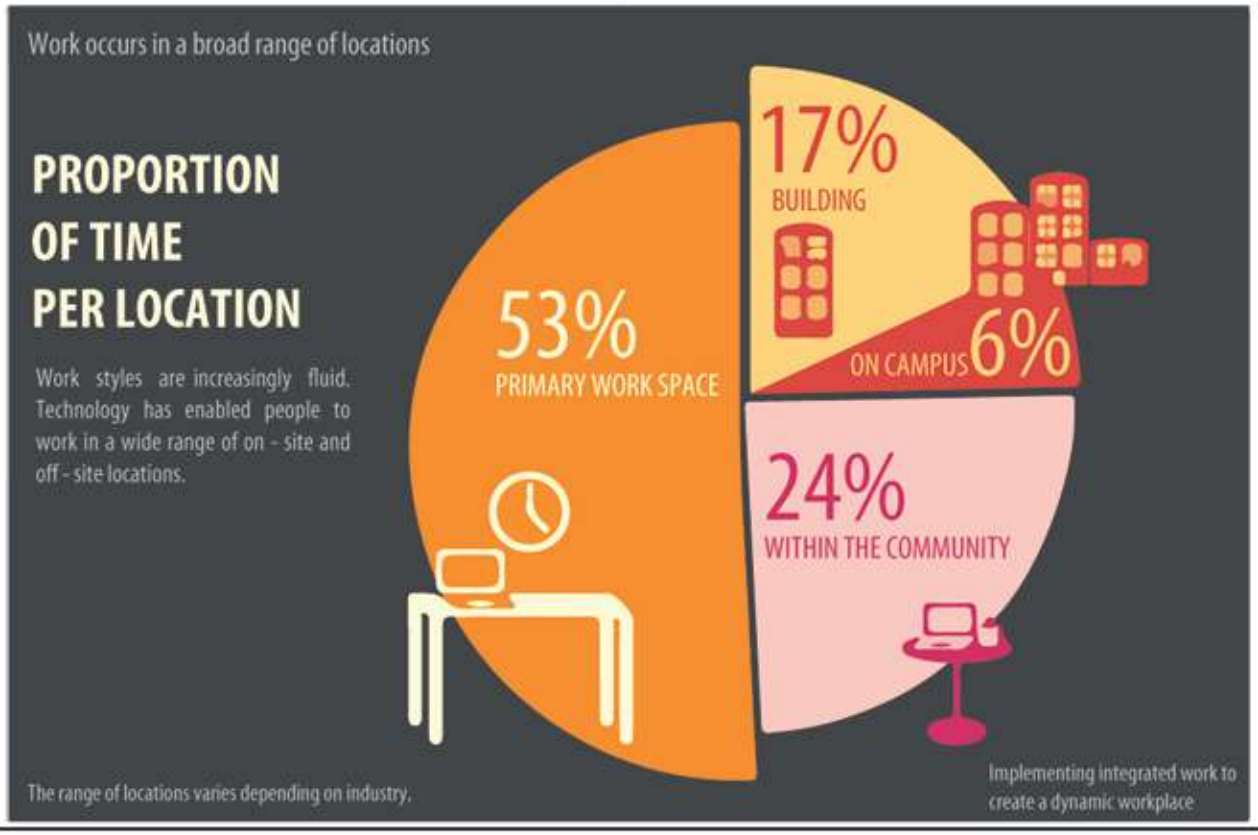


Fig 4.1 :Pie chart showing the time spent inside workplace.

While no one can predict the office of the future, in our current work environment there is only one constant that we can count on - Change.The pace of nature of work are changing at a lightening speed driven by high-speed technology innovations, a competitive economy and a diverse work-force with an entirely new expectations about the work environment.The workplace is a powerfull tool that can help organisations compete talent, engage in interactive sections to innovate ideas that helps to speed up the current market stock.

For an ideal workplace to move forward, it should start with a proper planning.Rather than looking for a one size fit to all solution, an alternative approach to workspace planning with its distinct look, feel and functionality can bring out a change.

Some strategical concepts to improve the effectiveness by rearranging the zones along the proximity line are as follows.

BUILDING BLOCKS FOR PLANNING

Today's workplace support not only process, but also more importantly- people, their culture and innovations resulting in a diversity of WORK MODES, an explosion of variety of WORK SPACES, and an array of WORK TOOLS required to engage many people and inspire them.

WORK MODES

• FOCUS is heads down individual work, which requires concentration and an absence of distrcation.

• SHARE is a short-term interaction between small numbers of person.

• TEAM is a group work, among a larger number of people working towards for the fullfillment of a certain activity.

• SOCIAL is a interactive behaviour that strengthen us with personal connections and oppertunities to learn from others.

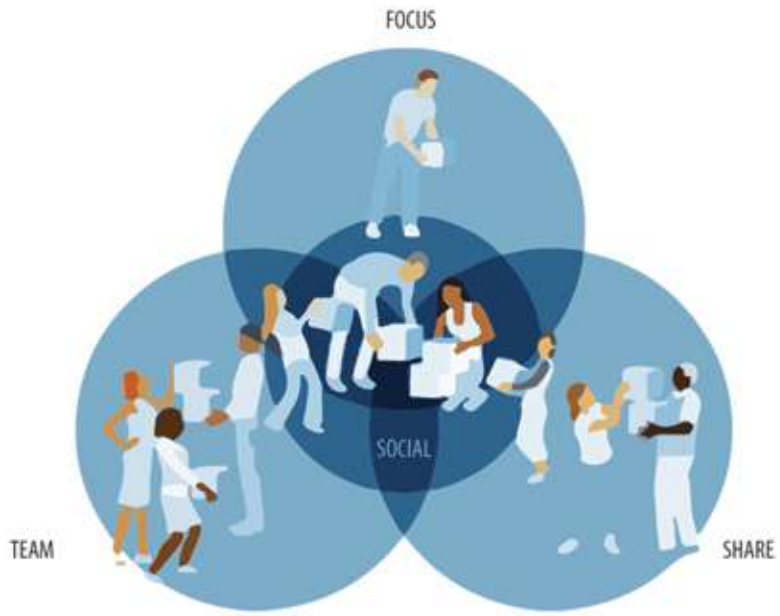


Fig 4.2 :Work space planning concept.

