

FLOWING EDUCATION

Research Plan
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COMPLEX PROJECTS
Bodies & Building Berlin
AR3CP010

students

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INDEX

01 INTRODUCTION	006
1.1 Problem Statement	
1.2 Research Question(s)	
02 RESEARCH FRAMEWORK	008
2.1 Theoretical Framework	
2.2 Relevance	
03 RESEARCH METHODS	010
3.1 Program	
3.2 Site	
3.3 Client	
04 DESIGN BRIEF	012
4.1 Program	
4.2 Site	
4.3 Client	
05 BIBLIOGRAPHY	018
5.1 Bibliographical References	
5.2 Figures	

01 INTRODUCTION

University, as one of the oldest institutions in the West, carries the ideals of human beings for higher education. Modern universities were born in Europe in the 11th century. For example, the oldest university in the world was the University of Bologna in Italy, which was founded in 1087. "As for the universities in history, it can be said that everything else has changed, but most universities are permanent. About 75 public institutions established in the western world before 1520 still exist in recognizable forms, with similar functions and uninterrupted history, including the Catholic Church... and 61 or so universities." Moreover, "most of the 61 universities are still in the same location, with some of the same school buildings, professors and students in the same classroom, and school management is conducted in the same way" (Kerr 1963). This not only shows the stability, tenacity, inheritance, and sustainability of the university as a space for higher education but also reflects the deep connection between the university and European civilization. However, Clark Kerr, the former president of the University of California, noticed the stability of the university as well as its transformative characteristics. "Nothing is lasting except change" (1963).

1.1 PROBLEM STATEMENT

Outside the campus, with the process of suburbanization of the post-war campus, the separation between universities and cities has become a new problem. Students are locked on an isolated island and completely separated from society. As Perry said in his book, a prison can be a university, and a university can also be a prison. It is not enough for universities to produce doctors, lawyers, and elites. We must encourage them to participate in current events (2015).

Within the university, great changes have taken place in the way of teaching and learning.

The role of a teacher is no longer fixed but played flexibly by anyone. And learning is increasingly not a single effort, but a shared cooperative experience (Taylor 2019). The democratization of traditional teaching space to promote dialogue, and more importantly, the rise of social learning space on the entire campus, have appropriately proved this.

With the impact of online universities such as the Open University and online university, more radical educational reformers began to question: Do we need a physical campus? Of course, this may be a false proposition. Because people always want a better experience. Especially for universities, although there are many conservative tendencies in teaching methods. But, in the past few centuries, universities have been among the most loyal investors of architects. The eagerness of university administrators for the ideal educational space and the enthusiasm of architects to change the world dovetailed, creating one radical learning utopia after another. However, this does not mean that the impact of informatization can be ignored. It poses a new problem to architects to some extent: how to create a better learning environment to attract students to use it instead of immersing in the convenience trap brought by virtual teaching.

1.2 RESEARCH QUESTIONS

With the help of information technology, people can not only store the massive knowledge formed over thousands of years in various network databases but also present the process of knowledge production in different spaces at the same time. Everyone can get rid of the role of a simple knowledge receiver and participate in the process of creating knowledge. At this time, education will present a new ecology that can be learned everywhere and all the time. The physical boundaries of peer communication,

work, and learning become blurred or even disappear completely, and the fluidity of educational space arises at a historic moment.

It can be seen from recent experience that the traditional model of space and ownership (space owned by colleges and departments) is changing to a more diversified and flexible shared space to cope with the increase of cooperative and peer-to-peer learning (Taylor 2019). This allows the expansion and contraction of the

department and provides more interaction and chance opportunities through shared space. Success depends not only on the type of space provided but also on how to connect different types of space through circulation and create interaction activities.

Then, under such a trend, how does the circulation play a role in creating the fluidity of university buildings for a better learning experience?



