B. ARCHITECTURE
THEORY OF ARCHITECTURE – I (AR6102)
PRINCIPLES OF ARCHITECTURE – SPACE
Lecture - 8

Scale for Spatial Relationship:

Spatial Relationships - Every architectural space has a unique form. They can all have a different scale within a building. All these different kinds of spaces with their difference in scale and difference in form and shape, how can they be related to each other? In what ways can a space be related to another space? That is what we are going to discuss in this discussion now.

For example - Spatial relationships. Within a house, there are different spaces like a living room, a dining room, a kitchen, a toilet, a bedroom. All of them may not be in the same shape, same scale and all have to be under one roof, how can they be next to each other, in what way are they related to each other? Here are some varieties in spatial relationships - A space can be kept next to each other and this is called as adjacent spaces. Two separate spaces can be linked through a common space which has an activity common to both the other spaces. There can be two spaces which can have two different forms, interlock with each other due to certain function and there is also a variety of space within a space. You will see all these varieties one by one. Here you can see certain sketches of a space within a space. You can see a cuboidal volume of a space and other small space within. In many cases in architecture, there are spaces which have overall activity and there will be small sub activity that happens within this space. That sub activity has to be defined within certain architectural elements. That's how this configuration of a space within a space happens. The smaller space within a larger space can be of same similar form like a cuboid within a cuboid here, you can see a cuboid is oriented differently for a specific reason. But a space within a large space can be of a totally different form due to a different activity. There are varieties of configurations that can happen within this category of a space within a space. Here you have a plan and a sketch of a house that exemplifies this space within a space. A house

designed by an architect Charles Moore in California. This is the overall volume of the house. The house is a unified element with many small spaces within it. Here, these four columns define as a small space within a large space and acts as a bathing area. You have another four set of columns which defines another space within this large space for a living activity. This is how it looks in a 3d form. Here are the photographs of the same building. This building exemplifies how a space can happen within a space. Now, we will move to the next configuration of how two spaces can be connected by a common space.

A two space of certain activity. For instance, two meeting rooms can be connected with a common space called a lobby. The lobby may be smaller in comparison with a bigger meeting room and it has to be at the centre so that it connects both the meeting spaces and it has the people entering the meeting space pass the central linking space. Certain other cases, what is called as a central leaking space can be even bigger than the destination spaces. This being the main central activity here, in this example we see, spaces of various shapes and various functions linked by a central linking space of a tiny volume, just a corridor. Here you see another example of architecture where you have various kinds of spaces linked by a central open space. The volume of which is equal to other volumes. This is the plan of a building called Jawarkhala Kendra, Jaipur, designed by architect Charles Correa. A nice example of how space is linked with another space through a common space.

This is the view of the central courtyard which acts as a linking volume. The third configuration of how spaces can relate to each other is the adjacent spaces. Space can be next to each other, proximal to each other for certain functional reason. There will be a separation between these two spaces. The separation can happen in many ways. The separation can be a simple wall with an access door or it can be a wall as a partitioned wall with openings all around. The separation can happen as rows of columns or it can just be a glass facade or a level difference between the two spaces. Here, in these examples that you see in these sketches, the two spaces are differentiated by just the level difference. Here in this case, just a row of columns. A space can be adjacent to or next to each other by all these varieties of blockages. Here is an example of 17th century villa, a Pavilion design with an adjacent space next to another and one of the space acting as a central space. There

is not much of openness among the spaces. The accessibility is through just a single door. Here we have an Indian example of a temple plan. How spaces happen to be adjacent to each other for specific function and connected only through a small opening. One enters a temple into a colonnade called Mandapa. There is another small Mandapa that leads to the main religious space called Garbhagriha. They are all different spaces with different scales and different forms, different light quality and different functional reasons. They are all situated next to each other catering a single movement space. A space can interlock one another as well. Spaces of different shapes can interlock in many varieties as it is shown in the picture here. We have a plan showing an architecture of St.Peter's Cathedral where you have the main movement volume, the main central atrium and you have the Alter at one end, you have columns of different volumes but they interlock with each other. This is how majestic the volume looks from inside. We have seen how different volumes of space can relate to each other. Now, we will see how we can organize different spaces in certain configurations according to certain needs here, there is this simple depiction through these diagrams of squares put together which depict a space.

A space can happen next to each other in many possible ways according to certain functions. For example - they can all be clustered like this, they can all be in a linear form radiating like this. They can be centrally arranged like this. All of them will have a different reason in architecture. For example, a linear structure like a railway station and a bus terminus have a spatial form next to each other due to its movement function. A space like an institution will have a centralized organization where there will be simply a main space that controls the function around.

Spatial Relationship for Organization:

So due to different functional reasons or due to reasons like lighting, ventilation, a spatial organization has to be chosen. We can categorize the spatial organization in the following terms;

A centralized organization - where all the spaces have a central focus. Spatial organizations can be linear where the spaces can be arranged one after the other. It can be Radial where all the spaces radiate from a single central point. The spaces can be organized as a cluster next to each other or

without any strict geometry, what we call as a clustered organization. Or there can be strict Grid Geometry with which the space is now organized and called as a 'Grid organization'.