To support the different work modes and diverse needs of people, today's modern workplace should incorporate a variety of spaces.

PRIMARY WORK SPACES denoted by the color code grey are home based spaces typically assigned to specific people and predominantly configured to support the individual, for their focused work.

ACTIVITY SPACES (colored) are shared " go to " spaces that complement primary
workspaces and support collaboration or focused work.They provide a variety of settings - from open to enclosed, casual to formal, small to large - to support variety of interactions, from improper meetings to planned interactions.

WORK TOOLS

Effective work environments rely on key elements to facilitate work modes and also enable the flow of work.

TECHNOLOGY - Multiple means for people to access and share data, communicate, express ideas, document results, access power and navigate the workplace.

FURNITURE - Furnishing that create different settings, which are user friendly and enable people to reconfigure the environment and connect with technology with one another.

ACCESSORIES - Lighting, organisation tools, adjustable monitor arms, ergonomic seating that offers micro adjustments for a person that can suit for his/her preference.

WORK TOOLS

Effective work environments rely on key elements to facilitate work modes and also enable the flow of work.

TECHNOLOGY - Multiple means for people to access and share data, communicate, express ideas, document results, access power and navigate the workplace.

FURNITURE - Furnishing that create different settings, which are user friendly and enable people to re configure the environment and connect with technology with one another.

ACCESSORIES - Lighting, organisation tools, adjustable monitor arms, ergonomic seating that offers micro adjustments for a person that can suit for his/her preference.

ACTIVITY SPACES

Fig 4.3 :Activity spaces - According to the no. of users.

Research shows that greater than half of work time is spent outside of individual assigned work-spaces in places other than the central office and in new kinds of spaces. The new workplace model is a variety of spaces for a variety of work. The workplace is becoming less formulaic and static, more adaptive and fluid as it supports the many different tasks, functions and interactions that are the incubator of new ideas. Office work-ers no longer lay claim to just a small square of real estate but share ownership of all the spaces that support the multiple tasks they are called upon to perform. In the emerging workplace the whole office is my office.Activity spaces are “go to” spaces, that is, destinations for temporary group and individual work. They include:

- REFUGE[1]
- ENCLAVE[1]
- TEAM MEETING[1]
- ASSEMBLY[1]
- COMMUNITY[1]

1 - Words reproduced from Knoll interactive spaces.

Five categories of activity spaces that are relevent according to the modern work patterns are as follows -

• REFUGE (1-2)

This is the "get away" space that enables heads-down focus work. It is typically a small, enclosed room of about 35-50 sq. ft. for 1 or 2 people, with video display, wall mounted whiteboard surface and movable furniture or table and chair.

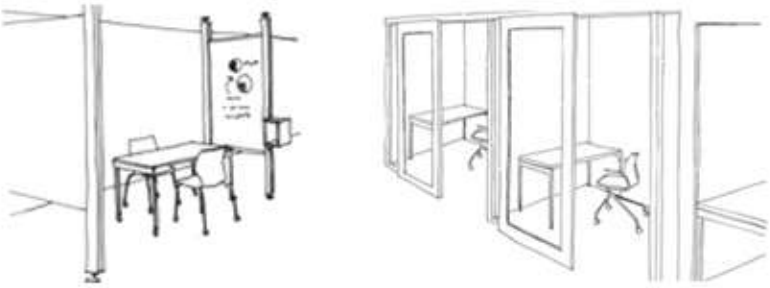


Fig 4.4 :Sketch showing the one on one focus demanding work space.

Fig 4.5 :Small discssion space which can be enclosed or open.

• ENCLAVE (3-4)

This is a "get together" space: generally a small open or enclosed space of about 100120 sq. ft. for secluded collaboration by 3 or 4 people. It is generally equipped with a desk height or low table, wall-mounted whiteboards and a video display. Video displays encourage off-site participants to join work sessions.

• TEAM MEETING (5-8)

The team meeting space is a dedicated workroom for a project team of 5–8 people. Usually about 200 sq. ft., either open or enclosed, it is typically furnished with a large table or clustered tables, one or more video displays, mobile and wall mounted whiteboards, and flexible seating options.

Fig 4.6 :A typical type of team meeting space with a moderate level of privacy.

Fig 4.7 :Large formal type of meeting spaces.

Fig 4.8 :Interactive spaces for formal and informal use.