Figure 1: Open University

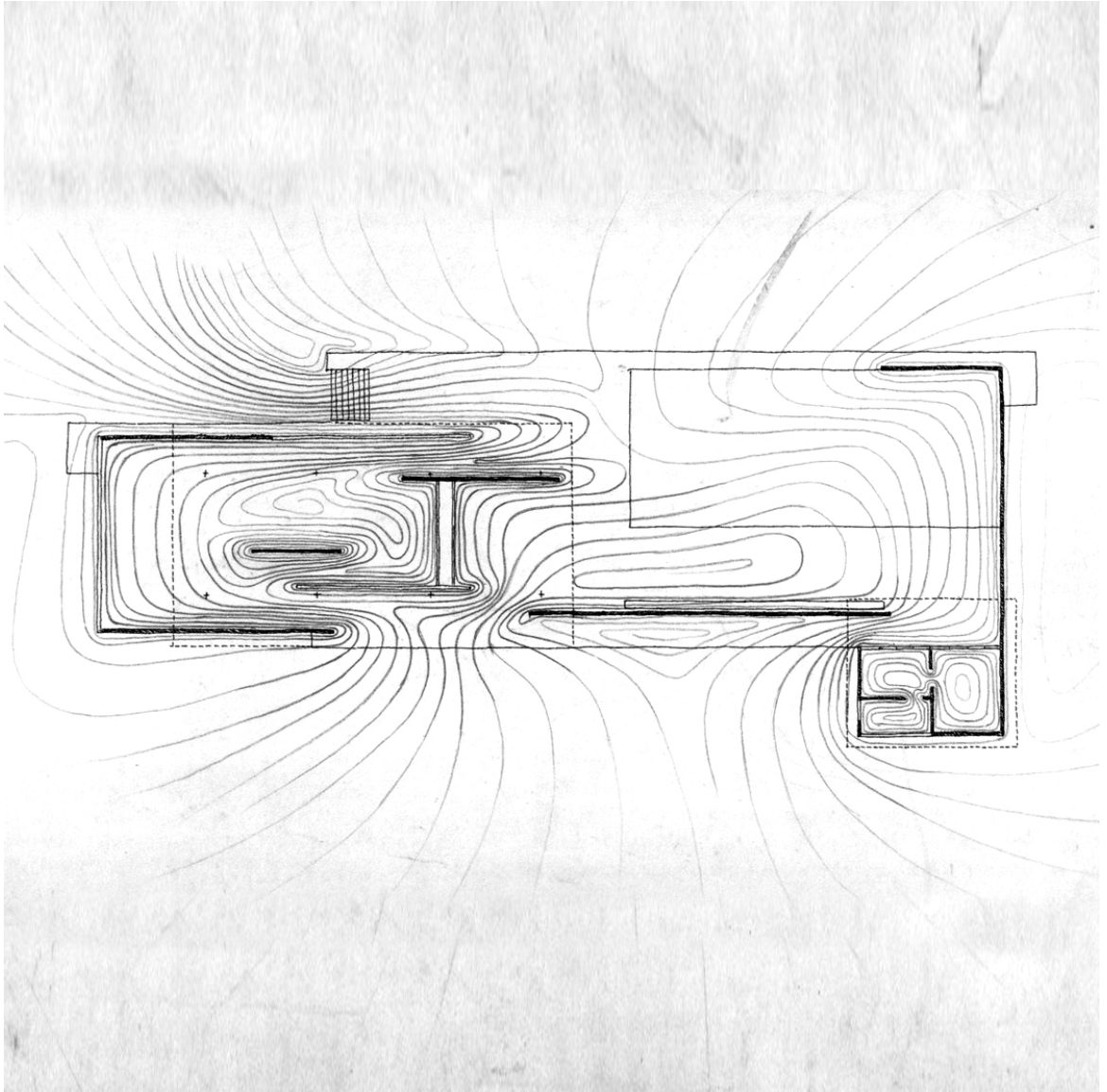


Figure 2: Barcelona Pavilion Study Drawings by Paul Rudolph

02 RESEARCH FRAMEWORK

2.1 THRORETICAL FRAMEWORK

The research will introduce the concepts of fluidity and flowing space. Fluidity could be understood to operate not as a substance, but as a formative of it (N.A.N.A 2014). Fluidity is a factor in which force elements mediate interactions between other particles within particular fields, materials, functions, and behaviors, and make them combine smoothly leading to social, physical, spatial, and temporal. It is also the adjustment of the integration between spaces and human beings, the behavior of inhabitants to make those interactions have forms and rules.

