

Reference experiences

1. Promote integrated design between campus facilities and external communities to ensure inter-exchange and connection

Outstanding universities are those that coexist with dynamic communities, and dialogue and exchange with external communities are increasingly important to modern universities. Within the conventional independent spaces for teaching, research and residence are transformed into integrated spaces to enable communication and sharing. The development and expansion of ITESM's campus not only facilitates inter-disciplinary and staff collaboration but also encourages students to interact with local industries and neighbouring communities. Campus facilities are shared with communities despite the boundaries between urban and university spaces, aiming to provide a more seamless area avoiding fixed boundaries and the specific delineation of space. The masterplan also proposes future strategies that will have an immediate impact on neighbouring communities. During the continuous community expansion, the masterplan proposed a series of measures to improve public parks, make communities safer, and upgrade streets and public spaces to encourage soft modes of transport such as walking and cycling, in turn transforming the area into a more liveable community to attract both residents and workers. ITESM has thus taken measures to ensure the campus' independence while sharing facilities with the community and realizing its social values with cutting-edge design extending value and experience across boundaries.

2. Facilitate holistic development that connects campuses with communities and urban industrial clusters

In the knowledge economy and era of innovation, the roles and objectives of spatial planning for universities and higher-educational spaces are now changing. Integrated, open, innovative and ecosystem-based campus spaces can be seen to promote enhanced collaboration and foster more dynamic environments. Universities are integral faculties in driving research,

knowledge and innovation, and attracting information and talent, and therefore play a key role in urban and regional economic development. Where situated alongside industrial clusters, universities can leverage the strategic co-location of innovative and productive spaces, promoting local commercialization and also focusing attention on research, investment and entrepreneurship ecosystems formed on the basis of university talent. The ITESM masterplan has attracted significant R&D and investment in the campus context, contributing to innovation and upgrading in local industry and entrepreneurship. In addition, the community has transformed into a vibrant, dynamic area in which the campus is more closely fused with the community and the city's industrial innovation. This project showcases the added value of university campus renovation projects in which key components are details from the functional and technical design of campus layout, technology transformations, facilities design and spatial planning to ensure land-use efficiency.¹⁴

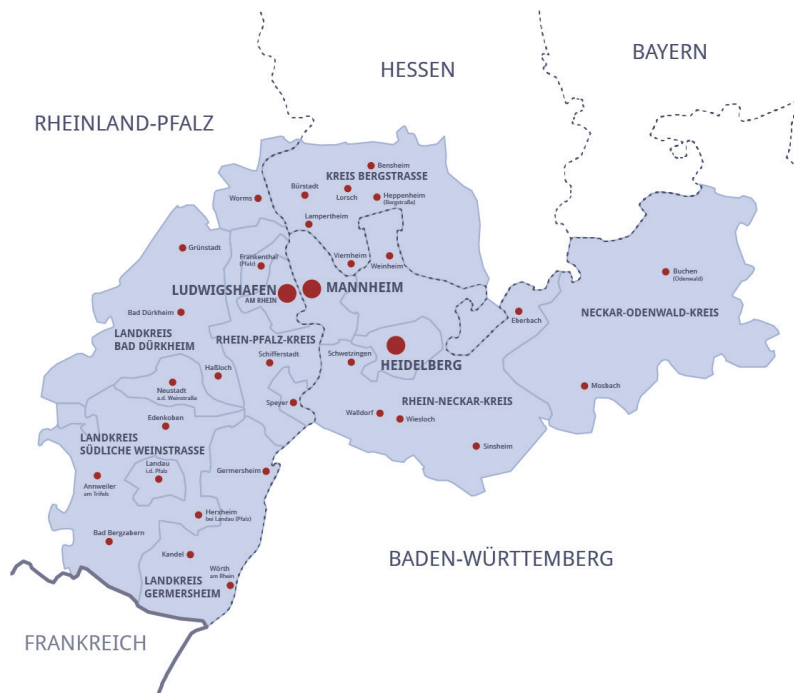
Heidelberg, Germany: Modernizing Heidelberg through Industrial Upgrading and Diversification

