

# **Coworking Spaces in Germany during the Covid-19 Crisis Utilized for Homeoffice and Homeschooling**

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## **Author's contribution**

*The sole author designed, analysed, interpreted and prepared the manuscript.*

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## **ABSTRACT**

**Aims:** To capture the perception of coworking space (CWS) users during the covid-19 crisis for homeoffice and homeschooling purposes in terms of process, physical evidence and people components of the service marketing mix.

**Study Design:** This is a grounded theory study in nature which explores the users' perceptions of coworking spaces.

**Place and Duration of Study:** Coworking spaces in Germany during the covid-19 crisis between March 2020 and August 2020.

**Methodology:** We included 200 respondents (88 male and 112 female; age range 18-88 years) who used the different services of various types of coworking spaces for entertainment, business and or education purposes as employees, entrepreneurs, retirees or students.

**Results:** Very important for the process are comfort and atmosphere together with cleanliness and safety (Mean 3.48, SD 1.31,  $r = 0.529$ ). The physical evidence mentioned location in terms of access and the facility itself (Mean 3.54, SD 1.11,  $r = 0.650$ ). People (Mean 3.31, SD 1.27,  $r = 0.619$ ) make the CWS function with management, staff and customer mix.

**Conclusion:** Coworking spaces received a big boost during the covid-19 crisis after initial lockdown and will continue to grow in the New Normal with homeoffice and on-line learning becoming the norm while CWS focus on process, physical evidence and people components of their marketing mix.

*Keywords: Architecture; covid-19; coworking spaces; digital divide; facilities management; homeoffice; homeschooling; interior design; service marketing.*

## 1. INTRODUCTION

The virus that was first identified in December 2019 in Wuhan, China spread worldwide. In mid-January, 2020, the first case of SARS-CoV-2 in the U.S. was reported in Snohomish County Washington State. In Germany the first SARS-CoV-2 case was reported January 27, 2020 in Landkreis Starnberg close to Munich, Bavaria. The World Health Organization (WHO) declared the outbreak as a Public Health Emergency of International Concern on January, 30 2020 and declared it a world-wide pandemic on March, 11 2020. As of middle of September 2020, more than 30.5 million cases have been reported in 188 countries and territories, resulting in more than 952,000 deaths; but also more than 20.7 million people have recovered. The only initial response to the virus were curfews, lockdowns and social distancing as there still was no reliable covid-19 test until the summer of 2020 (polymerase chain reaction (PCR) or less expensive Antigen tests) and still no vaccine by October 2020. These lockdowns resulted in homeschooling and homeoffice. Many times parents and children had to share a computer and an internet or Wi-Fi connection. So no wonder that as soon as coworking spaces (CWS) opened again many people shifted from home to CWS. Students as well as entrepreneurs and employees embraced these spaces to escape the cabin fever and the digital divide at home. This study explores how coworking spaces were perceived by CWS users during the corona crisis and what lessons to learn for the New Normal of co-working. As positive results of the covid crisis homeoffice became more acceptable and Germany even wants to provide a legal option for employees to work at least one day a week from home, not to mention the potential of CWS for entrepreneurs and SME as well as student online learning. The number of coworking spaces worldwide is projected to reach almost 20,000 in 2020 with a yearly growth rate of 21.3% according to Coworking Resources and an estimate the total addressable market size at \$1.6 trillion including the value of commercial leases.

