A Typology of Fantastical Cities and Architecture: Categorizing the Urban Imaginary

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ABSTRACT

Throughout time, imagining fantastic and future cities has played a key role in developing Urban Design as a discipline and a practice. Images of fictional cities strongly influence the way we perceive the urban world today and open the dialogue for negotiating our future urban reality. Following both deductive and inductive reasoning approaches, this paper proposes a typological system for organizing and analyzing fictional cityscapes and their built environment and facilitates the conceptualization of much-needed new urban visions that address contemporary urban issues, concerns, and transformations. The proposed typology is presented in the form of a "fictional city sheet", an analytical tool that can be applied across media to various representations of urban imaginaries. This work aims to promote stronger connections between the imaginary and the coming real, serving as a first step in planning the possible by exploring the impossible.

CCS CONCEPTS

• **Applied computing** → Arts and humanities; Architecture (buildings); • **General and reference** → Document types; General literature.

KEYWORDS

Architecture Fiction, Built Environment, Fictional Cities, Imagination, Speculative Design

1 INTRODUCTION

Architecture and the urban environment have always been fertile terrain for human imagination. From the tower of Babel to Borges' labyrinths, to the Penrose staircase and the foldable cityscapes in the visually stunning film Inception (Christopher Nolan, 2010) the creation of paradoxical, impossible, and unlikely structures has played an essential role in architectural imagination. These impossible and fantastic architectures have different functions. They can

be metaphors or allegories meant to teach something about humanity, ways to exploit the semiotic potential of representations and illusion, or representations of alterity (dream spaces, alien civilizations, possible and impossible futures). However, in designing these worlds of dreams, where design sees no boundaries other than the authors' imagination, architects too can step out of the familiar and allow their minds to explore a world full of imagination and possibilities.

Throughout time, imagining fantastic and future cities has played a key role in developing Urban Design as a discipline and a practice [13, 16, 23, 24, 31, 52]. Envisioning alternative urban scenarios has widened the imagination of architects and served in forming our present urban realities [25]. In this respect, fictional architecture is related to a tradition rooted in radical design [15] which evolved in speculative design [26] and design fiction [63]. In particular, the term "Architecture fiction" (AF) coined by Sterling [2006] (see [64]) indicates a type of speculative futurism that offers a way of exploring alternative built forms and cityscapes without the physical construction of such environments. Fiction provides a testbed for reality and anticipates the future present [22]. Through developing future urban visions, architects and urban designers can step back from a fixed system and creatively test the potential of reconfigured urban dynamics, technological development, and alternative cultural, political, and physical living conditions in a sort of "pretend game".

These images of fictional cities strongly influence how we now perceive the urban world and open the dialogue for negotiating our future urban reality [23]. This work proposes a typological system for organizing and analyzing fictional cityscapes and their built environment, and also facilitates the conceptualization of new visions that tackle contemporary urban issues, concerns, and transformations [61] such as overcrowding, social inequality, environmental degradation, climate change, urban gentrification, increased refugee influx, increased surveillance, technology and the smart city discourse in urban planning [39, 46], DIY urbanism movements [66], etc. The objective of this paper is to propose a typology that addresses and classifies the fictional, social, and spatial aspects of different kinds of imaginary cities. The typology is presented in the form of a "fictional city sheet", a parallel of role-playing games' "character sheets", serving as a creation and analytic tool that can be applied across media to different representations of urban imaginaries. By introducing these tools, we wish to promote stronger connections between the imaginary and the coming real: we believe that a more speculative and creative mindset would benefit architects, urbanists, and citizens alike in the endeavor of reimagining our living environment. Here, we propose a first step for planning and anticipating the "possible" by exploring the impossible.

Figure 1: Left: Emerald City from the Wizard of Oz. Image courtesy of TheHollywoodReporter, 2010. Right: Burj Khalifa in Dubai with an edited color scheme, Photograph by Donaldytong [Creative Commons Attribution], via Wikipedia.

2 IMAGINATION AND FANTASY [IN]FORMING REALITY

Fiction offers a unique set of perspectives and tools to enrich the architectural imagination and foster critical thinking. The constructed fictional worlds and the cities within them can be read as inspirations, reflections, predictions, and critiques of our actual world and lived realities [1, 16, 31]. "The practice of architecture is reliant on imagination" [16] and the process of constant and iterative creation of preferable possible realities, structures, and living conditions can benefit greatly from the imaginative freedom that fiction and its imagined cities provide [16]. It has been argued by urban theorists such as Stephen Graham and Lucy Hewitt that the design of the built environment has been constantly informed by science fiction images of the city [16, 31]. Examples include the aesthetics of the Burj Khalifa, inspired by the skyline of Emerald City from The Wizard of Oz (1939) (Figure 1), as well as architectural features used in Chinese cities and in the Arab Gulf states, which directly mimic

the verticalized imagery of urban science fiction, rapidly growing skyward [31].

The desire to imagine an alternative way of being in the world is one of the driving forces behind designing the built environment. This architectural quest for continuous improvement of the living space and shaping our physical realities is a utopian impulse that should be fostered and expanded by exploring the unconstrained limits of urban imagination [16, 25]. "built projects, material cities, sci-fi texts, imaginary futures, architectural schemes and urban theories mingle and resonate together in complex and unpredictable ways" [31, p. 395]. A clear example of this mingling between film, architecture, urban movements, and sci-fi text is present in Fritz Lang's 1927 Metropolis (Figure 2), inspired by his visit to New York City (material city), which incorporates a variety of architectural styles from Art Deco, Bauhaus, to Futurism and some Gothic influences (architectural styles), provides a Marxist critique of industrial capitalism and increasing social division (political and economic ideologies), and the city highly resembles the drawings for "Città Nuova" by Antonio Sant' Elia (1888-1916) (imaginary urban futures) [18].

Moreover, Edward Bellamy's novel Equality (1897) presented a comprehensive suburban vision and conceptual framework that influenced planners from Ebenezer Howard to Frank Lloyd Wright [70]. Wright acknowledged the influence of "Equality" on his Broadacre City proposal, an urban planning vision that promoted a form of radical suburbanization. Most notably in Broadacre City's fantastic renderings in the late 1950s, which depicted mechanized agriculture and flying cars [70]. This relationship and influence that different forms of media exert on each other are essential in understanding the world today and fictionalizing the one we dream of in the future [23, 31].

