Future-Oriented Spatial Planning: Reflecting on Horst Rittel's Work

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Abstract: Designing involves envisioning alternative futures and deciding which one to favor, which makes it a practice of intervention. This article examines designing as a question of deciding which future to bring about and the political consequences of understanding design in this way. It focuses on the work of the mathematician and design theorist Horst Rittel, particularly his notion of »Future-Oriented Spatial Planning«. Reflecting on Rittel's work, this article contributes to architectural theory and design research in two ways. First, it illuminates the topic of architecture as intervention by considering designing as a way to intervene by imagining futures as well as by analyzing Rittel's contribution as an intervention in architectural theory. Second, it recovers an important element of Rittel's work that has been neglected by design research and updates its ideas, making them applicable to current debates about the role of architecture and design in accounting for today's futures with a focus on the notion of care.

Keywords: Design Theory; Planning; Wicked Problems; Horst Rittel; Future; Democratic Planning; Participation; Climate Crisis.

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Introduction

Intervention, as defined by Merriam-Webster, is an act of interfering with an outcome or process. Because designing involves envisioning alternative futures – and deciding which one to favor – it is by definition a practice of intervention (Gethmann/Hauser 2009): The consequences of design can be far-reaching, not only for those directly affected by these (unrealized) scenarios, but also beyond any physicality, as ideas about what could have been can travel far. This also makes design a political matter. The following article examines designing as the task of deciding what future to bring about and the political consequences of understanding the process of design in this way. It focuses on the work of the mathematician Horst Rittel, particularly his lesser-known lecture »Future-Oriented Spatial Planning«[1] which he delivered in Munich in 1969 at a symposium on futurology (Rittel 1970). At a time when the future seems threatening but still calls for action, it is useful to revisit historical notions of design as a political practice of future-making which arose out of similar, yet different, critical moments in history. At such times, designing for alternative worlds becomes particularly relevant and raises the question of how the future can be planned democratically and equitably.

Rittel's work has focused on this political nature of planning and addresses the intervening characteristics of designing. His work is also relevant in the context of thinking about intervention in architecture, since he himself intervened in design theory in the mid-20th century.

The following section introduces Rittel's work in design theory as a theoretical intervention and provides the context for his lecture »Future-Oriented Spatial Planning«. The second part focuses on the concepts developed in this talk, namely on issues of knowledge and questions about the legitimacy of the planner with regard to designing as a practice of future-making. Finally, Rittel's ideas will be examined in light of contemporary issues, focusing on the idea of care in design as an approach to deal with the uncertain future in the time of the climate crisis.

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1 »Zukunftsorientierte Raumordnung« was the title of the German lecture, which Rittel himself translated to »Future-Oriented Spatial Planning« (Dept. of Architecture Records, Box III, Folder G1, Environmental Design Archives, University of California, Berkeley).

Post-War Futures: Searching for New Design Methods

Horst Rittel's engagement with design theory was rather contingent. Born in Berlin in 1930, Rittel studied mathematics and theoretical physics before he was hired as an operations researcher in a machine factory in Dortmund. Working with engineers, he became interested in their way of thinking, which was the starting point for his interest in design and planning, as he later recalled in a lecture (Rittel 1977). In 1958, Rittel joined the University of Münster's »Sozialforschungsstelle« to develop socio-economic prediction models, while also studying sociology and mathematical logic at the university (Churchman/Protzen/Webber/Krogh 2007). The same year, Rittel was appointed Professor at the Hochschule für Gestaltung Ulm (HfG Ulm) to teach the philosophy of science, epistemology, operations research, design methodology, and communication theory (Reuter/Jonas 2013). In line with the spirit of that time, Rittel was hired to support the »scientification« of design (Mareis 2014). This involved the search for methods to formulate design in a scientific way which seemed necessary to render the process of designing legible. Rittel explored how design decisions are brought about and how the process could be systematized, made transparent, and optimized. Trained as a mathematician and operations researcher, he used models from game theory and systems analysis as methodological tools to understand and systematize the design process. Rittel's preference for the term »planning« over »designing« reflected his suspicion of intuitive solutions (Fezer 2022). To him, design was planning action with the aim of controlling its consequences (Rittel 1987a).

