The Evolution of Kitchen Design

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MASTER'S THESIS
The Evolution of Kitchen Design-
Exploring the Development of Kitchen Spaces and its Progression Towards the Future

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ABSTRACT

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This thesis explores the evolution of spatial design in kitchens and discusses the influencing factors associated with these developments. The aim of this work is to give an overview of the developments in domestic kitchen spaces to better understand where it originates, and what makes it relevant in today’s terms of interior architecture. The work concentrates on advancements occurring in Western society and follows a linear time frame in design history. The chosen research method is qualitative, as it is based on literature review, with the support of audio- and video media analysis for data collection. The results reveal a variety of findings related to kitchen spaces, which divide the thesis into three sequential sections. The first section will open the topic by investigating premodern kitchen spaces and their functions, while the second section examines how modernism changed the appearance and layout of kitchen spaces. The third section will elaborate on ways kitchen spaces have adapted to the current living situation and what could be the future scenarios related to home kitchens. It becomes eminent in the research that design principles and innovation are closely related to factors reflected in the occurring eras. For that reason, examining our contemporary kitchens and contemplating on future solutions, new sets of alternatives are rising that address factors like small living, climate change and collectivism, which all-in-all apply in how kitchens are used and designed nowadays.

Keywords: premodern kitchen, kitchen design, kitchen efficiency, kitchen history, kitchen functions, kitchen innovations, Frankfurt kitchen, modernism, feminism.
INTRODUCTION

Kitchens – what was once a purely hidden utilitarian space has now become a space of living, expressing its owner’s relation to food, and encouraging interaction. Kitchen spaces are focal points when it comes to housing design by its necessary functions to the communications and the social aspect around it. From the analysis of spatial design in kitchens a lot can be delineated; its layout, devices, applied materials and functions can give away the era it belongs to, as well as dictates the rhythm and style of kitchen work and living.

The aim of this thesis is to show how spatial design in kitchens affect various factors in its user’s day-to-day life. The work discusses the spatial role of domestic kitchens in Western society and its design developments following a linear time frame. It investigates how societal changes and modern movements have influenced kitchen design and, on the other hand, how kitchen design has indirectly influenced women’s position in society. The work is divided into chronological sections, which move along time and elaborate on its spatial transformations.

Firstly, the research starts exploring the formation of a European premodern household to detect the establishment of a kitchen space within a home by asking: what kind of functions did a premodern kitchen have? An understanding of the principles and appearance of a 19th century kitchen will be given, followed by suggestions for improvement from its contemporaries. As initial ideas of efficiency will arise, the thesis discusses how industrialized work theory connects to kitchen labor, and how the results affect further design decisions regarding kitchens.

Secondly, the thesis continues moving forward into the 20th century with its advantages linked to society’s widespread industrialization. The second section introduces the concept of modernism and shows the spatial changes corresponding to the movement by asking: how does modernism reflect in kitchen spaces? Furthermore, the section will continue to move closer to kitchens we know nowadays, yet with examples of excessive advances to the culmination of kitchen spaces breaking the barrier with living rooms.
Thirdly, the last section will discuss where kitchen design has evolved so far and what could be learned from the previous movements. By looking into current living concepts and design trends, alternative movements like small living or collectivism emerge, which are reflected in kitchen spaces. As housing situations are in change, another curtail topic concerns the environmental scale behind design decisions. Thus, the third section will argue how the spatial design of kitchens responds to current movements by asking: what kind of factors influence today's spatial design in kitchens, and how are they implemented? Seeing as there are many alternative concepts to domestic kitchens, it is thought provoking to look back to where kitchens came from and contemplate on where they are heading next.
1. THE PREMODERN HOUSEHOLD

FORMATIONS OF PRIVACY

Domestic interiors could be considered as documentations of its time, being spatial vantage points to understand the occurring characteristics of a century. Back in the day when a home settlement resembled a self-maintaining system of working and living all at once, specifically fixed spatial arrangements were lacking in a household.¹ An understanding of comfort was of systemizing one’s spaces by dividing working, dining, and sleeping areas to its convenience, prioritizing working over intimacy.² In addition to the nuclear family, servants, employees, distant relatives, and adopted acquaintances used to live all together, which indicates the poor amount of privacy members of the household had. In primitive houses one room served all purpose (see fig.1), but if a family could afford more than a single room, specific functions related to work were divided between rooms, around which everyday life revolved.³ (see fig.2) Next to work and living the fireplace has always been a significant feature to a home, for it served the heating and cooking purposes for a household.

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² Chartier, 1989.
Changes and enhancements of society dictate the rhythm and style of living. For example, the Renaissance era created deeper emergence of individualism and self-consciousness that set new attitudes towards the conception of personal space.\(^4\) It influenced individuals to seek more privacy, which encouraged the desire for one to arrange its domestic spaces accordingly.\(^5\) New considerations related to one’s domain led way for gradual changes to become more defined and permanent. For instance, differentiating working rooms form living spaces led way for homes to have multiple chambers, rather than one big room, and therefore dwellings formed public and private zones.\(^6\) As a home formed numerous and smaller rooms, inhabitants started to draw additional attention to furniture according to the function of the space, and the setting of interior decoration became a way of personalizing one’s space - claiming one’s place in space, as a sign of individualism and comfort.\(^7\) Divided and well-equipped homes, with some form of room décor and furniture design were signs of a new way of life and living, in comparison to homes operating as workshops, which provided shelter. (See fig.3) Therefore the way a home appears and operates corresponds to factors and expectations related to the outside world of a home.

\(^4\) Chartier, 1989.
\(^5\) Currie, 2006.
\(^6\) Chartier, 1989.
\(^7\) Ibid.
In European urban environments due to the first Industrial Revolution, work gradually moved away from the dwelling, leading to a greater distinction between the public and private spheres compared to previous times. Consequently, the concept of home evolved into a space primarily intended for rest and relaxation, and the value of privacy emerged as a desirable quality.\(^8\) This meant assigning the public sphere predominantly to men, and associating the home as a sphere for women.\(^9\) When both the home responsibilities and family business were performed inside of the household, the sexual division of labor was not perceived as subjugation to one gender, because men and women shared the tasks regarding domestic chores and the family trade side by side.\(^10\) Unfortunately when the home and workplace became separate spheres, marital equality ended among men and women, because of the uneven amount of work and different

\(^8\) Ruudi, 2020.
\(^10\) Ibid.
A woman’s duty was considered staying home, taking care of the household and the children, which culminated into carrying out responsibilities while the men left home for work as well as when they returned home to rest. It was regarded as a sign of poverty and shame if a woman worked outside of the home, meaning that societal norms related to status and family affairs captivated women into working constantly for the benefit of the family.\textsuperscript{12} The bond between the home domain and the family was tightly united, referring to one of the reasons why the size, appearance and management within one’s home represented a family and its position in society.

\textsuperscript{11} Prost & Vincent, 1991.
\textsuperscript{12} Ibid.

Fig 4. Seymour Joseph Guy \textit{The Contest for the Bouquet} from 1866.
The mistresses leading roles of a household was orchestrating every day ceremonies such as family meals, and other social occasions that constituted the family’s relations with the outside world. Middle-class families generally employed three servants for household duties, but if there were means for only one, then the housewife handled chores along with the help. The ritual of dining dictated the tempo of life, and meals were not just a consumption of food, but a family occasion in an agreeable atmosphere, for which the mistress was responsible of. The reasons why mealtimes were important family engagements were firstly due to the lack of time men had for their families next to responsibilities outside of the home, making dining the event of the day for all of the family member to come together. Secondly, it was to educate the children of the household to act civil through the course of dining: correct attitudes, gestures and forms of speech were practiced through the ritual of eating along with family members evaluating the maturity of each child by the way they corresponded. Thirdly, social engagements were held along with dining; visits from relatives or guests happened through the ritual of eating together, setting certain expectations to the act that involved details from cutlery to the served meals.

