# 1 Office Space Planning Defined

## Definition of Space Planning

There is so much confusion about what office space planning really entails that perhaps a sensible initial approach to defining it clearly is to look at what space planning is not, rather than what it is.

Office space planning is often wrongly perceived to be something to do with either building architecture or with interior design. It is neither.

Building architecture is the art and science of designing and constructing buildings. An architect is principally influenced by factors such as the use to which the building will be put, the materials obtainable, the resources available in terms of money and labour, and contemporary artistic taste.

Interior design is the part of architectural design that deals with the planning and execution of the layout and decoration of an architectural interior. The interior designer is chiefly concerned with the placing and layout of rooms within a building, decoration of walls and ceilings and sometimes design of immovable types of furniture.

Space planning on the other hand is concerned with creating functional, effective, productive and flexible working areas that optimise the use of space within the constraints of the building and the offices.

So, office space planning is neither architecture nor interior design, nor is it simply an exercise in aesthetics. It is a matter of understanding the dynamics of office workspace and the patterns of workflow and communication within the office. It is a question of visualising the workspace possibilities presented by different office systems, components and technologies. It is the practice of achieving solutions that optimise the use of available office space for employee and task needs, reconciling the work needs of individuals with the business goals and objectives of employers.

An effective approach to office planning delivers answers to all of these factors, which are more broadly categorised as people factors, space factors and technology factors.

By managing implementation and change in each of these areas, workspace planning becomes a strategic tool. Correctly used, planning helps companies to meet their organisational goals. It enables them to remain competitive, to anticipate rapid changes in business and technology and to have the flexibility to react to change.

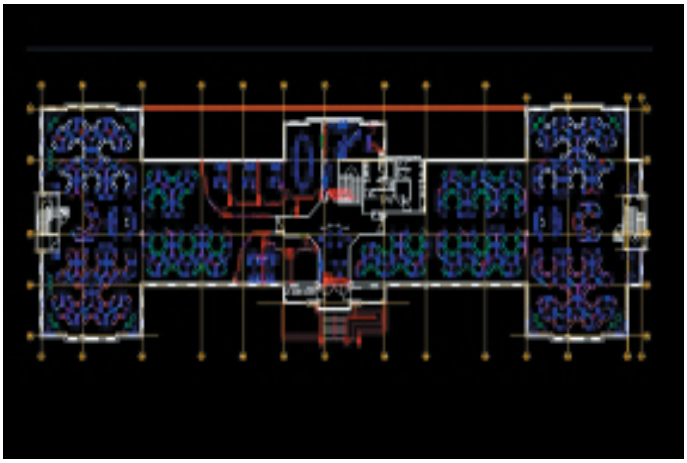
Undoubtedly, the practice of workspace planning is as much affected by patterns of change as any other discipline and current thinking will not be the final word. However, a full understanding of current workspace concepts will help to ensure that future developments provide more opportunities than challenges for the professional space planner. In working towards a clearer understanding of the concepts of office space planning, there are three main topics that should be considered.

Firstly, current office planning concepts have developed over a long period from the time that people first organised themselves into business units for the purpose of economic endeavour. Thus, observation of historical trends in working practices and workplace environments is a good starting point for developing an appreciation of how social and technological change impacts working patterns.

Secondly, by applying historical lessons to current thinking, we see the possibilities for innovation that are raised by current and emerging office systems and technologies. As we have already mentioned, technology is a key element of an effective workspace strategy. Right now, space planning must consider the potential for a revolution in work practices brought about by technology. The section on technology reviews the state of current and emerging office technologies and offers an hypothesis on how work practices may evolve in light of the technology.

Finally, once the principal concepts of the first two areas are understood, we can examine the actual process of workspace planning. The aim of this last section is to detail the systematic process of analysing and solving office space problems. A process like this is an essential component of professional space planning services, to deal with the complex matrix of factors that influence the effectiveness of the modern office environment. The approach outlined in this section provides a methodology to correctly identify critical elements and to deal with each facet.

We start by looking, in chapter 2, at the historical development of the office.



# 2 The Historical Development of the Office

## Definition of "Office"

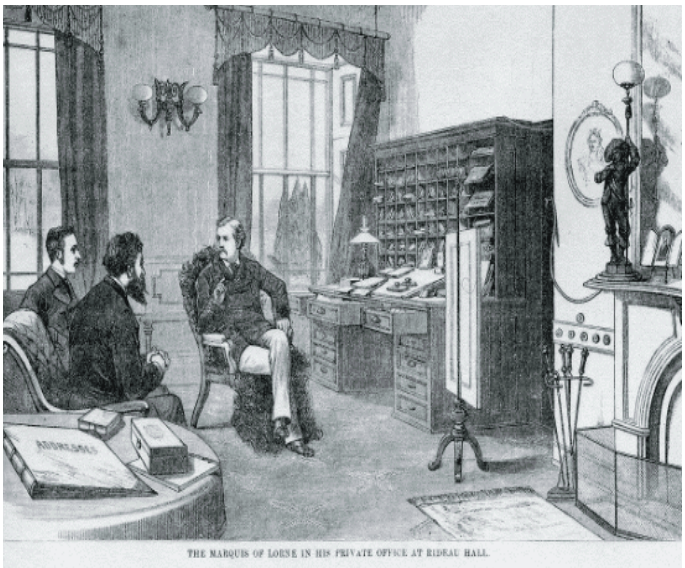
In the context of this discussion, an "office" is defined as a place of work where services or professional duties are carried out. The term first appeared in Middle English around the 13th Century, having been adopted from Old French. The word originally derived from the Latin word "officium" (duty) and even before that, in Old Latin, "opificium" from "opus" (to work) and "facere" (to make).

The origins of the term "office" suggest that it was initially used to describe 'rank' or 'tasks and activities' rather than 'buildings'. Use of the term in reference to buildings came later when it may have been used to refer to parts of an English manor house, such as the laundry or kitchen, where servants conducted household work.

## Early Offices and the Honeycomb System – up to about 1800

From a business perspective, the term "office" had been gradually absorbed into common practice by the start of the 19th century.

For hundreds of years up to 1800, a "business" was a small family concern probably involved in local trade of some description. The early business owner, typically a merchant or trader, personally managed all aspects of his enterprise, sometimes with the help of a few clerks. Because the business served a small local market, the need for administrative detail and record keeping hardly existed.