3 URBAN VISIONS AND PAPER ARCHITECTURE

In the early 20th century and mainly due to the industrial revolution, cities experienced a shift in the way they were planned, perceived, and designed. Architects, urban planners, designers, sociologists,
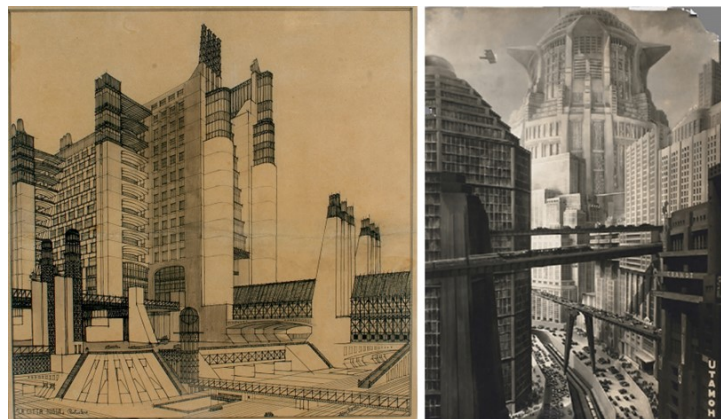

Figure 2: Left: Part of the series La Città Nuova, 1914, sketch by Antonio Sant'Elia. [Public domain], via Wikimedia Commons. Right: Fritz Lang's Metropolis (UFA, 1927).

and others directed their attention to understanding the connection between society, technology, and the built environment, making them essential players in this shift toward a modern technologized urban environment. Moreover, fiction writers and novelists played a key role in exploring the uncertain effects and consequences of technological development on the city and its citizens. These futurist depictions and imaginaries found a conduit in various media forms, from film to arts, which creatively portrayed these changes [24].

Thomas More's Utopia (1516) constituted an imaginary society with a political structure that contrasted with that of 16th century Europe. His vision addressed the social problems in England and described a fictional island devoid of such problems, presenting it as the "best state of a commonwealth" [52]. More coined the term "Utopia", which he intended as an "imaginative projection of a new place or state" [52, p. 15]. An imaginary good place that does not exist in the actual world, one that differs from the present, whether by being in another time or space, and embodies a political and social ideal. Utopia contains a double meaning; "a good, happy place" from the Greek *eu-topos* and "nowhere" *ou-topos*, and is often used to refer to other worlds and visions, frequently presented in different art forms and literature [52].

Throughout time, a strong connection developed between the city and Utopian thought. Fantastic urban visions were frequently developed in dreaming of social transformation [52]. Examples of the urban imaginary can be found throughout history, from the biblical New Jerusalem [59], Civitate dei of St Augustine in 426 AD, Christine de Pizan's La Cité des dames in 1405, the 16th century's gold city of El Dorado, sir Ebenezer Howard's Garden City (1898) [52, 70], to Eugène Hénard's discussion of future cities in 1910, Antonio Sant' Elia's Città Nuova (1914) [18] , Le Corbusier's radiant city in 1924 [47, 52], Fritz Lang's 1927 film Metropolis [18], Frank Lloyd Wright's broadacre city in the 1930s [52, 70], Archigram's 1960s Plug-in City, Living Pod, Instant City [57], the 1960-70s Gruppo Strum [52], to Bezos' floating space colonies today, and many more.

The late 19th and 20th centuries marked a period of intense utopianism [52]. This was evident in the numerous influential Utopian urban visions that emerged as a response to rapid urbanization, the continuous change in urban life, as well as Modernity's cultural and socio-economic transformations in western Europe. These visions perceived urbanism as a driver of change, a tool to enhance or save societies. The fictional ideal cities aimed to establish a new order and reorganize what the visionaries of the time deemed as dysfunctional spaces. The proposed urban schemes of Howard, Wright, and Le Corbusier significantly influenced urban planning thought and practice in North America and Europe, especially after World War II [37, 52]. They became ingrained in urban planning history, shaping the understanding of modern urbanism and influencing designers to come [13, 37, 52, 70].

Utopian modernist visions were later heavily criticized by the situationists and letterists from the 1950s, who attempted to develop alternative visions and possibilities for urban spaces. They viewed the city as a site for freedom, emphasizing the role of play and creative exploration of space [52]. Gilles Ivain's call for modifiable architecture [71] and the situationists' concept of unitary urbanism and the transformation of urban life manifested in Constant's vision of New Babylon, a constantly changing city where the environment is rearranged according to the residents' needs. The vision of New Babylon put emphasis on urban exploration and play, the fabric of the city's social life relies on wandering, mobility, and spontaneity [47].

Since then, many visions have emerged that glorified urban life and others that predicted its demise. Nevertheless, imagination remains a powerful tool for forming new radical urban possibilities for a radically uncertain future. In the face of the contemporary world's progressively challenging urban transformation, there is an urgent need to cultivate the imagination and re-engage in envisioning desirable future cities that critically assess our current urban reality [23].

4   VISIONS OF THE PAST FUTURE

Urban visions and imaginary, whether utopian or dystopian, usually tend to reflect the spirit of their age. Utopian visions that accompanied the poor living conditions, increased social division, pollution, and the numerous issues brought about by the industrial revolution, have often aimed to imagine solutions, and envision better living conditions and cities. Nevertheless, many visions extrapolated the issues and circumstances of their time into an unwanted future, one that presented countervailing perspectives of the city as a place of despair and alienation rather than a place of harmony and freedom [52]. The dystopian imaginary, often portrayed in fiction literature and film rather than urban planning schemes and movements, has offered valuable critique of the urban dynamics, living conditions, concerns, and even utopian urban visions throughout time.