• ASSEMBLY (10+)

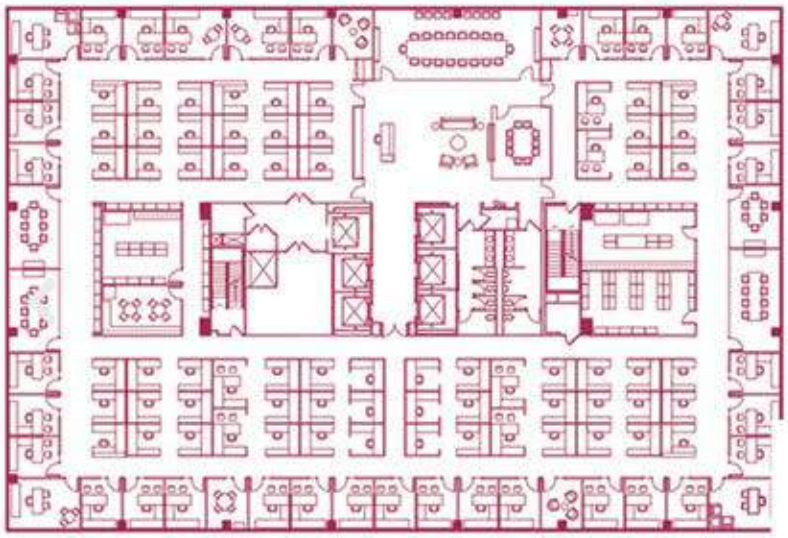
An assembly space is an enclosed group space for planned interaction, usually about 400 sq. ft. or larger and equipped with multiple display surfaces (tackable, whiteboard and video), credenzas for storage, and counters for refreshments and catering. Assembly spaces, sized for groups of 10 or more, include formal meeting spaces for presentations and training.

• COMMUNITY SPACES

Community spaces are the "town center" of the workplace, open to all and designed to encourage both serendipitous and planned interactions. Furnishings in these spaces range from informal seating and small tables, to lounge furniture groupings, to standing height counters with stools. Commons and café spaces are examples of community spaces that are used for social events and activities.

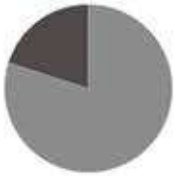
WORK PLACE LAYOUT

Re configuring the proximity of spaces inside the work place by re-shuffling the zones so as to promote more activity based healthy work environment.Changing the typical primary work space arrangement by introducing various types of activity spaces according to the users necessity can significantly improve the circulation of the employees, since there is no specific place or workstation assigned to them.They are given the freedom to choose from the variety of activity spaces available.Lets look at some types of arrangement with different amount of activity spaces added into the same layout.

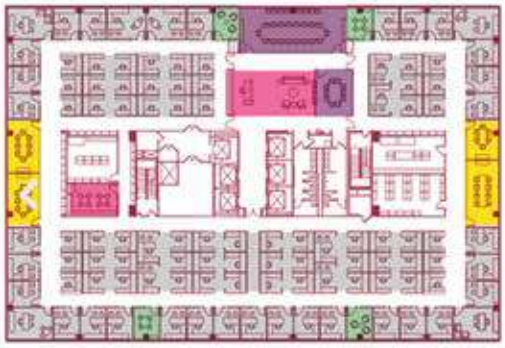


PERIMETER[2]

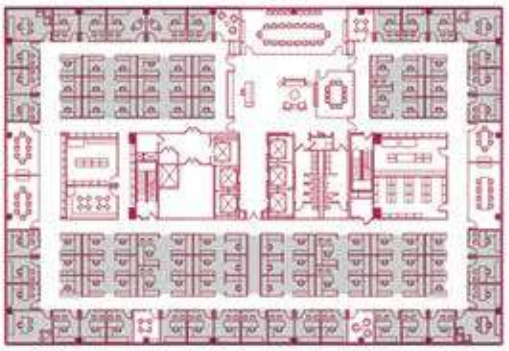
Perimeter planning, a classic approach to workplace design, places fixed enclosed spaces along the architectural perimeter while open spaces are positioned towards the building core.Professional and structured, Perimeter planning chiefly supports individual focus work and linear work processes.



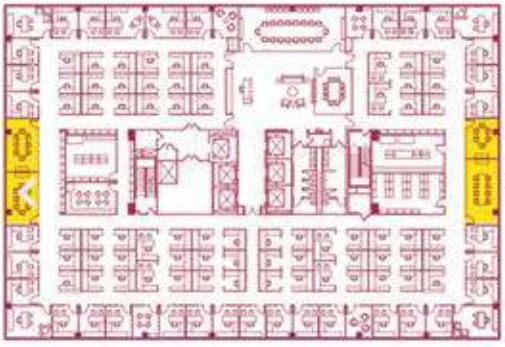
80% primary workspaces
20% activity spaces



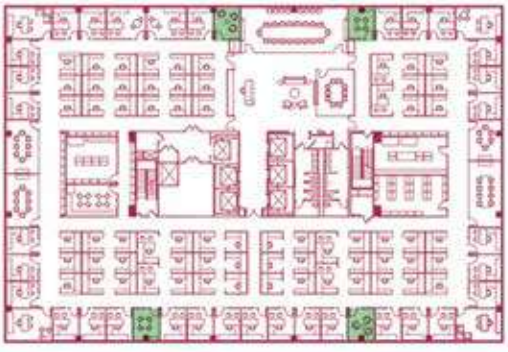
Primary
Refuge
Enclave
Team
Assembly
Community