THE MARQUIS OF LORNE IN HIS PRIVATE OFFICE AT RIDEAU HALL.

At some point, the term "office" was adopted to describe the place where business was transacted. Initially, there was no distinction between an office building and a domestic building – the first offices were simply rooms in parts of a house, with the rooms designated as places where work was done.
If the business expanded, more of a house was taken over and used as office space and logically, it is possible to conclude that entire houses would sometimes become buildings dedicated to offices rather than dwelling places.

There is evidence that the first "business districts" evolved because a number of houses in close proximity were taken over entirely for business use. This is more than likely to have been the result of business people wanting to be close to one another rather than because of specific civil policies. Even under these circumstances, office buildings were essentially domestic dwellings, with no structural difference to houses.

This early type of office is referred to as the Honeycomb System, derived from the use of small rooms in a building not specifically designed for office use. Interestingly, this kind of office is still in limited use, typically by very small businesses (for example, cottage businesses), suggesting that historical concepts are never rendered completely obsolete.

Despite these isolated examples, the practicality of this type of office system was effectively rendered obsolete by the onset of the industrial revolution, which completely transformed the face of business.

## The Industrial Revolution – from 1800 to 1900

There is of course no specific starting or ending date for the significant period of social and technological change now referred to as the Industrial Revolution. But by the start of the 19th century the social upheaval was sufficiently widespread to suggest that the industrial revolution was well under way.

Throughout the 18th Century, specifically in Europe and in Great Britain in particular, new methods of operation were being introduced into traditional areas such as agriculture, trade and craft. The formalisation of agriculture during the agricultural revolution preceded and precipitated the industrial revolution.

In spite of new agricultural techniques, some of the more developed countries were increasingly experiencing critical shortages of certain basic materials and resources -

traditional materials that had for centuries provided for needs such as fuel and building were becoming scarce.

In Britain, for example, the once vast areas of oak forest had dwindled to almost nothing. Oak had been put to a multitude of uses including fuel, buildings, transport and shipping. With the forests gone, there was an enormous incentive for Britain to find ways to exploit her large natural deposits of coal, simply to meet the demand for fuel.

Similarly, to provide building material, deposits of iron were readily available if ways to mine in quantity could be found. Fortunately, Britain had the benefit of a large work force, no longer fully employed in traditional activities like agriculture, that could be mobilised to undertake extensive mining of coal and iron.

And so the pattern of migration away from agriculture and rural areas took hold, bringing about the greatest social change attributed to the industrial revolution as populations in towns and cities exploded.

On top of and at the same time as the population migration, countries in Europe and America were experiencing unprecedented rates of population growth brought about by advances in food production and medical science. In America, the annual rate of population growth soared to 3% and in European countries to around 1%.

For production businesses, the increased demands of a growing urban population during the latter part of the 18th Century presented many opportunities. Some companies had already introduced steam and other machinery to accelerate their production processes. Others were using steam power to beat their dependency on water power so that they could relocate their production processes closer to sources of raw material and labour.

But despite the enormous change of the early part of the 19th Century, businesses remained relatively confined to local markets until the advent of the railway system in Britain, which was finally realised in about 1840.

By that time, the stage was well and truly set for the railways to explode across Britain during the first few years of the 1840s. The railroad system spread across Britain and across other European nations in a very short space of time and transformed that part of the world.

However much the railway impacted Britain and Europe, it was nothing compared to what happened in the United States where the railroad had its most profound and long-lasting effect. With a huge, largely empty continent and vast riches in natural resources, America's opportunity to exploit the railroad was unique and it precipitated a technological explosion that forever changed the face of business.

The railroad in America opened the continent up to expansion, it provided rapid access to rich sources of raw materials and it suddenly exposed local merchants to an infinite range of markets.

American business quickly learned that for those able to expand alongside the railroad, vast fortunes awaited. But in order to expand successfuly, businesses had to overcome significant challenges. For one thing, existing business structures were typically wholly incapable of dealing with the logistical and administrative complexities of the new scale of business. For another, expansion typically required significant capital investment and complex operations such as a railroad were well beyond the reach of individual businessmen.

In the case of the American railroad, powerful business alliances were formed and concepts of corporate management were developed to handle the complex running of diverse operations. Effective management solutions were established and the possibilities of new and emerging technologies were embraced to fashion business solutions. Some examples of the developments that would have been significant are listed below, although this is a far from comprehensive list.

1840 - postal system established in Britain
1840 - regular Atlantic steamship crossings
1840 - production of steel now commonplace
1871 - international wireless telegram services
1873 - new dynamo, mass availability of electricity
1875 - advent of international mail service
1876 - Bell transmits human voice over wire
1894 - automatic textile loom developed
1900 - internal combustion engine

As well as transforming the country, American railroad companies revolutionised business management with the management practices they conceived to deal with the challenges of the railroad business. Of all the problems faced by the railroad companies, the most critical was the issue of maintaining and running a profitable company with its employees and assets scattered across a vast area. Innovative solutions needed radical approaches to management thinking. The railroad companies responded by implementing management structures that for the first time included managers (isolated by distance) who were authorised and empowered to act independently on behalf of the owners.

Radical indeed - the disintegrated nature of the railroad operation meant that owners had very little say in the day-to-day operations of their business and relied entirely on their remote managers. Fortunately, because of the independent nature of their operations, remote managers began to view their jobs with the railroad as lifelong careers and they assumed complete ownership of their areas. In fierce competition with one another, they actively sought to increase the effectiveness of their operations.

They structured in the same way that manufacturing companies had structured to deal with mass production. Work activities were simplified; workers were channeled into specific activities; tasks were compartmentalised and a sophisticated management hierarchy developed.

**Milwaukee general office of the Chicago, Milwaukee & St. Paul Railway Co.," Milwaukee, WI, 1887**
**http://www.officemuseum.com/photo_gallery_1860s-1880s.htm**

The railroad companies became hugely successful businesses and consequently, many other organisations followed their lead and adopted their management techniques. Companies in different spheres of business were organised along the same lines as the railroad companies and a structured hierarchy of management appeared in such diverse industries as banking, insurance, manufacturing, importing and exporting.

All of these companies needed buildings with the space to accommodate their extensive office operations. Demand for buildings increased and fuelled construction. Development of building techniques and materials in the latter half of the 19th Century allowed construction of buildings specifically designed, constructed and dedicated for use as offices.