Case background

Heidelberg is a dynamic city with a mixture of traditional and contemporary tourism, culture, science and technology, and education. The city has a population of approximately 160,000 of which 56,000 are estimated to have immigrated – many of whom are scientists or students.¹⁵ In combination with Mannheim and Ludwigshafen, the city makes up part of the Rhine-Neckar metropolitan region as shown in Figure 3.14, a polycentric area serving as a key driving force in the German economy aiming to be one of the most attractive and competitive regions in Europe. With a strong scientific presence, Heidelberg is also home to Germany's oldest university and hosts a number of internationally renowned research institutes and research-based companies, thus making it a high-

14 Sohu News. URL: https://www.sohu.com/a/~200202426_716486 (2017) (Accessed: 05/08/2022).

15 City of Heidelberg. URL: <https://www.heidelberg.de/english/Home/Life/The+City.html> (Accessed: 11/08/2022).



Source: Initiativkreis Europäische Metropolregionen in Deutschland. URL: <https://deutsche-metropolregionen.org/metropolregion/rhein-neckar/?lang=en> (Accessed: 11/08/2022)

Figure 3.14 Heidelberg's location within the Rhine-Neckar metropolitan region

quality place with strong economic foundations to live and work in.

Heidelberg is an international tourist destination receiving over 3 million tourists annually. It has 18 museums and is famous for its traditional red roof houses which perfectly preserve the style of the Medieval Ages. The Neckar River divides the city into the north and the south banks, with greenways running parallel which offer leisure areas for local people. The two parts of the city are connected via several bridges, the most famous of which is Karl-Theodor-Brücke (see Figure 3.15), built in the 18th century. Steeped in history, Heidelberg aims to preserve these relics and the cultural identity of the city, as reflected by the city's local cultural identity preservation programme which includes approximately 1,000 protection objects and 2,100 individual buildings.

Founded in 1386, Heidelberg University is an important landmark and pillar of the city, and the oldest university in Germany. The university campus is fully integrated into the old city in that there are no gates, walls or clear boundaries, creating a strong

academic presence and reinforcing the prestige of Heidelberg as a city of science. Renowned writers and thinkers including Ernst Bloch, Martin Heidegger, Max Weber and Hannah Arendt all lived, studied and taught at the university, and it is this rich history that attracts a great many tourists every year. As of 2017, a total of 56 Nobel Prize winners and 19 Leibniz Prize winners once studied, taught or conducted research at the university. In the 18th and early 19th centuries, romantic literature was born in the city, and even today a large number of philosophers and sociologists live here. The United Nations Educational, Scientific and Cultural Organization (UNESCO) awarded Heidelberg the title 'City of Literature'. Heidelberg is home to 45,000 students from all over the world as well as a great many publishers, bookshops (1.5 per 10,000 inhabitants on average) and renowned translators. Heidelberg ranks third among all German cities in terms of per capita investment in cultural activities by public organizations (USD 295 per capita, USD 42.5 million in total). The important segments of the creative economy are book publishing (one-third of all creative professionals) and software. Its proportion of cultural and creative industries in overall economics is



Source: Sohu News. URL: http://www.sohu.com/a/243206390_100191781 (Accessed: 12/08/2022)

Figure 3.15 The famous Karl-Theodor-Brücke in Heidelberg

higher than other cities, with 75 percent of its revenue coming from literature and publishing. Currently, over half of Heidelberg's working population are employed in culture-related industries.

However, the development of the local economy has faced great challenges with the economic system over reliant on the tourism industry and its status as a university town. The homogeneous industrial structure reduced sustainability of the city's economy, which led to difficulties in raising the income level for local residents. Urban expansion and economic diversification thus became the common choice of local government, businesses and citizens.

