The soft technologies of urban development – the need for a broader technology concept

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1. Introduction: the soft technologies of urban development

Given current challenges of both social and environmental character in urban development, there is urgent need to not only improve our understanding of urban processes but also scrutinise the tools and skills necessary to successfully intervene in them. In this paper, central examples of such tools are identified in discourse, institutions and urban form, in turn relating to major practices in urban development, such as governance, planning and design.

These tools are moreover identified as 'soft technologies' with many similarities to regular technologies but also critical differences. Based on the definition of technology by Brian Arthur as "the constant capture of new natural phenomena and the harnessing of these for particular purposes" (Arthur 2009, 22) we draw the conclusion that if regular technology typically captures natural phenomena for a purpose, soft technologies capture phenomena related to human abilities, such as perception, cognition and emotions. Tentatively we may suggest that discourse captures cognitive abilities related to rational thinking in the purpose to understand and convince; that institutions captures emotional abilities related to sense of community, justice, fear of shame or sanctions for the purpose of creating a certain social order; and that spatial form captures perceptual abilities for the purpose of physical navigation, cultural experience and other fundamental human uses.

These three broad technologies are in the following scrutinised by first, identifying the human phenomena captured in them and second, discussing how a deeper understating of these may improve them as technologies. The aim is to contribute to a theoretical foundation of what we here call 'soft technologies' that may offer a basis for their further knowledge development, with the ultimate aim to improve practice. In extension, such a discussion opens for a broader conception of technology, important for issues of sustainability and societal development. However, we begin by setting the framework for these technologies and their related practices in the particular context of urban development.

2. The practices of urban development: governance, planning and design

The context of the technologies and the related practices that we want to address in this paper is urban development. Important to note then is that what we talk about as practices are not professions but something that more directly relate to what people do in their professional activity. This means that the same practices may be found in activities performed in several professions. For instance, architects may in their professional activity come to practice both governance and planning as well as design. At the same time, it is often the case that there are certain practices that are more

central to the identity of a profession, as the practices of design is for architects for instance. This central practice often represents a particular expertise found within that profession that is not found in other professions to the same degree. This also means that this expertise very well may be found in a professional not originally trained for the task but who through professional experience have developed such an expertise; architects have often proven able to become good planners for instance.

Clearly, this raises questions about professional training and concerns both what knowledge as well as what skills that are essential in different professions. It is not least in that context we also may raise the question about what tools that are essential and specific for different professions, again keeping in mind that professions are not tightly defined boxes with no overlap. Even so, it may prove useful to ask, what the particular expertise is that make individual professions needed in urban development; thereby creating a sustainable demand for it, but also the foundation to build identity within the profession that supports sufficient theoretical development and an internal critique that create peer examined standards for its practice.