Initially, development of office space was constrained by the height of buildings which were typically confined to just one or two floors. The reason for this was that stairs provided the only access to upper floors so the higher the level, the less attractive it became.

Once passenger elevators were successfully used for the first time (Equitable Life Insurance building, New York, 1870), the major disincentive for developing higher buildings disappeared.

Building developers now found that higher space was as attractive and popular as lower levels. The height and scope of office buildings accelerated, fuelled by the demand for buildings capable of housing large corporate administrative structures.

By the end of the 19th Century, the function of the office had crystallised into the keeping and maintaining of meticulous business records. Ultimately, many companies had adopted the management approaches pioneered by the railroads, with large administrative workforces and complex management structures.

To control the large numbers of people involved in administering business operations, some companies structured their operations along the lines of manufacturing and production industries. As a result, office work moved towards formalisation and mass production as it became defined in terms of specific worker activities.

**Equitable Life Insurance building (New York, 1870)**
**- first building to use a passenger elevator -**
**(http://www.officemuseum.com/office_buildings.htm)**

## Mass Production and Bullpen Office Systems – from 1900 to 1950

The movement of management thinking in the early 1900s towards formalisation is typified by the advent of Taylor's theories of scientific management.
(Frederick Winslow Taylor, 1856-1915).

One of the foremost management thinkers of the day, Taylor's principles of management were extremely influential. He based his management model on the concept of a machine with inexpensive and interchangeable parts, each part with a specific function. His model endeavoured to apply the machine concept to the principles of running a complex organization.

Initially, Taylor's theories were intended for the production and manufacturing environment but later, his principles

were adopted in all forms of business, including office and administrative functions.

The most notable aspect of Taylor's work is that for the first time in history, functions of management and functions of workers were separately identified and defined. Within each definition, specific functions, tasks and activities were isolated.

Without wishing to ignore the implications of Taylorism on the factory environment, the purpose of this discussion is to examine the impact of his theories on the office environment. In reality, his policies affected the office environment profoundly and spawned many of the organisational structures that we are familiar with today.

The key effect of Taylorism on the office environment is that offices were structured along the same lines as the production environment. Office technology, which by that time included the telephone and the typewriter, facilitated the integration of principles of mass production into office work.

Not surprisingly, the office environment that evolved under these circumstances closely resembled a production line. It earned the name "Bullpen" or "pool", characterised by large, open offices with rows of desks overlooked by one or more supervisors at the front of the office.

As required by Taylor's principles, the Bullpen office layout made it possible to standardise work activities and to supervise workers closely and easily. Employees were seated in open areas with no partitions and no adornments and confined strictly to their jobs. Activities were rigidly segmented, so that typists typed and filing clerks filed. No other activity, including conversation, was permitted. The office environment became as tedious and stressful as the factory.

Office technology did little to alleviate the sense of working on a production line. To a large extent, it simply confirmed the mechanistic nature of office work. In search of productivity and efficiency, companies pursued technologies like the electromechanical devices capable of sorting and manipulating paper records that became available in the 1930s and 1940s. The pursuit of technology was not deterred even if the high cost forced companies to have to centralise administrative functions.

**http://www.officemuseum.com/Photo%20Gallery%201900-1909/1902_Detroit_Typing_Dept._Nat._Cash_Register_4a20574r.JPG**

Popular use of the bullpen system came to an abrupt end after the Second World War, as a direct result of its failure to recognise the importance of employee motivation. The demand for factory workers after years of scarcity created a situation where the earning potential of factory workers outstripped that of office workers quite considerably.
To attract staff to office jobs, companies accepted that office work would have to be made more attractive. Among other things, this realisation saw the advent of employee benefits such as those that we take for granted today. Offices were also made outwardly more desirable to demonstrate a clear change in attitude.

By 1950, there was a further intriguing outcome of 50 years of dehumanising clerical office work. The clerical office, once the exclusive domain of men, had undergone a gender change - clerical work was predominantly done by women. One rationale is that promotion, which was one of the few ways to escape the general office, was not readily available to women who were generally seen as short-term job holders. Men on the other hand were provided with management opportunity and training. With the advent of management schools, male graduates were able to slot straight into management positions without ever having to work in the general office.

Several outcomes of this period are perpetuated in our working lives but the main lesson we should learn from the Bullpen era is this - office systems that do not take account of the worker's human needs - or hygiene factors - are seriously defective, particularly because they fail to address issues of worker motivation.

Given the obvious shortcomings of the system, it is somewhat surprising to find that it is still used in some environments today.

A remarkable record of this period of American office history is maintained by The Early Office - their superb web site is worth visiting.
http://www.officemuseum.com/site_index.htm.

## High Rise Buildings and Cell Offices - 1950 to 1960

Whatever its faults, the Bullpen system was undeniably extremely efficient in its use of office space. The biggest drawback that companies faced in moving away from the bullpen system was that any other office system needed substantially more space.

The solution to the space requirment was found in high-rise buildings, which were capable of providing vast areas of office space. Considering that the Empire State Building was built in 1931, building technology was entirely capable of designing and building high-rise buildings by 1950,

For companies looking for a way to shed the constraints of previous office systems, the high rise building must have seemed like an answer waiting for a question and companies saw the opportunity to provide each employee with their own personal defined office space. So was conceived the Cell Office System.

The cell (or cellular) office system is based on the concept of individual cellular offices interlinked by passageways. In some ways, it is similar to the Honeycomb system, except that cellular offices are designed specifically for office tenants and cellular office buildings are built specifically to accommodate offices.
Again it seems surprising that the fairly obvious pitfalls of this system were not foreseen. Apart from the practicality of giving each employee an office, any reasonable level of effective workflow or communication would be almost impossible in such an environment.

In reality, the raw cellular office concept was never workable and so a variety of refinements were tried. Cellular offices were constructed in various sizes, some with removable partitions. Cellular offices were built around the perimeter of the building with a “bullpen” area in the centre. Alternatively cellular offices were built in the centre with open “bullpen” areas around the perimeter.

Frankly, the real significance of the cellular office system is not whether it worked but rather what it meant in terms of the approach of management to workers.

The major significance of the cellular office concept is that it represented a major shift in management thinking in which (possibly for the first time) employee motivation was a primary consideration. This is further evidenced by the way in which employee workspace was fitted out and finished, in ways that had previously been reserved solely for management areas.