The term "flowing space" was first proposed by architectural theorist Sigfried Giedion when discussing the works of Baroque architect Borromini in *Space, Time, and Architecture*. When describing the wavy wall of San Carlo Church designed by Borromini, he wrote: "Borromini's wavy wall endows the stone with elasticity and makes the stone become an elastic organization. The wavy wall is still the natural companion of the flowing space of elastic plane design"(2008). After Gideon, Bruno Sevi, an Italian architectural theorist, also mentioned the flow space in baroque architecture in his book *Architectural Space Theory - How to Evaluate Architecture*, and also elaborated on the view of flowing space based on the wavy wall in San Carlo Church. They understand the flowing space of this period from the undulation of the wall. However, the composition of the church still does not break away from the central symmetrical pattern and closed space characteristics.

In the period of modern architecture, because of the emergence of new materials, new technologies, and new design concepts, the architectural space has undergone a revolutionary transformation. In 1929, Mies designed and built the famous Barcelona Pavilion. The whole space is relaxed and

free, which is called a "flowing space". This kind of flowing space breaks the centrality and closeness of classical architectural space and reflects the dynamic balance between people and the environment. Its flowing and open space feature is the embodiment of the fluidity, fast rhythm, and overall technicalization of modern life. The flowing space contains two characteristics: the continuity of mutual circulation of indoor space and the permeability of space, which refers to the mutual integration of indoor and outdoor spaces. These two enable people to communicate with each other, and also provide a basis for people to communicate with the environment.

2.2 RELEVANCE

Since the concept of flowing space was put forward, it has been widely used in museums and galleries, which have the nature of sightseeing flow. For the current trend that education space pays more attention to social interaction and communication, a flowing education building is likely to be the right answer to improve the learning experience.

03 RESEARCH METHODS

The research will be carried out from two dimensions: human and architecture. The human dimension refers to customers and users. This part is mainly conducted through interviews and online surveys. The dimension of architecture refers to the university as an architectural type. This part will analyze university architecture from the four dimensions associated with the university: city, campus, architecture, and classroom (Figure 3).

The relationship between the two adjacent scales leads to different aspects of research. For example, the relationship between the city and the campus will show the location, distribution, and scale of the university campus in the city. By arranging the 62 collected cases in chronological order, we can get the trend of location, scale, and building density of university campuses from the Middle Ages, through the Renaissance, the Enlightenment, and even after World War II to modern times. This part of the research will also be accompanied by the collation of changes in the number of college students. To demonstrate the connection between the number of students and the expansion of the university campus. The analysis of the relationship between the campus and buildings points to the architectural layout, building density, and floor area ratio of

the university campus. The analysis of the relationship between the building and the classroom points to the proportion of the functions and the flow inside the building.

3.1 SITE

Through taking photos, observing, experiencing, and recording the traffic status, landscape characteristics, terrain characteristics, and activities of surrounding people, we try to find the problems and contradictions in the site. Finally, through interviews with site users and surrounding residents, their feelings, the atmosphere of public space, and the role of buildings in the site are recorded. Finally, data integration is carried out based on the theme, and the obtained data is refined and sorted through the process of visualization.

3.2 PROGRAM

For the program, the case study will be the main research method. It will help the development of the program from two aspects. On the one hand, through the comparison of typical university buildings in different periods, we can understand the development trend of university buildings in terms of scale, flow, and functional layout from the perspective of the development process. On the other hand, the analysis, simplification, and extraction of the excellent university building cases in the past decade from the perspective of scale, flow, and functional layout will generate a paradigm as the benchmark of the proposal.