## 2. LITERATURE REVIEW

The literature review provides us with the theoretical underpinnings of the study. It looks at the historic development of coworking spaces and the models to analyze them in terms of architectural design and business model design. This helps us to base our research hypothesis on the preexisting models and follow a proven protocol to develop our model and contribute to the existing body of knowledge. [1] with their of study of coworking spaces in Finland created a typology for coworking spaces that became more or less an industry standard that is frequently cited in the literature. They defined six distinguished co-working space typologies which include: Public offices, third party places, collaboration hubs, co-working hotels, incubators and shared studios. In their initial categorization framework they also distinguished between non-profit and for profit business models. We further distinguished between coworking spaces that charged a usage fee and others that made money of the sale of food and beverages (F&B) and other services like Starbucks. [1] categorized the co-working space based on privacy level from public to private rooms. Our study closely followed these categorizations which we found extremely useful. Starbucks in 2010 changed from its policy [2] and provided free Wi-Fi and power outlets to customers which were previously prevented customers accessing electrical outlets [3]. [4] coined the phrase "Working alone together" where he looked at coworking as emergent collaborative activity which takes place like Starbucks but finds a formal home in official commercial coworking spaces where according to Fost [5] and his New York Times article professionals work on their own, but side by side. [6] see coworking spaces as a form of collaborative consumption that changes the way we work and live, especially in the New Normal where it reclassifies work according to Cappelli P. and Keller J.R. [7] predicted in their Academy of Management Review article. This went a long way from the sociological aspects described by Cremin, C.S. [8] when he studied self-starters, can-doers and

mobile phoneys. [9] did not call them phoneys he referred to hot jobs in cool places when he described the coworking space experience. McRobbie, A. back in 2004 saw artists as pioneers of the new economy. [10] looked at global virtual teams. [11] discussed the freelancing expertise of contract professionals in the new economy which may translate into the New Normal. It is also based on a notion of creative cities by [12] when he discusses the cultural industries and the creative class. [9] referred to coworking spaces as social factories. For [13] the coworking spaces became the missing middlemen for communities of practice in a freelance labor market. [14] expressed visions of the third wave of virtual work in their Harvard Business Review article. [15] also explored the creative labor and freelance networks that were made possible through the coworking spaces. [16] called them digital labor and focused on the cultural-materialist perspective, this makes us reflect on the digital divide that became more obvious in the covid-19 crisis. [17] coworking spaces as the buildings and new places of the creative economy. The sum of these buildings form competitive cities like London, New York and Berlin according to Musterd, S. and Murie, A. [18,19] explored the role of coworking spaces supporting work. [20] analyzed of coworking strategies for interaction and innovation, as coworking is a great place for entrepreneurs and SME to get started after the crisis. [21] reminds us of the age differences of the users of coworking spaces, ranging from students who learn on-line to seniors who shop online [22] and receive support from others according to Rosenbaum, M.S. and Massiah, C.A. [23]. [24] explored coworking spaces and new ways of managing. [25] explored proximities in Italian coworking spaces which is important during covid-19 social distancing and goes beyond interior design standards. There is also an extensive body of literature that explores the design aspects of the coworking spaces. [26] discussed how to create a coworking space handbook. This literature addresses architectural [27] and interior design [28] issues as well as facilities management issues [29]. There is also the marketing aspect of coworking spaces that referred to the four Ps of marketing (Product, Price, Place, Promotion) model according to Kottler, P [30], which expanded into the service marketing model that includes the People Perspective, Physical Evidence Perspective and Process Perspective according to Philip Kottler and Kevin Lane Keller [31].

### 3. METHODOLOGY

This study is qualitative in its very nature as it tried to capture the users perceptions of the coworking space based on various dimensions. But the research instrument developed by the primary investigator (PI) is a quantitative measurement. A paper-based survey instrument was developed by the PI and pretested following ontologies, epistemologies, and methodologies described by Decrop, A [32]. The visitors of the co-working space were interviewed by the researcher and the results were captured with paper-based and online instruments in the form of a questionnaires. Using an adapted grounded theory approach for inductive theory building following [33]. While being aware of common method biases according to Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. [34].

#### 3.1 Population

This study included coworking spaces throughout Germany of various kinds in both big cities and rural areas. This provided us with a good representation of the coworking spaces in Germany. As other co-working spaces in Germany are very similar to those visited it is expected that generalizations can be made based on this study. The coworking space their design and operation structure represents the coworking environment that is typically experienced by German coworking customers in Germany. It may be possible to generalize beyond Germany as similar structures exist throughout Europe and other parts of the world which immolate a similar coworking space typology as observed in this study.

