Integrated bottom up and top down governance of cities – A systems approach

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Subparts belonging to different parts only interact in an aggregate fashion—the detail of their interaction can be ignored. In studying the interaction of two large molecules, generally we do not need to consider in detail the interactions of nuclei of the atoms belonging to the one molecule with the nuclei of the atoms belonging to the other. In studying the interaction of two nations, we do not need to study in detail the interaction of each citizen of the first with each citizen of the second.

– Herbert Simon: The Sciences of the Artificial, 3rd ed. 1996, p. 207

The levels can interact with each other. […] not only does the movement of each single atom influence the movements of the neighboring atoms; but also the average velocity of a group of atoms influences the average velocity of the neighboring group of atoms. It thereby influences (and herein lies the interaction of levels, including "downward causation") the velocities of many individual atoms in the group. Which individual atoms we cannot say without investigating the details of the lower level.

– Karl Popper and John Eccles: The Self and Its Brain, 1977, p. 35

In order to understand and influence fast changing urban systems it is necessary to integrate bottom up and top down approaches.

1. Long-living urban systems are driven by fast changing environments

Cities are long living systems which can survive for centuries or even thousands of years. Some cities are several thousands of years old as, e.g., five thousand years old Izmir or two thousand years old Xi'an (Britannica 2012). When compared with businesses, cities turn out to be the more long-living systems. As G. West and L. Bettancourt figured out: "Cities almost never die, while companies are extremely ephemeral" (Lehrer 2010).

It seems that, over the past decades, cities became more exposed to fast dynamics and vulnerable to changes in their environment. On the one hand there is, in large parts of this world, an apparently un-stoppable inflow of dwellers into cities, with about 50 large urban areas growing about 3-5 % p.a. and Beihei, a Chinese city, expected to grow by even 10.6 % p.a. (Citymayors 2012). Cities like Shanghai (Fig. 1) or Warsaw (Fig. 2) have (re-)integrated (and positioned) themselves into the web of the globalized world during as little as twenty years.

Fig. 1: Shanghai Pudong financial district which has developed over the past two decades (photo of the Shanghai city model). Photo: Christian Walloth

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This development could not have been possible without the fast dynamics of "ephemeral" systems, i.e. businesses, playing a major role in driving such fast urban development. Businesses are driving urban change, growth and prosperity in, e.g., the labor market or the real estate sector, or through the offerings of commercial centers. On the other hand, urban dynamics become increasingly dependent on global economic cycles and cities appear to be increasingly constrained by environmental factors. For example, air pollution and heavy rains or droughts pose a serious

Fig. 2: Skyline of Warsaw. All skyscrapers besides the Stalinist one to the far left have been built over the past two decades. Photo: DocentX under CreativeCommons License.

constraint for many cities in transition countries (Fig. 3 and 4) and a rising sea level is a threat for cities built along the oceans' shores: about 0.6 bn people are living in coastal areas less than 10 m above sea level (msnbc 2007).
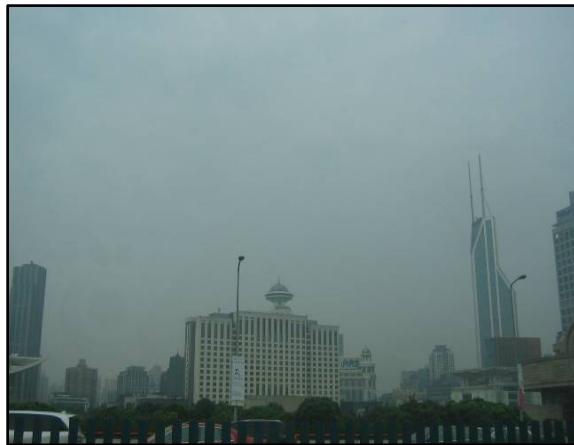
Fig. 3: Shanghai under haze. Photo: Christian Walloth.

Fig. 4: Guadalajara after a heavy rain shower. Photo: Christian Walloth.