Written in 1949, George Orwell's 1984 dystopian fiction presents a vision of what, for us today, is a "past future" that remains relevant today. It introduces a dehumanized society controlled by surveillance and propaganda in a totalitarian regime. In addition to its political critique, Orwell's 1984 also reads as a critique of Modernity's ideologies and its utopian urban visions [67] discussed in the previous section. The detachment and erasure of history and memory, its use of urban planning as a form of social engineering where society is transformed to fit the "modern citizen" discourse. Fritz Lang's dystopian Metropolis (1927) presents a similar critique of the modern dehumanized society, the top-down authoritarian nature of Modern imaginary, the vertical built-environment further detached from the human-scale [18]. This showcases the importance of fiction and dystopian imaginary, not only for presenting warning signs of undesirable futures, but also providing alternative visions and imaginary urban narratives that question and critically examine the ideals and mainstream thinking of their time.

Whether driven by a utopian impulse or a dystopian critique, fictional cities open a new window into understanding the past, present, and future state of our world. This research proposes a framework for organizing and analyzing the urban imaginary, paying particular attention to the spatial organization and architecture of fictional cities and clarifying their connections and influence on our perception of the present and future world.

5   HCI, CRITICAL DESIGN, AND THE IMAGINED CITY

Human-Computer Interaction (HCI) has seen an increasing emphasis on virtual environments [36], representing a shift from an

exclusive focus on functional interfaces towards an expanded consideration of user experience [14, 36]. This broad approach takes into account not only efficiency and effectiveness of interactions but also emotional and psychological resonance of designed spaces [11, 62]. These virtual environments, whether representing actual locations or imagined settings, go far beyond digital realms to encompass architectural and urban elements that influence user experiences [44]. This shift towards more nuanced understanding aligns closely with Critical Design principles, which examine emotional, ethical, and sociocultural dimensions of design [10, 26].

Virtual environments present unique challenges and opportunities in HCI research [72]. Being immersive spaces that simulate both real and imaginary worlds, virtual environments require a holistic approach in their design and analysis [14, 44] - beyond usability metrics, they require consideration of spatial design elements, narrative elements and even cultural and social dynamics. The need for an interdisciplinary approach that embraces these complexities is well-supported by existing literature. In HCI, there is a call for a more comprehensive incorporation of architectural and urban theories into the design of virtual environments [44, 69]. Similarly, in Critical Design, the utility of narrative and speculative frameworks for instigating critical discussions about design and society is well-documented [10, 42].

The typology of fictional cities proposed in this work serves as an academic bridge between these broader HCI and Critical Design frameworks. For HCI researchers, typology offers a way to systematically consider these more nuanced aspects of emotional and aesthetic dimensions in the design and evaluation of virtual environments. As for Critical Design, it provides a tool for critiquing and understanding the socio-cultural implications of architectural and urban forms in both real and imagined contexts.

6 METHODOLOGY

This paper proposes a typology for analyzing, organizing, and creating fictional cities represented in various media forms, from fiction literature, film, visual art, and video game environments to urban planning and design proposals. A combination of deductive and inductive reasoning approaches was used in formulating the proposed categories, the latter involving a process of content analysis of peer-reviewed journal articles identified through an extensive literature search on fictional cities, which allowed us to engage both with a series of fictional cities described and analyzed in the articles, and with the concepts, dimensions and perspectives adopted by the authors.

The deductive approach relied on established definitions, theories, and principles from urban and architecture studies, utopian studies, fiction studies, and literature studies, while the inductive approach extracted and summarized code categories through a content analysis of identified literature sources, where the manuscripts and their descriptions of fictional cities were analyzed to determine the presence of certain themes, words, and concepts in describing those cities. The proposed categories were then tested for comprehensiveness against 30 fictional cities discussed in the identified literature and presented in various media types, such as novels, films, visual art, video game environments, and urban development proposals.

The typology is presented in the form of a "fictional city sheet", which can be used to organize, analyze, and even conceive and create new urban visions and fantastical cities. The produced typological framework comprises 6 main themes, which include a total of 25 categories.

6.1 Deductive Approach to Formulating Categories

A deductive approach refers to "developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis" [51, p. 7]. It is a top-down logic that proceeds from general principles to a specific conclusion [9]. Through literature review and relying on established theories and definitions from architecture and urban studies, utopian studies, as well as fiction and literature studies, the following 13 categories were identified (Table 1).

The work by Ryan [2018] (see [56]) provided an ontological classification for describing genres of imaginary worlds, which has served as a strong basis for deriving the categories related to the fictional aspects of imaginary cities (categories 1-5). Literature on urban planning and design as well as urban planning theories and models [3–5, 30, 40, 73] helped identify categories 6 and 7, as the city's layout has been the focus in reading, analyzing, and forming urban life throughout time, and the city's infrastructure and modes of transportation play a key role in organizing the city's districts, services and has a direct effect on its form. Utopian, literature, and urban studies identified category 8, especially in the description of utopian urban visions of Modernity and their critique [52, 68]. Categories 9-13 relate directly to architectural engineering, design, and the built environment as well as literature on building construction [2, 6, 19, 21, 32].

6.2 Inductive Approach to Formulating Categories

An inductive approach "involves the search for pattern from observation and the development of explanations – theories – for those patterns through series of hypotheses" [12, p. 7]. Using this bottom-up logic, 1) an extensive literature search on fictional cities and the urban imaginary was conducted, followed by 2) a content analysis [28] of the identified literature, where observations of recurring themes and keywords utilized in describing fictional cities were collected and 3) then synthesized, resulting in the following 12 categories (Table 2). The literature search was conducted in January 2022, utilizing three academic databases, namely Web of Science, EBSCOhost, and Scopus. To maintain the quality of the study and to enable effective synthesis, only original research articles published in peer-reviewed journals in English were considered. The search term included the keywords: imaginary, fiction, fantasy, city, urban, architecture, design, and 57 articles were considered for analysis as they achieved the following inclusion criteria: 1) discusses a fictional urban scenario whether in film, literature, video game, art, or urban project 2) discusses the presented fictional city and its architecture 3) presents a conflict occurring in the discussed fictional city 4) is written in English.