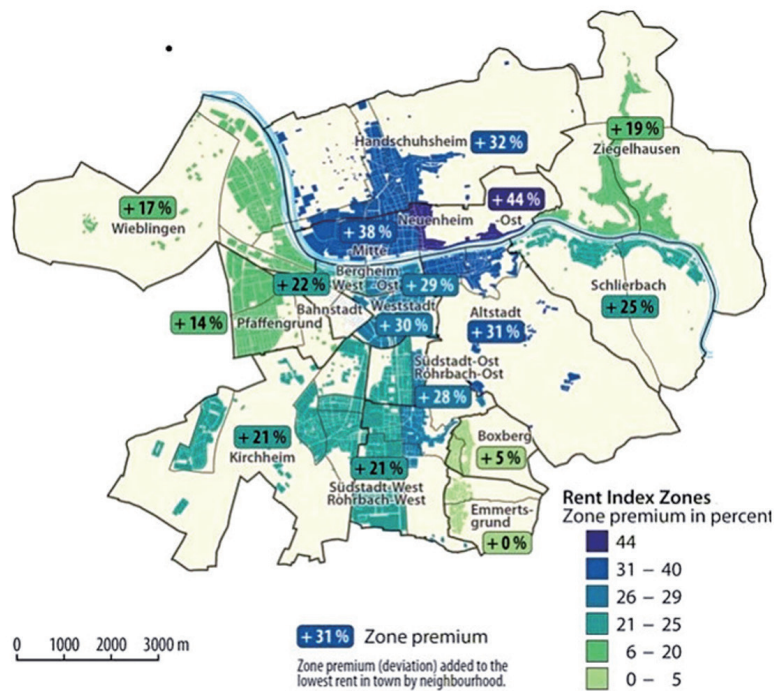
Implementation process

1. Urban expansion and diverse regional development

Each area of Heidelberg contains its own unique

characteristics and it is this diversity that makes the city vibrant and attractive. The long and narrow old city – the cradle of Heidelberg – is surrounded by city roads that intertwine with nature, whilst Weststadt contains many examples of residential buildings from the reign of Wilhelm. Bahnhofstadt is a railroad town and currently the largest Passivhaus colony, while other districts such as Handschuhsheim are comprised of combinations of less urbanized areas and life science research institutes with Rohrbach formerly known as a wine village. In terms of rental prices, Heidelberg ranks sixth among all German cities but a 'core-edge' structure is significant within the city and the rent in the northern 'creative' zone is on average 30 percent higher than the cheapest neighbourhood in the south (Emmertgrund/Boxberg) (see Figure 3.16).

Heidelberg has taken advantage of its rich tourism influx as a means to drive industrial development. Here, both conventions and exhibitions have played



Source: Gerhard, U., and Hoelscher, M. Knowledge Makes Cities: Education and Knowledge in Recent Urban Development. The Case of Heidelberg, Germany. *Inequalities in Creative Cities* (2017)

Figure 3.16 Distribution of housing rental prices in the different districts of Heidelberg

a key role in the economy. In regard to academic symposiums, 70 percent of Heidelberg's tourist accommodation income is generated from business travellers who make short stays and enjoy the city's history, cultural tradition and prestigious scientific presence. In addition, classical concerts, musical performances and other significant creative events are regularly held at the Heidelberg Convention Centre along with large-scale exhibitions, trade shows organized by global companies, annual conferences and other events. Small meetings play an important role too with the renowned Heidelberg Convention Hotel providing the ideal venue for conferences and meetings due to its high-quality facilities. The city benefits from universities, technological innovation and creative industries which attract highly skilled and creative workers and residents. This also creates new potential for high-quality education where an increased number of families with a strong academic ethos contribute to a more educated workforce. Statistics

from Gerhard and Hoelscher's research¹⁶ highlight that students who attend elementary schools within 'professorial communities' are far more likely to attend the best secondary schools.

2. Developing a technology cluster in partnership with Heidelberg University

With the support of Heidelberg University, local industries began to develop with healthcare one of the strongest performers. The healthcare industry in Heidelberg contains 20 percent of the city's working population; far higher than the German average of 7 percent. Due to the abundance of medical research projects, clinics and hospitals associated with Heidelberg's universities, the health industry is closely linked to these entities. Universities and higher education serve as important sectors in Heidelberg whereby R&D equates to 4 percent of local gross domestic product (GDP) and 1.9 percent of national GDP; and cultural institutions 6 percent of local GDP

16 Gerhard, U., and Hoelscher, M. Knowledge Makes Cities: Education and Knowledge in Recent Urban Development. The Case of Heidelberg, Germany. *Inequalities in Creative Cities* (2017).

and 3.8 percent of national GDP.