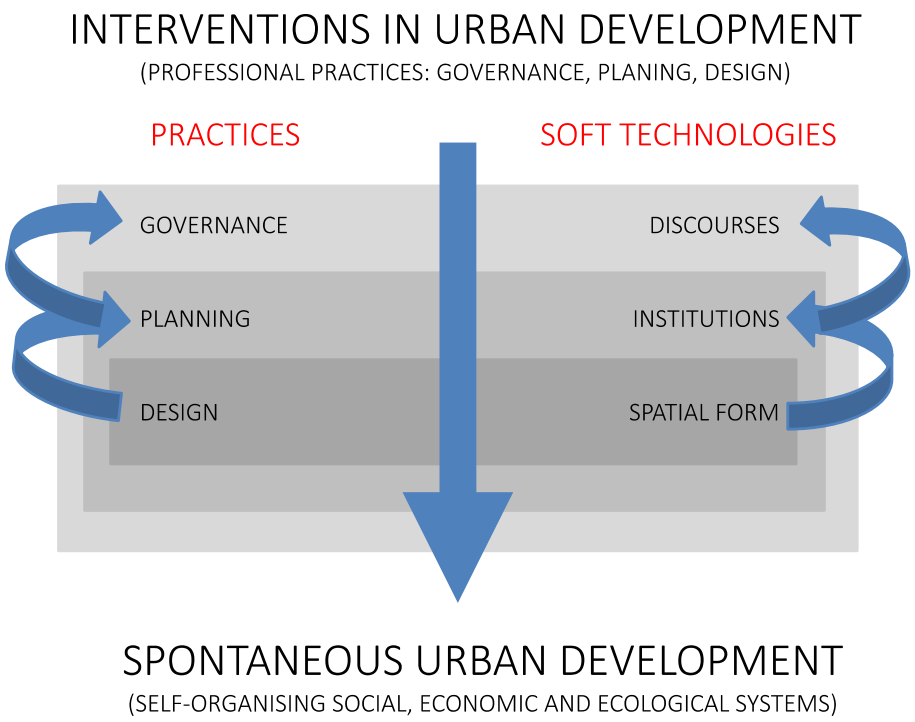

Figure 1. A model of urban dynamics combining cities as self-organising systems and as the object of planning interventions, sorted on different practices and their specific means, here called soft technologies.

In the image above, we have represented both our selected practices and their characteristic technologies in a simplified diagram of the urban development process (Figure 1). Importantly, this also offers an opportunity, to some extent, to structure the often rather confusing use of terms in the field of urban development, where not least the terms *urban development*, *urban planning* and *urban design*, often are used interchangeably. The emphasis on practices may here prove useful, since the inherent difference between these terms become clear if we identify the actual means used in the

practices, as we will do below. These means simply demand different expertises and skills, why they cannot be interchangeable. In extension, it is unlikely that one and the same person could master all of these means. The latter is a fact that may be lost in the current emphasis on knowledge rather than skills in society, which tend to blur the identity of different practices that then may look interchangeable. This tendency is clearly sensed in the practices in urban development, where we increasingly experience that we know more about cities and their processes, but not necessarily more about how to successfully intervene in these processes. The seminal distinction between "knowing that" (theoretical knowledge) and "knowing how" (practical knowing and skills) (Ryle 1946) is here often overlooked. Without going further into detail about this, we note that the different modes of knowledge and knowing have different ways of being formalised or situated in practice, and that the know-how relating to using knowledge in practice has been addressed as of importance for professional judgement and decision making (see e.g. Styhre 2013).

Hence, we add to the practices in the figure above particular means that one need to be able to skilfully handle to truly masters such a practice. Just to illustrate we may describe it as follows. The practice of urban governance, which we primarily find in executive political or administrative positions, can be identified with the skilful handling of *discourse*, which clearly is a broad term that both may take the form of spoken and written language and sometimes cover a lot more. A typical knack among successful politicians that may illustrate this skill, is the ability to find the words that changes discourse in for them desired directions. However, we increasingly find this skill applied throughout public administrations as a means to set the discourse about new policies or projects in particular directions. Hence, it increasingly has become a professional expertise central also to urban development projects, especially at use in overarching policy documents setting the frames for subordinated documents and actors.

We next list the practice urban planning, which represents a broad field that also has changed in focus over time, from the concrete design of town-plans (blue-print planning), towards an increased concern for the planning process as such and attention to its rigging and the ability for its different stakeholders to play their roles properly (power brokerage). However, whether concerned with the process or product of planning in this sense, we understand the planner's central means to be of an *institutional* kind, which is a broad field, but where we as distinctive for the professional identity of the urban planner find the ability to skilfully formulate land use regulations and property rights for instance, but increasingly also the ability to construct successful planning processes that allows for proper participation of its' addressed stakeholders.

Finally, we identify the practice of urban design with a more material concern for the physical city, especially its *spatial form*, which we also identify as the central means in the practice of urban design. Ultimately, it concerns the design of public space through the structuring and shaping of built form, albeit this here rather means the legal frameworks for buildings as expressed in planning documents rather than the design of actual buildings. Importantly, the concern for the detail of individual urban spaces and buildings that this often implies, does not mean that urban design is limited to local issues, but also concerns the structure of public space as it extends throughout the city.

Naturally, there are large areas of overlap here; the discourse of urban governance constantly refers to the spatial form of the city and, as touched upon, urban design actually concerns the legal frameworks of buildings and not buildings themselves, while planning, especially in its' sub-disciplines such as traffic planning, often concerns distinctly physical manifestations. We may further illustrate

these overlaps by adding how we in the interface between them also find entities central to urban development. Between governance and planning we find what we call *policy*; quite exactly a form of institutionalised discourse, and in between planning and design we find *infrastructure*, which we can understand as a form of physically manifested institution. Finally, we between urban design and governance find a dimension of the built environment that we call *symbolic form* – a kind of petrified discourse.