Table 1: Categories identified from literature following a deductive approach

	Identified Category	Source
1	Fiction Level (Alethic Value)	[56]
2	Defamiliarization Level	[43]
3	Fiction Genre	[56]
4	Urban Setting - Time	[56]
5	Urban Setting - Location	[56]
6	City Layout	[3][4][5][40][73]
7	Transportation Modes	[30]
8	Utopian/Dystopian Imaginary	[52] [68]
9	Construction/Architectural Impossibility Level	[6]
10	Architectural Style	[19][21]
11	Architectural Features	[19][21]
12	Building Typologies	[32]
13	Building Materials	[2][6]

Table 2: Categories identified from literature search following an inductive approach

	Identified Category	Recurrence in identified literature
1	Type of Media	100%
2	Conflict	95%
3	Chronological Nature of Conflict	100%
4	Critical Aspect	95%
5	Urban Setting Conditions	100%
6	Urban Influences	70%
7	Urban Condition	100%
8	Roles of the City	85%
9	City Residents	100%
10	Social Conditions	70%
11	Authoritative Figure in the City	80%
12	Technological Development	90%

6.3 A Categorization Framework for Fictional Cities

This section presents the proposed typological system for categorizing and analyzing fictional cities. The formation of the categories followed both a deductive (top-down) and an inductive (bottom-up) logic. After crossing and combining the two sets of categories, we organized them in a typological system (Figure 3) that comprises 6 main themes; Fictionality & Narrative; Urban Setting; Urban Planning; Urban Dynamics; Urban Imaginary; and Architecture, each consisting of several categories and discussed in the sections below.

The fictional city presented by Esser [2019] (see [29]), namely in William Gibson and Bruce Sterling's seminal novel, The Difference Engine (1990), will serve as an example and a testing ground for the proposed framework. Co-written by two leading figures in fiction literature, this novel helped establish the conventions of the steampunk genre. It provides sufficient information describing the city, Victorian London in this case, as well as its urban dynamics and the built environment. This work serves as a good example as it presents an alternative vision of a well-known location in a recognizable era that is fused with imagination and fictional representations capable of altering the readers' perception.

6.3.1 Fictionality & Narrative.
The fictionality and narrative theme comprises six categories, which tackle the fictional aspects of the analyzed city as well as the narrative within which the city operates (Figure 4). This first categorization theme explores the city as a product of fiction, understanding the type of medium in which the city was presented, the genre of fiction, the level of defamiliarization introduced, the core conflict taking place in the imagined city, as well as the critical aspects of the imagined scenario.

Type of Media | refers to the type of media where the fictional city was presented (Table 3). This includes literature (descriptive representation), film (dynamic visual representation), video game environment (dynamic/interactive visual representation), visual arts including photography, comics, illustrations, etc. (passive/static visual representation), and urban design proposals and visions (visual and descriptive representation). *E.g., in Esser [2019], the examined fictional city was presented in a novel (literature).*

Alethic Value | refers to the distance between the imagined urban context and the one we regard as primary or actual. The alethic value can be determined through the following alternatives: **1)** the representation of "what is" - **Non-fiction, 2)** of "what could happen in the Primary World, given the proper circumstance" – **believable**
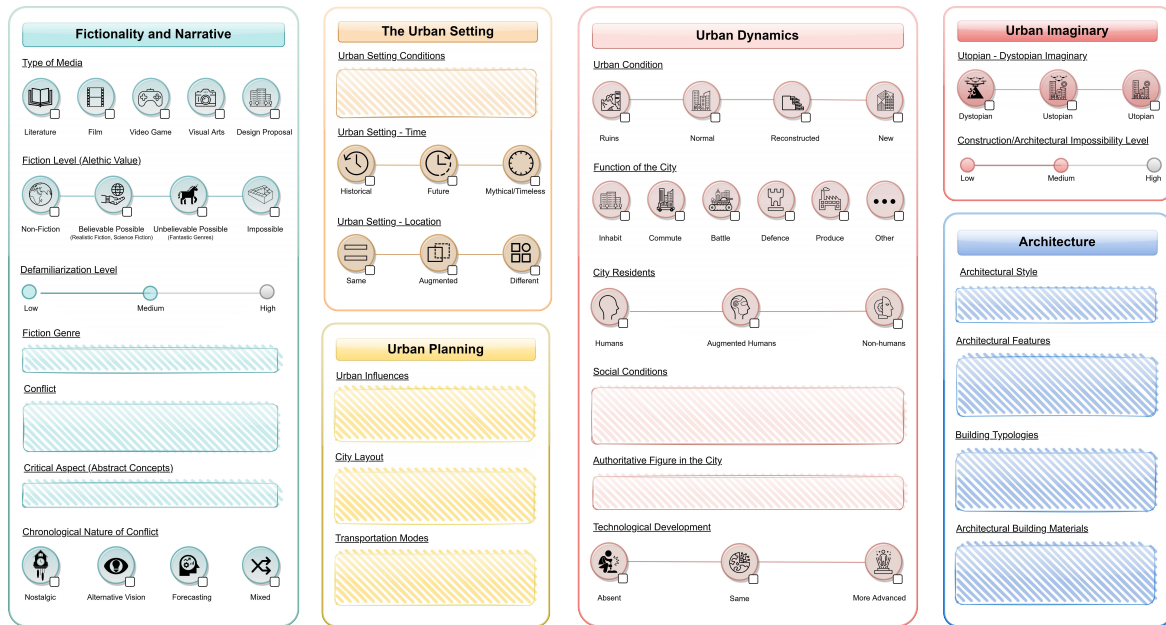
Figure 3: Proposed typological system presented in a "fictional city sheet" to organize, analyze, and conceive new urban visions and fantastical cities.