Primary

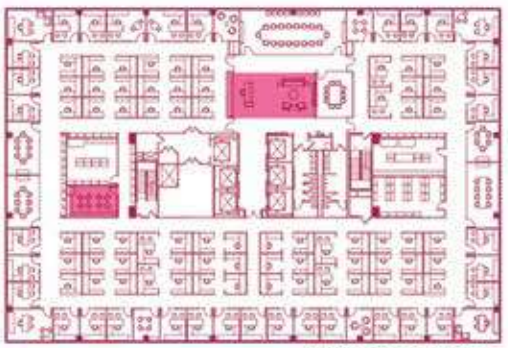


Team



Enclave

Assembly



Community

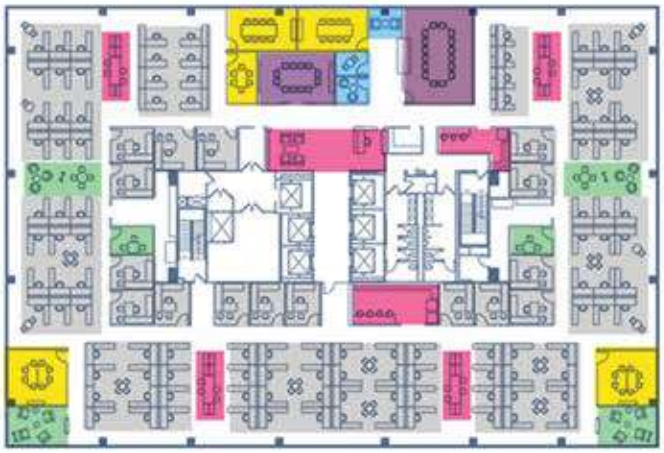
Fig 4.9 :Plan showing various types of activity spaces -scheme 1

2 - Words reproduced from Knoll interiors case study

CORE[2]

In core planning, open spaces have access to architectural perimeter and enclosed spaces line the building core.A lack of barriers along the perimeter brings natural light into the workplace, along with sence of equality.Core planning allows for a balance of focus,shared and team work.

Primary
Refuge
Enclave
Team
Assembly
Community



70% primary workspaces
30% activity spaces

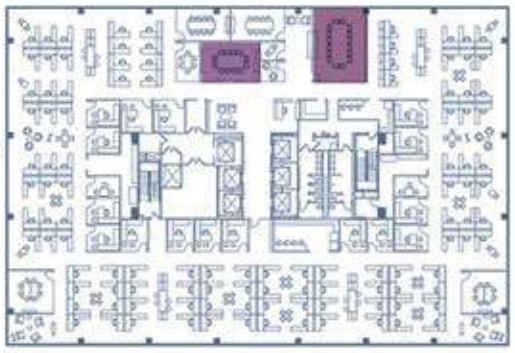
Primary

Refuge

Enclave

Team

Assembly



Community

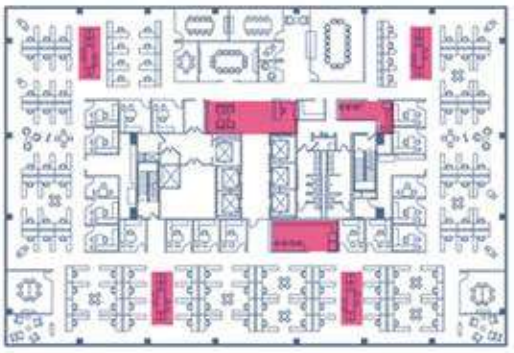
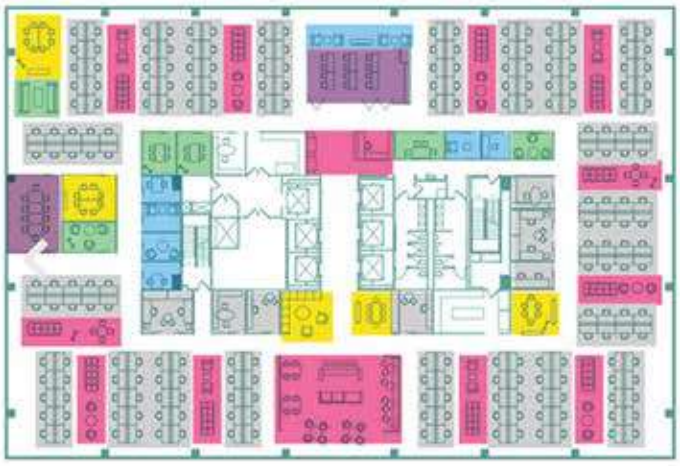


Fig 4.10 :Plan showing various types of activity spaces -scheme 2

2 - Words reproduced from Knoll interiors case study



Primary
Refuge
Enclave
Team
Assembly
Community

EFFICIENT[2]

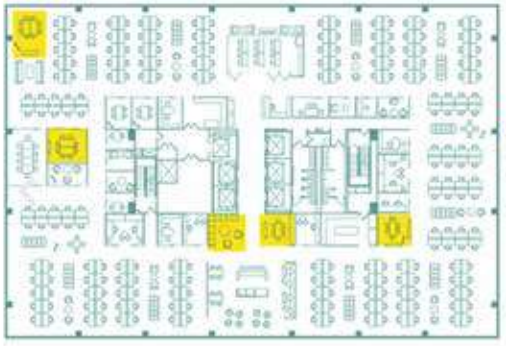
Efficient planning seeks to maximize space utilization and minimize real estate cost and is sometimes coupled with alternative workplace strategies like telecommuting, flextime and free address settings.An overall reduction in size of primary work spaces serves to flatten organisational structures and emphasize shared and team work.