A reason for these overlaps is that all these practices should not be understood as a sequence but rather as containing each other. Hence, governance formulate broad values, generally expressed in written texts (discourse), that contains planning and its' designation of functions to particular locations through regulations and property rights (institutions), which in turn contains the design of buildings and public space (spatial form), which creates particular conditions for urban processes in different parts of urban space.

To repeat, the reason we underline the difference between these practices despite the many overlaps, is to highlight how they all also represent different forms of expertise expressed in particular forms of knowledge and not least skills using various technologies as means in the practice. The ability to write texts is very different from the ability to construct regulations, which in turn is different from shaping space. There is no reason to believe that one and the same individual is able to master all of these, or that the expertise in one of them sanctions expertise in another. We are back to the golden rule of good public administration – the what-question belongs to politicians, while the how-question belongs to civil servants. Our point here is that just as decisions on what-questions in a democracy needs to pass a proper democratic process, solutions to the how-questions rely on the presence of proper expertise among its civil servants.

3. What is it that the practices in the urban development process actually need knowledge about

This brings us to a central question for all large urban development projects of today, what should the expertise of the civil servants working in such projects be. We are not so much talking about generic competences, such as legal, economic or administrative expertise, albeit these often are specialised for the purposes of urban development projects. What we are talking about are core practices specifically related to urban development, such as urban governance, planning and design. How these civil servants are educated, updated to new knowledge and trained to cooperate with each other in contemporary urban development is a crucial and urgent issue.

The reason we want to emphasise the knowledge issue here is that there is risk for confusion in this matter between, on the one hand, knowledge about the urban processes that we want to steer and direct, that is, urban social, economic and ecological processes such as social segregation, local markets and ecosystem services, and on the other hand, knowledge about the means we have to influence these processes, for instance, discourse, institutions and spatial form – a confusion between means and ends in simple terms.

There to some degree also has been a too narrow focus on understanding and directing the processes themselves, rather than what these processes actually do or produce by help of the available means. What is important is not the processes but the quality or character of what they produce, for instance a vivid and sustainable urban life.

In the end, it is also quite obvious that we cannot intervene directly in different urban systems in

themselves; we cannot physically push people together and tell them to integrate or to set up businesses in particular locations and we certainly cannot tell flowers to grow in our parks. What we do is use particular means, as listed above, by which we to different degrees structure and direct processes of this kind. As argued above, in the end it is the ability to master these means that proves the professional expertise in these practices and give rise to both professional identity and pride. Naturally, the presence of the ability to master these means is also decisive for whether an urban development project is successful or not.

This implies an important pinpointing of what knowledge that is needed in the training of these professionals. The knowledge challenge facing the practices in urban development is against this background not primarily how to increase the expertise in social work, real estate economics or urban ecology, but a deepened knowledge in how such phenomena may be captured, structured and directed by the means at hand in the different professions. Naturally, this implies some knowledge about social work etc., but the expertise in these areas is better found in other professions. Naturally, such professions may be included in urban development projects, but are not what typifies them; professionals in social work may be found in school administrations and health administrations as well as in urban development administrations, but you do not often find architects in school administrations or health administrations and if so, they are not regarded as their core expertise. Hence, the task for the core professionals in urban development is to know enough about urban processes to understand how they may support and structure them through the means particular to their own expertise.

This specification of the knowledge challenge in urban development is crucial, since it reveals how urban development is a broad set of practices that to a decisive part are differentiated by the skill to handle certain means such as spatial form, rather than knowledge about a particular urban topic such as social segregation. These means, furthermore, are both quite specialised and demanding to be handled properly, why they can be described as technologies, albeit a particular kind of technologies that we here call *soft technologies*. This particularity, we argue, is a major reason why an uncertainty about what exactly the expertise that constitutes these practices is based on. In extension, we also believe that it is a reason why the knowledge development of such soft technologies often has been neglected. Hence, there is need to delve into what more particularly soft technologies may be, which also raises the question what technology in general is – a more complicated issue than generally acknowledged.