Table 3: Examples of types of media sorted according to their representation method

	Passive representation	Dynamic representation	Interactive representation
Descriptive	Novel, short story, literature	Tabletop RPG	gamebook
Visual	Picture, painting, comic book	film, cartoon, video	video game environment

possible (this includes realistic and science fiction, which are close to the actual world because they respect its laws), **3)** of "what can be imagined but cannot happen in the Primary World" - **unbelievable possible** (such as fantasy worlds that are subject to different rules but conform to the laws of logic), and finally **4)** the "**impossible**" as the outermost level, which, as argued by Eco [1979] (see [27]), includes what cannot exist because it violates the laws of logic. This refers to fictional settings that contain contradictions, ontological impossibility, impossible space (as in the aforementioned Penrose stairs), and/or impossible time [55]. *E.g., in Esser [2019], the examined fictional city, presenting a uchronic vision of a steampunk Victorian London, falls under the "impossible" classification. The novel presents a fantastic city in an alternate historical setting, a fictional time period which cannot occur in the primary world.*

Defamiliarization Level | The concept of "Defamiliarization", proposed by Viktor Shklovsky in his *Art as Technique*, refers to the literary technique which presents ordinary and familiar objects or situations in an unfamiliar manner [43]. The Defamiliarization level of the fictional urban space can be placed along a spectrum including: 1) low; when our perception of the imagined city gives an impression of familiarity. The geographical location, city layout and dynamics, inhabitants, and objects remain similar to the primary world. 2) medium; the perception of the imagined city slightly shifts,

and the environment can offer different interpretations from the everyday ones. The geographical location and recognizable buildings and monuments remain similar to the primary world. City layout and dynamics, inhabitants, and objects may differ and become unfamiliar. 3) high; perception of the imagined city is dramatically different, and the presented environment and its components are unfamiliar. *E.g., in Esser [2019], the presented fictional Victorian London preserved the aesthetic of 19th century Britain, as well as the historical details of the era. The characters, including Charles Babbage, Ada Lovelace, and Karl Marx, are connected to real people. The geographical location remains mostly the same. However, early counterfactual technological advancement changes the city's dynamics, the utilized objects and machinery, as well as the familiar narratives of the characters, shifting the reader's perspective on that era. This shift introduces a medium level of defamiliarization.*

Fiction Genre | refers to the style or category of the imagined scenario where the fictional city is presented. This includes, but is not limited to, historical fiction, science fiction, fantasy fiction, urban fiction, speculative fiction, architecture fiction, climate fiction, Afrofuturism, etc. It can be noted that a genre can be described as the occurrence of a set of imagined scenarios sharing the same ontological rules; what is possible in a particular type of fictional world, what can exist and what cannot [56]. Therefore, hundreds of genres, subgenres, and combinations of rules are possible and can
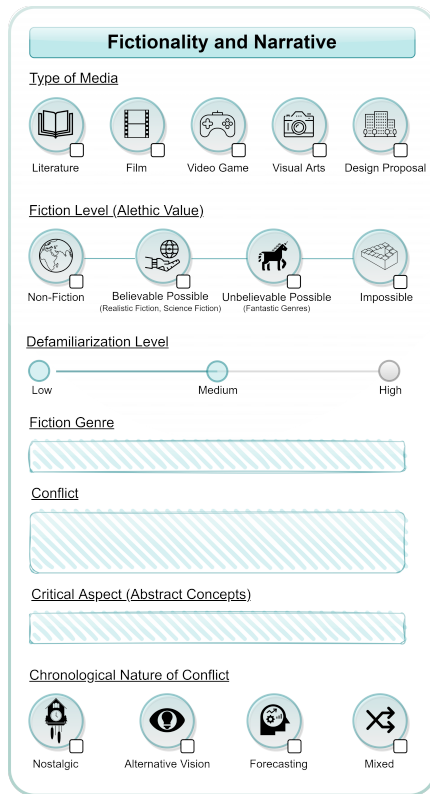
Figure 4: The "Fictionality and Narrative" theme card of the proposed typological system for fictional cities.

Figure 5: The "Urban Setting" theme card of the proposed typological system for fictional cities.

emerge with imagination and experimentation. *E.g., in Esser [2019], the presented fictional city falls under alternate history (Uchronic) fiction, a genre of speculative fiction.*

Conflict | refers to the main narrative and issues surrounding the fictional city, which are usually derived from the primary world and are critically examined through the lens of fiction. Identifying the ongoing conflicts within a fictional city not only helps us understand the imagined urban dynamics, but also allows us to make connections between the city's narrative, its proposed form, and its relationship to the actual world. *E.g., in Esser [2019], the presented fictional city tackles issues of domination by a machine-other, excessive surveillance of citizens, unbalanced power structures, and poverty.*

Critical Aspect | refers to abstract concepts from the primary world that are imported into and criticized by the imaginary scenario of the fictional city. For example, considering the effects of current and developing technologies and addressing long-term problems, such as climate change, rapid urbanization, food security, etc. This critical lens can "offer alternatives that highlight weaknesses within existing normality" [26, p. 35]. *E.g., in Esser [2019], the imaginary scenario provides critical insight into the de-humanizing conditions of capitalism, dependence on uncanny technologies, institutionalized slavery, and despotism.*

Chronological Nature of Conflict | refers to locating the criticized issues of the primary world in time, which can be 1) nostalgic:
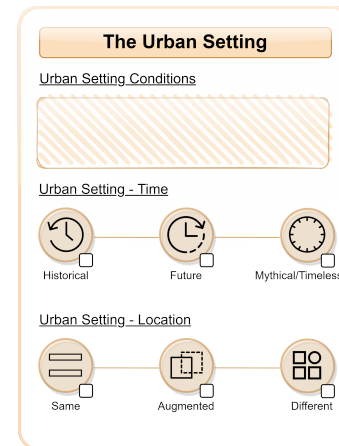
looking back on historical urban conflicts and re-exploring settings that are no longer accessible due to the passage of time 2) alternative vision: offering a parallel reality of a conflict, often introducing a solution 3) forecasting: extending ongoing conflicts into the future 4) mixed: a combination of 2 and 1, where an alternative vision is provided for a conflict in a historical setting, or 2 and 3, where an alternative vision is offered in a future scenario. *E.g., in Esser [2019], the nature of the conflict is mixed, offering an alternative vision of a historical Victorian London.*

6.3.2 The Urban Setting. The urban setting theme comprises three categories, which examine the fictional context, tackling the setting (time, place, and environment) of the analyzed city (Figure 5). This categorization theme explores the conditions of the fictional urban setting, as well as the time and location in which the city and its inhabitants operate.