60% primary workspaces
40% activity spaces

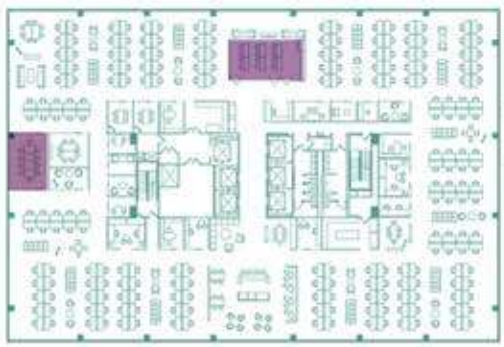
Primary

Refuge

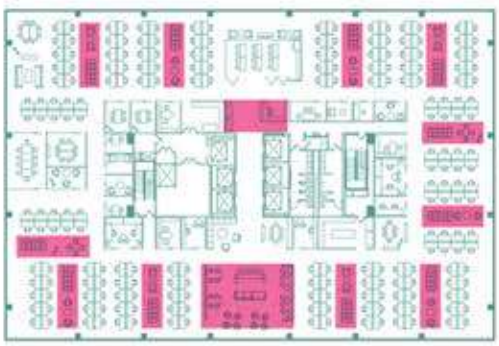
Enclave



Team



Assembly



Community

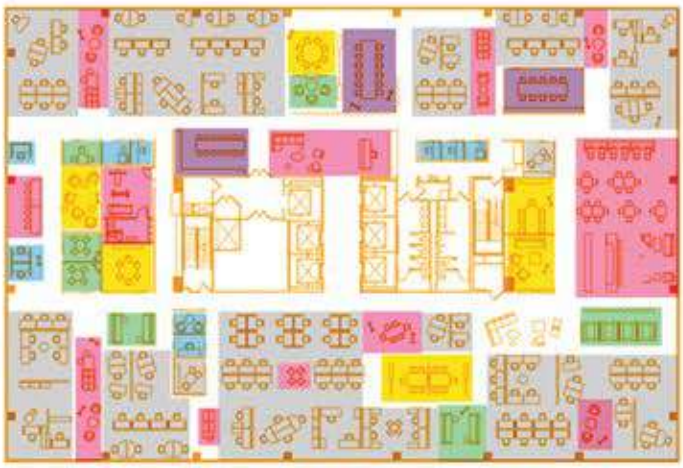
Fig 4.11 :Plan showing various types of activity spaces -scheme 3

2 - Words reproduced from Knoll interiors case study

ADAPTIVE[2]

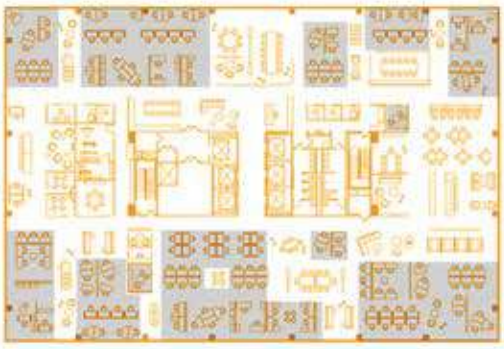
Adaptive planning uses movable elements to define a veriety work settings, allowing flexibility to meet changing needs and enabling people to shape their work experience.Adaptive planning seeks to connect people to each other and the organization by creating spaces for shared work and social activity.

Primary
Refuge
Enclave
Team
Assembly
Community

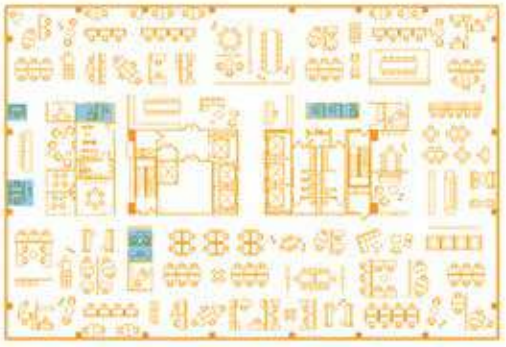


50% primary workspaces
50% activity spaces

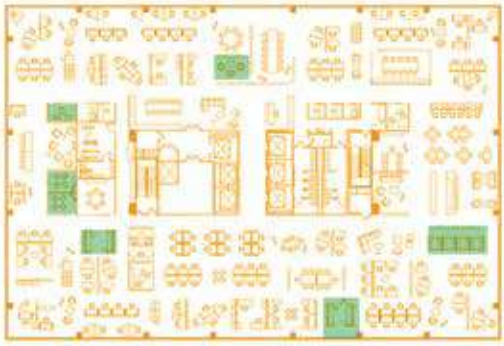
Primary



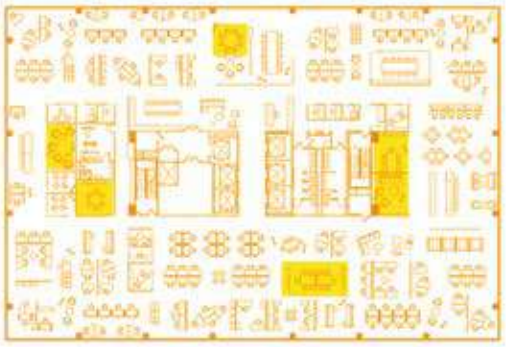
Refuge



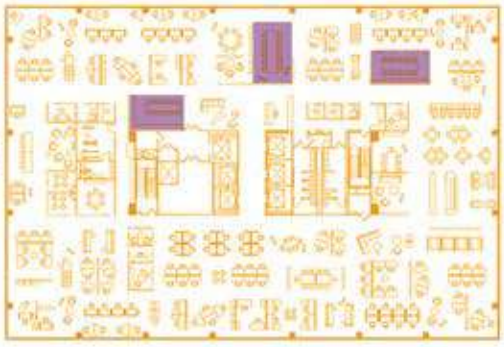
Enclave



Team



Assembly



Community

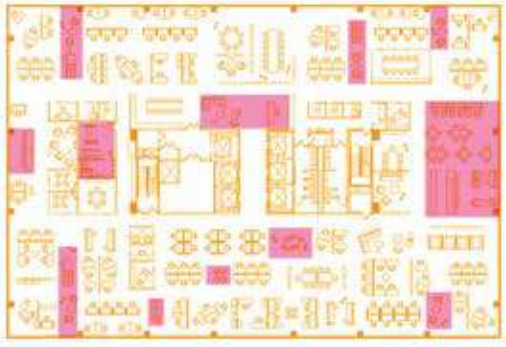


Fig 4.12 :Plan showing various types of activity spaces -scheme 4

2 - Words reproduced from Knoll interiors case study

Other activity spaces that can be incorporated in addition to the main five categories to improve the circulation inside the work space are given as follows :

THE CAFE AREA

The cafe areas offer refreshments and also include a high oppertunity for multimedia meeting zone for small team presentation.