As a departure from the bullpen system, the cellular office system was obviously intended to improve the morale and motivation of employees with the aim of attracting people to work in offices. The concept succeeded to the extent that employees were satisfied with their own space, territory and privacy. Employers did manage to attract workers into the office environment, albeit at a time when the status of factory work was diminishing anyway due to general improvements in living standards.

On the downside, the cellular office system proved to be less than ideal because of the many inherent issues. Companies who adopted the system experienced many of the typical and possibly obvious shortcomings.

- the space requirements are excessive as compared to other systems using open office scenarios
- the cost of constructing and maintaining multiple cellular offices is very high
- communication and workflow is badly disrupted by many individual offices
- management is unable to directly supervise workers
- organisational change and growth cannot be readily accommodated because of the lack of flexibility

The single biggest factor that inevitably led to the demise of the cellular office system was the lack of flexibility - we recognise now that flexibility is critical for organizations to be able to respond effectively to “churn”, the continuous, incremental change in company structure and reporting/ administrative requirements.

And so, inevitably, the need for flexible working space resulted in many companies abandoning the cellular office system. One can only imagine the enormous cost of learning this lesson and then wonder that the cellular office system is still in use today, although it is very rare.

## Introduction of Open Office System Concepts - 1960s

To many people, the 1960s represented a turning point in social attitude, a time when many established norms were openly challenged. Mass communication technology such as television was coming of age and exercising a strong, concerted influence on social beliefs and behaviour patterns. Electromechanical office equipment began to give way to true digital computers, albeit bulky, expensive and limited in capability. Consistent with the general move to challenge established norms of thinking, architects and designers were able to visualise and propose somewhat radical concepts.

In the late 1950s, recognizing the urgent need for a flexible working environment in the wake of the failings of cell office systems, the concept of open office planning (otherwise

known as the action office system) was first visualised in America. The principle of the open office system was to replace fixed cellular offices with low, movable screens that incorporated integrated storage modules. The active office concept aimed to maintain the principle of private workspace for employees while at the same time meeting the need for greater flexibility. Given the prior lessons about employee motivation, there was understandably a reluctance to surrender perceived successes.

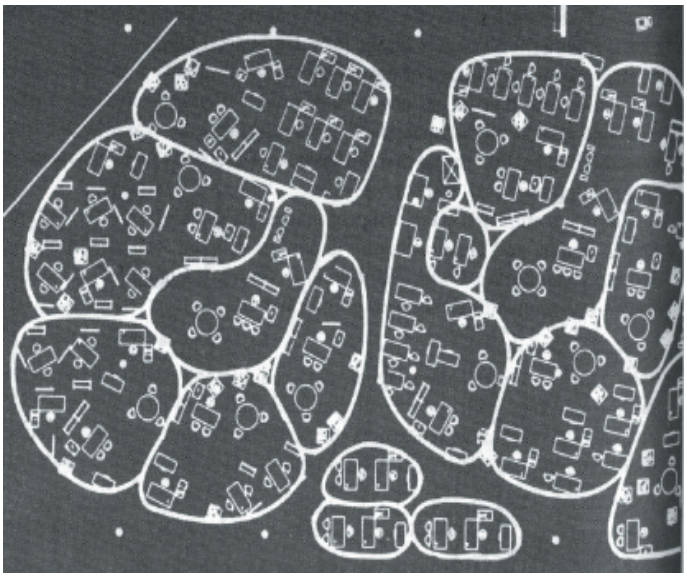
Certainly these early attempts at open office systems were successful on two fronts - first, they maintained the privacy and private space of individual employees and second, they maximised the use of office space. Unfortunately, some of the other issues of the cell office system, particularly those related to communication and workflow, were not considered and consequently not addressed.

At about the same time, a team of management consultants in Germany was working on a revolutionary concept termed Burolandschaft – directly translated as "Office Landscape". The Quickborner Team of Hamburg, Germany was comprised of specialists in office organisation and workflow and this team is credited with the original concept of office landscaping. Subsequently, the concept has been adopted in variously modified forms across Europe and the USA.

The key to the Office Landscape concept is that it directly analyses the relationship between the physical settings of the office and actual work processes. Little regard is given to geometric layout patterns because the office layout is specifically based on actual patterns of communication and workflow. Fewer screens and the addition of items such as growing plants support the layout of the landscape, giving it structure.

An article written in 1977 in *Plant Layout and Material Handling* by James Apple, published by John Wiley and Sons described office landscaping as:

"..One of the latest trends in office design and furnishing is referred to as office landscaping because of its irregular location of desks, tables, and chairs: and carpeting in place of floor tile. A major aspect of the trend is its attempt at arrangements that permit more efficient workflow and communication than achieved with the cubicle office arrangement. Proponents claim the layout should be designed more around the interaction of people than their place in the hierarchy. This often means breaking up traditional departmental lines, to put an accountant near an engineer because they communicate regularly. The arrangement of screens and planters is planned to provide channels of vision, and carpeting and acoustical tile soften noise to allow more efficient work and decision making. The major emphasis in the design of a landscaped office is on interrelationships among people, and much attention is paid to defining such relationships. .."



The Office Landscape system is possibly the most innovative approach yet to workspace planning. The majority of the concepts and systems that followed were simply refinements of the original concept - in many cases, the aim and the result of the refinements has been to tone down the radical concepts of Office Landscaping and thus defer to established perceptions and attitudes.

One such system, known generally as Group Offices, used the principles of Office Landscape except that it grouped common departments and sections within clearly defined areas. Group areas were screened off from passages or adjoining departments. Within groups, screens were used sparingly. Typically, the size of a "group" was 10 people or multiples of 10. Internally, the group was structured according to communication patterns.

Another refinement of the Landscape system, the Carrel system, is mentioned for completeness but has not been widely used. Briefly, the Carrel system is based on "alcoves", using storage cabinets to divide workstations into working areas and sections.

Concepts of the Landscape Office system will most likely persist as solutions to developing and future office needs are sought. In chapter 3, we will look at the ways in work paractices and attitudes, organisational structures and office technologies are shaping up to influence the future of our working environment.

# 3 Influences on the Development of Office Concepts

Recent Developments - 1980 onwards

The period since the 1980s is characterised by the rapid emergence and growth of "new technology" companies and the struggle for existence by "traditional" companies. An emerging trend is the expansion of service organisations and the resurgence of companies in industries like banking and insurance, at least those that have remodelled themselves into service businesses.