Summing up the situation of urban development in a globalized world, it appears that relatively short-living businesses are driving comparably long-living cities in front of them. How is it that a more narrowly defined man-made system – the system of business, which covers only few of Man's areas of life – is more influential than another, more holistic, man-made system – the city, the urban whole, which covers so many of Man's areas of live?

In order to answer this question it seems necessary to consider two factors influential in our cities: urban planning practice and the involvement of citizens in their divers roles. I will provide a closer look at these factors below.

2.   Urban planning methods are inapt for coping with fast urban developments

Urban planning often lags behind actual development of the urban fabric. The faster the dynamics of the city, the more is this phenomenon expressed, of course. It is interesting to observe that planning is carried out top down, while the overwhelming dynamics of the city arise from bottom up.

Most of today's applied planning methods are top-down driven and hardly consider bottom up dynamics. For example, let's come back to fast growing cities and briefly consider the

Chinese urban planning System. A concise account of the Chinese planning system is provided by Kai (2009). The top down planning scheme aimed at "guiding and regulating the development of urban economy and social construction" is described as status quo. Planning urban development is seen as a national task and, hence, "any unit or person must be subordinated to the decisions made by the government". However, in the same paper, it is acknowledged that in the current "stage of rapid … urbanization" as well as "under market economy" conditions divers interest groups should be considered through "wide-range participation of the public".

How could an established top down planning process be reformed to consider bottom up dynamics? There exist examples of some increasingly fashionable participatory approaches applied in western countries. Here, planning does consider bottom up phenomena – to a very limited extend, indeed. Three types of participation can be distinguished:

• First, there is public consultation, often required by law, for developments for which significant impacts on the environment or living conditions are foreseen. For example, the European Directive 2003/35/EC requires national laws to implement public consultation for projects which impact the environment. This typically concerns infrastructure projects like streets, train lines, or airports.
• Second, there is the type of neighborhood planning in which citizens are involved starting with the design phase. This typically concerns (re)developments of a block or building of a playground or small park.
• Third, there is such kind of participation in which citizen initiatives receive support in the form of advise and/or funding by the city and/or private donors. This may also concern the field of art and cultural activities.

None of these three levels of participation is intended or even suited for understanding the bottom up dynamics of the city. In the three participatory approaches outlined above, citizens are asked either for their fears (type 1), their needs (type 2), or their wants.

But urban dynamics don't happen in such kind of participation. Very resilient urban structures emerge in the absence of planning projects and participation as, for example, in the case of Shanghai's Tianzifang neighborhood. As Shinohara (2009) points out, "regeneration of Tianzifang was achieved by a self-organizational process". This process was kicked-off by the idea of a single man in 1998 and eventually achieved a critical point when the transformation spread into neighboring blocks as "a spontaneous act of the original inhabitants" in 2004. As late as 2005, the municipal government acknowledged the transformation by claiming the area a 'creative industry accumulated district' (ibid). Tianzifang is located in the very downtown of Shanghai (see Fig. 5).
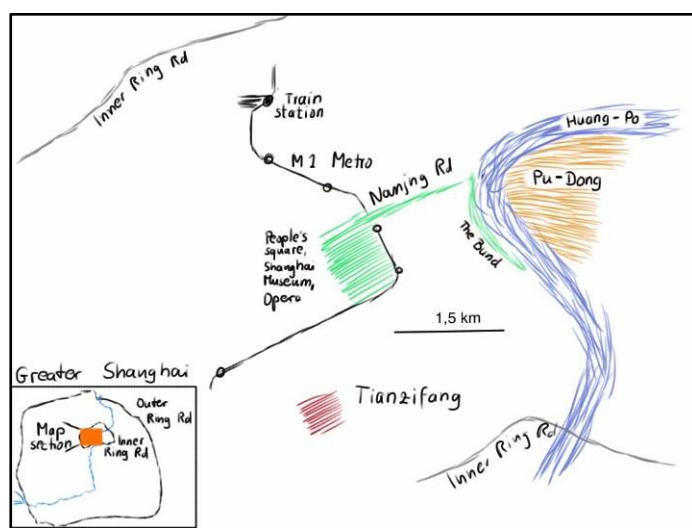