Clearly dining was a big part of a family’s daily life, and a ritual for socializing. The planning, preparing, and cooking beforehand demanded a great deal of

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13 Perrot et al., 1990.
15 Perrot et al., 1990.
16 Ibid.
17 Ibid.
18 Chartier, 1989.
attention and energy, since kitchen work was challenging due to the elementary techniques used in the 19th century. Housewives were either dependent on employing staff or constantly working themselves from one meal to another. Once the food was ready, it was expected to be served either by staff or by the housewife herself in poorer households. (See fig. 5)

KITCHEN FUNCTIONS

The housewife was expected to encompassed delicate elegance and unnoticeable competence while running her household and staff; “Like the mechanic at the opera, she controls everything that happened, yet no one sees her doing it.” Such commitment involved systematic approach, imagination, and skill. When it came to making food for the whole family it was hard to achieve with a single pair of hands, which is why employing staff was of essence to any family who could afford it. The complexity of kitchen work next to the primitive nature of preparation tools was the reason why the job was laborious and gradual. In the 19th century mechanized technology for cooking and storage didn’t exist, meaning food had to be handled immediately stopping it from spoiling. As for the central hearth, it was still functioning as a heater and a cooker making it a significant element in living spaces. The position of the chimney was supposed to double as a heat source and duct for more than one room, which is why the position was located well inside the house and away from the windows, making

it difficult to ventilate the kitchen from heat and smoke.\textsuperscript{21} For that reason kitchen spaces were kept well separated from the living headquarters with its related smells.\textsuperscript{22}

The nature of kitchen work was considered dirty and dangerous manual labor, because of the open fire and the unorganized placement of things.\textsuperscript{23} Kitchens were either positioned in the basement, or on the first floor facing the inner-yard, firstly, because being considered as a secondary space, it was placed to a more shady and hidden part of the dwelling, near the servants rooms along with the scullery, larder, and the pantries.\textsuperscript{24} Secondly, the circulation related to scullery and rubbish happened through the service entrance, which was connected to the kitchen, away from the eye and only for staff to use.\textsuperscript{25} The spaces were full of cooking appliances like stoves, roasting ranges, turnspits and hot cupboards, but lacking mechanized devices for washing, ventilation or refrigeration.\textsuperscript{26} Complex preparations with raw materials like butchering and feathering poultry was done, water was pumped in by hand and food was kept cool in iceboxes in the north facing larders.\textsuperscript{27} Next to preparing meals, kitchens were also used for other housekeeping chores like washing the laundry and maintaining the fireplace for heating. They were spaces full of manual tools for detailed work, running as autonomous workshops, cooking everything initially. (See fig. 7)

\textsuperscript{21} Bech-Danielsen, 2012.
\textsuperscript{22} Ibid.
\textsuperscript{23} Ibid.
\textsuperscript{24} Ibid.
\textsuperscript{25} Cieraad, 2002.
\textsuperscript{26} Baden-Powell, 2005.
\textsuperscript{27} Ibid.
A space in need of such attentiveness drew a considerable amount of awareness and planning. Considering that architects who planned and constructed housing during that period were all mostly men, it is no surprise that their perspective on kitchen work might have been closer to an ideal of home management, rather than the reality of it, simply because their relationship with home related chores was distant. Kitchens with its utility rooms were dealt with in a general sense, meaning that the positioning on a floor plan was according to its function and hierarchy, but when it came to spatial planning, like the placement of cabinets, cupboards, utensils and work surfaces, the layout was inconsistent. An erratic placement of things has later noted to be the cause of making kitchen work more tedious and time consuming. The need of a well-functioning domestic kitchen space wasn’t recognized by its contemporaries, because managing a home wasn’t treated as a professional act, rather than the priority of housewives.

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28 Mars & Thornton, n.d.
SYSTEMIZING A DOMESTIC KITCHEN

Women who had greater access to education and a more varied life outside the home started noticing details, which could generate a more systematic approach regarding household work. A refined placement of things in service kitchens on trains or ships was an indicator of how coherent domestic kitchen work could be if it were to follow similar guidelines. Catharine Beecher (1800-1878), a teacher who promoted equal access to education for women as opposed to men, was inspired by a galley kitchen on a steamship (see fig. 8). It encouraged her to think further of firstly how to apply such efficient measurements to domestic kitchens, and secondly that household work should be considered as a form of science on its own.29 Being an exemplary educator she published a book along with her sister Harriet Beecher Stowe (1811-1896) called The American Woman’s Home (1869) that discusses domestic economy from a woman’s perspective.30 Such literature was the first considerable step towards analyzing housework and management with the aim of improvement and efficiency.31

Fig. 8 An example of a galley of the Austrian passenger ship SS Africa in the Mediterranean Sea

In The American Woman’s Home, the Beecher sisters envision a small model house (see fig.6) with interiors that reveal detailed treatments for areas often ignored by

29 Tucker, 2014.
30 Ibid.
31 Ibid.
male designers of the 19th century. The concept of living described in Beecher’s book was ahead of its time; primarily because the model represented ways of economizing time, labor, and expense by the close packing of conveniences one can have in their house, which was a relatively small and functional dwelling. An open floor plan and movable screens made it possible to use one room with several purposes, together with the kitchen in the center, which was divided by sliding doors keeping unwanted smells away. An important feature that Christine Beecher took along from the galley was the kitchen’s logical furniture and storage layout, meaning everything was of hand reach and placed by theme.32 Open shelves were lined along the kitchen walls with precisely noted boxes holding cooking utensils and commonly used food supplies like flour and cereals. It was described as a better and economical solution to have visible and easily accessible storage, rather than using cluttered drawers.33 (See fig. 9) The kitchen layout was composed of two small spaces separating its cleaning and cooking functions, and the central positioning emphasized the idea of being close to the dining area, minimizing the length one would have to walk between rooms.34 (See fig. 10) Beecher also places windows above the cooking counter for ventilation and better lit working conditions, which, as ideas, became a model for many subsequent designers later on.35

Systemizing kitchen work by making it more comfortable, functional, and understandable was considered eye opening. From the wide spread of ideas addressed in *The American Woman’s Home* housework became subjected to further research and study. The benefit of such attention started being apparent, which motivated more housewives in defining further places of improvement for the sake of better home management. By virtue of Christine and Harriet Beecher conveying home organization as a form of domestic science, designers, household engineers and architects also started to write about domestic management with an emphasis on efficiency and labor-saving design.36

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33 Ibid.
34 Ibid.
36 Ibid.
CONNECTING EFFICIENCY WITH KITCHEN DESIGN

With the Second Industrial Revolution coming along, systemizing work for better results became common knowledge in industries. The encouragement for further analysis and practical spatial arrangements connected to home economics started being associated with Frederick Taylor's (1856-1915) general principles of industrial efficiency, for example: in order to increase productivity a worker must be provided with proper tools, equipment and work areas.\textsuperscript{37} Taylor's Scientific Management Theory promoted the idea that there is “one right way” of doing things from what Taylorism, a wide-spread management system, developed and influenced the whole world during the 19\textsuperscript{th} century. F. Taylor determined the best ways for a worker to do its job in a factory, conducting motion-studies on them in precise conditions only to reveal that a human is most efficient when performing an ongoing machine-like routine.\textsuperscript{38} The American

\textsuperscript{37} Taylorism | Efficiency, Time-Motion Study & Productivity, 2023.
\textsuperscript{38} Ibid.
efficiency ideology had a huge international impact, not only to the industrial organization, but also on every aspect related to the organization of labor.\(^{39}\) These findings inspired designers to start implementing efficient solutions to everyday life use, which in turn reflected on how the layout of dwellings could be rethought, especially when it came to service spaces like kitchens.

Christine Frederik (1883-1970), an American home economist and an exponent of *Taylorism*, was responsible for finding solutions between efficiency and kitchen design. First as a spouse of an engineer, it is noted that she overheard a conversation between men about the principles of efficiency, which gave her an opportunity to get more familiar with the concept, thus shaping her further career as a home economist.\(^{40}\) She published two influential books, starting from *The New Housekeeping: Efficiency Studies in Home-management* in 1914, followed by *Household Engineering: Scientific Management in the Home* in 1915, demonstrating how a kitchen had to be designed in-order to become an efficient workshop, requiring the workforce of only one well-trained woman. One of her prominent statements about home-management was that if housekeeping was reformed according to the principles of efficiency it would turn a simple housewife into a respectable professional manager of household affairs.\(^{41}\) The secret to an efficient kitchen, according to Frederik, was to arrange everything for the cooking of a meal on one side of the kitchen, and all you need for dish-washing on the opposite side.\(^{42}\) Because of the main two activities were food preparation and cleaning, the circulation around the kitchen had to proceed from the two functions, in Frederik’s opinion.\(^{43}\)

\(^{39}\) Cieraad, 2002.

\(^{40}\) Ibid.

\(^{41}\) Rutherford, 2000.

\(^{42}\) Cieraad, 2002.

\(^{43}\) Tucker, 2014.
She also conducted motion-studies by analyzing walking patterns within kitchen work, to understand how to arrange kitchen cabinets, the sink, and the cooking range in a logical order, saving unnecessary crisscross steps for the housewife in notion. (See fig. 11) Frederik’s work became exemplary due to the creation of sophisticated material dedicated for principles of a labor-saving kitchen. Her statement on how an efficient kitchen could transform a housewife into an upright manager also gained popularity amongst women during that time, for it signified an opportunity to gain a higher status in society than just being a housewife. It was proven in later practices that Frederik’s principles were taken under account in prominent architectural examples like in the Haus am Horn kitchen by George Muche and in the Frankfurter Küche by Margarete Schütte-Lihotzky. At first glance it seems like Christine and Harriet Beecher’s initial publication, along with Christine Frederik’s studies were not particularly big, yet addressing the importance of organized home-management, as well as working out a meticulous plan on how to apply efficient practices in real life, created a solid foundation for future design practices. Those practices initially became a starting base for future designers who were working out solutions that could change people’s quality of living in the following 20th century.

Fig. 11 Examples of poorly- and well-organized kitchen floor plans, demonstrating the circulation based on steps one takes in between tasks according to the layout of a kitchen. From the Household Engineering book.
2. KITCHENS BECOMING MODERN

THE RISING ROLE OF DESIGNERS

Throughout the second half of the 19th century until the break of World War I, kitchen design remained consistent, except for the conduct of research around the realm. A big game changer in design generally came due to the technological advancements and social implications from the continuing industrialization of society and the economical scarcity resulting from the World Wars.