#### 3.2 Sample

The study focused on for profit and nonprofit coworking spaces in Germany. The study included coworking spaces in urban and rural settings of various size and design. The survey was conducted during working hours on weekdays. As the majority of coworking spaces in Germany are not open 24/7. The participants were both self-employed, as well as corporate employees and students of various age ranging from high school to college and university age. There were also retirees and housewives who used the coworking spaces for e-mail social media and online shopping. The majority of the visitors were female (56 %) who were under 30 years old with a university education or at least a

high school diploma. But the age spanned from 18 to 88 and included participants of various socioeconomic classes, religious, ethnic and migration backgrounds. The sample size was 200 respondents, the sample was a random convenience sample which represented the demographics of the coworking space visitor population in Germany during the covid-19 epidemic.

### 3.3 Analysis

We used SAS for the statistical analysis of the data and calculated the mean and standard deviation (SD) Pearson correlation coefficient. In statistics, the correlation coefficient  $r$  measures the strength and direction of a linear relationship between two variables on a scatterplot. Where the value  $r = 1$  means a perfect positive correlation and the value  $r = -1$  means a perfect negative correlation.

+0.30. A weak uphill (positive) linear relationship

+0.50. A moderate uphill (positive) relationship

+0.70. A strong uphill (positive) linear relationship

+ 1.00 A perfect uphill (positive) linear relationship

Requirements for Pearson's correlation coefficient are:

1. Scale of measurement should be interval or ratio.
2. Variables should be approximately normally distributed.
3. The association should be linear.
4. There should be no outliers in the data

$$r = \frac{\sum_i (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i (x_i - \bar{x})^2} \sqrt{\sum_i (y_i - \bar{y})^2}}$$

$r$  = correlation coefficient

$x_i$  = values of the x-variable in a sample

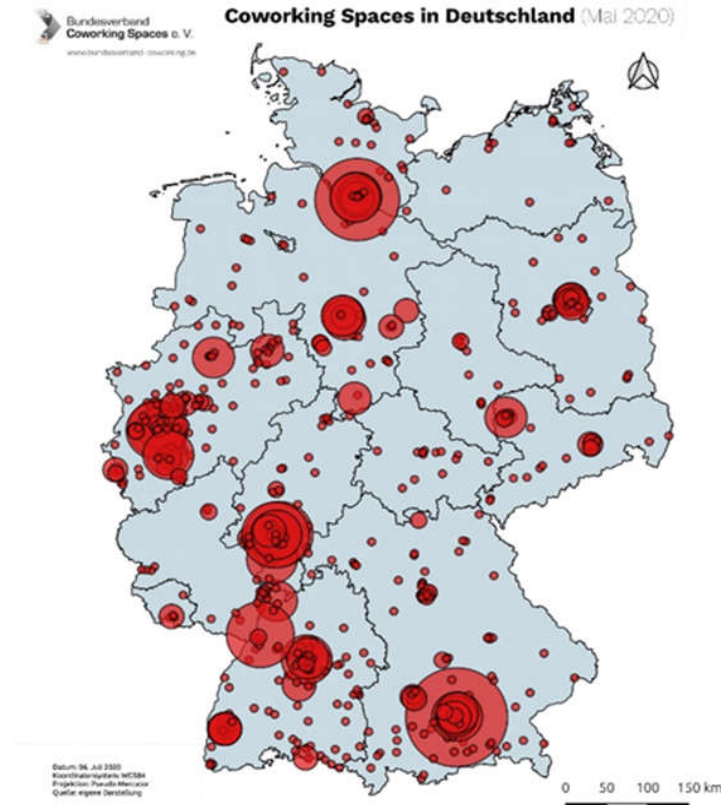
$\bar{x}$  = mean of the values of the x-variable