While Rittel was teaching at Ulm, he became involved with an independent research group, which was founded in 1958 as the »Working Group for Development« Issues in Heidelberg to reflect on technological innovations and their social consequences. The group's head was the chemist and sociologist Helmut Krauch, who was joined by Werner Kunz and Rittel as the central initial figures. They all shared a background in both the natural and social sciences (Seefried 2015). The group conducted workshops, studies, and field trips, initially to assess future technical possibilities of chemical nuclear reactors. They soon broadened their scope, looking at new methods of information processing and environmental issues (Hünemörder 2004). It is no coincidence that the group later called itself »Studiengruppe für Systemforschung« [Systems Research Group]. Visits to US research and development institutes, such as the RAND Corporation in California in 1962,

informed their early interest in operations research and systems analysis as planning methodologies to be employed in science and politics (Krauch/Kunz/Rittel 1966).

Yet, many of Rittel's colleagues in Ulm opposed his systematic approach to design. As he implemented rational methods into the school's curriculum and proposed a different departmental organization, he faced increasing resistance from the designers at HfG Ulm toward his methodological position (Rittel 1961). To them, the idea of planning as a rational decision-making process seemed too technocratic (Fezer 2022). Later, Rittel saw this conflict as a »lesson in the core problem of environmental design as an effort to improve the *condition humaine*« (Rittel 1987a: 118, translation: author). Yet, at that time, the dispute led to Rittel's departure from Ulm. In 1963, he was invited to teach the »Science of Design« at the College of Environmental Design at the University of California in Berkeley. The invitation was extended by Joseph Esherick, an architect and faculty member at Berkeley who had visited the HfG and recognized Rittel's potential to help redesign the college's educational approach (Protzen 2010). Influenced by his new environment, Rittel's ideas about planning began to shift. While he taught at the Department of Architecture, Rittel also worked with people from other departments and faculties, such as the urban planner Melvin Webber and the systems scientist C. West Churchman, a professor at the School for Business Administration. Rittel became part of a NASA-funded project led by Webber and Churchman called »Technology and Urban Management (TAUM)«, which explored whether »space-related scientific discoveries and technological developments« used by NASA could be applied to urban problems (Research Prospectus: 3). Finally, this project represented a case study for Rittel's ideas on design methods. In the process, however, it became clear that such a transfer was not easy to implement, as the nature of the problems was a different one. Rittel elaborated further upon this idea during one of Churchman's seminar sessions, where he first described the concept of planning problems as »wicked problems« in contrast to the »tame problems« faced by scientists and engineers (Protzen/Harris 2010). While Rittel remained committed to his idea that planning needed to be rationally understood and pursued, he departed from his conviction that designing could ever resemble an objective process. He concluded that there could not be one optimal solution to planning problems. Instead, planning depended on the political, social, and cultural context as well as the designer's worldview, which influenced how the problem was framed in the first place. Six

years after introducing the notion of »wicked« problems, Rittel expanded upon their characteristics in an article written with Webber, which was published as »Dilemmas of a General Theory of Planning« (Rittel/Weber 1973) and paved the way to a new understanding of design. It is no coincidence that as Rittel's most famous work this article was published in the journal *Policy Sciences* rather than a classic design journal. It not only points to Rittel's interdisciplinary way of thinking, but also to his continued emphasis on the similarities of decision-making in planning and political processes, a premise from which he always concluded with the call for a democratization of these processes (Rittel 1966).