With the widespread emergence of new sources of energy like electricity, gas, and oil, it promoted innovative development of automated mechanization. The rising demand in the job market linked to industrialization drove large numbers of people to cities seeking for work, and due to mass resettlement, industrialists, architects, and designers had to find ways to ensure basic living conditions for new city dwellers.44

The question of whether to switch to mass-production or stay with quality-focused sourcing in design were in conflict.45 In Germany, Deutscher Werkbund was founded in 1907 by architects W. Gropius (1883-1969), P. Behrens (1868-1940) and others in-order to reconcile these contradictions of the two disciplines, which weren’t resolved before the break of World War I. As Gropius was convinced that the fundamental conflict between industrial design and artistic freedom could not be resolved quickly, he saw the need of contributing to the topic long-term and founded Bauhaus in 1919, which would raise a generation of creators who would be competent in both fields.46 In the midst of political uncertainty and poverty, progressive artists in Germany began to reorganize cultural life. The ethics and social role of designers began to be conceptualized in a new way; it was apparent to Gropius from his handwritten manifest that “The ultimate goal of all art is building.”47 Bauhaus disciplines and style influenced the world to a great extent; not only did the design language modernize and improve, the role and

44 Forgács, 2022.
45 Helvert, 2016.
46 Forgács, 2022.
47 Gropius, 1919.
responsibility of a designer in society also advanced. It was noticed how the use of materials and resources in designing had a strong effect on economy, that in turn played an important role in shaping a new way of life, especially within the countries in Europe recovering from the losses of the I World War. In the contributions of devising the new way of living, designers were facing challenges from how to find solutions to the real material needs of people to finding ways of unifying class society. From the first half of the 20th century design solutions were closely based on choices reflecting socialist ideas with an emphasis on efficiency and economy.

A NEW WAY OF LIFE IN KITCHENS

Margarete Schütte-Lihotzky (1897-2000), well known for designing the Frankfurt kitchen in 1927, had a complex vision behind the design concept of an efficient kitchen. When receiving an offer to work in the Frankfurt project design team, her vision on the initial requirements for a new kitchen concept was that it had to be based on scientific principles and on the ideal of a rationalized economy. She visioned kitchen design of the 1920s to be created in a labor saving way, resembling a Taylorist work area where every movement is calculated and measured. Her visions were firstly justified by her strong political and feministic convictions, and also by recognizing needs brought about by social changes. The demand of rationalizing and streamlining work in kitchens was due to the opportunity of more women entering the labor market after the First World War. Women started having choices to fulfill oneself outside of the home working in factories, rather than being just a homemaker or working as a maid in a wealthier household. That considered, many middle-class homes were starting to lack suitable candidates to hire as staff, meaning housewives were to get by on their own, juggling between work and family life. In coordination with kitchen tasks and a tight time frame, an efficient spatial plan needed creating

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48 Helvert, 2016.
49 Ibid.
50 Lihotzky, 1921.
51 Henderson, 2016.
52 Cieraad, 2002.
53 Bech-Danielsen, 2012
in-order to able one person to bare a work force of several people. That taken under account, in Margarete Schütte-Lihotzky’s opinion, the answer to ease kitchen work was making technological enhancements, like electrical appliances available for every household, also to the working class. Her compact yet clever design schemes involved an electrical stove, water boiler, an ironing board and electrical lighting, which all in one was a rarity to see even in middle-class homes. Schütte-Lihotzky was convicted that such amenities could be planned in a social housing program if budgeted rationally, and that every individual in society, despite their class, is worthy of good living conditions. The designer convinced needed city administrations after numerous battles of debate, and the exemplary Frankfurt kitchen was born. It might just be that transforming a domestic kitchen so broadly became a wider statement of social egalitarianism, considering that the planned kitchen was initially for a social housing project. Besides, let’s not forget that kitchen work in general was still foreseen as low, from which Margarete Schütte-Lihotzky wanted to liberate women, by creating a design that could reduce women’s workload. Thus, the reasons why the Frankfurt kitchen is still talked about isn’t only because of the design, but also about the decisions behind its design, that sparked larger debate in society.

THE FRANKFURT KITCHEN

The source of inspiration for the Frankfurt kitchen (1926) was like its predecessors. Margarete Schütte-Lihotzky gathered her ideas from studying galley kitchens on train wagons, as did Catharine Beecher on ship galleys for her attempts to organize a domestic kitchen. The Frankfurt kitchen was an advanced example of its time due to consisting out of precisely functioning modules and by involving built in features supporting modern technology. (See fig. 12) The kitchen has also been strongly influenced by Taylorism and the subsequent work of Christine Frederik; it is regarded as a brilliant example of the application of scientific management to the residential kitchen.

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54 Henderson, 2016.
55 Hochhäusl, 2013.
56 Henderson, 2016.
57 Tucker, 2014.
In the space the housewife was surrounded by interconnected work surfaces with features like an integrated meat grinder, cutting and ironing boards, a shaft connected to the trash bin, and a swivel chair to sit on. A window was planned inside the kitchen for the natural light to cast straight onto the working surface, similarly, as it was planned out in the model house of Catharine and Harriet Beecher a century earlier. Schütte-Lihotzky designed small metal drawers with direct access to needed grains and spices along with cabinets storing dishes above the sink, and pots and pans stored near the stove – figuratively, the floor plan resembles a compact machine tool fueled by a zealous single worker going by a strict circulation and planned tasks. (See fig.13) Most importantly the goal was to be inventive, innovative, and rationally budgeted, so the design could be accessible and affordable for any household despite class. The Frankfurt kitchen was a space planned solemnly for one person to conduct traditional kitchen work, so for that reason the space was small and calculated, reflecting an ideal that Schütte-Lihotzky wanted to fit in its reality.

Fig. 12 Established example of a Frankfurt kitchen design exhibited in MoMa in Counter Space: Design and the Modern Kitchen, 2011.
The renewed kitchen design received lots of attention and alterations. In the Netherlands, for example, a Dutch architect J.W Janzen was instructed to adapt the Frankfurt kitchens standards to the requirements of a typical middle-class Dutch household, which was deeper and narrower for the German kitchen shape, thus creating the so-called ‘Holland’ kitchen in 1929. (See fig. 14) Janzen’s design, in comparison with Schütte-Lihotzky’s features, separated strictly the organization of cooking and washing, so the food processing line was placed on the opposite side of the cleaning line. A cabinet next to the built-in refrigerator was covered with a foldable top self for easy access to the cutlery below, and also a service hatch to the living room was another attribute, that the Frankfurt kitchen lacked. The Holland kitchen was praised in many aspects, with its wooden worktops and coupled sinks in combination with a modern swivel tap for the heavy duty of bucket filling. According to the Netherlands Research Institute of Domestic Labor, who hired J.W Janzen, the Holland kitchen was a true factory of the household. Conclusions drawn from the popularity and mass-distribution of the first standardized kitchen confirms its importance and reform of how future kitchens started to be perceived along the way. The Frankfurt kitchen was a huge sensation inspiring imitation next to Holland also in Sweden, Belgium, Britain and in the Soviet Union.

58 Cieraad, 2002.
59 Ibid.
60 Ibid.
In hindsight the Frankfurt kitchens success lied behind its modularity, production, and affordability, however, when it came to reducing the workload for women and rapidly adjusting household management to electrical appliances, the kitchen can be perceived critically. Firstly, coming back to Christine Frederik and her goal behind developing an efficient kitchen; she was encouraged by the idea of heightening a housewife’s status to a professional managers level if one would be of control over a very well-organized kitchen. This was at first seen as a positive benefit for women in society, yet nothing significant, since it intended the woman to only pursue her ambitions inside the home realm. As Margarete Schütte-Lihotzky followed Frederik’s conducted research, she as well intended only women to work in the kitchen, but this time alone; her intentions to save time from unnecessary steps and with the help of new appliances wasn’t so timesaving. The design unfortunately isolated women in a narrow workshop, forcing them to conduct repetitive movements just like a factory worker, but without a salary.  

Thirdly, while women were surrounded by new electrical appliances and integrated features like the ironing board, expectations for their work grew higher. Not only could the wife roast meat in the oven, but iron table napkins in addition to preparing dinner. The electrical appliances did make a difference in cooking with a flick of a switch, yet they also made a household dependent on more expensive energy. Apparently there where families in fear of living in a modern household only dependent on electricity or gas, for the reason

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63 Mars & Thornton, n.d.
of being left empty handed when the times got tough to pay the bills.\textsuperscript{64} The modern Frankfurt kitchen was not adapted to go back on wood heating, therefore excluding less secure families.

Lastly the modularity and standardization that came along with the Frankfurt kitchen design influences our kitchen layouts still to this day. It is apparent that domestic kitchens benefited from flush working surfaces, which were handy, ergonomic, and cleaner than before. The compactness of storing needed equipment, assigning tools and foodstuffs to a specific position did create more clarity to kitchen work from what there was no turning back. Ultimately the functionality of the Frankfurt kitchen set a milestone for further kitchen design development. Moving forward in time a templet of the Frankfurt kitchen will be present in future modifications, which is why Margarete Schütte-Lihotzky aspirations are still topical to the following modern periods.