Fig. 5: Location of unplanned Tianzifang neighborhood (in red) in downtown Shanghai (orange section of greater Shanghai map) in relation to the landmarks of People's Square, Nanjing Rd., Bund (in green), and Pudong financial district (brown). Graphic: Christian Walloth

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Looking at these considerations it appears that participatory approaches applied today are not able to capture bottom up dynamics and make them fruitful for urban development practice. Top down urban planning can even fail in being the driving force of change in cities which are shaped by fast moving actors: citizens in various roles, e.g., as businessmen or artists. Wouldn't it be interesting for urban planners to understand the dynamics that arise from the citizens' own actions and reactions?

3. Since planning is not an end in itself, we should aim at effective planning

We have seen above how businesses seem to drive cities in front of them and how urban dynamics happen in areas disregarded by urban planning and participatory approaches. This can lead to planning running behind actual developments, e.g., an artist neighborhood growing unplanned in a hyper-dynamic city like Shanghai. This situation challenges the very usefulness of planning, the reason to be for the planning profession. Since planning is not an end in itself, the planner should seek for intended results of his or her planning (intended results exclude such outcomes which are physically there, but which are quickly adopted for other uses than intended or which decay fast).

Below, I will suggest an approach on how to improve the planning methods using a concept of fast and slow, framing and triggering systems.

4. Effective planning requires bottom up and top down governance

If planning should be effective, it must overcome the limitations of today's approaches and reposition itself within the metrics of fast (bottom up) and slow (top down) dynamics as an actor *fast enough to trigger change and slow enough to guide* other actors' dynamics. Understanding (and eventually employing) bottom up dynamics requires more than the actual approaches of participation outlined above.

4.1 Fast and slow systems

Let me outline the idea of "fast enough to trigger and slow enough to guide" by coming back to the example of business and cities. This example, in fact, compares apples and oranges. Why? Businesses generally are, as compared to cities, small and dynamic. As of 2008, there were only three exceptionally large private companies of "metropolitan size": Walmart with 2.1 m employees, McDonalds with 1.7 m employees and Foxconn with 0.8 m employees (Economist 2011). There were, in 2006, more than 170 urban areas larger than these three largest private companies (Citymayors 2012).

Cities, in contrast to businesses, are characterized by comparably slow changes over most of their lifetime. Their dynamics are constraint by engraved physical structures and slowly adapting urban policies. Changes are often triggered by faster agents, such as shown for the case of Shanghai above. Citizens may simply trigger changes in the larger, slower urban system by, e.g., redeveloping a run-down neighborhood or starting a new business. While such triggering from bottom takes place, it is in fact framed by the slower urban structure (physical structure, policies, cultural codes etc.).

In their function of framing possible actions, cities rather compare to economies than companies. And companies, in turn, rather compare to groups of urban dwellers. Just as economies are framing the way businesses develop, cities are framing the way citizens (in whatever roles) act. Just as some business development can impact and change economies, the action of some urban dwellers can change the way cities develop. An example for businesses changing economies is that of Toyota, which managed well through the 1970s crisis. The Toyota Way was taken as an example by other Japanese companies which "paid

off through a revitalized economy by 1983" (Hall 2009). No doubt, the success of that single company has influenced other economies around the world as well. An example for how urban dwellers can create change in cities has been provided above for the case of Shanghai's Tianzifang district. Another example is that of Berlin Prenzlauer Berg, which became a thriving neighborhood kicked-off by the actions of private actors (in their different roles as dwellers, investors, architects etc.) in the 1990s, meanwhile Berlin's urban planning was concerned with transforming Berlin into "a post-industrial office and service center" through business and entertainment districts such as Potsdamer Platz and Friedrichstraße and a thirty years lasting project of rebuilding Alexanderplatz square. Years later, by the end of the 1990s, the city of Berlin joined into the development of Prenzlauer Berg as an actor of redevelopment (Levine 2004).