Between his introduction of wicked problems in 1967 and the publication of the article in 1973, Rittel was invited to give a talk at »SYSTEMS 69«, a German conference on futures research in Munich. His lecture »Future-Oriented Spatial Planning« synthesized key concepts that Rittel would later elaborate upon in his career, such as the epistemic freedom of designers, the notion of planning as an argumentative process, or the idea of counterplans. This indicates that his reconceptualization of design theory arose from his ongoing re-evaluation of design processes, rather than being a paradigm shift. However, this text has remained peripheral to the reception of his work. Several factors might have contributed to this neglect. Unlike other texts by Rittel, this article has not been translated into English. Yet, it also speaks to the fact that, by and large, only Rittel's notion of planning problems as wicked problems has been taken up by design theory. This concept has influenced the discipline for decades, but without historicizing the context of its emergence and evaluating political motivations (Mareis 2011). Nevertheless, this idea was only one part of Rittel's larger body of work. Jean-Pierre Protzen and David Harris summarize many of Rittel's important contributions to design theory in their book *The Universe of Design* (2010). Due to his engagement with various scientific discourses, however, this account is not exhaustive and does not include a translation of this text. Architectural historian Torsten Lange points out that the diversity of Rittel's work »between techno-scientific approaches to planning and architecture's re-framing as an autonomous (even artistic) practice since the mid-1970s« (Lange 2017: 63) may have contributed to the lesser reception of his work. Yet it is precisely the diversity of his theoretical contributions that makes Rittel a central figure in understanding the shift in design theory that took place in the mid-20th century. This shift was also a response to contemporary

social change and the multiple crises of that time, which in turn correlates to simultaneous debates in architecture.

»Germany's Futurologists at Grandpa's Congress«

»SYSTEMS 69« was conceived as an interdisciplinary congress on the topic of futurology. The idea was born within the parameters of the aforementioned Systems Research Group, namely by the group's Director, Krauch (Seefried 2015). This conference, however, never took place, despite invitations that were not only sent to Rittel but also to internationally renowned researchers such as the rocket scientist Wernher von Braun and the American futurist Herman Kahn, and his French colleague Bertrand de Jouvenel. Historian Elke Seefried speculates that Krauch likely lacked sufficient funding and thus, the conference never materialized. Instead, the information scientist Karl Steinbuch from the »Gesellschaft für Zukunftsfragen« (GfZ) adopted the idea (Seefried 2015). At the time, the GfZ was a new umbrella institution for German research on the future whose actors sought a greater public audience for their work. One of Steinbuch's aims for the conference was to showcase technological progress. He subsequently involved the industry in organizing »SYSTEMS 69« which opened its doors at Munich's exhibition grounds in mid-November 1969. Major corporations such as AEG, HP, IBM, and Siemens sponsored the event and supported an extensive accompanying exhibition of »new« technologies in fields as diverse as energy production, chemistry, information technology, and urban and transportation planning. This focus was also reflected in the audience. Most of the attendees (750) were representatives of the industry. Besides, roughly 250 scientists, 50 administrative officers, and only a few politicians were among the visitors (Seefried 2015). Similarly, it will come as no surprise that almost all of the attendees were male (Eberspächer 2019). Science in general and academic discourses on conceiving and planning futures specifically were dominated by men. This was especially true of systems research, the most popular method at that time, which had its roots in military planning and warfare, as Rittel pointed out (Rittel 1984).

The relatively high entrance fee was intended to help finance the extensive event, but it created an exclusive atmosphere which was criticized by a student group in particular. Moreover, the group's criticism did not only concern the format, it also extended to the content. The future of technology could not be considered without contemplating social consequences

or alternatives (Seefried 2015). One of the critical voices came from a female student. During a panel discussion, Gisela Loh reminded the older, male audience that the future is at least as important to her as it is to »older gentlemen professors« which caused quite a turbulent debate (Eberspächer 2019: 239. Translation: author). Yet, it was not only the conventional format and its aged presenters that seemed inappropriate for a conference on futurology, but the content was also often rather dated. Despite Steinbuch's ambitious goal to assemble groundbreaking research on future developments, according to historian Achim Eberspächer, the program did not provide any profound new insights. Eberspächer quotes a German newspaper that joked about »Germany's futurologists at grandpa's congress« (2019: 232. Translation: author). As such, many talks focused on promises and premises of technological progress that were already apparent to most attendees beforehand. Lectures by scientists on different panels dealt with energy infrastructures, chemistry, information science, urban and transportation engineering, aerospace and marine research. In contrast, Rittel emphasized the political notion of planning and deduced necessary links between planning and participation: Democratic planning procedures were only possible by means of participation.

