URBAN FUTURES: SCENARIO-BASED TECHNIQUES

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In his recently published book 'Design Futuring', Tony Fry (2009) outlines a design methodology that includes the use of scenarios as a way to encompass within the design scope considerations (and concerns) about the future. Society is on course for an environmental meltdown and cities are largely responsible for this threat. If the future must be secured, we must learn to design with the future in mind and redirect design practice accordingly. The idea of a change of direction implies that to date designers have predominantly acted in response to the here-and-now, ignoring the future consequences of their decisions. In a way, this pattern of behaviour can be regarded as entrenched in contemporary (and maybe past) culture. Fry maintains that 'while the inability to project our action in time seems to be a structural limitation of our mode of being, overcoming this condition and acquiring much greater futuring capability will become an increasingly vital factor for securing our on-going being... Unless this is done, later events can make earlier decisions redundant, or expose them as inappropriate'.

It would seem that today the human species possesses an excessive tendency to restrict the time scope of actions and focus predominantly on the preoccupations of the moment. Yet, such a tendency seems not to conflict with its opposite. History is scattered with utopian visions of the future, ambitious paradigm shifts whose physical and theoretical marks (or scars) are still with us, and to which we still knowingly or unknowingly reference. Ebenezer Howard's garden city model, for example, (2009 [1902]) is still influencing the urban design debate and is the urban form that some associate with eco-cities. Peter Kropotkin's dream of a delocalised and diffused pattern of urbanisation integrating work, live and play, and nature (1994 [1912]) resonates in, say, much of the transition towns' philosophy. It can therefore be assumed that in the face of the capacity to imagine, outline, and appreciate options that could lead to a better future, the present has the power to obliterate our long-term dreams and dictate a more pragmatic, often short-sighted line of action. These two impulses can coexist in society and still be decoupled: while there is an aspiration to change for the greater good, personal conditions and value systems lock in day-to-day decisions and professional choices, gearing them up to the often unsustainable necessities (either induced or real) of the present.

History provides sufficient evidence that contingencies can push towards very unsustainable directions. In his seminal study on the collapse of societies, Diamond (2005) cogently reconstructs the dynamics that brought mighty civilisations to extinction. In spite of their sophisticated cultural and social architecture (in itself a visionary project in constant evolution: a cultural construct

regulating social aspirations and relationships), their relentlessly increasing daily needs and wants proved irreconcilable with their long-term ambitions. That is why, as Fry asserts, today design practice must be redirected. It is not sufficient to envision our future. In order to substantiate it we must change our design methodology abandoning a schizoid attitude of envisioning bold shifts of society and still operating professionally with a business-as-usual approach. A new methodological approach can remind us of the impact our current choices will have on the future, thus reconciling the future with the present.

The process of designing in itself can be defined as 'the planning and patterning of any act towards a desirable, foreseeable end' (Papanek 1984). Thus implicit within the concept of designing or planning is the idea of the future (Conroy 2006). Still, what motivates designers in taking their decisions? As students, architects and urban designers are encouraged to nurture and express their particular views, using space to mould places. At a higher level, they are taught to think of these spaces as vessels for cultural values. The resulting process is one that morphs aesthetics and function, appearance and performance. Nevertheless it is undeniable that the fascination with form comes with the risk of an undue reliance on its potential for conveying and transmitting contents that can divert the design focus away from that of the building programme and its effective performance. Over the last three decades there has been much formal experimentation. Nevertheless form for the sake of form can produce consumable objects. In a sort of 'the media is the message' logic, formal experimentation can become self-referential: 'architecture talking about architecture' (Hagan 2009). Much experimentation, however, has focused also on the building and city programmes, namely the conditions and the modalities with which buildings and spaces can perform. This new fertile ground of design investigation inevitably takes the time factor to centre stage, since it deals with the multiplicity of uses the built environment will support over its lifetime. This is important since as professionals we tend to crystallize buildings at a point in time, expressions of a cultural milieu and collective aspirations. Be it the Garden City utopia or the modernist's 'city of towers' dream, the paradigm of the moment always dictates how buildings and cities are designed. But how do we ensure that current visions of a brighter future will succeed? And even so, how do we ensure the future we dream is a positive future?