4. The means that shape cities in the urban development process: soft technologies

Perhaps the most distinct definition of technology in recent years has been given by American scientist Brian Arthur who states that "technology is always based on some phenomenon or truism of nature that can be exploited and used to a purpose" (Arthur 2009, 46). Arthur also gives three definitions of definitions of technology that to some extent are related: first, technology is *a means to fulfil a human purpose*; second, it is *an assemblage of practices and components*; and third, it is *a collection of devices and engineering practices available to a culture* (Arthur 2009, 28).

We argue that this also applies to soft technologies, but whereas traditional technology relates to engineering and captures natural phenomena, such as wind or streaming water for energy purposes, the phenomenon that soft technologies capture is ourselves as human beings and our particular abilities, who quite obviously also are a kind of natural phenomena, albeit of a very particular kind.

To clarify this idea, we first need to point out how most modern technology in this sense is coupled in *a series* of captured phenomena to reach particular purposes – just think of the many phenomena captured in a modern motor-car to create the large set of technologies that make it run. A particular role in any such series of captured phenomena in a technology is played by the phenomenon that constitutes its energy source, something needed in any kind of technology. Above we spoke of wind and streaming water, which through history has been very important here, but we also realise that the energy source often has been human beings themselves. However, capturing humans as energy source is not what defines soft technologies as different from regular technology; it is found in many technologies.

The difference concerns the phenomenon captured by the technology that gives it its particular function, which in the case of soft technologies, moreover, is a phenomenon found in ourselves. What we are after can be given a first illustration by Churchill's famous words, arguing for the rebuilding of the commons chamber after its' bombing during the Blitz: "we shape our buildings and afterwards our buildings shape us". What he was talking about was the rectangular shape of the destroyed chamber, which he found quintessential to the two party-form of British parliamentary democracy, why to rebuild it in any other shape, such as a semi-circle that was proposed, would weaken this parliamentary form. So, while humans shape technology, often in a manner so that humans can be captured as the energy source of the technology, this is not what is typical for soft technologies, what is typical for them is that they are technologies whose *function* is made possible by capturing some dimension of ourselves as human beings.

Figure 2. If we define technology, following Brian Arthur, as to concern the capturing of phenomena for a purpose, we in regular technology find that to concern natural phenomena, such as sunlight that through a prism may be captured for the purpose of lighting a fire (left). In contrast, soft technologies concern the capturing of subtle dimension of human capacities, such as the human perceptual-cognitive apparatus that can be captured by spatial form to structure our movement in space (right).

However, there may be need for one more clarification. If we in the following of Churchill say that soft technologies are technologies designed to shape ourselves, we realise that there is a large amount of regular technologies designed to do exactly that – we only need to think about the tools we use to cut or comb our hair. However, these are tools that are used to shape our physical bodies, which not is what Churchill was after, neither we. What we are after are technologies that are designed and used to shape our behaviour, emotions and thoughts, that is, far more subtle aspects of ourselves. Again, we need to think about which phenomena that are necessary to capture to achieve this.

If we speak about technologies or tools such as scissors and combs, humans clearly are both the energy source of these tools as well as the object that they shape, albeit in the form of our physical body, but we are not the phenomenon captured to make the technology in itself work. In the case of the scissors, we see how we certainly are captured as the energy source of this technology, by shaping the scissors so that they fit our hand in a manner appropriate for our movement of our fingers, not least the thumb, but when it comes to the ability of the scissors to actually cut hair, what is captured is not a human phenomenon but a natural phenomenon related to the atomic structure of steel, it is this phenomenon that is captured and enhanced into the sharp edges of a pair of scissors.

In contrast, the human phenomena captured by soft technologies concern the capturing of other faculties of humans, not our capacity as energy source; phenomena that has to do with our cognitive and perceptual apparatus and our emotions, but in extensions of this also physical capacities of our body. By successfully capturing these by way of different technologies, such as sounds, images, discourse, institutions like rules and rituals, or the spatial form of the environment, we may in principle, steer and direct the thoughts, emotions and behaviour of humans. Clearly this is not possible in the immediate and predictable way of regular technology – something we should be grateful for – but certainly to some important degree. In extension, we can thereby also guide and support not only individual humans but also relations between humans, with the purpose of structuring and directing society more generally.

This of course makes all of these practices highly political as well as ethical, which raises important questions in need of further elaboration, something we not will address here however. If anything, our discussion here high-lights issues of this kind already present in that any political polemics, law making or shaping of the environment is conducted in the aim to structure and shape society and our everyday lives. Our argument here concerns the degree we can do this with efficiency and transparency, not whether we can choose not to do this, something we find impossible.