Future-Oriented Spatial Planning

Against the progressive and optimistic backdrop of the conference, Rittel began his talk by painting a bleak image of the future: Due to air and water pollution, social inequality, urban impoverishment, high land prices, and resource depletion, »it has become clear that it does not take a nuclear war to make the earth uninhabitable« (Rittel 1970: 174. Translation: author). While many agree that one cannot watch the earth being destroyed, Rittel stressed that it remains unclear *who is acting or should act, and how action should be taken*. These issues can be summarized in one question: »How should the use of which spaces be planned in view of which futures in whose interest?« (Rittel 1970: 175. Translation: author). This question would urge elaboration upon procedural aspects of spatial planning. This emphasis followed from Rittel's interest in design decisions and the epistemological question of how people think of, and plan, for the future. Thus, for him, the most important and difficult question remained »the problem of deciding what future ›one‹ wants to and should bring about, and how it can then actually be set in motion« (ibid.). From this premise, Rittel inferred two central issues: First,

the nature of knowledge needed for (well-informed and responsible) planning and second, the legitimacy of planners and their relation to power.

The Nature of Knowledge and Issues of Legitimacy

On which knowledge should one build the search for alternative futures? Neither quantitative analyses, trends, and coercive factors, nor arguments based on spatial-planning theories are sufficient to reason for a well-informed decision, stressed Rittel. Quantitative data or prognostics could not account for unforeseen events or sudden changes in behavior. Planners, however, should be interested in these intervening and unforeseen factors, as it is precisely this quality of intervening that characterizes their work.[2] With regard to spatial theories, Rittel drew on Popper's theory of falsification, according to which a theory cannot follow from facts only. Thus, data can only be meaningful when read against the background of a theory, while facts can only confirm or falsify theories, but never prove or imply them. If facts, unlike theory, can be incorporated in a variety of ways, then there is no such thing as scientific planning. According to Rittel, the logic of planning is therefore inherently different from the logic of science. Later, he referred to planning problems as wicked problems, whereas he considered scientific problems to be tame problems (Rittel/Webber 1973).[3] The formulation of a wicked problem already implies its solution. Among other distinct characteristics, wicked problems are also unique: Designers, politicians, and others involved in future planning cannot repeat a planning task and therefore cannot proceed as empiricists would do: »There is no planning without forecasts, and no forecast without assuming invariants« (Rittel 1970: 178. Translation: author). The task of the planner is to choose some of the conceivable invariants. This choice is not pre-determined, but a question of fantasy as well as of self-confidence – which power do I ascribe to myself as designer? If facts do not form a theory, Rittel argued that »behind every theory of spatial planning is – usually unstated – ›the worldview‹ of its author« (Rittel 1970: 180. Translation: author). According to Rittel, this is not necessarily a

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2 It is statements like these that distinguish Rittel's ideas from purely cybernetic notions of planning.

3 The claim of science operating on an objective knowledge base has been challenged, but this does not diminish Rittel's argument.

bad thing. Later in his career, he framed this idea as the »epistemic freedom« of designers; the joy and burden of designing (Rittel 1987b).

Rittel argues that the absence of an objective knowledge base poses a challenging question regarding the planner's legitimacy. If designing is about envisioning alternative futures and choosing which one to favor, there is at least one deontic premise at play, that is, at least one proposition expressing a certain obligation as an instruction for action. Without such a claim, there could be no recommended action. Moreover, if there is no objective knowledge on which to base spatial planning decisions, there is no professional expertise in spatial planning for the future (Rittel 1970: 183). Instead, spatial planning is logically arbitrary, so are planners legitimate actors if they cannot be experts who derive their action from facts? Rittel saw only one solution: The continued negotiation of the deontic premise must become a central component of planning processes, with the professional planner as one participant among many. As the most important part of this process, decision-making should include those affected by planning as the experts of the specific situation: »Plans are doomed to fail if those affected by them are not motivated to live under the plan's consequences« (Rittel 1970: 187. Translation: author).