In truth, we have experienced a period of unprecedented global change and there is little likelihood that the rate of change will abate. The work environment has been subject to a number of specific and highly influential transformations in office technology, organisational structure and work practices.

**TECHNOLOGY:** The most obvious technological change in the office over the last twenty years has been brought about by the advent of the personal computer and associated technologies, such as desktop printing. A glance at the outstandingly successful companies of the 1980s and 1990s confirms which of the technologies have wielded the widest influence.

Not only is the proliferation of computers significant, so too is the number and range of people who now use computers routinely. Of course, it is arguable whether personal computers have enhanced job content to any extent. Whatever the conclusion, there is no question that the benefits of information access and speed of communication have established the personal computer as a major influence, not only in the office.

The other emerging technology that has the potential to transform working practices is mobile telephony, particularly when the true convergence of mobile computing devices and mobile communication devices is finally achieved.

**MANAGEMENT AND ORGANISATION STRUCTURES:** On Monday October 19, 1987, the business world suffered the worst stock market crash of all time. There were many possible reasons for the severity of the crash but one – program trading - stands out above all others. It stands out because program trading relies on computers, rather than people, to make trading decisions. In 1987, simply put, computer trading dragged the world's stock markets into financial melt down in the course of literally a few minutes.

Long after the event, financiers still argue whether the crash precipitated a recession. Beyond its effect on subsequent management thinking, that discussion is outside the scope of this document – except, for many old style companies already under pressure from shifts in their traditional markets, this event may have delivered a killer blow. Household names disappeared within a few short years. Others survived only as mere shadows after slashing infrastructure and operations. Many thousands of highly capable employees and managers were made redundant as companies delayered management structures and surgically removed non-core operations.

For the most part, recovery was fast but the scars are there for all to see, particularly in terms of the following characteristics of modern companies:

- once delayered, management structures have remained very flat.
- companies have fewer core employees who find they are working harder for longer hours
- terms of employment have been restructured to make more employees more readily dispensable
- employment has been redefined in terms of short term contracts and part-time or temporary work

In essence, companies have opted for caution and flexibility in terms of structure and workforce, . To the extent that technology supports these aims, it has been used. There should be no illusions about the strategies used by the modern company to achieve its goals.

A final point on the structure of organisations should examine the ways in which the client interface has altered in many service organisations. Increasingly, the interface is managed and conducted through call centres which have been made possible by the capability of modern information and communications technologies. Call centre technology is continually advancing and so too is the preparedness of clients to use the call centre interface. Many more companies can be expected to recognise the gains in productivity and efficiency and to adapt their client interfaces and relationships to the call centre model.

**OFFICES AND WORK PRACTICES:** If companies are determined to maintain flexibility in relation to human resources, it is reasonable to expect a similar reaction to any other aspect of corporate infrastructure, especially expensive and relatively inflexible components such as real estate.

For some time, there has been a widespread trend to relocate offices away from expensive city centres into less expensive suburban or even rural locations - to such an extent that city centre decay is a phenomenon in many major cities around the world.

Typically, these new locations do not allow high rise buildings and the typical office building is increasingly constrained to no more than two or three levels, obviously with a larger footprint than a high rise building with the equivalent space.

The majority of these new style offices are designed and built as open plan offices. The best of them provide deep space, ideally suited to open plan styling.

In response to the shift in office buildings and the sheer cost of floor space, office layouts have become compressed and economical. The evolution of component desks with rectilinear and organically shaped work-tops has produced the **Cluster** system. With innovations in screening systems, storage, voice-data-power systems, clustering is capable of delivering the requirements of a modern day office system.

Office systems are now capable of integrating technologies such as electronic communication and in fact we are approaching the point where technology systems and furniture elements are rapidly becoming inter-dependant. Office furniture has the capability to carry technology to the desktop and to effectively play a primary role in joining technology users together.

No discussion on emerging work practices would be complete without acknowledging the much talked about potential for tele-communting or home working. So far, there is little evidence of any move towards decentralised working to this extent. Although technology has theoretically made the concept workable, there appear to be simply too many human and psychological obstacles to overcome before it can truly be an option.

## Emerging Developments - The Future of the Office

Up to this point, our purpose has been to identify and examine some of the many factors that affect office dynamics. Appreciation of these factors is essential before trying to understand the direction that current and future office design will take.

While the accelerated rate of change makes prediction very difficult, some of the factors that will dictate the future of the office environment are clear:

- technology will continue to make rapid advances
- competition will increase at a global level
- working styles and attitudes will change

Innovative office design is clearly possible but history has shown that the most difficult challenges and obstacles will always be human ones – real or perceived issues like status, image and rank can defeat the most well intentioned design.

Ultimately however, profitability in the face of competition will determine whether a company succeeds or fails and it is to be expected that responsible companies will use whatever benefit they can gain to maintain a profitable and successful organisation.

Throughout, we have continually reiterated the point that the technology of the day creates possibilities – this certainly does not mean that we have to use all the available technology – that mistake is made too often – but rather we should be aware of the technology that exists to better the chances of coming up with innovative solutions as problems arise.

For visionary companies that are able to grasp the concepts, the optimum solution to office design will use the best of each of the concepts and systems we have discussed. We are also fortunate to have a range of emerging concepts that, together with established systems, provide a recipe of rich possibilities.

Emerging office systems concepts are indicative of how changes in technology, structures and attitudes may influence future working patterns. Some that have been experimented with are:

**HOT DESKING, HOTEL DESKING OR SHARED DESKING:** employees no longer have personal workspace. There are fewer desks than staff so desks are shared between several employees. This concept works best in call centre environments and for staff whose jobs require them to spend most of their time out of the office, for example field sales or support.

**TELECOMMUTING AND TELECENTRES:** Both of these are methods of decentralising the office. The employee works from home or from a local serviced office facility and the work comes to the worker, rather than the worker coming to the work.

**CYBER CAFES AND TOUCHDOWN AREAS** These are designated areas where online computer and communications facilities are provided. The areas are usually located in a relaxed environment or leisure area, hence the use of the term “café”.

## Conclusion - Approaches for Effective Space Planning

Clearly, there are many options and outcomes for future office working and it may not be possible to formulate a single solution for all situations. In fact, if we learn anything from history, a single solution may not be ideal.