Due to the complexity of the internal functions of educational buildings, the boundaries between some functions are not obvious. Therefore, to compare different cases more intuitively, the functions are divided into three different attributes: teaching&learning, lobby&circulation, and support. To explore

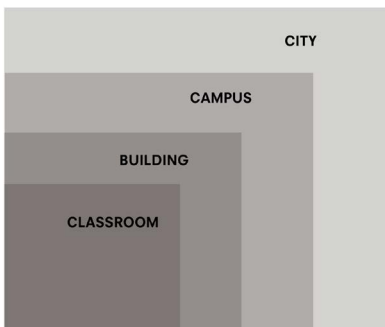


Figure 3: Four Scales of Analysis

the flexibility of teaching and learning space, it is further divided into special and flexible. Through such division, we can more intuitively analyze the basic mode and development trend of function proportion in university buildings.

3.3 CLIENT

Client research mainly uses two data sources for information collection. First of all, try to understand customers' expectations and special needs for education space by interviewing Google's internal employees or architects who have participated in Google campus projects. Second, it used web-based databases and software to investigate Google's organizational structure and employee training methods. And by analyzing the existing seven Google campuses, we can judge the future development goals and ambitions of Google in the field of education.

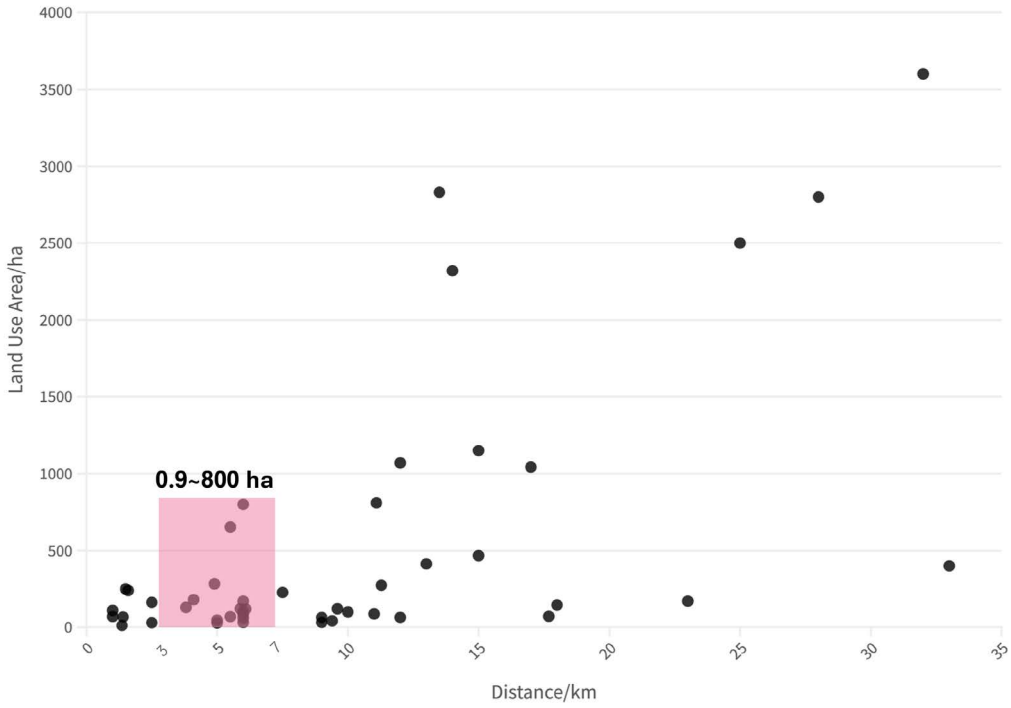


Figure 4: Distance & Land Use Area

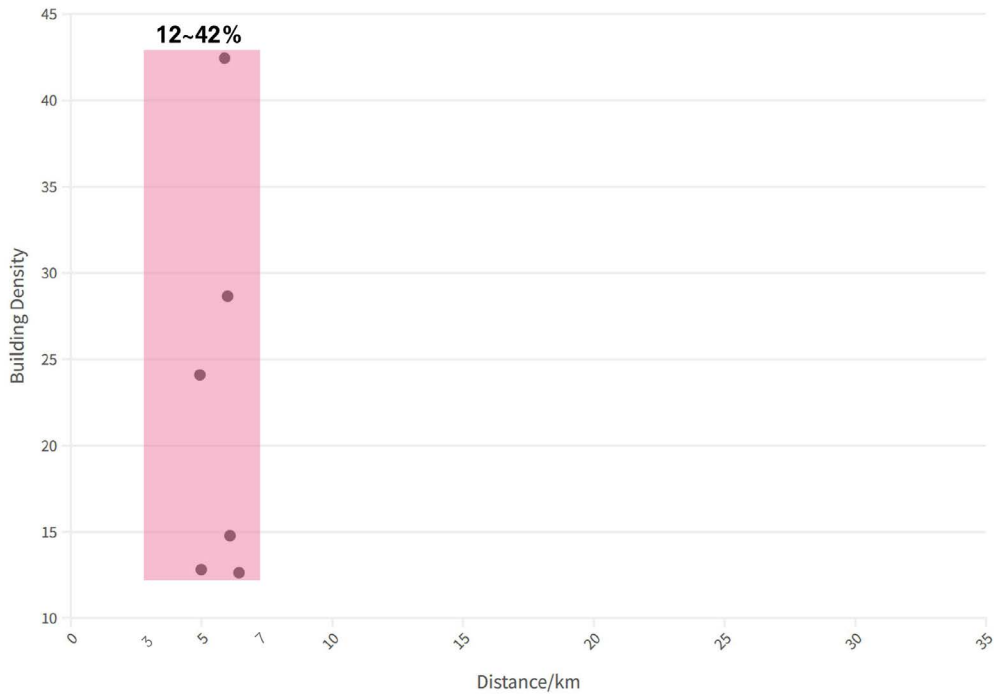


Figure 5: Distance & Building Density

04 DESIGN BRIEF

4.1 SITE

Through a large number of case studies on the relationship between campus and city, we can get the development trend of campus location and scale. The conclusion is obvious: campuses are getting bigger and bigger away from the city center. The distance between the campus and the city center is also related to the size of the campus land: the farther away from the city center, the more the campus land area.

These data will play a certain reference role in the selection of the site. For example, the team's requirement for mobility is to be located in the surrounding area of the ring of Berlin's public transport, that is, within 3-7km from the city center. After using this condition to filter cases in the database, it can be found that the land area of all eligible

cases fluctuates between 0.9 and 800 hectares. This range sets a benchmark for site selection: under normal circumstances, the site size should be no less than 0.9 hectares and no more than 800 hectares (Figure 4).

In addition to helping to limit site selection, the database can also provide reference for site strategies. By screening all the cases that meet the distance requirements and calculating their building density, it is concluded that the reasonable range of campus building density is 12-42% under this condition (Figure 5).

By limiting the conditions step by step and extracting reasonable scope from the case base, we will finally locate an optimal site in Berlin and basically determine how to develop it (Figure 6).