$y_i$  = values of the y-variable in a sample

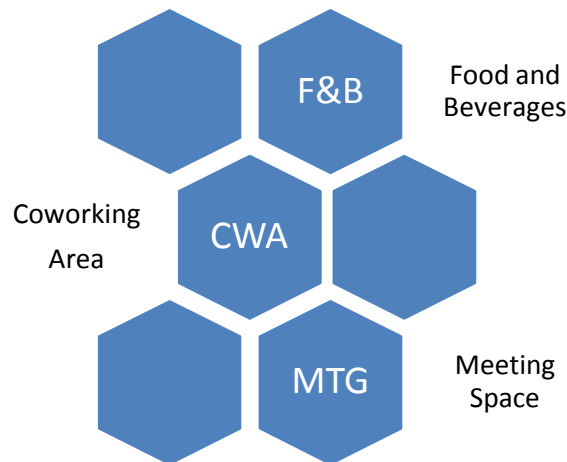
$\bar{y}$  = mean of the values of the y-variable

**Table 1. Demographics Coworking Space Study**

Coworking Space Study Demographics	Respondents (Count)	Percentage (%)
<b>Gender</b>		
Male	88	44 %
Female	112	56 %
Total	200	100 %
<b>Age</b>		
<20 years	38	19 %
21-30 years	62	31 %
31-40 years	24	12 %
41-50 years	36	18 %
51-60 years	20	10 %
61-70 years	14	7 %
71-80 years	4	2 %
>80 years	2	1 %
Total	200	100 %
<b>Education</b>		
High school	44	22 %
Vocational school	12	6 %
University	124	62 %
Total	200	100 %
<b>Occupation</b>		
Student	64	32 %
Self-employed	36	18 %
Employee	84	42 %
Retiree	16	8 %
Total	200	100 %



**Fig. 1. Coworking Spaces in Germany (May 2020)**  
 Source: <https://www.bundesverband-coworking.de>



**Fig. 2. Coworking Spaces (CWS) Functional Areas**

#### 4. RESULTS AND DISCUSSION

The results of the study can be grouped according to the variables in questions of the research hypothesis. These include product, price, place and promotion which are part of the traditional marketing mix for products according to Philip Kotler [30] the father of marketing. But our research focused exclusively on the addition

three Ps of the service marketing mix which includes people, physical evidence and process according to Kottler, P. and Keller, K.L. [31].

##### 4.1 Process

The process of coworking spaces varies and includes various dimensions. It usually starts with the reservation and registration. That means

registration may be required for first time users as well as reservations. Other coworking spaces work on a walk-in basis. Reservation/registration received a mean of 3.49 and SD 1.67. The payment can range from free to cash to credit card and monthly billing received a mean of 3.49 and SD 1.67 and were disagreed on. Cleanliness was especially important during covid-19 times and received a mean of 3.49 and SD 1.67 and was strongly agreed upon. Security and safety which may include, registration for covid-19 tracking, monitoring of users temperature, wearing of facemasks and social distancing. Security had a staff component as well as a technology component in form of close circuit television (CCTV). Security received a received a mean of 3.49 and SD 1.67 and was agreed upon. Comfort is very important, users don't want to spend hours in an uncomfortable plastic chair which also creates an inexpensive atmosphere. Atmosphere and comfort were strongly agreed upon with a mean of 3.48 and a SD of 1.75. The software applications are very important as many times users go to a coworking space as they don't have the proper app on their own computer, for instance to do proper sound or video recording or editing. Also most coworking spaces do not allow you to download and install customer apps. Software applications received a mean of 3.45 and a SD of 0.72 and were disagreed. The process distinguished also for profit coworking spaces or services and public coworking spaces. Public working spaces were preferred with a mean of 3.78 and SD of 1.76 and strongly agreed upon. Overall the importance of process was agreed upon by the participants of the study and received a mean of 3.84 and a SD of 1.12.