Even though there may be no single solution, there is only one right approach to office space planning. In every case, a full and comprehensive analysis of the organisation has to be made before we can identify which system/s are best suited to the individual components of the company. Each function must be considered both independently and in terms of its relationship to the whole. We must consider elements such as the image and culture of the organisation, the demographics of its work force, documentation systems, work flow, communications and many more.

In chapter 3 we will look at office planning methodologies but it should be borne in mind that office design and planning is a specialised undertaking best carried out by a professional office planning company. The latent cost of a poorly designed and badly implemented office is incalculable. Conversely, the benefits of a well designed office translate directly into performance and profitability.

Nevertheless, it is still a good bet that some organisations will only achieve the perfect office layout they are on the point of collapse.

# 4 Office Space Planning Methodologies

## Introduction to the Space Planning Process

A question often asked is why plan? The answer is that the success of a modern company depends entirely on the extent to which the fundamental building blocks of the organisation are integrated . The interaction of these key elements largely determines whether the goals and objectives of the business are met.

Critical business elements with which space planning is primarily concerned are those involving people (employees, managers, clients, suppliers), technology (systems and processes) and environment (office space). Between them, these three areas encompass the key components of almost every organisation.

To provide solutions that adress each of these factors, space planning must deliver a number of essential outcomes, some of which were introduced in chapter1.

- functional, effective, productive and flexible working areas
- optimum use of available office space for employee and task needs
- effective workflow and communication throughout the organisation
- integration of relevant office systems, components and technologies
- reconcile employee work needs with the business goals and objectives of employers.

In order to ensure that these objectives are met, the process of workspace planning must be as methodical as it is creative. For interpretation and analysis to be valid, the planning process needs as much relevant information and raw data as possible.

Above all, effective planning must take into account the possibility of future organisational change. There is a tendency for organisations to ignore change or to absorb change in small steps even though the rate at which it occurs today is almost as fast as it can be measured. Effective planning foresees change and ensures that it is considered, understood, predicted and implemented - in other words, planned.

So it can be said that the key to office planning is the management of change, particularly the psychological impact of change on people. Paradoxically, the office environment is constantly changing, whether because of technological developments, or due to changes in organisational structure or to fluctuations in the business environment.

Good planning and design provides solutions that manage change effectively and allow the organisation to meet business objectives. For this reason, successful planning depends on how well two key principles are delivered.

The first principle is the extent to which people who will be affected by change are involved throughout the planning process. Essentially, the approach to involving people means that opinion leaders and influencers must be identified and through them, change must be promoted on the basis of the benefits. Involving people is as simple as consulting them about their needs and then constantly keeping them informed about changes that will affect them. In this way, the chances of achieving commitment to and support for the process of change are greatly enhanced.

The second principle is that design practices must be “people centric” and must therefore focus on the ergonomics of the relationship between workers and the workplace. As far as possible, the potential people factors of every component of the workplace should be considered, for instance:

- physical buildings and office areas
- workplace furniture, desks and seating
- wall and floor finishes and décor
- lighting
- environmental control
- noise levels
- access to services
- pause areas and meeting areas

How important then is planning? Well, simply in terms of the potential savings on things like false purchases, retrofits, low productivity and wasted time when things go wrong, the return is potentially immeasurable.

And by applying a systematic methodology to the process of planning, the chances of success are greatly enhanced. Typically, a systematic planning approach will include the following steps:

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| STEP 1 | - | clearly identify client’s needs and objectives |
| STEP 2 | - | fully understand the company’s organisational structure and cross-functional relationships |
| STEP 3 | - | assemble accurate, detailed plans of the building and office areas |
| STEP 4 | - | propose solutions for client review |
| STEP 5 | - | review, update and agree final proposal |
| STEP 6 | - | implementation process |
| STEP 7 | - | review and maintain implementation |

In subsequent sections, we will examine each step in turn and in some detail. We will recommend an approach that will help to make sure that the key aspects of office space planning are properly covered and dealt with. Bear in mind that, while we can demonstrate how the planning exercise should be approached, the design process itself is much more of a creative activity. This means that design cannot readily be defined in terms of systems or methods. Since it combines specific talents, experience and skills, design is perhaps best delivered by office planning professionals.

# Section 1 - Information Gathering

The first stage of the planning process is essentially an information gathering exercise that typically starts with some sort of request from the organisation's management.

At this early stage, it is important to encapsulate the essentials of the management request in a succinct summary of the goals and objectives of the planning exercise. The summary is otherwise referred to as the client brief. It provides the terms of reference and the authority for the activities that follow.

## Client Brief

Because the client brief provides the authority and framework for the planning and design exercises, it necessarily must define a number of key factors, in particular:

- the scope of work
- design considerations, such as the corporate image and any special preferences
- budget allowances and constraints

The best way to approach the client brief is firstly to understand the nature of the client's business and then to establish the perceived problems that the client is trying to solve by making changes to the office environment.

Obviously this is done through discussion with relevant management personnel, listening and asking pertinent questions until the objectives can be written down and agreed. Professional planners with previous experience of office planning projects can also contribute to the discussion by introducing concepts that the client may not have considered.

Once agreed, the briefing document provides the framework for every planning activity that follows. Without it, the planner does not have authority from the company's management to proceed. With it, the planner can proceed to the next step in the information gathering process, which deals with assembling detailed information about the structure of the organisation.

## Company Structure - The Organisation Chart

Most people recognise an organisation chart or organogram as a series of stacked boxes joined with vertical lines, representing the reporting structure of the organisation. The chart usually catalogues the power to command and the right to issue directives from top to bottom. From bottom to top, the chart represents reporting channels.

This representation is termed a "formal" organisation chart or organagram because it defines positions and levels of power and status within the organisation.

For the planning process, we also need a written representation of the relationships in the organisation, including reporting lines, staff numbers and inter-departmental ties.

For this purpose, a second ("informal") organisation chart is required, to supplement the formal organisation chart. The informal chart identifies two very important components of information, namely lines of communication and patterns of workflow within the organisation.

To define the organisation charts, a process of discussion with department heads, groups and members of staff is undertaken. The discussion process is referred to as a survey or otherwise as a special needs analysis.

## Special Needs Analysis

The survey stage entails direct involvement with the staff and employees of the client organisation and to a large extent the success of the survey depends on how well issues of human emotion and feelings are handled.