To illustrate the reasoning above by way of the particular soft technologies listed, we can say that discourse captures both our cognitive and emotional abilities in the form of thoughts and ideas and shape these by constructing conceptual structures and worldviews that direct towards particular ways of framing and thinking about certain things, such as a new urban development project. Institutional settings next, aim to capture and make use of such things as our sense of community, trust and shame and if this does not work, fear of sanctions. It does so by organising cultures of relations between actors by setting up rules and regulations, for instance related to land-use, or contracts stipulating agreements between parties, which we to a surprisingly high degree tend to obey, despite that they to the most part only are words on paper or even word of mouth. Increasingly, moreover, we have come to realise that we do this as much due to trust and solidarity as to avoid shame or painful sanctions (e.g. Bowles & Gintis 2013). Spatial form finally, capture, among other things, dimensions of our perceptual-cognitive apparatus that support our ability to navigate in the built environment, where physical movement is an essential part not only of getting to where you are going, but of perception and cognition itself (e.g. Gibson 1987). By capturing and shaping these human capacities, spatial form can give human movement in space structure and direction. We may finally also note how humans in all of these cases also is the energy source of these technologies.

These soft technologies can also be said to operate on different levels, where for instance discourse captures human phenomena on especially the individual cognitive level, institutions especially capture cultural phenomena of relations within a community, and spatial form perceptual phenomena of

interaction between humans and the physical environment.

To illustrate the ramifications of such technologies we in the case of spatial form see how its influence on movement patterns generates different concentrations of co-present people in different urban spaces, which in turn creates certain social and economic potentials in these spaces, for instance good or bad conditions for local markets. This can further be supported by institutional settings that designate appropriate land-uses to different locations in accordance with the size of co-present people generated by spatial form, and finally that you through discourse may have been given a certain mind-set when you visit a particular place of this kind.

Importantly, in the case of soft technologies we cannot, quite obviously, expect the same precision or determinism that is typical for regular technologies; human behaviour is simply not as lawful as natural forces. Again, this most likely is something we should be very grateful for. Therefore, we can neither expect the kind of specificity and optimisation typical for conventional technology. Again, the phenomena captured are not that lawful why these technologies rather frame and create conditions for a certain range of potentials; we may interpret discourse within a certain range of possibilities, we tend to abide to rules but not in identical ways, or we may move down a street, but each time by a somewhat different path. Perhaps the most efficient dimension of such technologies, therefore, is their ability to negate certain things; discourse opens for many but not any interpretation, and rules may set the frames for a certain range of behaviour but not any kind of behaviour, and spatial form may give shape to a great variety of movement patterns, but not any pattern.

Hence, soft technologies rather set broad frameworks and create allowing conditions within which a range of things may happen, while at the same time disallowing a lot of other things; hence, the name *soft technologies*. They should therefore be characterised as generic and robust rather than specific and optimised, which importantly, does not make them less sophisticated or easy to master; if anything, the opposite is the case. It is also important to underline how these characteristics sit well with the urgent need in our times to achieve greater sustainability. Where conventional technology, due exactly to its specificity, rapidly becomes outdated, since there always are new and improved forms of technology – rapid technological innovation rate is today the cause of great environmental stress – while soft technologies, due to their broad usability and robustness, often last over very long time periods; compare a building to a computer.

It is clear that we here speak about a kind of technology that it is important that we are able to specify and define. A useful distinction is found in anthropology where one speaks about the difference between tools as *implements* and tools as *facilities*. Implements typically accelerate and direct energy to specific purposes and are concerned with efficiency. A typical case can be any kind of machine designed for physical processing. Facilities, on the other hand, slow down, store and maintain energy as a resource for a variety of purposes and have a concern for permanence. Typical cases can be anything from a dam to a railroad track. The field of urban planning and design obviously concerns facilities rather than implements and is therefore in a position to offer essential contribution to these new directions of technological development (see e.g. Marcus and Koch 2017).