Politicization of Planning

Democratizing the planning process was therefore of paramount importance to Rittel. This seemed necessary to him, not only for methodological reasons, since the best expert on deontic premises is the affected person. In his manuscript, Rittel also emphasized the need to secure self-determination over one's own living conditions, a claim that found its way into the published text, but only in a more moderate tone (Rittel 1969).

People affected by planning processes not only need to be heard, but also to assume an active part in the planning process – the ultimate goal of participation. However, this raises further procedural and practical problems: How do you determine who should participate? What would the planning unit be? How are the interests of those who cannot participate in the process represented? In a later article, Rittel points to the impossibility of participating in all the planning processes involved in every issue that affects one's own life; there are simply too many (Rittel 1972). Other practical issues remain: How are the costs and benefits of the consequences of planning distributed among those affected? Not to mention issues regarding making the ultimate

decision or democratic voting. This leads to one of Rittel's central points. He argues that what are missing, then, are »social technologies« to facilitate planning as an argumentative, pluralistic process and that the initiation of a »public discussion about which of the innumerable alternative futures is worth bringing about« (Rittel 1970: 186. Translation: author). To facilitate planning as a pluralistic process, Rittel demanded that »the process of spatial planning needs politicization« (Rittel 1970: 185. Translation: author). As a first methodological step, he suggested the introduction of »counterplans«. There should be forms of organizing planning that engage planners and counterplanners in a continuous argument. The articulation of different goals, visions, needs, and interests could stimulate a learning process that contributes to the formation of collective expertise and provides opportunities to form opinions.

Such an understanding of planning as a political issue would require democratic control. How this could be organized, however, would have to be evaluated on a case-by-case basis. Yet, Rittel still stressed that laws and regulations for spatial planning would need to be revised and replaced as they remained based on the notion of expert planning. In his paper, Rittel suggests several issues to be included in a new legal framework, such as: securing fundamental rights, establishing the co-planning rights of citizens, introducing planning jurisdiction, and re-regulating property rights to land. He concluded by presenting various potential futures, which ranged from a polluted world in which individuals wear personal oxygen masks, to a future where work is no longer necessary and people have time to participate in designing their environment.

Diversification of Potential Futures

Rittel's final vision of manifold potential futures represented a general shift in thinking about the future at the time. The idea of pluralistic futures began to supersede the idea of one predictable future that could be planned for. Not only was this diversification a main premise for the rise of futurology as a »new meta-discipline« (Seefried 2014: 1), but it was also the seed for a democratization of futures that were designed and enacted every day by civil initiatives and local communities (Gidley 2017). In 1969, when the futurologists met in Munich, the imagination of futures called to action from both activist and disciplinary perspectives. The environmental movement was already emerging in tandem with the nuclear threat. In 1962, marine

biologist Rachel Carson had published *Silent Spring*, a study of the devastating effects of pesticides on water and the environment which helped to spark a new environmental consciousness. The Club of Rome was founded in 1968, although at the time of the conference *The Limits to Growth* had not been published. After the post-war optimism about planning in the West, skepticism had begun to set in; the future no longer seemed promising and prosperous. Rittel's lecture is indicative of that growing dubiousness and as such, was an intervention into the pro-development setting of the conference. He drafted a world that demanded action: »The future must be guaranteed« (Rittel 1969) reads a pencil note in his manuscript. Roughly a decade earlier in Ulm, he had given a talk entitled »The Future Is to Be Managed« (Rittel, undated. Translation by author) – in comparison a rather optimistic title. In 1969, he saw participatory planning methods as the only appropriate means to plan for potential futures, despite the unavoidable problem that ultimately, there are no »just solutions in the sense that everyone is equally affected by them« (Rittel 1970: 188. Translation: author)

Rittel's argument for democratizing and diversifying planning was shaped by his experiences in the US. In the end, he noted: »It may be that spatial planning and the other dimensions of futurology will remain in the hands of the experts. It may be that this will also lead to serious rebellions outside the US« (Rittel 1970: 191. Translation: author). He introduced American discourses and knowledge of participatory design methods to Germany, thereby intervening in the conference setting with a Californian perspective. Similarly, Rittel had intervened in design discourses in Ulm, Berkeley, and later, Stuttgart as a mathematician who sought logical grounds on which to facilitate democratic discussions and planning procedures.[4]