Urban Setting Conditions | refers to the context of the imagined city and its distinctive features. This can vary from imagining subterranean cities [20, 49], submerged metropolises [23, 41], floating urban islands [58], post-apocalyptic cities [38, 68], and multiplanetary living [35, 65, 68] to rearranged nation borders [67, 70] and contemporary urban design proposals similar to our primary world [7, 47]. *E.g., in Esser [2019], the story takes place in a hyper-Victorian mechanized London witnessing the convergence of humans and machines.*

Urban Setting – Time | refers to the temporal location of the fictional city. This can be 1) Historical: taking place in a specific past or present temporal setting, that can be recognized by references to real-world individuals and events in the past 2) Future: taking place in a far or near future, which is often recognized by the utilization of advanced technologies or visions of utopian/dystopian urban conditions or 3) Mythical/Timeless: referring to completely fantastic settings and fairy tales [56]. *E.g., Esser [2019] presents an example of a historical urban setting.*

Urban Setting - Location | refers to the geographical location of the fictional city in relation to the primary world. This can be 1) realistic: occurring in an actual geographic setting similar to
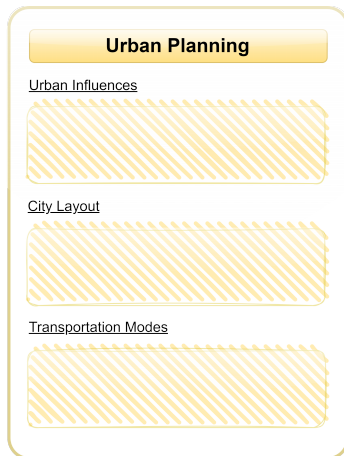
Figure 6: The "Urban Planning" theme card of the proposed typological system for fictional cities.

the primary world 2) augmented: occurring in a recognizable but rearranged world geography, which can have references to the primary world 3) fictional: occurring in radically different world geography that is either completely invented or has no reference in the real world or even no place names [56]. *E.g., in Esser [2019], the location is the same as the primary world, which is London.*

6.3.3 Urban Planning. The urban planning theme comprises three categories, which examine the urban fabric and infrastructure of the analyzed city (Figure 6). This categorization theme explores the urban influences of the fictional urban setting, the layout and organization of the urban fabric, and the utilized modes of transportation.

Urban Influences | refers to the effect of urban planning models, ideologies, approaches, a real world location or visionary urban proposals (garden city movement, city beautiful movement, radial city, broadacre city, etc. [52]) on the structure of the fictional city. *E.g., in Esser [2019], the fictional city was inspired by 19th century planning of Victorian London.*

City Layout | refers to the organized arrangement of the city's functions, services, and zones. This can be read from the city's urban fabric and through either descriptive or visual representations (e.g., classifications of urban form and network patterns such as grid, radial, loose grid, organic, etc. [45, 53], as well as classical models of urban structure and land use patterns such as the concentric zone model (1925), sector model (1939), and multiple nuclei model (1945) [17]). *E.g., in Esser [2019], the organic Victorian city is described as one vast information-processing machine, 19th century London augmented with "looming architecture, and towering, sublime Difference Engines".*

Transportation Modes | refers to the utilized vehicles and main means of travel within the city, which indicate the fictional city's infrastructure. *E.g., in Gibson and Sterling's fictional Victorian London, citizens utilized pneumatic trains, horse carriages, omnibuses, Steam Gurneys, and steam buses.*

6.3.4 Urban Dynamics. The urban dynamic theme comprises six categories, which examine the interconnected layers, relationships,
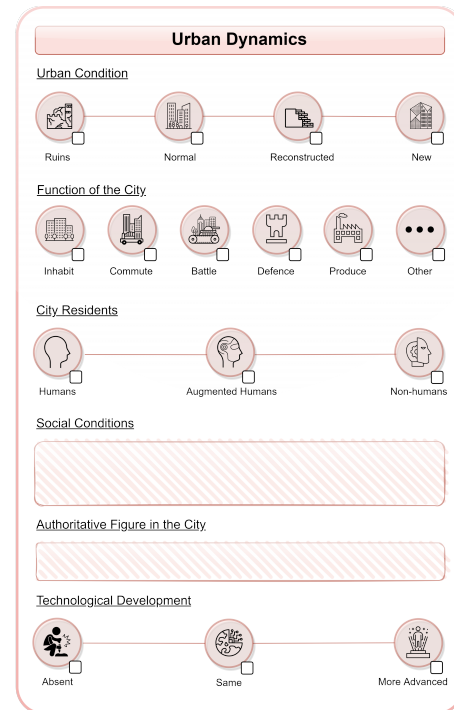

Figure 7: The "Urban Dynamics" theme card of the proposed typological system for fictional cities.

and interactions that form the urban fabric (Figure 7). This includes the physical urban conditions, the roles the city may play, the residents, their social conditions, the authoritative figure in the city, and the state of technological advancement present.

Urban Condition | refers to the described state of the fictional city's built environment. This is often determined by a certain event taking place in the fictional city's narrative and can have either destructive, adaptive, or constructive effects on the built environment. The physical urban state can be 1) in ruins: destroyed due to a catastrophic event 2) unchanged/normal: the condition of the built environment is not affected or is similar to the primary world 3) reconstructed: where there city's built form adapted to a major event, or the original form of the city was enhanced 4) new: where the proposed built environment is fantastical, or the city is presented in a visionary urban proposal. *E.g., in Esser [2019], hyper-Victorian London is reconstructed (enhanced) as it adapts to the early arriving technological developments and new constructions were introduced.*

Function of the City | refers to the functions the fictional city may serve. This category can be observed in highly imaginative urban proposals. The city can be 1) inhabited: which generally serves as the main role of cities unless they are rendered uninhabitable due to a catastrophe. Imaginary cities can (also) 2) commute: this is present in nomad cities such as the walking city proposal by Archigram. 3) Battle: where cities are equipped with urban-scale artillery such as the traction cities in Mortal Engines. Or they can serve for 4) Defense: where cities are fortified and in constant risk of attack or required to provide protection against harsh and uninhabitable
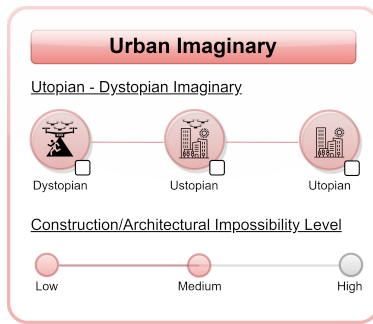
Figure 8: The "Urban Imaginary" theme card of the proposed typological system for fictional cities.