Two types of systems		
Dynamics	Fast	Slow
Direction of action	Bottom up ("Upward causation")	Top down ("Downward causation")
Role	Triggering, Adapting	Framing, Guiding
Examples	Businesses, Urban dwellers	Economies, Cities
Table 1: Fast and slow systems		

Tab. 1: The analogous relations between fast and slow systems are summarized

It should be mentioned that the relation between framing and trigging systems is a relative one. These systems can be seen as nested. For example, cities are faster than nations, and biological processes in Man are faster than the effects of Man's action in the city. This concept leads to "hierarchical levels or layers, [each of which] is open to causal influences coming from lower [i.e. faster, trigging] and from higher [i.e. slower, framing] levels" (Popper and Eccles 1977, p. 35). Another example for such upward and "downward causation" (ibid.) is the relation between local and global ecosystems. The slowly changing world ecosystem is framing local ecosystems and actions, e.g., measures of adaptation to climate change. On the local level in turn, emissions or cut down rain forests can trigger changes in the global ecosystem. Also, it shouldn't be forgotten that faster systems, e.g., citizens, can trigger revolutions, which can lead to the necessity of the framing system to change spontaneously. There is, in fact, also the possibility that the larger system dies, as in the case of the ancient city of Babylon (Britannica 2012).

Hence, referring back to the above stated quote about the lifetime of cities and companies, I conclude that economies and cities (including their governing and planning schemes) survive comparably long partly due to their inherently slow dynamics and partly due to the ability of their faster subsystems to adapt and buffer environmental changes. Faster subsystems, like interest groups or companies may even die and make place for better adapted specimen. While the faster systems adapt or replace themselves, the overall macro structure of the city remains relatively stable. For example, people's professional occupations and lifestyles may change substantially while the same physical urban structures remain in place and the schemes of urban governance, public administration and local tax systems only change a little.

Above considerations also offer an explanation for the observation that smaller, shorter living entities (e.g., businesses) are driving long-living cities in front of them. When it comes to the initiation of change in the city, the bottom up forces with its faster actors can trigger such change according to their goals, while the top down planning agencies are left to influence by setting an overall framework.

### *4.2 Top down and bottom up governance is needed*
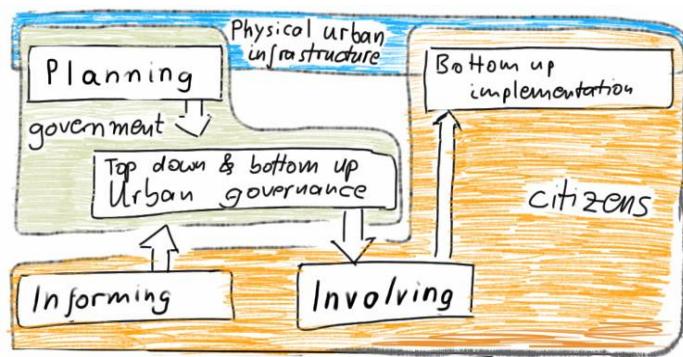
Fig. 6: Schematic figure showing the involvement of government and citizens into the shaping of the city, here on the example of physical urban infrastructure. Graphic: Christian Walloth

Through above outlined considerations the limitations of top down urban planning approaches should have become clear. Top down planning might be good to constrain but it is often too slow to effectively set impulses. I conclude that, especially in fast changing urban environments, urban planning practice can only be successful if it is compatible with the dynamics created and maintained by fast urban actors. Urban dynamics must be understood and urban dynamics must become a tool to implement urban change. This only works through the involvement of fast agents.

Therefore, if urban planning in fast changing cities should be effective, it must be able to manage two challenges: First, urban planning needs to understand and consider the bottom up dynamics which are already at work. These bottom up dynamics have the power to put a great plan at risk and to get their own bottom up 'plan' to work instead. Second, urban planning must involve fast moving actors to implement the plan. These two challenges combine the elements of fast and slow systems, the framing planning and governing and the triggering actors' dynamics, into an integrated top down and bottom up governance approach (Fig. 6).

Understanding and considering bottom up dynamics

For understanding the urban dynamics, urban planners can learn from citizens. In contrast to the top down planning approaches and different from the participatory practice outlined above, I suggest workshops aimed at getting to know about what's going on in the city (Fig. 7). This requires a shift in the targets of participatory workshops towards learning and away from the type of participation outlined above, which is about the wishes of the public concerning their future.