Caring for Futures (of Spatial Planning) Today

Despite these efforts at diversification, the futures presented at »SYSTEMS 69« were limited, as the conference was organized and attended almost exclusively by white men from Europe and the US. Similarly, rational planning methods were a male invention ideally rooted in Western military laboratories. Thus, there are many arguments as to why conceptions of the future

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4 Later, Rittel would not »only« intervene into design theory, but also more directly in the environment, becoming a planner of information systems himself, although he would probably have rejected such a denomination.

back then were problematic. Post-colonial and feminist theory have raised awareness of the fact that »future« was, for most of the time, a paternalistic and patriarchal project that often had devastating consequences. Angelika Fitz and Elke Krasny point out that modernism in architecture and urban planning was »based on the ideology of progress with its promise of building a better future. [...] The future was built on the annihilation of the existing« (Fitz/Krasny 2019: 12). The effects of this ideology have been devastating, as evidenced by global warming and the ongoing environmental degradation that shape today's world.

As a result, current discourses mostly seek futures elsewhere, such as in notions of »care« that have emerged in architecture from feminist thought. Architecture's role in contributing to the climate crisis due to its consumption of resources and the production of waste has led to calls to limit the destructive consequences of building. Instead, there is a growing focus on repairing and maintaining existing structures, rather than building new ones. This approach prioritizes caring for buildings rather than destroying them. Unlike the movements of the 1960s that protested demolition as a displacement strategy, today's focus is on the environmental impact of demolition. This change is due to recognizing the amount of energy invested in the built environment, the growing scarcity of resources, and an awareness of extractivism and its destructive consequences.

Yet, the political scientist Joan Tronto (2019) notes that »caring architecture« extends beyond caring for the physical environment. She stresses the significance of caring for relationships rather than objects, which necessitates a completely new perspective on the connections between the built environment, nature, and humans. This perspective also highlights the environmental impact of construction on non-human habitats: Sealed or excavated grounds and deforestation for the purpose of construction harms many species and undermines efforts to maintain biodiversity. Moreover, this perspective also emphasizes that architecture is not only built on material resources, but is also built on diverse forms of capital, (un)paid labor, and time, and therefore entangled with politics, economics, and social norms. Fitz and Krasny highlight that critical care in architecture should therefore aim to diversify practices and economies, not only alternative, circular, and local economies but also »community engagement, volunteering, participatory workshops, skill building or public environmental pedagogy« (Fitz/Krasny 2019: 14). This focus on caring for socio-natural relations in the context of political economies shifts attention to the interdependence of the

numerous factors that influence architectural practices of future-making. It also reflects Rittel's call for the development of social technologies to facilitate planning as a pluralistic process.

Indeed, these recent approaches to designing futures with care in architecture share common ground with Rittel, who called for a democratization of design by engaging as many diverse actors as possible in a pluralistic planning process. Today's discourses about building inclusive futures strive to realize this diversification because they are built on the premise of engaging diverse voices. Thus, attention has shifted to perspectives on futures that were unheard of in Rittel's time. Yet, while Rittel was still driven by the idea of design as imagining a future as something new, today's focus on care in architecture emphasizes the perspective of the existing as the context and framework in which we continuously build and realize futures. Thus, the scope of, and arena for, today's design actions have also shifted.

In the end, Rittel's reminder that designers cannot draw on objective knowledge on which to base their decisions could be an important contribution to current discourses of care, especially of care for the existing. Statements on those are often based on numbers that express the devastating impact of architecture on the environment. While these facts are true and alarming, they are meaningless insofar as no action can be inferred from them without formulating a deontic premise. Facts will never tell us which future to bring about, but we must make them meaningful by debating worldviews and negotiating various potential futures. In this lies the epistemic freedom of designers that comes with moral obligations.

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