In summary, we see a need for far more research in these technologies when specifically applied in urban development, not least when it comes to understanding how they best support each other. This is central, not least, since in the end nothing can be accomplished in an urban development process outside of practices of these kinds and their particular technologies; it is such practices and their expertise that ultimately define what is possible to formulate as ends in this process. Essential here is

the skill and knowledge in each of these practices to be able to translate politically sanctioned ends into particular means, such as spatial form, institutional settings and discourse. But there is also need for an increased understanding of how knowledge in one of these professions is translated into the knowledge of another, so that they properly support each other, for instance, so that spatial form in the best possible way is institutionally embedded to accomplish its ends.

5. The incoherence of steering documents: the mixing of soft technologies

To return to the implications of this for actual urban development projects, we at closer scrutiny see how steering documents found in official urban planning processes are constituted by different sorts of soft technologies of the kind discussed above, but also that these are mixed in various manners. There is therefore reason to question, first, to what degree the directives formulated in these documents, making use of soft technologies in this effort, are apposite responses to the formulated ends for the projects they concern and, second, to what degree the different technologies support or contradict each other. In short, there are two sets of translations here, one from ends to means and another between means, where we want to investigate whether these translations are handled in a adequate manner, or put differently, to what degree documents of this kind are externally expedient and internally coherent.

Drawing from two workshops in the ongoing research program Fusion Point Gothenburg addressing the large urban development project *Älvstaden* (The RiverCity) in Gothenburg Sweden, it became quite obvious that there are problems in both these regards. For instance, it is apparent how overarching goals found in its vision documents are so broadly formulated (RiverCity Gothenburg Project Group 2015) – leaving them open for interpretations – so that the document has proven of little support when taking further steps in the planning process, for instance in the sub-projects Lindholmen and Masthuggskajen. Of particular importance is that they also lack a clear foundation in an analysis of likely development scenarios for the city, why the goals often are found stipulated without proper foundation in an examined idea about the future. To remedy this, additional documents have been produced, which however, again are quite broadly formulated and open for interpretations and therefore do not constitute much support for subsequent planning. This is further explored in another paper presented at this conference: Marcus and Nilsson, The professional 'languages' in urban development.

So far, we have been talking about the texts found in these documents, but the same goes for their representations of spatial form that in the documents on this comprehensive level are diagrammatic and broad, most often consisting of simplified maps pointing out broad development directions. It is easy to see how certain things may not be possible to decide on this comprehensive level, but there is also reason to point out how certain things also may need to be, to accommodate a successful continuation of the process.

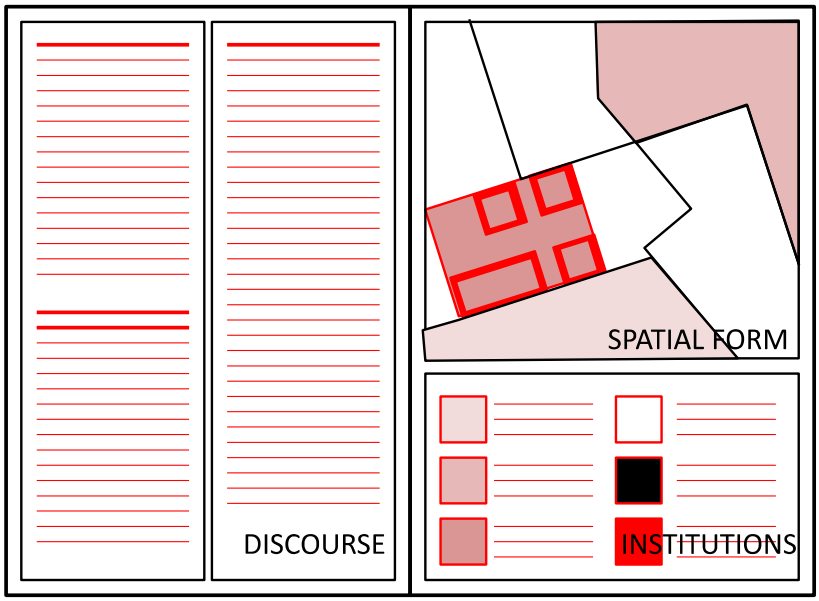

Figure 4. Steering documents in the urban development process are typically constituted by soft technologies such as discourse, institutional frameworks and representations of spatial form. A critical issue is then to what degree these technologies support the ends of the projects but also to what degree they support each other.