MODERNISM REFLECTING IN KITCHENS

When architects in the 1920s and 30s developed modern architecture, the wealthy was not the only considered client anymore. Housing for the general population was coming more on the agenda, since urban areas were rapidly growing and people were in need of fit living spaces.\textsuperscript{65} At the start of the period, tuberculosis was a disease closely associated with the fast growth of industrialization and a poorly nourished urban working class who lived in insanitary and overcrowded conditions.\textsuperscript{66} The pursuit of a more hygienic way of life was the objective of architectural modernism to improve the welfare of society as a whole.

The health movement held distinctive importance when it came to material development and spatial arrangements in interiors. \textsuperscript{67} Fundamental demonstrations in the modernist movement were the reflection of desires to change our living spaces to be safer, more practical, and visually holistic.\textsuperscript{68} The

\textsuperscript{64} Mars & Thornton, n.d.
\textsuperscript{65} Bech-Danielsen, 2012.
\textsuperscript{66} Campbell, 2005.
\textsuperscript{67} Ibid.
\textsuperscript{68} Architecture of Health, n.d.
health movement’s program was an anticipation for functionality where an emphasis on hygiene came to the foreground of architectural thinking, meaning that simple and practical constructions were designed for achieving open living spaces where a fair amount of sunlight and air could penetrate each unit in a dwelling.69

Technological improvements eased the extensive use of materials like aluminum, ceramics, glass, and rubber, which brought fresh qualities into architectural design and its interiors. When it came to kitchens, more attention started to be drawn on work surfaces. Worktops started to be covered more with easy-to-clean materials like linoleum, and walls just above worktops started being tiled to protect them from excessive splashes. Even colors were believed to have hygienic properties. Schütte-Lihotzky alleged that her deep blue Frankfurt kitchen cabinets were able to repel flies, for example.70

Working out solutions for a healthier way of living, architects at the time concentrated on details that aided people in staying healthy, such as large windows with lots of sunshine or roof terraces allowing easy access to fresh air. Le Corbusier (1887-1965), for one, developed fundamental elements defining the modern style, he realized them, among other projects, in well-known single-family homes to apartment buildings, one of which was Villa Savoy (1929-31). The reason why Villa Savoy is generally a highlighted example of modernism is due to the apparent ‘Five Points’ symbolizing modern architecture, yet it also stands out from its design considerations linked to the hygienic movement. Details that come out especially in the kitchen points out the importance of ultimate cleanliness. The kitchen is a clinical example of converting into a laboratory-like workspace where the

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69 Campbell, 2005.
70 Bell & Kaye, 2002.
walls and kitchen tables are tiled. An almost sterilized atmosphere is cloaking the room, without ignoring its functional nature.\textsuperscript{71} (See fig. 15, 16) For Corbusier the kitchen was an eminently practical place, where social interaction took place: “The kitchen is not precisely the sanctuary of the house but is certainly one of the most important places. Kitchen and salon – these are the rooms which are lived in.”\textsuperscript{72} Thus, designing it with care and attention reflects to the general well-being of a household.

As the modernist design revolution altered ideas for a greater future, a phenomenon comes up in mind when looking at kitchens apart from other living spaces in a household – kitchens are inevitably important, but still hidden and isolated. Kitchens possess enough importance to be designed considerately, but attribute to the captivity of closed doors, supposedly out of practical considerations and the still existing hierarchical factors. Weather it’s a kitchen in a working-class household like the Frankfurt kitchen turned out to be, or a housing example commissioned the wealthy in the face of Villa Savoy, no compromises in the face of functionality and cleanliness is made. The size of the kitchen of Villa Savoy is clearly bigger, for the reason on staff being present, yet it is visible that shelves have been placed in a similar logic and worktops are divided into different tasks just like in the Frankfurt kitchen.

\textsuperscript{71} Sbriglio, 2008.
\textsuperscript{72} Boesiger, 2015.
KITCHEN INNOVATIONS

Socialist principles regarding design decisions for the general are more visible along the first half of the 20th century. After the Second World war a new age of consumerism, advertising, and style took over the Western market, which was dictated by design. With a growing middle-class and a booming economy North America became the epicenter of commercial design, exporting its culture and products also to Western-Europe as a result of the Marchall Plan. Innovations that stemmed from the United States came to the European market as an afterthought. Thanks to continues modernization and rising living standards residential design starts to take on a more refined shape. Post-war kitchen design takes an almost utopian shape in the States, which also influences Europe to think more boldly. When necessities are met in most dwellings after the war periods, domestic kitchens start to resemble progressive workspaces, where advanced ideas are experimented.

The modern kitchen continued to take shape in the face of standardized counter heights and matching upper and lower cabinets. A bigger variety of materials were explored with properties that are more water-repellent and wear resistant. Machines started to look less like furniture and more like the trains, cars, and steamships that powered progress in the outside world. Streamlined aesthetics were applied to kitchen interiors, which refers to the practice of applying curves to an object reducing drag and creating even surfaces giving

Fig. 17 Two 20th century kitchen illustrations expressing the change of style when streamlined aesthetics rise in favor.

73 Helvert, 2016.
74 Ibid.
75 Archer, 2019.
appliances the look of speed, science, and progress.\textsuperscript{76} Although the appliances were first very expensive for general households, yet with economy blooming the so called \textit{American Dream} became closer to materialize in peoples personal havens called homes. Companies producing and selling home appliances tried adding an extra amount of energy to also sell the desire of a certain lifestyle with the products they created.\textsuperscript{77}

In 1943, Life magazine published a spread displaying an almost futuristic design prototype called: \textit{Kitchen of Tomorrow}. The concept was designed by H. Creston Doner who worked for Libbey-Owens-Ford. (See fig. 18) Libbey-Owens-Ford was a glass company, which was interested in promoting variable use of easily obtained and familiar materials, which were worked into new shapes and forms.\textsuperscript{78} For example, sliding panels were designed to cover the kitchens sink, cooktop, and a divers set of automatic appliances in a decorative manner. The kitchen counters appeared feminine and were multifunctional. The furniture was constructed to transform into a functional work surface as well as an elegant countertop hiding the kitchen gadgets to avoid visual clutter.\textsuperscript{79} Another unique feature was the transparent oven creating a show just out of cooking. During the testing for innovative solutions H. Creston Doner took his wife’s proportions,

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Fig.18_Kitchen_of_Tomorrow_worktop Prototype.png}
\caption{Fig. 18 \textit{Kitchen of Tomorrow} worktop prototype from Life magazine in 1943.}
\end{figure}

\textsuperscript{76} Archer, 2019.
\textsuperscript{77} Novak, 2008.
\textsuperscript{78} Ibid.
\textsuperscript{79} O’Connor, 2010.
strength, and preferences as a reference in the creative process.\textsuperscript{80} Thus, with regarding only feminine proportions in his spatial design, it confirms with no doubt the kitchen being solemnly a woman’s domain. The \textit{Kitchen of Tomorrow} suggested lots of new conveniences and insights about the physical work of cooking and cleaning.\textsuperscript{81} Then again, the design of it made it mostly convenient for women, since the proportions were designed accordingly. Doner’s eccentric innovations promoted high end technology and efficient workflow promising more freedom from kitchen duties. The labor-saving technology seemed advanced and impressive enough in-order to be convincing. Foretelling the postwar optimism that would follow during the economic boom of the 1950s, the Libbey-Owens-Ford \textit{Kitchen of Tomorrow} made people believe that something life changing was about to happen in American homes.\textsuperscript{82} A new attitude considering domestic kitchen design that advocates a modern mode of family living.\textsuperscript{83} Suddenly kitchens are entitled to become attractive with innovative features hidden under a representative look that could be truly exciting for the eye.\textsuperscript{84}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig19.png}
\caption{\textit{Kitchen of Tomorrow}, example how a worktop converts into a bar countertop.}
\end{figure}

\textsuperscript{80} Archer, 2019.
\textsuperscript{81} Novak, 2008.
\textsuperscript{82} Archer, 2019.
\textsuperscript{83} Mitterbauer & Smith-Prei, 2017.
\textsuperscript{84} General Electric Kitchen Institute, 1940.
In 1956, when *The RCA Whirlpool Miracle Kitchen* prototype was launched at the American National Exhibition in Moscow, Soviet Union it created a lot of talk, as it represented a significant leap in household automation.\(^8^{5}\) It envisioned the technological innovations and promises of the mid-twentieth century, where the housewife could get everything done by a flick of a switch. The kitchen space was divided into three compartments with multiple units, all controlled by the *Planning Center*. (See fig. 20) Next to meal planning with *Magic Meal Maker*, a bottomless drink dispenser was promised, the floor cleaning was automated by a running robot, and meal preparation could be entertained with television programs along with mood lighting panels in the ceiling.\(^8^{6}\) A new wonderful world of pushbutton cooking, cleaning, and homemaking was designed to showcase the latest advancements in American consumer technology and the American way of life.\(^8^{7}\) It was intended to showcase American innovation and contrast it with the Soviet Union’s more traditional and collectivist lifestyle, making kitchen design a tool of provocation within the Cold War era.

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\(^{86}\) 1957 Flash Back, 2022.