At this stage, management of change becomes an integral part of the planning process. By nature, people have an in-built resistance to change and resistance to change can affect the quality of information received by influencing the level of co-operation towards the process.

The key to success is to identify at an early stage the "influencers" – not the people in positions of authority but rather those ordinary members of staff whose opinion carries weight with other employees. Concentrate efforts on those people - winning their confidence is the easiest route to overcoming resistance to change.

The survey can be much more effective and consistent if a standard questionnaire is prepared beforehand. The questionnaire should allow the following information to be defined:

- department or group title
- employee's position title and name
- employee's function and direct supervisor or manager
- employee's direct subordinates
- other groups or departments inter-acted with and nature of interaction
- other relationships, such as customers or suppliers
- specific workspace needs, such as size of desk, storage, open or private area
- specific technology needs
- measurements of existing office workstation components and work area
- notes on general observations

The key skills needed to carry out an effective survey are concerned with observing, measuring, interviewing and documenting. Clearly, a prepared survey form makes it easier to cover all the aspects

Nevertheless, the survey will unavoidably uncover common office problems. Most people, while being surveyed, will initiate discussion about problems and possible solutions. The survey team should therefore be prepared with a common understanding of potential problem areas and common solutions. In the following sections, we will men-

tion some of the common problem areas and look at ways of managing them correctly.

*The Survey - Observation*
The biggest danger with questionnaires is that the interviewer can receive misleading information from the interviewee. It is therefore important to study and observe the interviewee's reactions to questions, as well as the reality of the interviewee's environment. This will provide some indication and understanding of the employee's work habits to compare with the results of the questionnaire.

Also, observation should encompass the total environment and should not just be limited to the workstation. The bigger picture defines paper flows, communication lines and it helps to identify opinion leaders.

As we said before, use the survey to find opinion leaders who influence the thinking of many people, positively or negatively. Importantly, opinion leaders are not necessarily senior but they have the ear of many other employees and can therefore be used to advantage, if handled correctly.

*The Survey - Measurement*
In the context of the survey, measurement refers to physical measurement of the working environment. The working environment comprises the workstation (desk) together with the workflow and documentation around it.

Measurement makes it possible to define the workflow and to allocate documentation to different storage zones. Measurement also defines the size of the work area needed by the individual worker, including variables such as desk size, number of drawer units, screens and so on.

*The Survey - Interviewing*
Use of a standard form to conduct the Special Needs Analysis provides a vehicle to document information in a consistent manner. It also serves as a prompt for the interview at each individual workstation.

To be useful, the analysis must record accurate and factual information because the planning stage will involve interpretation of the information gathered during this process.

## Obtaining Building Plans

Any planning that we do will be done on scale drawings so a pre-requisite is to have the building and/or office area on a formal plan.

There are various sources of building plans. First, find out whether the client has existing drawings. If not, building plans may be available from the managing agent or landlord of the building or alternatively from the municipal planning offices.

Irrespective of the source of the plans, changes may have been made to the building since the plans were drawn up. For this reason, it is important to verify the accuracy of plans by measuring up the building and office areas.

If no plans are available, the building must be measured in detail, in its entirety. Accurate measurement is vitally important to the effectiveness of the planning cycle. To illustrate this, a common fault is to omit a column. However difficult it seems to do this, such oversights inevitably go unnoticed until the installation of furniture, when it becomes a critical factor especially if the column is situated where a desk should be.

When approaching the measuring exercise, the most important assumption is that everything within a predetermined space will affect the office plan. So it is important to make as many notes as possible. Check and record measurements carefully, neatly and in detail and the design and planning stage will be much easier.

In particular, measurement needs to pay particular attention to the following details.

- positioning and swing of doors because they define access and unuseable space
- columns or other physical fixed objects that define obstructions to floor space
- positions of windows because they define natural light sources and prime positions
- power and electrical points
- air conditioning outlets and wall fixed units
- light fittings
- any other protrusions from floors, ceilings or walls

To have the best chance of getting the measurement complete and accurate, first make sure you have the right tools, namely a tape measure, a pencil and paper.

Measure systematically, taking a starting point on the perimeter walls and moving in a clockwise direction, to finally return back to the starting point.

Measure, note and mark any fixtures and protrusions on perimeter walls, such as windows, airconditioning units, presentation boards and beams.

Note each door and also indicate the direction of the swing of each door.

Measure and note all physical objects in the building, such as columns, walls and bulkheads.

Make a note of power skirting, measure and mark power sockets and telephone points along the walls and columns.

Measure and mark floor standing units and power points along two axes, to allow the exact positioning to be determined on the final layout drawing.

Note and measure any differences in floor levels, for example steps and ramps.

Note the ceiling grid by measuring the size of a complete ceiling tile and then by marking and measuring a starting point for the ceiling grid. The starting point must indicate both axes and is best done by measuring the size of an incomplete ceiling tile at one of the corners of the building,

The survey and measurement exercises provide the raw materials for the analysis and translation processes.

Before we can get into the actual design of office layouts, we will need to draw up the building and office areas onto plan. The best way to produce professional layout drawings is with a software CAD package (computer aided design). There are many CAD packages available and perhaps the most well known is Autocad. Alternatively, drawings can be done manually but this is extremely time consuming and error prone.

Also, draughting is a skill that requires plenty of experience and an understanding of building standards. However, it is possible to describe a consistent approach to setting up plans on the basis of which an effective office layout can be constructed.

### Producing Building Plans

The starting point in producing layout drawings is to define the constraints that physically determine the template on which the layout will be based. The building form is the most decisive physical constraint and no layout can even be conceived without knowing the shape or form of the building. The building form acts not only as a boundary within which people must work and be housed, but it may also dictate limits on the flexibility of approaches to internal office planning. To draw up the building, use any plans made available by the client, together with the detailed measurements of the physicall building.

Once the building form has been drawn up and defined, the next step is to identify areas of the building that are taken up by utilities. Utilities comprise service cores that include facilities like lifts, staircases, toilets, lobbies and fire escapes. These areas are important for two reasons. Firstly, they do not form part of the useable office space - they determine the area that will be used as office space. Secondly, utilities are important considerations in terms of major access to and exit from the building, as well as general accessibility to working areas.

Finally, once the utility areas are on plan, the layout of essential building services should be included. Services include things like power, lighting, network and telephone cabling and air conditioning. As the planning process develops, it will become clear that optimum utilisation of these building systems and services provides major benefit in terms of productivity and cost effectiveness.