The reservation and registration process has a correlation coefficient of 0.215 was found less important among the users. The payment process pretty much the same correlation coefficient of 0.275 as users preferred places with simple payment schemes preferably for free. Cleanliness was almost a straight line with a correlation coefficient of 0.862 very close to perfect. Security and safety were similarly high with a correlation coefficient of 0.709. Atmosphere and Comfort is very important, with a correlation coefficient of 0.779. Software applications received a lower correlation coefficient of 0.356 as they are not as important for all coworking space users... For profit correlation coefficient of 0.379 and public coworking spaces with a correlation coefficient of 0.656 that was very high and shows the strong

preference for public less profit oriented coworking spaces with moderate prices. The process component of the coworking space marketing mix received an overall average correlation coefficient of 0.529 which makes process a moderate uphill relationship.

## 4.2 Physical Evidence

Services are tangible in nature and have physical touchpoints or evidence. Here we looked at the satisfaction with the interior design of the coworking spaces in terms of the Bauhaus form follows function with layout of workspace and design features down to the restrooms (Mean 3.51, SD 0.63) agreed upon. Very important also are very fast (5 Mbps and higher) and reliable internet connections via Wi-Fi and broadband LANs (Mean 3.81, SD 0.71) which are often the reasons to seek a coworking space during covid-19 times was strongly agreed upon by users. The individual work area should have ample space and power supplies as well as a creature comfort (Mean 3.90, SD 0.75) which was strongly agreed upon. According to the survey there also should be appropriate meeting rooms for team meetings and discussions (Mean 3.33, SD 2.45) but was only mildly agreed upon. Ample parking spaces for both cars, motorbikes and bicycles are extremely important along with easy access to major roads and means of public transportation (Mean 3.75, SD 0.72). Food and beverages (F&B) should be also available for a fee or preferably complimentary (Mean 3.46, SD 0.75). Coworking spaces are often frequented to print documents or create large size color posters and displays, it is therefore important that the CWS offers these services as a one-stop shopping service. The same holds true for scanning, copying, and binding services. (Mean 3.33, SD 1.04). The tangible products of the work in the coworking space often need to be shipped via messenger services, postal services or parcel carriers like DHL, FedEx, and UPS etc. Other services may include the sale of computer accessories like chargers, power banks, cables and memory sticks which are required by the user to conduct their business and they are often willing to pay a premium price to have them in times of need, to complete their business without time delay (Mean 3.24, SD 2.05) and was mildly agreed upon as not all users of coworking spaces use these types of services. Overall the physical evidence components received an average of (Mean 3.54, SD 1.11) and was generally agreed upon.

Interior design received a very high correlation coefficient with 0.668. But a strong and stable internet connection was found to be even more important with a correlation coefficient of 0.864. But the second highest correlation coefficient received the individual coworking area. The meeting rooms for group meetings were less important for the participants with the lowest correlation coefficient of 0.427. Parking and access to public transportation received the highest correlation coefficient of 0.896. Food and

beverage services were found less important especially for those services which were not complimentary with a coefficient of 0.463. Printing and scanning were found to be important with a high correlation coefficient of 0.642. Postal services were less frequently used and only received a correlation coefficient of 0.371 which was the lowest. Overall the physical evidence received an average correlation coefficient of 0.650 which is strong uphill relationship.