THE PICINIC BENCH

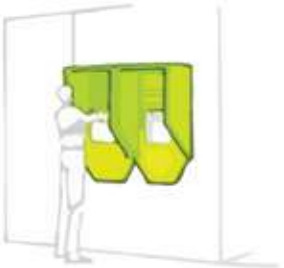
Perhaps it would be beter to spent sometime outside the work box to absorb the green and freah air around you.

COPY / RETRO ACTIVITY

The print pool / copying facilities are necessary in each workplaces.It not only becomes a part of our job but also promote a dedicated interactive space for all the employees.

BRAIN STORMING IDEAS

Always2 heads is better than 1.Its good to develop ideas and these brainstroming areas to explore and develop new ides together.



PHONE BOOTH

Taking a call will be so fustrating especially inside an open plan office.For privacy when they take that important call, providing an informal acoustic hood is ideal.The additional benefit is that it will be less disrupting for both the user and people around him.

Fig 4.13 :Othe activity sapces which can be added to increase the movement inside a work place.

4.1.2 CIRCULATION

The circulation system provides major opportunity for walking, which is widely considered as the most popular choice of physical activity. Strong consideration of stairs and ramps should be included instead of escalators and lifts. Stair climbing is a daily task in most buildings that can have major health benefits if promoted over escalator or lift use. Stair use has been linked with better cardiovascular health and has been shown to lower cholesterol levels.

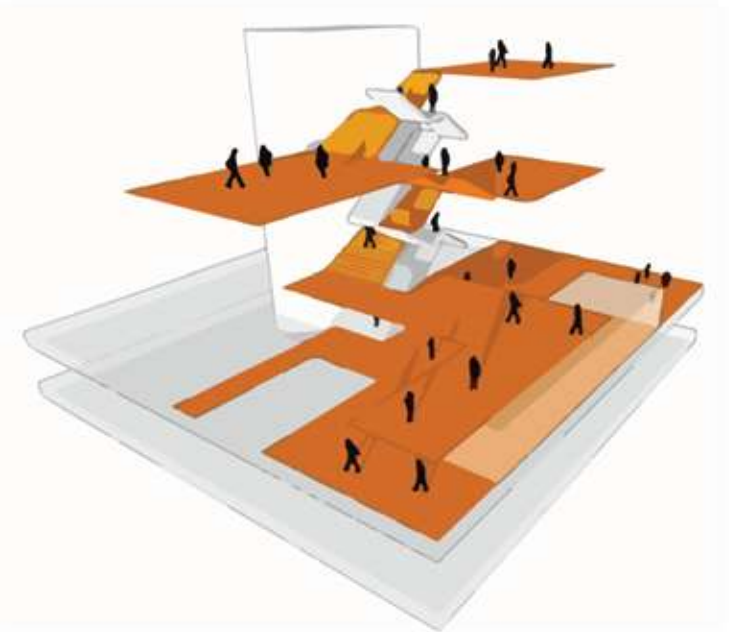


Fig 4.14 :A play with levels and stairs to promote physical activity.

• STAIRS

A significant proportion of the adult population does not perform sufficient physical activity to reduce the risk of obesity, sustain cardiovascular health, and prevent muscle mass loss due to aging . Everyday activities, such as stair use, provide important opportunities for incidental physical activity, especially for people who find it difficult to participate in moderate physical activity through recreation and planned exercise. Unfortunately, although every multi-story workplace building has stairs, the stairs are rarely used compared with elevators. Many health promotion professionals use "push-pull"strategies to bring about healthy behavioral changes. To date, most stair use research has focused on "pull" strategies that combine education, activity programs, and environmental interventions to make engaging in voluntary stair use both attractive and routine in existing buildings. These studies have focused on the use of motivational signages , aesthetic improvements, or the spatial attributes of the location of stairs within the floor plan. "Push" strategies include interventions designed to mandate new behaviors and change attitudes toward physical activity.

FACTS
REGARDING STAIR USAGE

Fig 4.15 :A poster image advocating stair use.

The number of calories burned by climbing stairs depends on how long it takes, the intensity of the activity and your weight. You will burn more calories by climbing seven flights of stairs in 10 minutes than in five minutes.

• Formula

The formula for estimating the number of calories burned after climbing seven flights of stairs is METs x 3.5 x weight in kilograms ÷ 200 x duration in minutes. MET, or metabolic equivalent, is a number that represents your energy output. To convert your weight to kilograms, divide your weight in pounds by 2.2. You weight is 63.6 kilograms if you weigh 140 pounds.

• MET Value

According to the Compendium of Physical Activities Tracking Guide, the MET value for running up stairs is 15. Walking up stairs while carrying a load has a MET value of nine.

• Calories Burned

A 140-pound person will burn 83 calories after running up seven flights of stairs in five minutes. Walking up the same flight of stairs in 10 minutes while carrying an object will burn 99 calories.