It is a fact, however, that we are experiencing the beginning of an age of scarcity, although scarcity should be defined. Is it induced or is it real (see Goodbun et al. 2012)? Does it stem from an excessive concentration of resources for the few, or is it the result of overexploitation? There is no univocal answer, although that which is known through science evidences the finite nature of resources and the critical deterioration of ecosystems. It demonstrates that excessive consumption entails high environmental bills. Designing in an age of scarcity becomes therefore the opportunity for a paradigm shift in design thinking, with political and methodological implications. Implications are political because designing for scarcity is concerned with the disadvantaged. The social landscape is rapidly mutating. Low-income groups today are swiftly increasing in number, including the educated young as well as professionals. Skills and education are no longer a guarantee of economic success and opportunities are increasingly limited. It is for this majority with scarce economic possibilities that designers will probably be called more and more frequently to work in the future, developing new architectural approaches and exploring innovation (so far predominantly focused on the wealthy) within tight constraints. The implications are also methodological: tight resource constraints impose thrift, ingenuity, and a particular attention to the long-term, so as to ensure resources are well allocated, and the built environment we design adapts to future aspirations and needs, thus lasting longer. Since this is not

a conventional professional and/or didactic approach, students and professionals will inevitably need to go through a learning curve (see Fisher 2008), possibly facilitated by new methods and tools.

Concerns about the future, the scarcity of resources, and about the sustainability of present lifestyle are a call to arms for designers. Still the question remains of methodological approaches fit for purpose. The last decade has witnessed designers engaging in participative experiments, co-design, and more. Fisher (2008) defines this practice 'public-interest architecture' as opposed to one that concentrates its efforts for those who have ample means. It is also in this context that the research developed by the Urban Futures team can find a useful application within design practice. The research has produced a method to analyse the long-term efficacy of that which is designed today using an explorative form of scenario analysis.

Scenarios have been and are used to explore the challenges and risks that lie ahead. They were first utilised in war games during the first years of cold war, with Herman Kahn and his colleagues being some of the main experts in this field (for an account on scenarios techniques see Ruskin 2005). Only in the 70s was this approach developed into a stream of future studies, which were particularly appropriate to explore consequences of environmental degradation and excessive resource exploitation, at a point in time in which they were coming to public attention. 'Limits to Growth' for example (Meadows et al. 1979; Meadows et al. 2004), is one of the most famous studies utilising scenarios developed with mathematical models. In parallel to quantitative approaches, scenario techniques were developed using qualitative ones. For example, Royal Dutch/Shell used them as a strategic management technique to explore the probable evolution of markets and the consequent impact on their business. This type of analysis implies projecting a plan of action (any plan of action) considered for implementation against the backdrop of a set of conditions that may happen in the mid/long-term. In so doing, the plan of action can be modified to be valid under all possible future conditions considered. Modern scenario techniques tend to merge quantitative and qualitative models. The development of a storyline, a narrative that can convey the several nested levels in which the future unravels, is a precious tool for discussions at a strategic level. Datasets generated through mathematic models provide the evidence base supporting the reasoning developed through the exercise of scenario analysis. Scenarios are extensively used at a macro scale to probe the long-term efficacy of national and global systems (e.g. energy systems, food systems, climate change etc.). The merit of the Urban Futures methodology is to provide a tool that can be used to assess a smaller scale of intervention (i.e. urban development), which can enable professionals operating within the built environment domain to utilise a scenario-based techniques without possessing any particular futuring skills.

Scenario analysis can be normative if the exploration of one or more desirable futures is functional to gain an understanding of pathways for the accomplishment of a desired end point (e.g. an aspirational vision of urban development); it can be exploratory (or descriptive) if diverse future scenarios are used to interrogate plausible developments of the present in order to understand the significance of potential impacts (IEA 2003). It is from this second approach that the Urban Futures41 method originates. Eschewing the temptation to outline a desirable future of the world, designers can focus on the performance of the built environment and on its intended programme. Thus, to an extent, the method is neutral, in that it does not interfere with design aspirations and objectives although by questioning a field of possibilities, it identifies vulnerabilities that may undermine performance, so inevitably impinging on design choices. More importantly, the method can be used as a strategic approach to direct the attention within the

design process towards the future.