It should be notes that, in order to learn about fast bottom up dynamics, no computer simulation based on yesterday's insights will be of great help. Instead, it is indispensable to involve the fast actors, i.e. citizens in their divers roles. Through them, urban planners can learn about ongoing urban dynamics and near-future potentialities. The study of the citizens comments, actions, or anticipated changed

Fig. 7: A workshop setting *with citizen participation. Photo: Daniel Bläser.*

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habits in if-then scenario games could yield much more insight: how would the bottom up actors behave and thereby reshape the city?

Involving fast moving actors to implement changes

An integrated urban governance approach is as much about learning about urban dynamics, as it is about employing these – often subtle or latent – dynamics in the implementation of the community's goals. While in the beginning of a planning process, workshops should be designed to learn about yet undiscovered bottom up processes, subsequently, private initiatives, businesses etc. are to be involved into implementing change.

Some suggestions of how to involve actors have been brought forward by the meta-governance debate. Four ways of metagovernance have been classified by Sørensen (2006). I suggest to explore a fifth category in order to strategically work with the existing bottom up dynamics.

Four plus one way of metagovernance (after to Sørensen, 2006)

#	Identifier	Characteristics	Approach
1	Designing the system	"framing the self-governing institutions and networks… through the shaping of the political, financial, and organizational context"	Top down guidance, no bottom up
2	Storytelling to influence	Shaping "interests through the formation of the meanings and identities … images of friend-enemy relations … [and] visions"	Top down influence, no bottom up
3	Facilitating individual aims	"offering support and facilitation to self-governing actors" while "the metagovernor does not seek to achieve his or her own objectives"	No governance – bottom up only
4	Being a voice among many	"a metagovernor can seek to obtain influence on the outcomes of self-governance through direct participation [of himself]"	No governance – bottom up only
>	**A top-down and bottom-up suggestion**		
5	Facilitating selected actors	According to a top-down strategy, selected leveraging actors are enabled to implement parts of the strategy	Bottom-up informed strategy, top-down selected leveraging actors, bottom-up implementation

Tab. 2: Approaches of implementing change through fast actors

The four ways of meta-governance aim at influencing actors through classical regulations, narratives, facilitation of their work, and participation of the meta-governor in the actors' processes, respectively (Tab. 2). The first way is rather classical and makes use of the slower, framing dynamics. The second approach may involve the communication of a vision to reinforce or ignore detected bottom up dynamics; it is also working as a guiding, top-down process. The third way comes close to the third approach of participation outlined above: actors are enabled without any aims of the meta-governor; this means that only bottom up processes will be at work, with the framing top down steering given up (this seems to me not

realizable in practice, since – if not by urban planning directives – bottom up action will have to obey *some* laws and regulations and, hence, actions are constrained). Fourth, the meta-governor to participate in self-governing actors' actions means to give one voice to the urban planner – but there is neither the bottom-up engagement of actors to achieve a set strategic goals, nor the top-down support of the actors' acting.

Hence, a fifth way might be required, truly making bottom up actors engage in shaping the city in line with a top-down strategy which, in turn, considers the emerging dynamics from bottom-up. This involves the meta-governor to give up some responsibility and to team up with those actors which through their acting support the urban development plan.

5 Involving hyper-dynamic actors can help urban planning in hyper-dynamic cities

I suggest that an integrated top down and bottom up systems approach is a possible solution to "planning in a (hyper)dynamic urban context". If the hyper-dynamic actors are involved, planning can sync in even in fast changing environments. Else, planning would only be able to set constraints and such impulses, which might come too late and will not be accepted by the citizens. Planning also needs to integrate with overall urban governance in order to engage with citizens and to involve citizens into the implementation of urban development projects. While some practice of participation and meta-governance is already applied, non of the approaches is considering the duality of slow and fast urban dynamics yet. Hence, I suggest to work with this paradigm of fast and slow, framing and triggering systems in order to make urban development through an integrated top down and bottom up governance approach more effective.

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