Automated kitchens became an expression of a glamorous lifestyle, where food could be produced for the best price and at the fastest pace, followed by an easy cleanup. Innovative kitchen appliances transformed housewives into task force managers - a glorious symbol for a modern woman, who was able to trust tiresome tasks to modern technology. Once again, an attempt was made to reform the status of a homemaker, converting the woman from a family servant to a technical specialist. The status transformation might have not worked that well with Christine Frederik’s initial ideas, but it certainly changed the image of a woman in the fifties, having the ability to control cultivated electric appliances while looking her very best.

This new modern homemaker becomes somewhat of a phenomenon of its time, which can be traced back in examples of pop culture. Jacques Tati’s comedy *Mon Oncle* (1958), for one, portrays a modern homemaker. The French motion picture lays a glimpse over a nuclear family living in an ultramodern home, which is governed by the wife. The Arpel family, like any other, goes about their daily routines, but what is significant about it is the home they live in. Next to being desolate and empty, parodying modernism, the kitchen is a sterile laboratory and a complete mystery to operate except for the woman of the household. (See fig. 22) The satire behind a kitchen being overly complicated and the woman looking like a fancy version of a technician, who seemingly appears to be more distant from reality than anyone else in the movie, is entertaining yet thought provoking.

Modern kitchens, filled with impressive gadgets that mostly women were taught to operate, seem to be captivating them even closer to home. The free time a modern woman was promised was now spent in her impressive kitchen, isolated in between tasks. The daily tradition of shared family meals shape the nuclear family and its structure, just like in the previous century, thus a kitchen’s smooth operating was dependent on a housewife alone. As the nuclear family was the basic structure of the social order, dining together had a prominent role for enacting it, meaning that the style of the kitchen also dictated the style of dining.

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88 Archer, 2019.
89 Charytonowicz & Latala, 2011.
OPEN KITCHENS

As meticulously planned kitchens were efficient workspaces studies started showing negative side effects, housewives were experiencing due to the isolation of kitchens from other living spaces. Those studies indicated designers to create more satisfying features, like exposing the kitchen space more towards the living room. The serving window for one was more thought of. The opening became a multifunctional shuttle between the kitchen and the living room. It allowed the housewife direct food serving and faster clean up, next to monitoring the children or keeping up with the conversations during meal preparation. The serving window could be an inducement of many design features in the domestic

Fig. 21 Scene from *Mon Oncle* demonstrates a highly modern housewife preparing her son for lunch in a technically meticulous matter, displaying the way kitchen design dominates the mode of meal preparation and dining.

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91 Charytonowicz & Latala, 2011.
realm, such as erasing boarders between the living and dining room to developing a holistic space out of a kitchen and a living room. When observing Viljo Revell’s housing project for *Koulukallion rowhouse* designed in 1954, one can notice the conformation between the dining and living space, in connection to the kitchens serving window. (See fig. 23) The kitchen is still separately established, but the layout of Viljo’s design forms an open dialog between the three spaces with its functionalist style and opened kitchen unit. Another example of exposing the kitchen could be a design feature related to a kitchen cabinet that transforms into a window and a dining table, welcoming others to be a part of kitchen duties. (See fig. 24) From the convenience of adding a dining table into the kitchen, an intimate space inside the family realm was established. The kitchen was no longer just a functional workspace, it became a cozy place for social activities with the family members, creating an atmosphere that started resembling the feeling of home.92

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The dilemma of dining in the kitchen with the family, but keeping a dining space for more formal gatherings, needed a solution. A dining space left often empty in mundane occasions no longer justified itself, which broke down the wall between the kitchen and the dining area making way to a modern concept of an open kitchen.\textsuperscript{93}

When the kitchen came out of hiding, it became a central space in the house, which made cooking a visible part of everyday life.\textsuperscript{94} A spatial and a visual dialog between a workspace and a leisure area was set to be solved. Bearing in mind that living rooms possessed a representative tone, open kitchens were left to follow the same scheme when it came to holistic housing design. Architects were standing in front of a challenge to keep a kitchen's functionality and blending it in with the aesthetics of the living room. Initially the materials and colors of kitchen cabinets were thought out to match the living spaces, creating a camouflaged look to draw less attention on spatial thresholds. Compartments were cleverly designed to keep kitchen equipment out of sight avoiding visual clutter. Techniques for spatial unity gave freedom for architects to combine creativity with functionality. For example, in the \textit{Utzon House} by Jørn Utzon (1918-2008)

\begin{flushright}
\textsuperscript{93} Bech-Danielsen, 2012.
\textsuperscript{94} Ibid.
\end{flushright}
himself, built in Denmark 1952, the kitchen and the living room are situated in one big space, with a clever detail. (See fig. 25)

Fig. 24 side view and floor plan of Jørn Utzon house, Hellebaek, Denmark; 1952

Fig. 25 A closer look into *Utzon House* kitchen, where the utilities are hidden behind an alcove extending from the fireplace.

Fig. 26 side view of the *Utzon House* interior where the kitchen appliances are hidden behind the
The central fireplace connects the living space along with the kitchen, creating a minimalist look by slightly hiding the kitchens utilities behind a nook (see fig. 26), forming a clean look with square volumes and an open circulation. (See fig. 27) Since such openness was influenced from suburban America, it was still daringly innovative in traditional Denmark, which is why Utzon hid a sliding door in the brickwork of the chimney to hide the kitchen worktop if necessary.  

Nevertheless considering the modern act in opening the kitchen up shows how well Europe was influenced by the western societies progress and fortified architects into experimenting.

Another explanatory project designed by Pierre Koenig (1925-2004) in 1960, is situated in Los Angeles, called The Stahl House (also known as the Case Study House No. 22). It stands out for its open plan in the living area. The kitchen is a free standing, cabin-like structure within the larger living room designed with an illuminated ceiling and sliding doors. (See fig. 28) Funnily enough it gives an impression of the kitchen moving into the living space, meeting the style requirements with matching materials and offering an entertaining element with a bar counter top, but by knowing it’s place, there is an opportunity of disappearing behind sliding doors. As it turned out the kitchen worked best as an open workstation and bar, demonstrating that the open kitchen concept is successful enough to claim its place and stay. With a spatial dialog created between the living, dining, and cooking areas, a new typology forms from that type of spatial evolution. Slowly but surely open kitchens worked their way up to lose the role of only being women’s closed domains. Kitchen spaces started acting more like transparent workshops that welcomed anyone who is interested in participating. A greater role of socializing and entertainment starts taking part inside the living realm connected to cooking, which influences the merging of kitchens and living rooms more generally.

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95 Davies, 2006.
96 Ibid.
97 Davies, 2006.
98 Cieraad, 2002.
Technological progress like the ventilation hood made it possible for an open kitchen to blend seamlessly into a living room, on the other hand the appearance of a kitchen appliance played an equally important role when it came to function versus aesthetics. With the liberation of interior design, it became obvious that personal taste started being a differentiator among consumers with the same functional needs. A market for design products that started reflecting values emerged, meaning that the choice of design became an indirect expression of a consumer’s personality and identity. Therefore dwellings became less like ‘machines to live in’, and kitchens more than social cooking spaces. The kitchen developed into a designed product aiming to fit into one’s lifestyle. While dwellings advanced into a key place for a resident’s self-realization, turning into

100 Sudjic & Beyerle, 1999.
a mirror of personal style by decorative motives, kitchens also follow the same pattern. In extreme cases, life-style kitchens sacrifice function over decoration. Surely the preparation of meals and cooking is still available, but with the cost of ergonomics, space, or equipment.

Matti Suuronen’s (1933–2013) *Futuro-Talo* (eng. *Futuro House*), from 1968 is a notable example how a very futuristic concept of living is in coalition with the spatial design. *The Futuro House*, elliptical in shape, captures the experimental forms, and optimistic ideas of the space-age architecture, reflecting faith in technology, and highlighting plastic as a miracle material.102 (See fig. 29)

Fig. 28 *Futuro-Talo* by Matti Suuronen, 1968. On the left the exterior view is captured. On the right *Futuro-Talo’s* general floor plan is explained.

*Futuro’s* interiors are circularly planned around the fireplace. Despite the capsule being first intended as a ski cabin, the prefabricated house was carefully planned out to meet all the essential needs of a small home. The master bedroom and bathroom are separated, leaving the living-dining and cooking area to exist as one. *Futuro’s* kitchen layout is obviously one of a kind – the functions of cooking, cleaning, and storing have been preserved but reduced, the predominant material used is plastic, and the design of cabinets are strongly in line with the buildings shape, color and atmosphere. Since the kitchen is fully subjected to the

101 Helvert, 2016.
102 Maneval, 2021.
characteristics of the building, its size, comfort, and ergonomics are following the housing concept, making it a lifestyle kitchen. (See fig. 30)

When contemplating about lifestyle kitchens the design becomes limitless and dependent on the style of living.¹⁰³ For example, kitchens can be either positioned on a spot where the living room unfolds around it, or kitchens can be recognized purely from identifying cooking functions in a living space – the greater mission is reflecting the established lifestyle in a dwelling. Lifestyle homes and kitchens are considered as spaces of self-promotion.¹⁰⁴ It is the self-image that interior design communicates when entering one’s home. Therefore, the living rooms with its open kitchens are the ultimate spaces for gathering, to further feed the image.