In the Urban Futures method, scenarios that are used to test the resilience of design options portray four diverging but plausible urban conditions in 2050. They are based on the work of the Global Scenario Group (see Gallopinet al. 1997) although the original scenarios developed by that group were enriched by the Urban Futures research team so as to better capture the conditions of the urban context. Scenarios are determined by the different evolution of the world's drivers of change. These include: society, technology, economy, environment and policy. Internally consistent variations of the drivers influence the unravelling of the present towards different directions. Deploying the scenarios on the imaginary axes of social equity (i.e. self-interest/solidarity) and political structure (i.e. global/national); it is possible to visualise scenarios covering a wide range of alternatives. The analysis is therefore developed by comparing design options against sufficient amplitude of plausible evolutions of the present so as to identify all possible adverse factors to the good performance of the option considered. As a result risks will be elicited that need to be addressed to ensure the functioning of the design option whatever the future holds.

This multiple evaluation has similarities with the concept of different 'trajectories or visions of the longer term future' introduced by Hillier (2011) as opposed to a future envisioned in continuity with the present, or as a path-dependent repetition of the past, which tends to form the (unreliable) basis for traditional urban design and planning. Arguably the future is uncertain, and design and planning methods based on a linear evolution of the present are inevitably predicated on flawed assumptions. Hillier argues for a 'cartographic method' to develop planning, in which potentialities are traced, and maps of the forces' interplay are drawn up. The resulting map can be a valuable instrument for taking decisions informed by future risks and challenges. Likewise, rather than relying on a determined design strategy to attain the desired aim, the map of possibilities resulting from the Urban Futures method of analysis can represent a rich tool of exploration, in which possible design pathways can be compared, considered, or even merged in a non-linear process.

An exhaustive presentation of scenarios, characteristics, and the methodology can be found in the BRE publication 'Designing resilient cities' (Lombardi et al. 2012). The method has been also formatted into a free web-based tool (see **www.urban-futures.org**). What follows is a brief description of the scenarios:

New Sustainability Paradigm – Society moves towards an ethos of 'one planet living' and embraces equity and sustainability values. New socio-economic arrangements change the character of urban industrial civilization, rather than its replacement;

Policy Reform – Policy attempts to regulate the market so as to mitigate its impact on economic imbalances, social equity and environmental degradation, although the public domain resists change. Tensions between continuity of dominant values and greater equity for addressing key sustainability goals ensue;

Market Forces - Free market doctrine dominates, with individualism and materialism as core society values. The 21st century global system evolves without major surprise, in the belief that incremental market adjustments are able to cope with social, economic and environmental problems as they arise;

Fortress World - The world is divided, with the rich minority living in interconnected, protected enclaves and an impoverished majority outside. Armed forces impose order and prevent collapse.

The method can be used in many ways. A comprehensive list of urban characteristics (i.e.