**Table 2. Process parameters**

Process Parameters	Mean	S.D.	Results
1. Reservation/registration	3.09	2.17	Disagreed
2. Payment	3.05	2.14	Disagreed
3. Cleanliness	3.84	0.71	Strongly Agreed
4. Security/Safety	3.51	0.92	Agreed
5. Atmosphere/Comfort	3.85	0.73	Strongly Agreed
6. Software Applications	3.06	2.22	Disagreed
7. for profit	3.52	0.92	Agreed
8. public	3.91	0.65	Strongly Agreed
Average	3.48	1.31	Agreed

**Table 3. Process Correlation Coefficient Analysis**

Process Parameters	Correlation Coefficient
1. Reservation/registration	0.215**
2. Payment	0.275**
3. Cleanliness	0.862**
4. Security/Safety	0.709**
5. Atmosphere/Comfort	0.779**
6. Software Applications	0.356**
7. for profit	0.379**
8. public	0.656**
Average	0.529**

**Table 4. Physical evidence parameters**

Physical Evidence Parameters	Mean	S.D.	Results
1. Interior Design	3.51	0.63	Agreed
2. Wi-Fi/Internet	3.81	0.71	Strongly Agreed
3. Coworking Area	3.90	0.75	Strongly Agreed
4. Meeting Rooms	3.33	2.25	Mildly Agreed
5. Parking/Public Transportation Access	3.75	0.72	Strongly Agreed
6. Food and Beverages	3.46	0.75	Agreed
7. Printing/Copying/Scanning/Binding	3.33	1.04	Agreed
8. Postal/Other services	3.24	2.05	Mildly Agreed
Average	3.54	1.11	Agreed

**Table 5. Physical evidence correlation coefficient analysis**

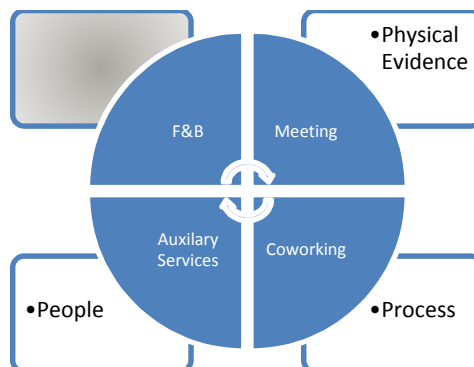
Physical Evidence Parameters	Correlation Coefficient
1. Interior Design	0.668**
2. Wi-Fi/Internet	0.864**
3. Coworking Area	0.871**
4. Meeting Rooms	0.427**
5. Parking/Public Transportation Access	0.896**
6. Food and Beverages	0.463**
7. Printing/Copying/Scanning/Binding	0.642**
8. Postal/Other services	0.371**
Average	0.650**

**Table 6. People perspective**

People Parameters	Mean	S.D.	Results
1. Staff friendly/service mind	3.95	0.51	Strongly Agreed
2. Staff efficient/fast/problem solver	3.91	0.66	Strongly Agreed
3. Management effective/creative	3.33	0.86	Agreed
4. Coworker mix	3.42	0.92	Agreed
5. Homeschoolers	3.53	1.87	Agreed
6. Homeoffice Workers	3.92	0.56	Agreed
7. Gamers	1.83	2.86	Mildly Agreed
8. Social Media/Shoppers	2.62	1.92	Mildly Agreed
Average	3.31	1.27	Agreed

**Table 7. People correlation coefficient analysis**

People Parameters	Correlation Coefficient
1. Staff friendly/service mind	0.875**
2. Staff efficient/fast/problem solver	0.815**
3. Management effective/creative	0.662**
4. Coworker mix	0.709**
5. Homeschooling	0.479**
6. Homeoffice	0.676**
7. Gamers	0.279**
8. Social Media/Shoppers	0.456**
Average	0.619**