Technologiepark Heidelberg, as shown in Figure 3.17, is located at Heidelberg University with an additional research base in Bahnstadt. It is an important local industrial cluster that is now world-renowned as a high-tech park. The park is home to one of the most important biotech research centres in Germany with 2,800 scientists and employees. It is also the most important bio-pharmaceutical industry cluster in Germany and a leader globally, with hundreds of resident pharmaceutical companies such as BASF, Merck and Roche Diagnostics. In addition to relying on R&D resources from Heidelberg University, the park cooperates closely with numerous international biotechnology parks, renowned domestic and international research institutes, and bio-technology companies boosting the development of bio-technology industry clusters in the city.

The Neuenheimr Feld zone is one of many zones with a 40,000 m² radius comprising laboratories as well as commercial and industrial facilities which make up the

core zone of Technologiepark Heidelberg. Due to its integration with Heidelberg University, it is often used for practical research with a creative and dynamic atmosphere that encourages communication between students, young scientists, experienced entrepreneurs and lecturers.

3. Developing a cross-regional technology innovation network

To further develop local high-tech industries, Heidelberg goes beyond its geographical boundaries to establish technical cooperation with neighbouring cities. As Heidelberg's closest city, Mannheim is less than a 30-minute drive away. The Heidelberg-Mannheim Health and Life Sciences Alliance was founded in the mid-1980s in Bergheim, Heidelberg. As the first medical park in Heidelberg, it pioneered modern clinical facilities and inspired a range of innovations in medical research and teaching. The network comprises multinational companies such as BASF, Merck, Sanofi and Roche Diagnostics as well as more than 400 small and medium-sized pharmaceutical companies.



Source: Technologiepark Heidelberg. URL: <https://www.technologiepark-heidelberg.de> (Accessed: 10/08/2022)

Figure 3.17 Technologiepark Heidelberg

Research institutions in the vicinity include the Heidelberg University, two local medical schools in Heidelberg and Mannheim, and domestically and internationally-leading research centres such as the German Cancer Research Centre, the European Molecular Biology Laboratory and the Max Planck Institutes in the Rhine-Neckar region. Combined, they create an exclusive technological development network in the medical engineering field whereby companies provide technical knowledge services for companies and conduct R&D and training. As life science and medical researchers and institutions in the Rhine-Neckar region joined the Heidelberg-Mannheim Health and Life Sciences Alliance, Heidelberg has made a great leap forward in innovative research, patient care and health economy.

In addition to cross-regional cooperation, transnational cooperation is also an important means to upgrade Heidelberg's technology. In 2013, a cooperation agreement was signed between André Domin (Illinois Institute of Technology, Chicago, United States of America) and Dr. David Baker in the presence of Rita Athas, President of World Business Chicago and Ralf Kindervater, President of BIOPRO Company in Baden-Württemberg. Dr. Eckart Würzner, the Mayor of Heidelberg and X Scharff, his counterpart in Palo Alto, signed the Smart Cities Alliance at Heidelberg City Hall to cooperate on economic matters, science and the environment.¹⁷

Reference experiences

1. Promote industrial diversification to strengthen urban economic resilience

Although Heidelberg initially faced a lack of economic sustainability and resilience due to the composition of its industrial structure, the process of industrial diversification through the integration of creative industries was key to laying the foundations for the emergence of additional industry, creating a more heterogeneous and resilient economic base. Despite its position as a traditional tourist city, Heidelberg quickly ushered in economic recovery following the outbreak

of COVID-19 due largely to the introduction of a series of emerging industries in recent years. Other cities with varied resource endowments can therefore use the example of Heidelberg as a reference for industrial diversification based on local characteristics and foundations.