Figure 6: Current Site

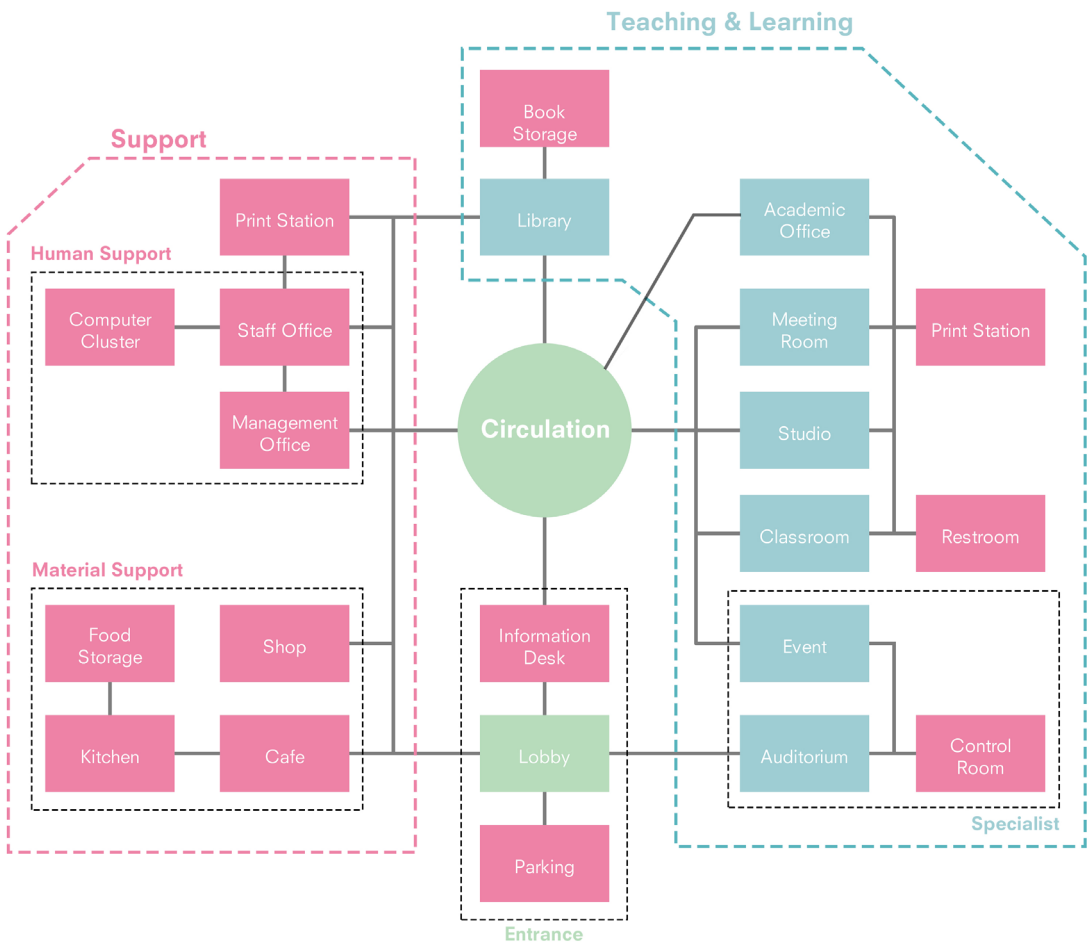


Figure 7: Flow Scheme

4.2 PROGRAM

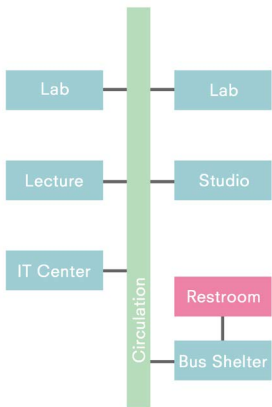
First of all, among the three important functional components of educational buildings: teaching & learning, lobby & circulation, and support, teaching & learning accounts for the largest proportion, followed by lobby & traffic, and support is the least. In the six cases analyzed, the average proportions of the three are 66.8%, 22.9%, and 10.3%.

As the core function of teaching buildings, teaching and learning spaces are further divided into special and flexible learning spaces. Specialist refers to the functional space with high requirements for equipment, optical environment, or acoustic environments, such as auditorium, electricity hall, and laboratory. In addition to these spaces, for example, the classroom and studio are spaces that can realize functional transformation by changing the layout. Therefore, the proportion of specialist can be regarded as an indicator of building flexibility to some extent. The higher the scale, the less flexible the building space. Because the project is expected to have relatively reasonable building flexibility, the average value of 12.6% of the seven reference cases is temporarily adopted as the proportion of the special part.