The Furniture House (1996) designed by Shigeru Ban (1957-) in Japan is an interesting spatial example of absolute conceptual unity. The one-bedroom house is separated by walls created out of storage units, which involves a big living

¹⁰³ Baden-Powell, 2005.
room with a kitchen that is distinguished only from a tabletop equipped with a sink and stove tops. (See fig. 31) It is the style of spatial purity that hides everything redundant inside storage spaces, exposing only the necessities such as chairs, a table, a waterpoint and a cooking top. The boundaries between structure and furniture have been redrawn, highlighting the character of the building to go along with its every function.\textsuperscript{105} From this example one could question what the priorities of its residents are when it comes to cooking. Are they limited to the capacity of two stoves or are there more appliances hidden inside of the cupboards. Perhaps the meaning of a kitchen becomes wider than expected? A kitchens value can range far beyond from just providing the possibilities for food-related activities. Data from a ‘kitchen life’ study conducted by social science researchers revealed that the kitchen is not a neatly bounded space reserved exclusively for practices relating to food work anymore, but a space where several aspects of domestic life take place.\textsuperscript{106} Thus, a kitchen which is able to cater to the cooking needs of a resident, as well as transform into a living room extension or disappear completely creates a spatial flexibility allowing any kind of activity to happen.

Fig. 30 The Furniture House; 1996 by Shigeru Ban. A photo of the minimalist kitchen is on the left along with the buildings floor plan on the right.

\textsuperscript{105} Davies, 2006.
\textsuperscript{106} Wills et al., 2013.
This takes a turn to a versatile measurement within a domestic spatial concept, which is allowing domestic design to abandon conventional boundaries. Meaning a home doesn’t have to have specific and separate rooms for cooking, living, working, or sleeping anymore, rather than requiring clever arrangements to its dwellers to conduct those activities. It is apparent that moving forward in time, transferring from the 20\textsuperscript{th} century into the 21\textsuperscript{st}, design principles developed from modernism are still applied today, but with a wider consideration on its occurring trends, needs, and issues.
3. KITCHENS TODAY AND IN THE FUTURE

As it is challenging to predict the future, it is also difficult to point out a certain style dominating kitchens nowadays, only because of the number of possibilities given to a designer. Most home kitchen spaces are continuing the design scheme modernism created; streamlined surfaces, easy to maintain materials, electric and time-saving appliances to well-organized storing. An open kitchen layout is a widespread spatial occurrence, and the spatial arrangements in general have become more neutral when it comes to gender. Kitchen spaces nowadays commonly reflect the expectations its user has on cooking, dining, and living, which can vary greatly from the lifestyle of a user.

With living costs rising, urban areas densifying, and climate change being a major challenge of our time, greater attention is needed to be drawn on how living spaces are designed, changed, or adapted. Movements like the tiny house movement or co-living are popular alternatives that respond to current living challenges. Kitchens designed in tiny homes or co-living buildings are significant, since they are spatial examples of either downsizing to necessities or acting as a mediator between residents. The question of how small spaces affect the resident’s well-being and habits around cooking and dining is also important to consider.

Another phenomenon influencing kitchens and home-cooking is the increased accessibility of food services, which in a way eliminates the need for a fully functioning kitchen within a home. According to EU statistics on homecooked meals the average amount of dishes cooked within a home is around seven meals per week, meaning that most of the cooking happens outside of a home. That raises an intriguing question whether a home could be designed without a kitchen or is there a deeper relation between a home and a kitchen space?

Looking into the topics stated above, the factors of material use in kitchen spaces is inevitable. The footprint designers leave on ecology with every decision should be carefully considered. Common materials, especially in mass-produced

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modular kitchens from affordable brands like IKEA, initially make a good impression, yet hide concerning issues related to the furniture's after-life. Therefore, even though the appearance of the kitchens has not changed significantly after modernism, the form, functions and material development have, which are going to be the focus points of the last section.
SMALL LIVING WITH SMALL KITCHENS

The decreasing size of households in developed societies is a factor affecting urban housing settlements, which in turn influences domestic interiors. By the year 2017, one third of all households in the European Union were one-person households.\textsuperscript{109} As the size of housing can be measured by the average number of rooms per person: there were on average 1.6 rooms per person in the EU in 2021.\textsuperscript{110} Inferring from prior data one can conclude that a significant amount of people in the European Union is roughly living alone in one- to two-room dwellings.

The rise of solo living is well addressed by researcher Anne Tervo, who examines solo dwellers domestic spatial needs in her doctoral dissertation titled: \textit{Domestic Space for Solo Living - Changing patterns in the Helsinki Metropolitan Area, Finland}. The growth of one person households according to Anne Tervo’s research is affected by many factors such as demographic changes, individualism, increase in gender equality and wealth. Small housing as in micro-apartments has been an upward trend for a while now, which doesn’t seem to be stopping any time soon for multiple reasons like the rising cost of living, urbanization, and factors concerning our ecological resources. The relevance of Tervo’s dissertation lies behind the results confirming that kitchens have remained to be the most important design questions regarding the scale of a dwelling. The kitchen type is a key element in an ideal floor plan and its design solutions are impacted by the apartment size, meaning that if the apartment size decreases, so does the kitchen size.\textsuperscript{111}

Looking into the planning of small dwellings, efficient use of space is inevitable. The layout of a kitchen space is bound to its positioning by the dwelling’s communications, such as water pipes, ventilation, and electricity stabilizing kitchens to certain positions. As our other living spaces also revolve around the arrangement of the dwelling’s communications, small housing design is left to consider smarter and more compact options. The challenges of designing small kitchens nowadays coincide partly with the challenges Margarete Schütte-

\textsuperscript{109} Eurostat, 2018.
\textsuperscript{110} Ibid.
\textsuperscript{111} Tervo & Hirvonen, 2020.
Lihotzky faced with the Frankfurt Kitchen. Kitchens still must be altered to time saving efficiency, offering labor-saving technology and a smart layout, in addition to that, kitchens nowadays are also unified with other living spaces and used by more than one person at the same time. Those additional components have been capable of further shaping the role and appearance of kitchens.

KITCHENETTES

A kitchenette, known as a compact, linearly laid out kitchen that caters to the essentials, can often look like a nifty cabinet. Agius Scorpo Architects, amongst many others, have designed a kitchenette in a 23 m² studio apartment that features key functions fitted inside a wall to perform the resident’s food making by appearing and disappearing when needed. (See fig. 31) Small living spaces can represent clever solutions for kitchenettes - from fully integrated alcoves to separate functional units, shifting the identity from conventional kitchens to a compact and efficient feature of food handling. The design of kitchenettes varies from being one with the living spaces or with a possibility to disappear, transform or claim their own nook.

![Fig. 31 Kitchenette designed Agius Scorpo Architects, project Fitzroy III, 2017](image)

The concept of a kitchenette cannot be considered as an entirely modern occurrence. As it does reflect the ways and conditions of modern living, small living spaces that combine a cooktop in it date back a long while. For example,

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people living in lesser economic conditions in the 20th century could not afford bigger living spaces, rather than a room serving every function. (See fig. 32) Then again, inside the tendency of a small household movement a kitchenette is a feature reflecting the contemporary ways of living, not necessarily the wealth of a household.

Fig. 32 Tenement interior from the 1930s.

The way a kitchenette mirrors modernism is by creating a functional division inside a living space. Domestic spaces started being highly regulated in early modernism by experts defining the functions in a dwelling, that is dividing living spaces into sections like work, leisure, and family-life.113 Nowadays, in compact living, the divisions between work and leisure are conducted through design elements and solutions rather than separating every function with designated rooms. Solutions that are flexible to change become attractive within a small dwelling. Boundaries are becoming more diffused with the help of technology and versatile spatial planning, yet a kitchen still forms a clear area where a dweller works. The functional area in a small dwelling must perform in a variety of ways

113 Saarikangas, 2002.
to serve needed occasions, because if people choose to live alone it doesn’t necessarily mean that they also choose to spend their time alone.

When dealing with a small space, figuratively every square meter is planned – we can cut corners and custom design solutions around the living- and bedroom areas, but what cannot be denied are some standards in kitchens that create boundaries like essential functions providing water and heat - the basics for life.

A Portuguese architecture practice called Fala Atelier designed five studio apartments within an old house in Porto. The studios distinctly make room for a washroom and a necessity cabinet, whereas the rest is left to define by the dweller. (See fig.33,34) The kitchen is, again, in the cabinet becoming present when needed and vanishing for visual clarity, which makes the living, sleeping room flexible to all sorts of arrangements with or without a kitchen insight.

Fig. 33 Fala Atelier, projects 035 cabinetry.
A popular way of spending time together still to this day is cooking or sharing meals, which is why having a kitchen-dining area is considered with great probability in housing, despite how small a living space gets. Another factor about kitchens is the value people bestow upon the space, which makes it hard for some to imagine a home without a kitchen. Architect and researcher Anna Puigjaner ponders whether a home kitchen is a legitimate choice in the perspective of a sustainable future.\footnote{Medina, 2018.} It’s provocative to suggest eliminating kitchens from homes, because kitchens are considered still to be the center of it. Puigjaner has pointed out in her work: “when we talk about housing there was no problem if you eliminated the living- or bedroom, but if you touched the kitchen, it generated a very curious adverse reaction”.\footnote{Bestard, 2016.} The reason behind it, in Puigjaner’s opinion, is that kitchens were instilled with certain ideological values during the twentieth century linked to the role of women, politics, and the construct of the ideal family, which is influential to this day.\footnote{Bestard, 2016.} If ideally one would like to spend time and effort on cooking at home, the reality behind a fast-paced life nowadays, involving also eating out and ordering food in, has proven the opposite outcome.
for home cooking. The average amount of meals cooked within European homes are slowly decreasing year after year. Shouldn't these factors prompt designers to also approach kitchens in a more creative way, rather than still following Margarete Schütte-Lihotzky's blueprint from the 1920s?