We will look into all this configuration, one by one with certain architectural examples. Here we see certain pictures of how a centralized organization of architectural spaces can be. The centralized form can eventually take the shape of a sphere, it can be in a triangular form, it can be squarish or it can be in any of these forms here we see plans of religious spaces from medieval architecture. Most of the examples of religious architecture of medieval time, they all have a centralized organization. All the architecture from that time needs a specific gathering space with many auxiliary activities that happen around the central space.

This is the view you'd see in Hagia Sofia, Istanbul. Actually designed as a cathedral, now used as a mosque. It has a centralized organization, the main atrium being the central space and it has many other ancillary spaces that are arranged around it. This is the exterior view of the same building with the central space in the centre and all the ancillary spaces around it. This organization is called the centralized organization, will always offer importance to the main space in the centre. In another example of an architectural plan showing the design of a St.Peter's Cathedral in Rome happens again in a centralized way with the main Atrium space in the centre and all the ancillary space radiating from it.

An organization can also be linear. Spaces in which case will by one next to another. Considering each and every square here to be a space, they can all be linked with the single connecting cord like this. The connecting cord space can connect spaces of different forms. Linearity doesn't have to happen in single straight line. A linearity can be in turns. The moment a line turns, the nodes become a special space.

Here we see an example of a plan of what is known as an apartment building. This is by a famous architect by the name, Architect Le Coursier. This arrangement of linear organizations have one advantage of connecting all the spaces with a simple linear moment at the centre of which you have the main circulatory staircases. If you observe most of the apartment buildings and hotel buildings will be of a linear arrangement where you have

smaller rooms positioned on either side of the corridor. Here is again a same plan by a South Indian temple which shows a linear organization of spaces next to each other. Spaces of different function with certain sequences another example of linear arrangement. As mentioned linearity doesn't have to be straight, it can be a line of any form. Here is a plan showing a hostel building designed by Alvar Aalto. This is also linearity but of a sinus form. The architect in this case got inspired from the landscape of Finland where he is from. This is how the building looks like.

The space arrangement also can be Radial. With the choice of linearity, centrality or radial arrangement, it has to be based on specific purposes. Mostly in architecture, a radial organization happens where there is a need for central control. For example - in the case of a multi-storeyed hotel building. There will be a central circulation space where there will be a lobby, a staircase or a lift from where all the rooms will radiate. A service can happen easily. Even people in the movement will radiate from the central space to all the branches of the building. The radial organization has its advantages. A radial organization in another way is also a central organization. Here you see another example of a radial organization which is a residential building overlooking a valley. The view of the same building that you saw in the plan before. Another example of a radial organization of space, here it is a secretariat building of UNESCO. The view of the same building. Mostly, in these type of buildings the central circulation space will be right at the centre and all the ancillary spaces will be radiated arms of the building. Another example of radial arrangement of spaces - In this case it is the plan of a South Indian temple from Karnataka where you have the central mandapa, a ritualistic space from there you have the radiating spaces, the three garbhagriha that happens in three numbers radiating from the central mandapa.

The view of the same building. The organization of spaces can be clustered also. Clustered organization can happen in many ways as shown in this picture. A cluster can be a space of similar shape and form. It can be a cluster of different shape and form of spaces. It can be a cluster of similar shapes but of different scales in proportion. All the spaces can be clustered within a rigid boundary but with some sort of axial arrangement. We have all these varieties of clustered organizations that can happen. Clustered organization may not have a strict geometry. Here is the plan showing the

plan of Fatehpur sikri in India where you have the resigning space of the king, the ministers and also the gathering space. The court of the king, everything arranged in a single large complex. You can see in the plan, there is no strict geometry, either centralized or radial or a big pattern. The arrangement of the spaces is based on the terrain up and down, which is not a simple plain. The view of the same complex, Fatehpur Sikri.

Finally, the organization of spaces can be in a grid manner. Here you can see varieties of modulations of a grid arrangement. There can be very rigid grid that is initially followed. The grid can be broken or there can be an overall grid which is broken in its centrality. Starting from a rigid arrangement, a grid can be diluted as per the need of the activity of architecture. In south Indian examples of Mandapas, mostly the historic architecture with colonnade buildings either in India or foreign countries. They will always have a grid arrangement due to structural reasons. Here you have a plan of a museum built by an architect Louis Kahn called Kimbell Art Museum which had simple geometrical grid arrangement of a rectangular space that forms a unit arranged next to each other. Most of the buildings that have a structural grid also have an architectural spatial grid.

This is how the single unit of a rectangular space will look in reality. The regular geometric grid arrangement of architectural space in architecture will also show up in its exterior form like what you see in this building. A proper geometry shown both in the plan and also perceived in the exterior elevation.