2. Understand the value of industrial upgrading through the integration of quaternary sector industry

Heidelberg has seen significant transformation throughout its history and the city has undergone an extensive process of industrial development and diversified industry integration. Where Heidelberg first developed a business conference and exhibition industry based on local assets and cultural heritage, this was followed by the incorporation of biomedicine and other emerging industrial clusters due to the advantages created by science and technology talent from the local universities and industrial bases. The progression in knowledge and technology has strongly influenced life in the city, and has been key in bolstering the capacity and sustainability of Heidelberg's local economy and the wider Rhine-Neckar metropolitan region. In particular, knowledge and innovation among urban and regional industries aims to innovate the spatial compositions of industry, unlock and provision key resources, and drive the advancement of technology and economies to boost the competitiveness of regional industry. Consequently, in an era in which knowledge, technology and innovation are the powerhouses that enhance competition between quaternary industries and therefore, economies, it is important to understand the role of such industry in boosting economic growth and competitiveness.

3. Facilitate the integration of industrial clusters and cross-regional coordinated development

Heidelberg's high-quality industrial clusters and cross-regional coordination strategy help accelerate the city's development. Whilst industrial diversification is a gradual process following the formation of specialized industries, it is necessary to build a cross-regional cooperation network to further accelerate industrial development. According to relational economics, industrial innovation and upgrade is dependent on

¹⁷ City of Heidelberg. URL: <https://www.heidelberg.de> (Accessed: 11/08/2022).

local and external knowledge combined; neither local nor external resources can be overlooked. Cross-regional cooperation in the traditional sense emphasizes the optimal allocation of material factors to promote economic growth. Although the role of technological factors is valued, it emphasizes the importance of technology in driving economic growth in an exogenous way. Cross-regional innovation cooperation states that intellectual capital formed by knowledge spill-over and human capital flow will directly impact the cost of new knowledge capital in a region, thus making technology an endogenous driver of regional economic growth. Facilitating cross-regional innovation cooperation will greatly improve a city's ability to acquire external knowledge resources and establish new knowledge networks so as to improve the city's economic momentum and economic growth potential.

Shanghai, China: Inheritance and Innovation of Century-old Brands in Shanghai's Huangpu District¹⁸

Case background

The core premise of SDG 8 – promoting inclusive and sustainable economic growth, employment and decent work for all, is essential for sustainable development. SDG 8.2, in particular, emphasizes the importance of achieving higher levels of economic productivity through diversification, technological upgrading and innovation including through a focus on high-value added and labour-intensive sectors. SDG 8.3 promotes development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourages the formalization and growth of micro, small and medium sized enterprises including through access to financial services. Since 2015 in an aim to better reach these targets, the government has released new policies that explore innovation and entrepreneurship. On

11 June 2015, the state council issued *Opinions on Implementing Several Policy Measures to Vigorously Promote Mass Entrepreneurship and Innovation* (GF [2015] No. 32). This noted the need for mass entrepreneurship and innovation as a driver for development, a strategy to enrich people, promote fairness and increase domestic prosperity. This is a significant approach to promoting economic restructuring in which a new engine is introduced to drive momentum for development along an innovation-driven development path, and a major initiative to stabilize growth, expand employment and stimulate the wisdom and creativity of hundreds of millions of people to promote vertical social mobility, equity and justice.

China has a population of more than 1.3 billion and a labour force of over 900 million. Every year there are large numbers of college graduates, rural migrant workers, urban residents and retired military personnel out of work hence the potential to transform human resources into human capital is vast. National overall employment is under pressure and structural contradictions are prominent. Mass entrepreneurship and innovation via transforming government functions, and the development of a service-oriented government



Source: Photo provided by the Shanghai Huangpu District Employment Promotion Centre

Figure 3.18 The Old Brands, New Vitality innovation and entrepreneurship campaign

¹⁸ Many thanks to the Huangpu District Human Resources and the Social Security Bureau, the Shanghai Huangpu District Employment Promotion Centre, Tongji University, the Shanghai Society of Sustainability, the Shanghai Public Welfare Entrepreneurship Base, the Shanghai New World Co., Ltd., Yuyuan Inc., the Hengyuanxiang Group, the Shanghai Huaihai Commercial (Group) Co., Ltd., the Shanghai Yimin Commercial Group Co., Ltd., Laofengxiang Company Limited and other relevant departments and old brands for supporting the development of this case.