### Producing Block Layout Drawings

With the building template in place, the layout process can begin. Initially, we need to establish how the organisation structure affects the options of different layout solutions. To do this, we start with a basic block layout drawing based on the organisation charts and on the results of the survey and special needs analysis.

A block layout is a space allocation diagram that breaks a floor plan down into distinct areas, typically services, ancilliary areas and departments or sections. The block layout serves as a visual representation of the breakdown of the areas and it serves as a point of departure for the subsequent design process.

The aim of the block layout drawing is to produce a conceptual layout that optimises space utilisation within the physical confines of the building. For the purposes of the block layout drawing, areas are allocated at a group and departmental level rather than by individual employee. We can establish the space requirements per department partly from the workstation sizes recorded in the survey and partly from the conclusions of the needs analysis. Space allocation should not simply be dictated by the status quo. After all, the purpose of the planning exercise is to achieve a more effective layout than the existing one.

Once we have a basic block layout drawing with areas allocated by group and department, overlays are added to further develop the picture. Overlays are also derived from the information collected during the survey and recorded on the questionnaire.

The overlays allow us to devlop a series of block layouts each with a specific relevance to the final layout. The output of the block layout process should provide a number of documents, including the following:

- a block layout of area allocation by group
- a grid showing channels of communication among and between groups
- charts detailing work flow patterns
- major traffic routes iin the building and office areas
- fire escape and emergency routes
- building service layouts, such as power, telephone, netwroking, air conditioning and lighting

Provided that the layouts are created as a series of overlays, then the final layout stage becomes a simple exercise of allocating space to individual workstations within a pre-determined area.

Finally, block layout drawings are the basis of reviews with the client so that by the time work commences on detailed design layouts, a general consensus for the proposed layouts has already been establsihed.

### Producing Detailed Layout Drawings

What we have done so far is to break the planning process down into distinct activities - the special needs analysis, the translation and analysis process and the layout process. Provided this method is adhered to, the journey towards the final layout is greatly simplified and the chances of mistakes are minimised.

In the final stage of converting block layouts into detailed layouts, we once agin use the information gathered in the survey - the survey recorded the composition of available workstations and furniture as well as the furniture needs of individual employees as defined by task requirements.So one role of the detailed layout process is to allocate available furniture on the basis of employee work needs.

The needs analysis and breakdown of requirements is used to plan the total environment while catering for each individual person in the organisation. Having said that, it should be understood that the special needs analysis does not in itself lead to the creation of an effective office environment. There are a number of factors that collectively contribute towards making the workplace effective and they must all be accounted for in the final plans. Some of these factors have been mentioned consistently throughout this document, namely:

- cost effectiveness
- optimisation of work efficiency and productivity
- increase in the effective working area
- improvements in communication and work flow
- increased flexibility
- improvement in the office environment

What happens during the design phase is a matter of the creativity of the individual designer. However the final outcome of exercise is to produce a proposal, supported by a set of detailed layout drawings, that at least meets the objectives defined in the client brief and is acceptable to the client organisation.

If the functions and roles of the organisation's components have been correctly identified and the information correctly interpreted, the planning process will more than likely produce an effective solution.

Although we cannot tell you how to design, there are a number of important design considerations, a proper understanding of which will help to make sure that the right design decisions are made.

From a design perspective, we are primarily concerned with aspects that affect the relationship of the worker with the work environment. Table 1 summarises the key considerations, each of which is dealt with in greater detail in chapter 4.

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| ACOUSTICS | BUILDINGS |
| COLOUR | FINISHES |
| FLOORING | LIGHTING |
| PRIVACY | STATUS |
| TRAFFIC | VENTILATION |
| WORKFLOW | DESKING |
| ERGONOMICS | SEATING |
| STORAGE | TECHNOLOGY |
| ELECTRICAL POWER | VOICE AND DATA |
| CABLE MANAGEMENT | SPECIAL AREAS |
| REGULATORY | MEETING AREAS |

Table 1 - Design Considerations

When the final layout design is complete and agreed, final approval from the client for the project will probably depend on two additional pieces of information, namely the project budget and the project schedule.

### The Project Budget and Project Schedule

The budget will determine whether or not the project falls within the client's cost expectations. The project schedule will provide a project timeline and list of activities.

Unless you are going to do everything yourself, it is highly likely that a team of suppliers and contractors will be involved in delivering the project.

Producing a budget is therefore a case of defining distinct areas of work that will be supplied or performed by specific suppliers. From a pricing perspective, in some cases it may be necessary to obtain several competing prices for each item, in other cases the client may require a tender process. Ultimately the project budget requires that each defined area is priced and in order to price, suppliers and contractors will require detailed specifications of requirements. If the final layout drawings have been done correctly, it will be possible to provide specific drawings with specific relevant information to each supplier.

At the same time as the pricing is determined, suppliers should also estimate the duration of their portion of the work. The time estimates provide the basis of the project schedule.

Depending on the extent of the changes being made, the team of suppliers and contractors could be fairly extensive, bringing all the associated complexities of different professional disciplines all trying to the same job in the same space at the same time. for this reason, the project schedule is a critical tool to co-ordinate and manage the many varied activities that may need to take place to finalise the project. In the next section, we look at project implemenation in more detail.

## Section 4 - Project Implementation Process

The implementation phase of a design project is, in reality, a culmination of all the planning and preparation leading up to acceptance and initiation of the project.

By now, we should already have appointed suppliers and contractors for each aspect of the project works. We should also have produced detailed project drawings and a detailed project schedule.

At this stage, just before the implementation process commences, it is worth reiterating our earlier point that office planning is concerned primarily with the effective management of change. Bearing in mind that whatever change is being comtemplated will profoundly affect the client company and its people, everything possible should be done to make sure that the company and staff are prepared for and accept the change.

How can we do this? Well, there are different options and the key is to make people genuinely feel that they have been consulted and that they are involved. An approach that we suggest is this:

- first, obtain proposal sign-off from the managers of departments or groups that will be affected by the change, to try to ensure buy-in.
- second, consider conducting orientation meetings for the members of staff who will be affected, to involve them and to let them know what they can expect from the change

Throughout the implementation process, it should be remembered that people will be affected by change and reasonable efforts should be made to minimise impact.

For the rest of it, the project is a case of managing suppliers and contractors and of dealing with any problems as they arise.