**Fig. 3. Coworking service mix model**



### 4.3 People

As in any service business the people make the difference so it is no wonder that the people component received high scores. Very important with the highest score were friendly service minded employees (Mean 3.95, SD 0.51) which was strongly agreed upon. Similarly high were the scores for the efficiency of the staff and their ability to solve problems (Mean 3.91, SD 0.66) which was also strongly agreed upon. Management appeared less important with a Mean of 3.33 and a SD 0.86 which was agreed upon. The coworker mix appeared to be important for the participant and agreed upon but not crucial with a Mean of 3.42 and SD of 0.92. Also the students who use the coworking space for online learning were agreed upon but not a serious consideration for most participants with a Mean of 3.53 and a SD of 1.87. Homeoffice workers at the coworking spaces formed an important people component with a Mean of 3.92 and a SD of 0.56. There were also individuals who used certain coworking spaces but not all for various gaming purposes and had a Mean of 1.83 and a SD of 2.86. Also individuals who came to coworking spaces to use social media as predominant reason scored with a Mean of 2.62 and a SD of 1.92 were mildly agreed upon. Overall the people perspective of the mix received a Mean of 3.31 and a SD of 1.27 and proofed to be an important component of the overall coworking space mix.

Staff friendliness and service mindedness received a very high correlation coefficient of 0.875. Similarly high also ranked staff efficiency and their ability to solve problems with a coefficient of 0.815. The effectiveness of management ranked lower with a coefficient of 0.662. The coworker mix was important for participants with a coefficient of 0.709. User who were in the coworking space for learning and homeschooling purposes during covid-19 received a coefficient of 0.479 while homeoffice from the coworking space received a higher coefficient of 0.676. The presences of gamers in some coworking spaces received a coefficient of only 0.279 and the social media users and on-line shoppers in the coworking space a correlation coefficient of 0.456. Overall the people component averaged with a correlation coefficient of 0.619. These results will be discussed more in detail in the following conclusion part of the paper.

### 5. CONCLUSION

As the study was conducted during the covid-19 epidemic special attention was given to the safety and cleanliness aspect by the respondents. Social distancing and limitation on maximum capacity of coworking spaces also played an important role. Wearing masks and frequent cleaning and disinfecting of the space. Seating arrangements that allow social distancing as well as controlled movement in the space mostly in a clockwise direction with signage. There were many first time coworking space users during the corona crisis created by the need for homeschooling and homeoffice, as well as online shopping to purchase items from otherwise closed brick and mortar stores. Even watching movies in CWS became an important occupation during the corona crisis as cinemas were closed for a long time due to the lockdown. Coworking space users included freelancers, both remote working entrepreneurs from small-to-medium sized enterprises (SME) and start-up teams, as well as remote working corporate employees. Coworking spaces also played an important role in terms of business continuity and agile recovery solutions during the covid-19 crisis. The coworking spaces in the study included formal and informal, public and private conventional coworking spaces, ranging from library style spaces that cater to civic needs like education to fancy private club coworking spaces with club facilities like pool and sauna and fitness center. Coworking spaces offer affordable small open workspaces to individual serviced offices with conference rooms, private meeting rooms, for large corporations, with janitorial services. Food services, kitchen, bistro and cafeteria with complementary tea/coffee to fresh brewed coffee and cappuccino, or Starbucks type coffee shops. Another extreme are business centers for start-up entrepreneurs, teams and corporations, with a mailing address, locker, phone booth, business phone with direct dial-in (DDI), office supplies, receptionist to full secretarial services.

There are various coworking space cultures for audiences ranging from students, professionals to retirees. Calm and professional places for more mature professionals while for younger crowds DJ, pizza, happy hour and meetups to foster the startup culture. Coworking spaces also carry different price tags from free to daily, weekly and monthly memberships that can cost several hundred Euros for all-inclusive packages. Websites like Easycowork help users find the appropriate coworking space, ranging from hot-

desk to dedicated desks and private offices in swanky industrial warehouse-like workspaces. Opening hours of coworking spaces are still limited in Germany most of them open 9 am to 7 pm, some 8 to 8 if you are lucky with weekends and holidays closed. 24/7 if you rent the space on a monthly basis and have your own key or access card. The term coworking space nowadays has as many variations as when we talk about restaurants, they come in various forms and shapes this is the point we want to make with this study which was reflected in the answers to the mix of process, people and physical evidence.

## CONSENT

As per international standard or university standard, participant's written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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