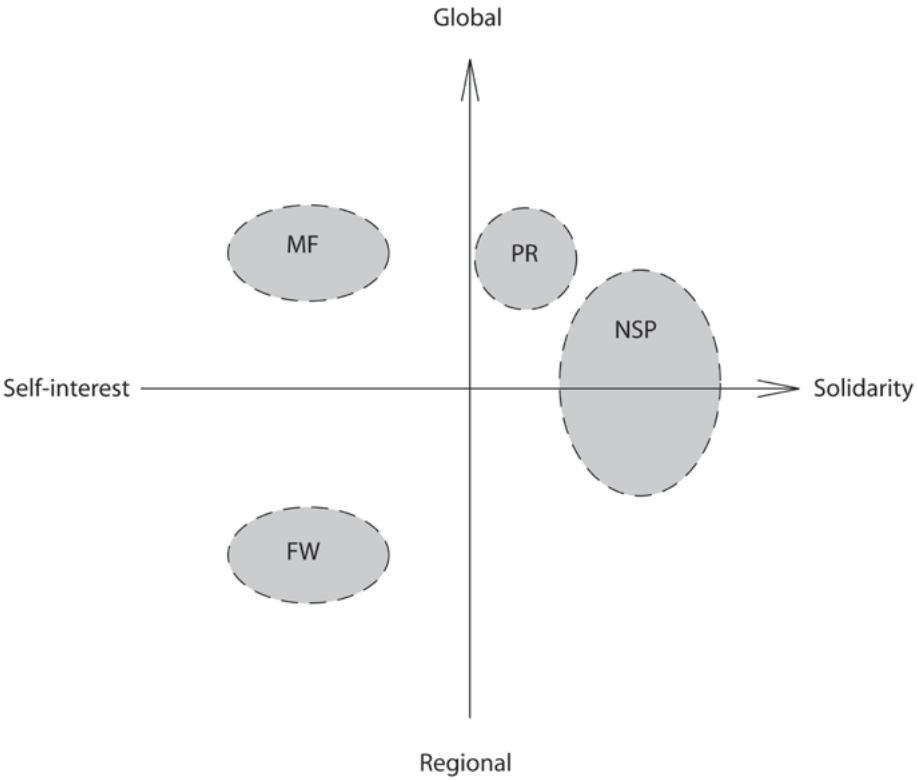

Figure 6-1 The four scenarios deployed on a diagram with axes Global/Regional and Self-interest/ Solidarity. Key for the four scenarios: NSP = New Sustainability Paradigm; PR = Policy Reform; MF = Market Forces; FW = Fortress World (modified from Hunt et al. 2011).

indicators of urban sustainability such as domestic energy use, water quality, dwelling density, etc.) supports a rigorous and detailed evaluation that can be both quantitative and qualitative. In addition to this type of analysis, a 'light touch' version that is more appropriate for short workshops or brainstorming sessions can be utilised. In this format, it is sufficient to grasp the dynamics behind scenario narratives (i.e. how the drivers of change behave) and discuss the consequences of these dynamics on the design options examined. It is an evaluation that lends itself to be developed discursively and that can be easily performed within small design teams or in isolation, thus facilitating its use even for small scale design projects. It was trialled, for example, in the course of a short workshop within the European Urban Summer School 2012 (EUSS), in which a brief description of the method was presented to an audience of postgraduate architects, urban designers, and young professionals with diverse backgrounds. Subsequently, teams that were developing design projects for the summer school were asked to quickly trial the method on their design schemes.

The Urban Futures method is structured in five steps (see Figure 6-2). The sequence is designed to be circular and iterative rather than linear. It allows the analysis of single particular aspects

(e.g. materials, technologies, strategies, policies, etc.) of urban development. Findings can be used to modify the initial design and make it more resilient to future events, thus closing the loop. The first step consists in the identification of the intended purpose of a 'solution for sustainability'. It prompts answering questions such as: is this solution fit for the purpose stated? Has it really the potential to attain it? This is an important step, since it brings the focus to the design programme and the benefits this is supposed to deliver, thus taking the finality of the project rather than the solution examined or its form to centre stage. For example, one of the groups testing their initial design scheme in the course of the EUSS workshop described their plan of installing an over-sized billboard on the wall of an existing building as a means to encourage interaction of passers-by and therefore community building. Bromley-by-Bow, the area for this project, is a degraded London neighbourhood inhabited by low-income groups. Expressing thoughts on the billboard and possibly exchanging opinions with those standing by the billboard could constitute an occasion to facilitate interaction and a much needed community cohesion. The identification of the intended benefit of the design concept leads to some questions such as: Is the billboard an effective media and its position ideal for luring people to express themselves? Will the billboard be vandalised thus failing its objective? Such questions help scrutinize the actual effectiveness of the design concept. Their formulation leads to the second step, aimed at detecting the 'necessary conditions' for delivering the initially stated benefit, not only now but, more importantly, over the potential lifetime of the design scheme. For example, owners of the buildings must allow the use of the external wall for a sufficiently long period to attain the intended results (i.e. community building). This poses an issue of ownership. Passers-by must be willing to use the wall for communicating their thoughts, which poses an issue of communicating effectively to them the purpose of the billboard. It also poses an issue of community engagement of each individual. The third step consists of assessing these 'necessary conditions' against the four scenarios. This can be done consulting characteristics and performance of relevant indicators or, in the light version, deducing some risks implicit in the nature of each scenario. For example, in a Market Forces world the external wall of the building may be reclaimed by the owners that have little interest in community issues. Can we think of a way to protect the billboard? In a New Sustainability Paradigm world, a community is likely to be well established even in currently disadvantaged areas. Can we think of a way the billboard can be adapted so as to be utilised in this scenario too? In the fourth step, findings are aggregated to determine the degree of resilience of the solution. Finally, in the last step a decision informed by the analysis results can be taken. If conditions are supported in all futures, the 'solution for sustainability' is robust. Conversely, causes of adversity must be identified so as to address them, or another solution must be selected.