4.2 PUSH STRATEGY

THE SKIP-STOP CONCEPT

Stair climbing can be a low-cost and relatively accessible way to add everyday physical activity, but many building stairwells are inaccessible or unpleasant and elevators are far more convenient. Introduction of this new concept to change the use and attitude toward stairs in an office building where the main elevators for ablebodied users stop only at every third floor (“skip-stop” elevators). These users are expected to walk up or down nearby stairs that have been made open and appealing (“skip-stop” stairs).

Although implementation issues related to organizational objectives, costs, security, barrier-free accessibility, and building codes exist, the skip-stop feature offers a successful strategy for increasing stair use in workplaces.

This design concept can be incorporated into buildings as a “push” strategy that mandates stair use by reducing access to elevators through the provision of “skipstop” elevators (for able-bodied users, that do not stop at every floor, thereby requiring users to take the stairs to access skipped floors) and adjacent stairs in workplaces. Suppose if a 13-story office building includes two vertical circulation cores: one with skip-stop elevators serving one side of the building and a traditional elevator core serving the other side of the building, then the circulation core with skip-stop elevators has four that stop at every third floor, an open staircase adjacent to the skip-stop elevator lobby that provides access to the floor below and above not served by the skip-stop elevator.

SKIP STOP CIRCULATION DIAGRAM

Elevators stop at every third floor, opening onto sky lobbies with grand stairs leading to the floors above and below.

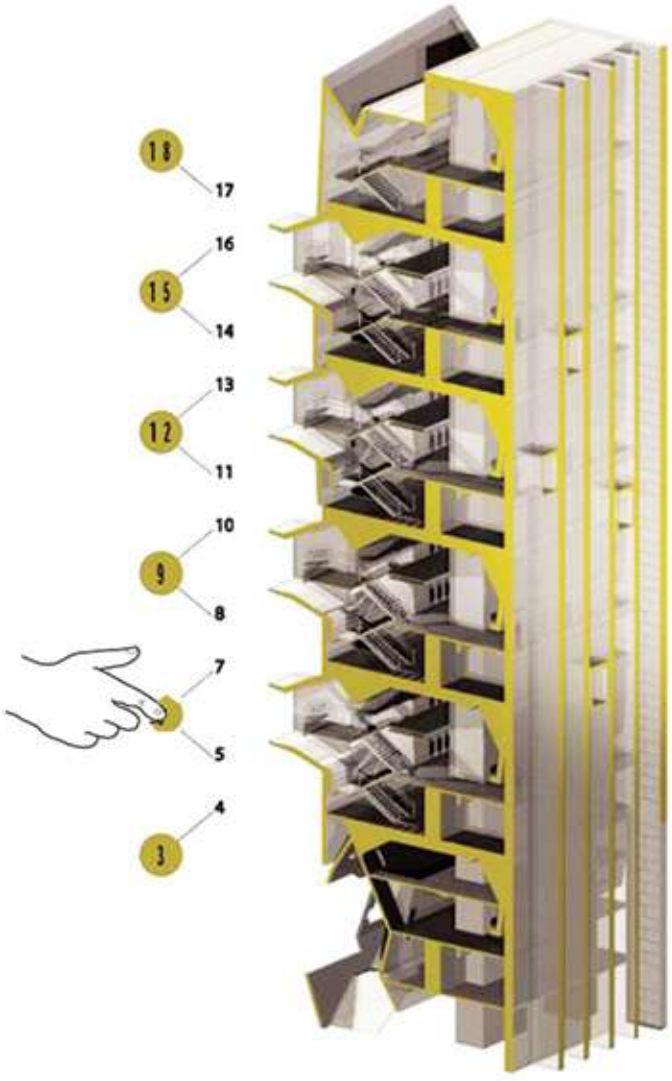


Fig 4.16 :The skip-stop circulation system inside a building.

The skip-stop elevators and stair design was envisioned as a means of organizing the high-rise building into a more human scale, increasing personal interaction and office cohesion among employees, and increasing physical activity while decreasing nonproductive time spent waiting for elevators.

The skip-stop design strategy has great potential for increasing overall stair use in new and some existing buildings. The skip-stop strategy could be adapted to many existing buildings with elevators and adjacent fire stairs. Existing elevators could be reprogrammed to skip access to certain floors for most building users, requiring them to access other floors via openly accessible fire exit stairs. Access for persons in wheelchairs or with other mobility limitations could be maintained with the use of access control devices, thereby permitting elevator access to every floor for persons with disabilities.

4.3 PULL STRATEGY

Fig 4.17 :Piano stairs - Stairs that produces music on stepping on it.

A creative method of making it more , joyable to take the stairs instead of the elevator in a train station in Stockholm, Sweden, is a significant precedent that can be adapted into the design of the solution of physical inactivity. The imaginative method of incorporating musical tiles that produced musical tones/notes whilst people stepped on them directly next to an escalator, encouraged people to walk up and down the stairs because they were making music and having fun at the same time as burning calories and benefiting their health.

The 'Piano Stairs' produced 66% more foot traffic than the escalator whilst installed and provides an interesting point for the argument that fun can produce behavioural change for the better.An insight that could perhaps be developed to assist architecture to promote and encourage physical activity.

4.4 CONCLUSION

We started by discussing about Health, its purpose, Sedentary life style, certain health issues caused due to this physically inactive behaviour of ours, Rapid decline in health rate across the world due to these issues, The Architectural context in which it happens frequently- the Office spaces.

Fig 4.18 :A man at work even though his body is idle.

To know about the current and past conditions of our office spaces a time line review as well as two live case studies were undertook.Apart from that arrangement of spaces inside and circulation patterns both- vertical and horizontal were observed.