environments such as submerged cities and multiplanetary living scenarios. 5) Produce: where cities can produce food, oxygen, energy, goods, knowledge, etc., such as solarpunk cities and industrial cities. And 6) Other: refers to other functions and capabilities fictional cities can have. *E.g., in Esser [2019], the city serves as a habitat and production hub.*

City Residents | refers to the nature of the fictional city's described inhabitants, which can be: 1) humans 2) augmented humans referring to enhanced post-humans, cyborgs, etc. 3) non-humans, who can range from animals, androids, unfamiliar lifeforms, mystical creatures, to celestial beings. *E.g., in Esser [2019], the fictional city is inhabited by humans and eventually machines.*

Social Conditions | refers to the existing state and circumstances affecting the life, welfare, and relations of the residents. *E.g., in Esser [2019], the residents suffer from socio-spatial and economic inequalities alongside the existence of marginalized communities and spaces.*

Authoritative Figure in the City | refers to the main political power and decision maker in the fictional city, if any. This is determined by the city's narrative and is often used for criticizing issues of power balance in the primary world. The fictional city can have an autocratic religious regime, it can be a totalitarian state, it can be run by the elite few, etc. or it can have no authoritative figure. *E.g., in Esser [2019], the presented fictional city is a totalitarian state run by the "Industrial Radical Party".*

Technological Development | refers to the overall process of invention, innovation and diffusion of technology [34] described in the fictional city in relation to the primary world in contemporary times. The state of technology in the fictional city can be 1) absent 2) same 3) more advanced. *E.g., in Esser [2019], technology is more advanced with the introduction of self-conscious machines.*

6.3.5 Urban Imaginary. The urban Imaginary theme includes two categories, which examine the overarching ideology (utopian/ustopian/dystopian) in the proposed fictional scenario (Figure 8). The categories explore the typology of the urban imaginary, and the level of its construction/architectural impossibility.

Utopian – Dystopian Imaginary Scale | refers to the overarching theme of the imagined city in terms of an optimistic 1) utopian imaginary that offers an ideal scenario as presented in earlier sections and defined by More [52]. A 2) ustopian imaginary, as coined

by Margaret Atwood, which suggests that utopian and dystopian scenarios can exist within each other and not as exclusive states [48]. A balanced ustopian scenario can be viewed through various characteristics and perspectives of different actors in the fictional city, creating a kind of convergence of utopian and dystopian imaginaries. Or a pessimistic 3) dystopian imaginary, which pictures an undesirable worst-case scenario dominated by negative social forces [60]. *E.g., in Esser [2019], the fictional city presents a dystopian imaginary and narrative, where de-humanized citizens are under constant surveillance and are eventually replaced by machines.*

Construction/Architectural Impossibility Level | considering whether the described fictional structures can be constructed and experienced similarly in the primary world, the fictional environment can be rated as 1) low impossibility level: referring to geometrically possible structures that adhere to the laws of nature, and where the building materials, tools, and technology required for construction are present in the primary world 2) medium impossibility level: referring to geometrically possible yet challenging structures that adhere to the laws of nature, where the building materials, tools, or technology required are still not present in the primary world, yet may become possible 3) high impossibility level: refers to paradoxical and geometrically impossible structures that defy laws of nature in the primary world. *E.g., Although unlikely, it is possible to construct the Victorian-style structures presented by Esser [2019]. The vast pyramids and presented pseudo-Egyptian architecture can pose challenges yet are possible to construct with today's technology and materials. Therefore, this scenario presents a low architectural impossibility level. However, it is improbable and impossible to reconstruct the presented hyper-Victorian London in the same geographical location.*

6.3.6 Architecture. The architecture theme comprises four categories, which examine the characteristics of the built environment presented in the fictional city (Figure 9). The categories include the architectural style, features, building typologies, and utilized building materials.

Architectural Style | refers to a set of characteristics and external influences that shape the form and materiality of a structure, making it identifiable in historical and design terms [8]. *E.g., in Esser [2019], the imagined city of London is composed of Victorian architecture infused with retro-futurism.*

Architectural Features | refers to prominent architectural elements, design, proportions, and general arrangement contributing to the aesthetics and design integrity of a building present in the fictional built environment. *E.g., Esser [2019, p. 146] mentions the fictional city's pseudo-Egyptian architecture, placing emphasis on "fortress-doors, framed by lotus-topped columns and Briticized sphinxes, looming some twenty feet in height", as well as" windowless, dustless, highly efficient structures."*

Building Typologies | refers to the types of buildings according to their function or form that are presented in the fictional city. New Building typologies can be introduced in imaginative scenarios, such as proposed structures on planetary surfaces, and existing building typologies can be assigned new fictional functions, such as Hogwarts school of witchcraft and wizardry in J. K. Rowling's Harry Potter. *E.g., in Esser [2019], there was a mention of Scientific Palaces,*
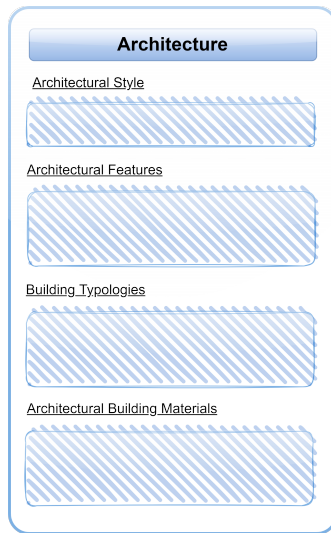
Figure 9: The "Architecture" theme card of the proposed typological system for fictional cities.

as well as a Central Statistics Bureau shaped like a vast pyramid, 19th century Victorian residences, stations, and racing tracks.