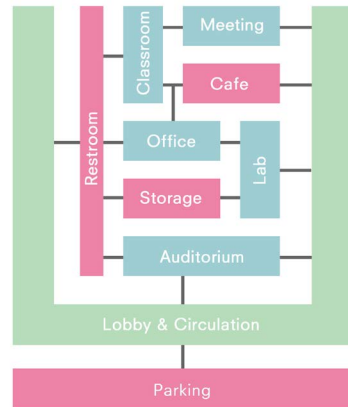
Circulation is the intermediary space connecting other spaces. It is also the main

place for social interaction (Figure 7). From the case study, its proportion is probably one of the indicators to measure spatial liquidity: the higher the proportion, the stronger the liquidity. However, it should be noted that the mode of connecting traffic space with other spaces is not single. At present, there are four kinds of fish bones, wine cups, doughnuts, and knots (Figure 8). Fishbone type usually uses linear corridors or halls to connect different teaching functions. The doughnut type uses a circular corridor to separate the core functions inside the ring from other functions outside the ring. The wine cup type usually places the traffic space outside and wraps the teaching space. The knot type is the most special, and the traffic space is wrapped around almost every teaching function. This means that you must pass through the traffic space to reach another functional area.

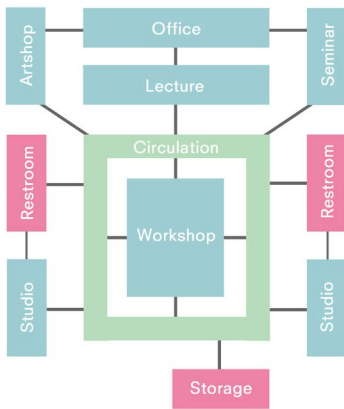
It is not only the most mobile but also in a typical knot organization case, Rolex Center, the traffic space accounts for 47%. In this project, we hope to build a more mobile university building more aggressively. Therefore, 50% of the traffic space is temporarily used as the starting point of the future university architectural design (Figure 9).



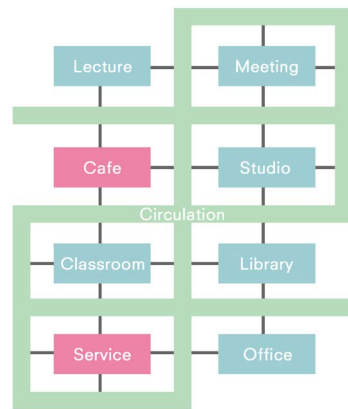
Fish Bone



Wine Glass



Donut



Knot

Figure 8: Four Types of Circulation



Figure 9: Program Proposal

4.3 CLIENT

Google is one of the largest Internet giants in the world. He has always had his own ambition and pursuit of education. As early as the beginning of the 21st century, Google began to establish a Google campus around the world to cultivate its own Google developers and new companies. But six years ago, when Google wanted to open its seventh Google campus in Berlin, it had already arrived at the strong protest and opposition from Berlin residents. The reason is that Google's move will lead to gentrification

and privacy problems. To this end, Google had to temporarily shelve the leased site and give it to social service agencies.

If Google changes its goal, it will not set up a campus, but a real university. It will not only avoid the predicament of gentrification and win a good reputation in Berlin, but also use its own resources to combine university courses and train future employees. If successful, this university will also be the best signboard and proof that Google products enter the education market.



Figure 10: Protest against Google

05 Bibliography

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5.2 FIGURES

Figure 1: Adapted from: <https://www.circodeideias.pt/en/evento/the-university-is-now-on-air/>

Figure 2: Adapted from: <http://hiddenarchitecture.net/barcelona-pavilion-study-drawings-and/>

Figure 3: created by author

Figure 4: created by author

Figure 5: created by author

Figure 6: created by author

Figure 7: created by author

Figure 8: created by author

Figure 9: created by author

Figure 10: Adapted from: <https://fuckoffgoogle.de/2017/12/11/in-front-of-umspannwerk-kreuzberg/>