Some of the strategies we came up across on the basis of the data collected:

The new method of “Activity based working” where employee occupants out number desk spaces encouraging employees to walk around and discover new and interactive ways of working.This system also has physical benefits to the employee’ health by encouraging people to walk around the building negotiating stairs and through many different areas on a daily basis, a successful method of incorporating physical activity into everyday life. It’s an inventive way of designing a traditional floor plan to encourage movement around it. By challenging the general understanding of office layouts and working environments perhaps the building can achieve an environment that successfully promotes physical activity.

Stairs which act as the major circulation core in improving the physical wellbeing as left unused in most of the building as it lacks aesthetic appeal or is completely hidden from the people.Then also human beings have a tendency to take short cuts to reach their goal faster and in this case without any effort by taking elevators and escalators without knowing that the stair can be a part of a healthy life.We looked into push-pull strategies like the piano stairs and skip-stop elevators which attracts people into taking stairs by making it fun in other words people takes stairs only when there is another advantage over climbing the stairs which can nullify the effect of climbing-Pull strategies the skip-stop system on the other hand forces people to take stairs as if there is no other option left for them.

The role of this project is to promote and encourage the importance of physical activity within every-day routines in order to combat the onset of chronic disease. A stronger argument can now be put forward for architects, urban planners, and designers that they can play a major role in encouraging physical instead of sedentary forms of activity within the built environment.

"What's fascinating is the way of transforming. Because you can't change it physically, you can't go and move a light post or the staircase but you can change the way you are looking and the way you use it and make it your own." By changing the way people view traditional architectural elements such as stairs and floors architects have a way of making people aware of the physical act of using them. The next step perhaps is to make the interaction fun, interesting and inspiring and people will want to repeat the physical act over and over thus promoting physical activity within an architectural environment.

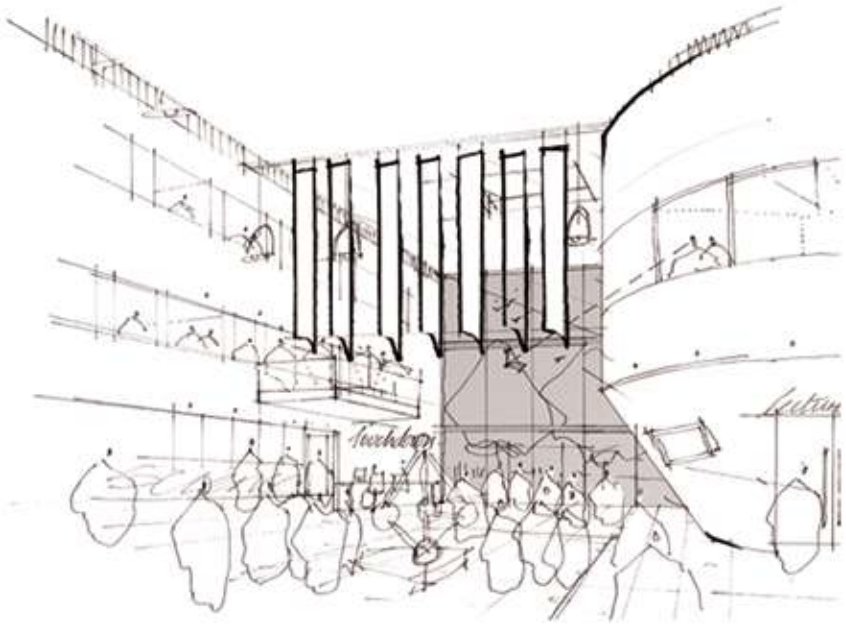


Fig 4.19 :An active architectural context.

BIBLIOGRAPHY / REFERENCES

BOOKS

World Health Organisation. Obesity: Preventing and Managing the Global Epidemic. Report of a WHO Consultation. World Health Organ Tech Rep Ser. 2000.
Centers for Disease Control and Prevention. The Association between School Based Physical Activity, including Physical Education, and Academic Performance. Atlanta, GA: U.S. Department of Health and Human Services. 2010
Journal of Public Health Policy 2009, 30, S111–S123
Active Design Guidelines- Promoting Physical Activity and Health in Design.
Architecture Australia magazine July/august 2015 edition
Herman hertz berger articulations

WEBSITES

http://www.who.int/mediacentre/news/notes/2011/world_cancer_day_20110204/en/
Physical activity and education -
http://www.examiner.com/article/physical-education-vs-physical-activity-differences-and-benefits
http://morphopedia.com/projects/sanfrancisco-federal-building
"Physical Activity in jobs", http://idealbite.com/health-dangers-of-working-a-desk-job/
http://www.knoll.com/activity spaces
"Sitting Ourselves to Death", http://www.stuff.co.nz/life-style/wellbeing/5306614/We-re-sitting-ourselves-to-death
http://www.anthembio.com
http://www.bodhi-pro.com
http://www.hassellstudio.com/details/medibank
http://www.archdaily.com/medibank-hassells
Physical Activityburden", http://www.who.int/mediacentre/news/notes/2011/world_cancer_day_20110204/en/
"The Fun Theory", http://www.thefuntheory.com/
WHO, "Obesity 2008 Stats" http://www.who.int/mediacentre/news/notes/2011/world_cancer_day_20110204
http://www.wired.com/culture/design/magazine/17-04/pi-design
http://ehow.com/about 5268185_history office design.html
"Sittinghours", http://lifehacker.com/5879536/how-sitting-all-day-is-damaging-your-body-and-how-you-can-counteract-it

VIDEOS

Health and architecture, medibank Australia
The secreat lifes of buildings eltrabajo
How to make work place into an agile activity based environment