Architectural Building Material | refers to the materials used for construction in the fictional city, which can resemble those used for construction in the primary world (steel, concrete, bricks, glass, etc.), technologically enhanced materials [50] (transparent concrete, smart concrete, transparent metals, shape shifting metals, self-healing coatings, etc.), materials that are not commonly used for construction (crystals, gold, emerald, etc.), or imagined materials (invisible materials, living materials, etc.). *E.g., in Esser [2019], utilized building materials are similar to those used in the primary world, namely concrete, bricks, Steel, stone, brass, wood and plaster.*

7 CONCLUSION - IMAGINING A BETTER TOMORROW

Philosopher Slavoj Žižek famously said that it is easier to imagine the end of the world than the end of capitalism. The difficulty of imagining alternatives is evident in the urban environment, where even the most progressive representations of "solarpunk" or "afrofuturistic" cities tend to propose skyscraper-filled megalopolises covered with trees or inspired by traditional African architecture. The cookie-cutter approach to design that resulted from the growing emphasis on efficiency and practicality, the spread of standardized building designs, the impact of Computer-Aided Design (CAD) technology on the design process, the pressure to adhere to practical and financial limits, and the standardization of building materials and techniques has resulted in a loss of individuality and uniqueness as well as a decline in imagination in the fields of architecture and urban design [33, 54].

Fiction and imagination seem to offer the perfect tools for rethinking, even radically, the potential and the development of urban spaces - especially in a world of global urbanization and in dire need of new sustainable modes of city living. Our typology and sheet are meant as a tool to facilitate the use of imagination in architecture.

On the one hand, they can be used as analytical tools to examine existing fictional cities, map and distinguish their elements, explore their inner semiotic workings and, eventually, use them as sources of inspiration. On the other hand, the typology can be used as a playful blueprint for imaginary cities, a parallel of role-playing games "character sheets" that can guide and support the creation of coherent *architecture fictions* in efforts of speculative design and exercises in creativity.

The adoption of the "fictional city sheet" gives us the freedom to think about more possibilities than we may otherwise be able to. We can think more systematically about the possible consequences of various decisions and actions and explore a variety of prospective futures. By depicting a drastically dissimilar city and utilizing this new framework to envision future urban scenarios, this tool allows us to re-examine our assumptions about the future and assist in challenging the prevalent narratives and beliefs that affect our perception of the urban environment while rekindling imagination and creativity.

Moreover, the proposed typology contributes to scholarly discussions across HCI, design, and urban studies. It invites multifaceted debates about desirable and undesirable futures while providing a versatile research tool that enriches our understanding of real and virtual spaces.

Further studies should investigate how urban fiction can inspire and guide the practical implementation of urban changes at different scales. At the citizen level, imagination has always been a catalyst for DIY urbanism [66], but, with the help of immersive technologies, has the potential to revolutionize our relationship with the city and our ability to reshape the environment. At the architectural level, imagination is a precious tool for architects to reimagine their practice and propose new, sustainable models of building. Finally, at the urban level, imagination is key to reinvent the built environment so to make it livable, inclusive, fair, and sustainable.

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A APPENDICES

A.1 FICTIONAL CITY SHEET – READY FOR PRINT

A.2 Table of journal articles identified from the literature search and utilized in the methodology's inductive approach

Table 4: Journal articles identified from the literature search and utilized in the methodology's inductive approach in determining the framework's 12 categories.

	Publication Title	Publication Year	Author/s
1	Speculative fiction and African urban futures: Reading Imagine Africa 500	2021	Kiguru, Doseline
2	Sublime Experience for Sustainable Underground Space: Integration of the Artists' Works in Chichu Art Museum	2021	Park, Eun Joo; Kang, Eunki
3	Designing future experiences of the everyday: Pointers for methodical expansion of sustainability transitions research	2021	GarduñoG arcía, Claudia; Gaziulusoy, İdil
4	Domestic Logistics: Worldbuilding the Home	2021	Witt, Andrew
5	Post-dog tales about human extinction	2021	Sýkora, Peter
6	Making A Martian Home: Finding Humans On Mars Through Utopian Architecture	2021	Jeevendrampillai, David; Parkhurst, Aaron
7	The Psychology, Geography, and Architecture of Horror: How Places Creep Us Out	2020	McAndrew, Francis T.
8	Urban archetypes applied to the study of cities in historic contemporary fictions. Symbolic urban structures in Age of Empires III and Bioshock Infinite	2020	Sánchez García, Manuel
9	Welcome to the Post-Anthropolis: Urban Space and Climate Change in Nathaniel Rich's Odds Against Tomorrow, Lev Rosen's Depth, and Kim Stanley Robinson's New York 2140	2020	Mączyńska, Magdalena
10	Beyond techno-utopia and its discontents: On the role of utopianism and speculative fiction in shaping alternatives to the smart city imaginary	2020	Bina, Olivia; Inch, Andy; Pereira, Lavínia
11	<i>Black Panther</i>'s Utopian Project: The Innovative Potential of Fiction and Speculation by Non-Architects	2020	Kenney, Fiona; Shukl, Vaissnavi
12	Exploring velotopian urban imaginaries: where Le Corbusier meets Constant?	2020	Nikolaeva, Anna; Nello-Deakin, Samuel
13	Learning from Civilia. Heterodoxias Críticas, Historiografía y Proyecto Urbano [Learning from Civilia: Critical Heterodoxies, Histogriography and Urban Design]	2020	Lus, Arana; Parnell, S.
14	Virtual Reality and Reading Cities: Gps-Based Applications As A New Form Of Literary Tourism	2020	Stefanovska, Ana
15	Holism and Division in Dreams of the Metropolis	2020	Sangster, Matthew
16	Sport events, space and the 'Live City'	2019	McGillivray, David
17	The Confines of Subjectivity: Spaces of Resistance in George Orwell's <i>Nineteen Eighty-Four</i>	2019	Tereszewski, Marcin
18	Uncanny Retrofuturism and Urban Otherness Victorian London as Steampunk Cyber-City	2019	Esser, Helena
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