The emphasis on kitchen design today should be based on actual usage and a flexible output, rather than filling homes with standard cabinetry. The problem behind standard product packages is that they are based on a generalized user profile, which demands adaptation. Anna Puigjaner’s idea behind the Kitchenless Home as a new living concept for the 21st century is not about erasing kitchens from living spaces completely but embracing the idea of living with a smaller kitchen meant for cooking occasionally. By creating a more realistic spatial scenario, which reflects how much an inhabitant uses its domestic kitchen, leads to more sustainable spatial planning.

A media company called Never Too Small (further on NTS) has dedicated their platform for promoting small footprint design and living. Their channels show ideas of spatial design in correlation to sustainability, smart design, and creative ways of living in small spaces. By posting contemporary housing projects, often-remodeled apartment plans, kitchens are handled in very diverse ways. It comes to light that sustainable kitchen design reflects conscious decisions based on the frequency and intensity the space is used, when forming its layout and choosing appliances. For example, a minimalist apartment in Singapore was featured in a NTS post this year July. The living space was designed for a solo dweller, who wished for a spatial representation of a single-minded pursuit of perfection. The transformation outcome, resulted in a unifying cabinet system that meanders through the whole apartment hiding needed functions. A small and discreet kitchen is also hidden behind the cabinetry, being truly minimalist with just a sink and two cookers. The reasons behind such a solution were the dweller living alone and him cooking simple dishes seldomly. (See fig. 35) These decisions were expressed by custom and user-based design solutions.

118 Gallup & Cookpad, 2022
119 Never Too Small, n.d.
120 Beath, 2022.
121 Ibid.
leaving more room for the client’s hobbies and style of cooking. From the disciplines NTS projects advocate redesigning existing living spaces and kitchens to better fit its occupants’ needs is a perspective towards more viable choices concerning the future. While the 21st century living concepts lead way for domestic kitchen downsizing the opportunity of comprehensive home cooking shouldn’t disappear when living with kitchenettes. If the need for a bigger kitchen arises for a solo dweller, in an out of the ordinary situation, then an alternative solution could be a shared kitchen facility in a housing unit that allows bigger scale cooking. Anna Puigjaner has also advocated in her work that when private kitchen sizes would be reduced, there must be a remaining possibility for occasional revels. What remains important is the flexibility behind choosing.

Fig. 35 A cooking point located in the left cabinet and a water point to the right with remedies, from NTS.

\[^{122}\text{Medina, 2018.}\]
COLLECTIVE KITCHENS

When moving forward in practices fostering collectivity, co-habiting as an alternative comes to the fore. Shared living is becoming an increasingly popular option nowadays as millions of people struggle to find adequate and affordable housing in cities by themselves. There are community-based living arrangements, which support a shared lifestyle, meaning commodities, appliances, even living spaces can be shared within the community. A phenomenon that has also popped up is real estate developers offering affordable small homes to people who would be willing to share their personal space with strangers. For example, Finland’s leading housing provider SATO has developed a housing complex called StudioKoti, which consist of micro-apartments sized 15.5m². According to the Finnish building regulations 20m² is the minimum dwelling size for living, unless it’s student housing that provides shared living spaces in the same building. SATO’s housing project was clever enough to use a similar strategy; giving common spaces for the dwellers as a compensation from the small living spaces, and building studios with high ceilings to fit a mezzanine, which makes the apartments unofficial floor area 22m². Nevertheless, the living spaces are small, but despite the size every apartment has their own kitchen and a dining table that can be pulled out of the cabinet system. (see fig. 36) Although the small size of the kitchen imposes constraints on the occupant, what seems more problematic in such an apartment is the space limitations in general. Shared facilities, such as a common living room and kitchen, are meant to extend a resident’s living conditions, yet in a more public realm with incentives like sharing service facilities and socializing with their neighbors.

Investigating SATO’s website, the common rooms have two focuses: service and leisure. Services include a laundry room and a sauna with a terrace, and leisure

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123 One Shared House 2030, n.d.
124 FINLEX ® - Säädökset alkuperäisinä, n.d.
125 Rasi, 2017.
entails a shared kitchen with a dining area. Although every resident has a private kitchen nook (see fig. 36) the building provides a larger space meant for communal cooking, dining and living for all the residents. (See fig. 37) The decision of applying a food related space to encourage socializing between neighbors requires eating to be a binding element between strangers.

Kitchens are social spaces due to the possibility of creating value that can be shared yet creating that sort of value also entails a certain atmosphere by the space or people. Commensality, meaning eating with others, is a prevalent manifestation of human sociality that fills a need of interaction with one another, establishing or reinforcing bonds while nurturing and fueling one’s body.127 Interviews with StudioKoti residents reveal satisfaction from the common kitchen, stating the pleasant feeling of coming home to find neighbors sitting together drinking coffee or sharing a meal.128 That said it is somewhat evident that the common kitchen is fulfilling its duty by extending the inhabitants living spaces and encouraging residents to interact with one another.

Everything seems great on paper but what is concerning about the concept of StudioKoti is limiting private apartments to the bare minimum and compensating it with shared spaces - making individual comfort a part of joint decision making with other homeowners. It might work for a certain amount of time yet long-

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term results about this sort of living arrangement are in development. It can lead to issues like socializing under pressure, claiming one's space over others, overlapping slots for individual use, and a general lack of privacy, which could lead to dwellers not considering the shared spaces as an option for their personal benefit. Shared communities have specific rules and mindsets, which are created and agreed upon beforehand together, but if the shared community is managed by a real estate agency a lot can get lost in translation, because of the differences in deductibles.

A shared kitchen could be a way to build and strengthen relationships when it comes to open mindedness around food and cooking, but people can also be sensitive over what they eat and how they cook. Expectations related to cooking and cleaning vary between individuals, which can connect or push away people from each other. When it comes to developing shared spaces, especially kitchens, it is often emphasized how cooking together is a benefit, but dietary preferences or restrictions cannot be ignored in this case. Diets can exclude some community members from shared dinners, so if the private space is officially 16m² the quality of life can become to feel narrow. Not to mention the disability to host a proper dinner in a private home that small.

It is questionable in general how people experience living in small spaces. It can feel freeing to not be dependent on a lot of things and manage big spaces, yet living alone in a small space can also elicit feelings of confinement or isolation\textsuperscript{129} It has also been pointed out that living in a micro-apartment isn’t suitable for a whole lifetime for an individual.\textsuperscript{130} A space for spontaneity is missing in small living spaces, because micro-apartments are designed to cater minimalist day-to-day living for one to two persons. An increase in living space represents an increase in liberty. Having friends around, sitting in peace and quiet or eating as a big group are all activities limited by lack of space, but by facilitating these activities, one would expect more space to lead to higher well-being.\textsuperscript{131}

\textsuperscript{129} Field, 2022.
\textsuperscript{130} Koivisto, 2018.
\textsuperscript{131} Foye, 2017.
Small scale living as a contemporary housing trend doesn’t always signify clustering people's lives into compact units. That no doubt motivates citizens to find alternative solution for city dwelling like claiming more living space by investing in building a community themselves; either occupying a spacious apartment with several people or developing a communal housing project. Next to SATO’s project, which is rather exceptional, there are collective living arrangements that offer a more livable private space next to commonly used spaces. Casa Malta in Helsinki is a collective apartment building (see fig. 38) led by a community of enthusiastic residents, who had a vision of shared living arrangements within Helsinki city. From visiting the site and meeting a few community members it occurred that the common kitchen space (see fig. 38) is a big part of the dwellers coming together for joint activities and socializing, yet that didn’t motivate any resident to consider living without their personal kitchen. Jaana Merenmies, a Casa Malta member, explained that arranged collective dinners are a way for the community members to both break a weekly routine and ease everyone’s personal workload at home, which makes good use of their collective kitchen, but it was mostly meant for collective outcome only and not for personal cooking, that could replace a community members home.

Fig. 38 From the left: the Casa Malta building [1] in Helsinki, with its communal dining room [2] and kitchen space [3].

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kitchen for gaining more personal space.\textsuperscript{133} That taken under account, it seems like the concept of a collective kitchen in Casa Malta is a bonus feature, which has potential to move towards into more sustainable principles if necessary, but for now kitchen spaces are kept as pioneering features for maintaining bonds and creating new ones, collectively or personally.