To briefly touch on this, we need to remember how urban development concerns a subject matter with great extension in space, where the planning process typically goes from comprising larger parts of this subject matter to smaller parts of it. It is easy to see how essential ingredients in urban development, for instance tram systems, by necessity need to be treated on a level of planning that comprise larger parts of the city and not piece by piece in smaller parts. However, such matters that by necessity concern large parts of the city and therefore are best treated in comprehensive planning documents, cannot immediately imply that they should be treated with a lower resolution; we may actually need to decide in what locations the trams shall run, rather than just indicating their general direction.

There is also a sort of mix of ends and means in these documents in that certain means related to spatial form, such as density and active building frontages, are discussed as ends, when they actually are means for something else, often vibrant urban life. An absolute distinction between ends and means on these matters is difficult to attain, but this is exactly a point where, despite these difficulties, the treatment of discourse in this context needs to reach some level of precision in relation to its subject matter. Stressing the definition of discourse as a form of technology that we have made use of, we may say that discourse is put to use to accomplish something; it needs to perform in accordance with a purpose, which in this context means that it needs to create support for the next step in the planning process, and not only repeat a description of its goals. We may in the case of discourse speak of different genres of writing that are put to use for different purposes, from more visionary types of writing in overarching policy documents to more rigid and precise forms of writing the closer one gets to legally binding document stipulating land use and property rights. To illustrate, using the wrong genre of writing, will not execute the needed purpose and thereby actually reveal a lack of professional expertise.

9. Examples from the Älvstaden project: innovation at Lindholmen and culture at Masthuggskajen

There is rich material possible to discuss from the workshops conducted within the Fusion Point program of which we only can lift a few examples. In the Lindholmen workshop the central issue was how and to what degree an initiated architectural competition actually supported the broad aims of the Lindholmen area as an innovative meeting point between academia, enterprises and the city. Again, it became apparent how the broad aims described in comprehensive documents like the RiverCity Vision could be interpreted in several ways and moreover, that there was no substantial analysis of alternative development trajectories for the city. Concerning the first, the aim of building a creative hub between academia, private enterprise and public actors, could either be interpreted as small scale, informal settlement with self-organising structure of meeting places filled with start-ups, or it could be interpreted as large companies, leading in their industry, that facilitate in-house creative environments. Naturally the two ask for very different urban solutions that even so were not discussed or developed either in the RiverCity Vision document or the brief for the competition. The effect was that all proposals for the urban structure in a rather unreflected manner went for small-scale solutions, one may guess because this is the idea given by current discourse on the matter, or that it allows for more 'urban' solutions dominating current urban development discourse. Importantly, a few months after the competition, Geely Auto decided for a major investment in Älvstaden, clearly demanding a large-scale solution.

Figure 5. Illustrating problems in the urban development process of Älvstaden by drawing examples from the Fusion Point workshops. To the left, the unreflected interpretation by the architectural offices based on the competition brief that a creative hub at Lindholmen concerned small-scale start-ups rather than large-scale industry leaders. To the right, the narrow limitation of the competition area, leaving out essential aspects of the spatial system for a successful solution of the given task

Another example of the inadequacy of the steering documents was how the brief for the architectural competition was delimited to an area only comprising the Lindholmen area, which reveals a lack of understanding of the extensive and relational characteristics of the urban systems that are the object of urban development. This delineation meant that vital ingredients for a successful architectural solution of the creative hub, whatever interpretation one made of it, was not accessible to the competing architectural offices. In effect, this meant that they were assuming certain preconditions for their solutions that never were made explicit and for which there was no guarantee that they ever would be realised, for instance, different connections across the river. As a result, the uncertainty

about the performance of the proposals was very high. As a matter of fact, any accountable evaluation of the different proposals was in effect made impossible due to this narrow delineation of the area.

The workshop about another urban district, called Masthuggskajen, concerned the issue about how and to what degree it was possible to create conditions for some of the cultural activity, characteristic for the area today, to live on also after the large interventions the Älvstaden project will bring. The broad interpretation forming the basis for the work towards this objective was that Masthuggskajen over a long time had constituted something of an edge of the city centre with lower density, less formal control and also lower rents, allowing for a diversity in cultural activity, further supported by some major cultural institutions in the area. Some rather quick spatial analyses were, however, able to demonstrate how the area, far from being located on the edge of the city and neither in an urban area of low density, rather was found in a most attractive location of high density close to the city, that through the new developments would be further enhanced, especially due to a lot of new office floor space for some of Gothenburg's larger firms.