In the workshop the analysis was not entirely completed, and the last steps were not developed. Nevertheless, the initial and brief evaluation indicated a few factors that can help reinforce the initial conceptual design. First, the scheme must encompass factors such as community and building owners' involvement. Second, the solution must be adaptable enough to be used also under social circumstances different from today. This can imply many things: an effective integration with the building envelope that can enhance the formal qualities of the building (thus circumventing the owner's reluctance to make the wall available); the planning of a series of community events as an integral part of the design scheme; and the design of a multifunctional surface that can be used, say, as a local notice board in a New Sustainability Paradigm scenario.

Inevitably, large scale projects will require more sophisticated appraisals when using the Urban Futures method. Nevertheless, in its simplicity the example presented here captures well

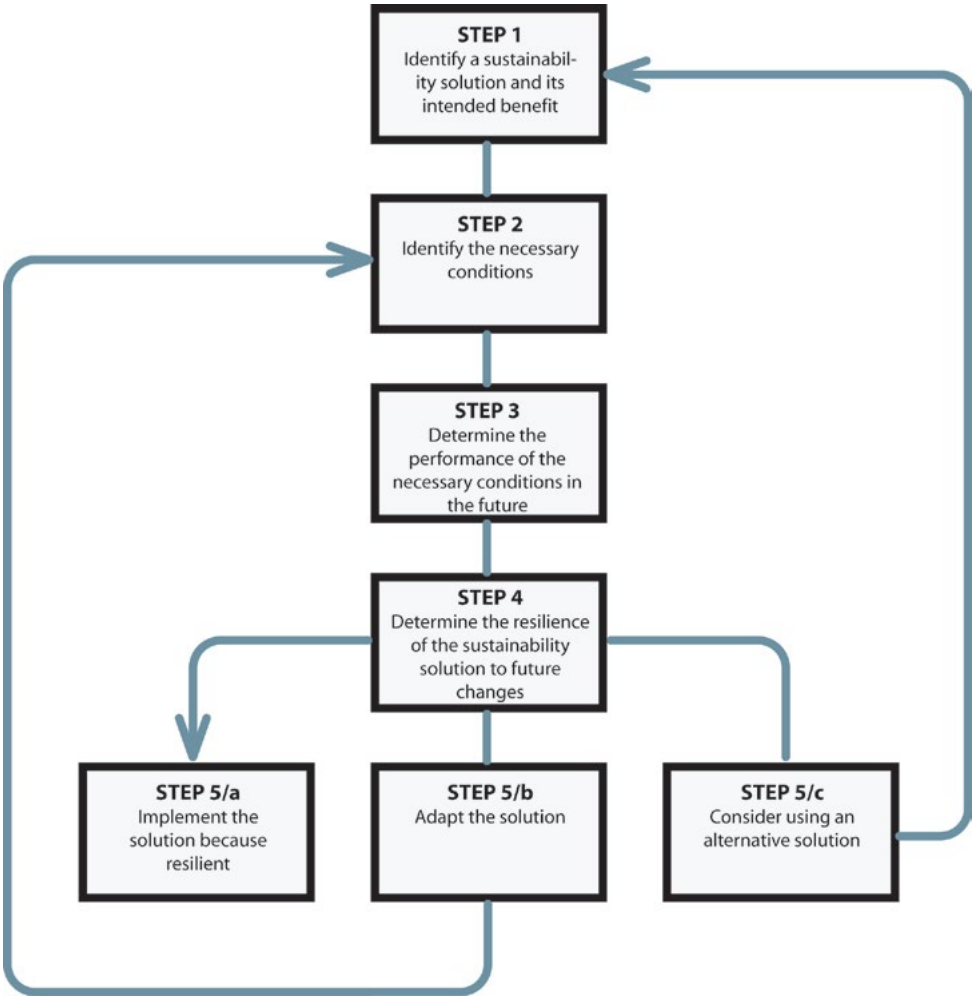

Figure 6-2 Diagram of the five-step sequence of the UF method (modified from Lombardi et al. 2012).

the potential of the method to change conventional design processes and integrate a particular attention to long-term factors within them. Ultimately the method is meant to be a tool to facilitate a change of attitude. It clearly represents only one of the possible structured approaches for such a purpose. Still its novelty lies in the use of scenarios as a way to capture the several dimensions of the city. Their narratives encapsulate the social, the economic, and the environmental showing how these interact. This way, users are prompted to an integrated appraisal of their projects. It is hoped that this structured approach can facilitate change. It certainly changed the attitude to design of those who developed it.

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