KITCHENS AS PRODUCTS

As kitchens generally are standardized prefabricated modules installed in place, it is also exciting to experience them as function-based products, independent from fixture or space. Joe Colombo (1930-1971) designed a kitchen for an Italian production company Boffi in 1963. (see fig. 39) Colombo believed that good domestic design should be available to everyone and reflect new living patterns.\textsuperscript{134} Minikitchen - a mobile kitchen cube on wheels – is an example that definitely challenged conventional ideas of domestic living. “Things have to be flexible”, said Colombo in 1966, “my kitchen can be easily moved when not in use, it closes in a single compact volume like a box”.\textsuperscript{135} It’s impressive how Colombo anticipated the direction of contemporary living nearly sixty years ago by creating a kitchen concept that releases a user from strict boundaries. The kitchen is a compact product that’s intelligently solved in just half of a cubic meter, remaining relevant to this day. It is a complete unit on wheels and electrically powered that includes everything needed from a kitchen, even if miniature: refrigerator, two cooking ranges, containers, drawers for pots and dishes, a pull-out tray, sockets for small electric appliances and cutting boards.\textsuperscript{136} The stored cutlery is meant for serving up to six people making the roll-in, roll-out utility an admirable design composition. Since the Minikitchen was initially created in the 60s Boffi released an improved product (see fig. 40) of the mobile kitchen to the market in 2006, indicating that there’s increased demand for it.

\textsuperscript{133} J. Merenmies, personal communication, January 23, 2023.
\textsuperscript{134} Urquiola & Hudson, 2007.
\textsuperscript{135} Mateo, 2005.
\textsuperscript{136} Mateo, 2005.
Next to the Minikitchen there are several imitations of mobile kitchens created, some resonate with the nomadic furniture concept, which in turn supports a nomadic lifestyle that is gaining more and more relevance as a movement today.

The emergence of nomadism is a core trend of the advanced societies in the 21st century.\textsuperscript{137} The Corona pandemic, for one, proved the efficiency and capabilities people preserve while working remotely, leading remote work to be a justified option if one would have a desire for a mobile lifestyle. Nomadism is a way of life of people who do not live continually in the same place but move cyclically or periodically, which is something that greatly influences furniture design.

\textsuperscript{137} Dobrinskaya, 2016.
Furniture that folds, inflates, stacks, knocks down and is lightweight are all attractive features when it comes to moving them around. Another feature that must be considered from a sustainable viewpoint is the material being disposable and recyclable after leaving it behind. James Hennessey and Victor Papanek as design practitioners wrote books of nomadic furniture building since the 70s with the emphasis of showing and teaching how to build sustainable furniture independently. The reason of creating knowledge as such was the issues linked to a mobile lifestyle; inconveniences behind moving heavy or fragile furniture and needing new furniture when arriving to the next destination. The book illustrates clever and multifunctional solutions to day-to-day needs, for example a fold-out table that fits for a small apartment yet is capable of seating seven persons. (see fig. 41) The core value of the book, in the opinion of the authors, is to enable people to have more by owning less. When analyzing the minikitchen concept by Colombo, it is hard not to draw links with the same mindset as Hennesey and Papanek stated - Less is more! By being creative a mapping out needs, a lot less could be used for gaining more, which generally is a designer's responsibility when approaching challenges, especially in the view of climate change.

When dealing with issues related to environmental change, one might ask how much is needed to reduce in-order to still feel comfortable? That brings us back to the question of how well kitchen design features should be considered, favoring a user’s cooking habits yet remaining responsible towards our planet. Joe Colombo might have been right to downsize a kitchen unit into

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Fig. 41 A fold-out table idea for nomadic living.

139 Ibid.
half of a cubic meter, but what is more concerning is the materials kitchen production companies are normally using when developing a general affordable kitchen unit.

MDF IN KITCHENS

MDF (Medium Density Fibre-Board) is a very popular material when mass-producing kitchen cabinetry. It’s a cheaper alternative for solid wood, that is made up of sawdust and chippings of timber, all collected waste products from the machining process, which makes the material cost much lower than plywood and solid wood. MDF has even gained a status of being a sustainable choice because of that, but little is considered when it comes to the afterlife of the material, not to mention the added components MDF-boards are produced out of. It’s a laudable concept to produce building materials from woodwork residue, but because of the added components the disposal of MDF waste is considered problematic. Firstly, the glue holding fine fibers together contains formaldehyde, which is a cancerogenic substance that breaks out when sanding or cutting the material complicating the post-completion product development and material disposal. Due to extremely fine fibers screwing into an MDF board can often result to splitting and cracking, in addition, when the screw is in successfully then the fixing can become more loos over time due to the fibers breaking a part easily. Lastly, MDF absorbs water rapidly causing the material to swell and lose its structural properties when exposed to excess moisture. Nevertheless, MDF with other composite materials like OSB (Oriented Strand Board), for example, are widely used in interiors for being affordable and having a varied selection in production for manufactures. Unfortunately, the composite materials are also burdening global landfills because of low quality and inadequate re-use options. Big furnishing brands like IKEA are providing

affordable solutions, which unfortunately represent spatial practices that are driven by market logic. Standardized design is being overproduced, while vernacular techniques and practices are slowly disappearing.

Coming back to the Frankfurt kitchen design, where mass-production in kitchen furniture laid the first stone of, products back then were more considerate when it came to material choices and user’s actions within kitchen work. When paying closer attention to the details the cabinets encompassed, it is apparent that an easily adjustable and a vernacular system (see fig. 42) was though out to store needed cutlery or cookware and, moreover, everything was produced form solid wood making the cabinets durable, fixable and sustainable. When looking at a regular IKEA MDF cabinet it is also adjustable, but only with full volume shelves and specific knobs that are
provided by the same company reducing the scope for personal preferences and creating dependency on products only compatible within IKEA. If the MDF board breaks, cracks or swells, it’s simply impossible to restore it to its previous form, whereas with solid wood it’s a different story.

When designing future kitchens, stationary or not, the emphasis for future design must consider flexibility behind a spatial layout or product, and the materials it is produced of. One alternative to MDF could be building unstandardized kitchen furniture from second cycle solid wood, by adapting the pieces into needed units with accessible and easy skillsets that J. Hennessey’s and V. Papanek’s literature, for example, is suggesting. Another sustainable alternative could be to forage more affordable aluminum for domestic use expansion. The material is almost fully recyclable with a long lifespan, traditionally used in industrial kitchens. Approaching kitchens as an investment for durable use, mapping out the features kitchens must provide for their users, leaving space for flexibility, could result into better design that wouldn’t end up being replaced after a decade. Good design always considers the technique of production, the material to be used, and the purpose for which the object is wanted. The vast standardization of kitchens could manifest itself over time in losing the unexpected, original and unique ways of living, leading people to follow trends that come and go. Uniform design might even influence the style of cooking. If we look back to the pre-modern era, space efficiency influenced the style of cooking greatly. What makes one think that compact appliance-oriented kitchen packages won’t change attitudes towards cooking and the approach of how one wishes to use one’s kitchen? Many questions are left to answer in the world of design and innovation as time moves on.

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143 Russell, 1949.
CONCLUSION

The appearance and functions of kitchens have gone through drastic changes throughout history. Some kitchens remain to be the heart of the household to this day, and others hidden necessity nooks for dwellers. A lot can be learned from the characteristics of a kitchen space, that can indicate attitudes, norms and the development of a society, making kitchens fascinating subjects in housing design in general.

First by exploring spatial divisions within a household and defining kitchen functions from the pre-modern era, the research revealed how complex the nature of kitchen work was because of harsh working conditions and manual labor. The way spatial design in kitchens affected countless factors in its user’s day-to-day life was evident from how well kitchens were built and organized. The amount of considerations kitchen spaces received from designers, was linked to how efficient kitchen work resulted to be for women. Industrialization and technological advancements also played a big role in the topic, because that enabled tasks to become easier and timesaving. On the other hand, revolutionary appliances raised bigger expectations for kitchen work, which didn’t release women from household responsibilities that easily, as first hoped. The isolation and captivation factors behind closed kitchens affected women’s well-being to a sufficient degree that designers were forced to consider alternatives, such as open kitchen planning, which unlocked a wider perspective to how kitchen design needed to be further developed.

Modernism as a movement is still visible and influential in several aspects on how designers solve challenges today. The Frankfurt kitchen, being the first modern kitchen design example, was an astonishing work of dedication from Margarete Schütte-Lihotzky, because most of the things that we take for granted now as standard kitchen features, were unheard of before they showed up in the Frankfurt kitchen. The Frankfurt kitchen was a milestone where lots of references and conclusions could be made in looking back to the design issues kitchens acquired before to which ones are relevant now.
The issues related to kitchen design today are met with numerous alternatives. Although the Frankfurt kitchen remains a somewhat blueprint to how kitchens are perceived, many exciting suggestions have been created by designers when it comes to integration, volume reduction, and collectivism. Kitchens have become smaller and more precise, as living arrangements nowadays are also getting more compact. Next to reconciling with reduced options, some communities have found sharing a way of expanding ones living arrangements and shared kitchens as catalysts of forming relations and bonds within a community. Nowadays, it’s important for kitchen design features to remain flexible and functional, but one cannot ignore the generally low material properties and over-production of mass-produced design that is everywhere. Designers must challenge themselves to think of more sustainable yet affordable solutions when it comes to forming domestic kitchens. Encouraging designers to abandon unified schemes could result in more unique applications, advocating an attitude that is also considerate to our climate.
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