All together this brought doubt to the possibilities to retain the diverse atmosphere of cultural activity typical for the area today, where the conclusion was that either much more forceful interventions, by help of spatial form or institutional frameworks, were necessary if this aim was to be accomplished or new aims should be chosen. This bore witness of how urban development projects often are initiated without proper understanding of the spatial potentials of the particular location the development concern, which in turn allow for the formulation of aims that may prove misplaced.

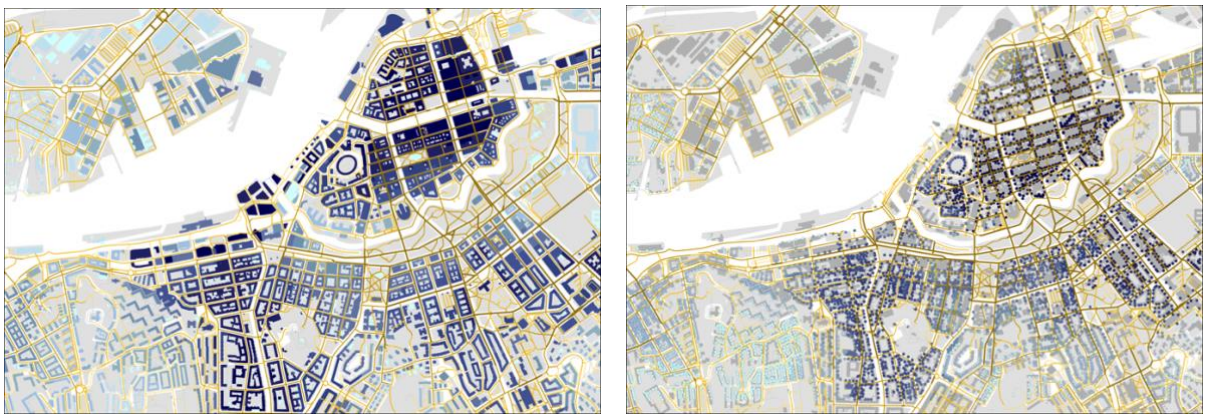

Figure 6. Illustrating problems in the urban development process of Älvstaden by drawing examples from the Fusion Point workshops. To the left, the conception of Masthuggskajen as located on an edge of the city could be put to doubt by some quick spatial analyses. To the right, the immense impact of the proposed amount of new office floor space for large companies also brought doubt on the ability to retain the atmosphere of cultural activity in the area.

10. Conclusions

In this paper we have aimed to put the search light on some of the vital means or tools central for professional practice in urban development projects. We have argued that this is essential if we are to train and support a high level of professional expertise in this field in times of massive knowledge challenges. This implies a stress on skills and not only knowledge, since what in the end may change

the trajectory of our cites into greater sustainability is the ability to change them through the professional means and tools at hand.

Tentatively, we identify a set of such means in discourse, institutions and spatial form, broadly relating to the practices governance, planning and design, essential for urban development. However, we importantly note that these means are of a very particular character with similarities but also vital differences to what regularly is referred to as technology. Based on Brian Arthurs definition of technology: "technology captures phenomena for a purpose", we define discourse, institutions and spatial form as belonging to a different category of technology that we propose to be called *soft technologies*, since the 'phenomena that they capture for a purpose', in contrast to regular technology, not are natural phenomena but humans and their particular abilities.

More specifically we suggest that discourse is directed to our ability of rational thinking but also address us emotionally, while institutions, such as rules and regulations, capture our shunning of feeling shame but also our will to cooperate, and spatial form, finally, address ourselves as perceptual organisms, whereby we for instance navigate the environment. Hence by designing discourse, institutions and spatial form we may capture ourselves and direct our behaviour in certain directions.

While this may seem intimidating and instrumental, it is hard to see any other rationale for an urban development process than exactly this. Our aim by addressing these practices and even arguing that they are part of what we generally refer to as technologies, is therefore, on the one hand, to make this fact more explicit and thereby open for more direct and precise critique, but also, on the other hand, open for improvement in knowledge and skill in these technologies, so that we may see a more efficient and accurate professional practice in the field. In the end, discourse, institutions and spatial form are ancient tools that humans since the very beginning used in the aim to organise their worlds.

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