

Urban Trauma and Self-organization of the City. Autopoiesis in the Battle of Mogadishu and the Siege of Sarajevo

TRAUMA URBANO Y AUTOORGANIZACIÓN DE LA CIUDAD. LA AUTOPOIESIS EN LA BATALLA DE MOGADISCIO Y EL SITIO DE SARAJEVO

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Introduction

Cities under armed conflict become urban laboratories. Changes of their urban structure reflect intrinsic properties of the city, hardly noticeable in circumstances of stability. Not only does a conflict-conditioned urban trauma imply shattered spatial and social networks, it also removes memory from space, jeopardizing both city's history and future. However, viewed through the lens of complexity, "trauma is an element that is not external, but intrinsically constitutive of a city's organization" (Burke, 2010) – it defines the moment in which the urban system needs to reinvent itself in order not to disappear. In that sense, our object of study addresses an urban specificity that

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usually occurs in urban conflicts of high uncertainty: self-organization. This paper briefly exposes two cases that concern self-referential systems in war situations. The first case is the city of Mogadishu (Somalia) during the October 1993¹ pacification attempt by the U.S. Special Forces and the second is the city of Sarajevo (Bosnia and Herzegovina), held under siege for more than three and a half years, between April 1992 and December 1995, by Bosnian Serb troops. In both cases, armed conflict caused an increase of self-organization in the urban system, changing its future unpredictably and irreversibly.

Self-organization under conflict

Anderson defines self-organization as a “phenomenon whereby system-level patterns spontaneously arise solely from interactions among subunits of the system” (Anderson, 2002). This is the spontaneous occurrence of nonlinear organizational patterns through interaction of the system’s elements.

In order to express the degree of self-organization of an urban structure, we need to perceive the city as a complex urban system. Here, we understand complexity as “a measure of the number of possible states a system can adopt” (Wagensberg, 2010) and assume that the organization of the city is “the integration and interaction of different, often both conflicting and complementary elements” (Ruiz, 2001). The city needs maintenance to avoid degradation; its stability is maintained through partial laws of disorganization and reorganization, described by processes of organization and disorganization (Ruiz, Op. cit.) These laws, built over time, are transformed under conflict and a self-referential process based on adaptability is initiated. Processes of self-organization partly depend on the random factor, and, in turn, allow the city’s endurance through multiple consecutive steady states, unpredictable and selective at the same time.

This loss of stability leads to the realm of adaptability, defined as the system’s resilience to increased environmental uncertainty. In that sense, adaptable and adaptive systems are reciprocal. In order to survive changes in its environment, a system must test its ability to evolve by: (a) increasing its

1 In 2013, the authors of this article published a paper on topological representation of the Battle of Mogadishu through application of the graph theory (Aquilué and Ruiz, 2013).

complexity, i.e. increasing the number of accessible states without losing its identity, (b) increasing the capacity to anticipate changes within the environment, (c) increasing its control over the immediate environment or (d) suitably combining all the above. (Wagensberg, op. cit.)

Self-regulation of a system based on autoproduction is a process of autopoiesis, which allows system to reproduce, organize and maintain itself while preserving its autonomy from the environment. The elements of autopoietic systems form the network of actions that produce them and are observed from their own spatial unity. It is important to stress that this type of system constitutes itself as a concrete unity in space and time.

An autopoietic system constantly distinguishes itself from the environment. It is noteworthy that its limits are defined homeostatically and that changes in the environment imply self-organization of the system through a set of processes, which can cause changes in the system, but never devoid it of its identity. An autopoietic system is characterized by:

- *Autonomy, in the sense that the autopoietic machinery integrates changes into maintenance of the system's organization.*
- *Individuality in the sense that the autopoietic machinery maintains its own identity independent of any mutual action between the system and its environment by a repeated reproduction and maintenance of its organization.*
- *Self-determination of the boundaries of the system.*
- *Absence (or specificity) of input-output relationship: self-regulation. (Ruiz, op. cit.)*

Self-regulation is a part of system's nonlinear organization, which enables it to change and evolve. The nonlinearity allows us to express the essence of change. Under certain stimuli, fluctuations of an open system cease to be mere seasonal fluctuations that maintain the system stable, to become fluctuations capable of causing changes in the system. Systems no longer adapt but rather tend towards new unpredictable states, devoid of stability and equilibrium – reaching a state of uncertainty that involves a change in their macroscopic structure. These are the dissipative structures (Wagensberg, op. cit.). As a system moves away from equilibrium, the complexity – understood

as all possible and available options for the system that are compatible with its environment — increases. As the diagram shows [see Figure 1], fluctuations (which in a stable state tend to return to the starting point) in a dissipative structure bifurcate, shooting up the number of possible options.

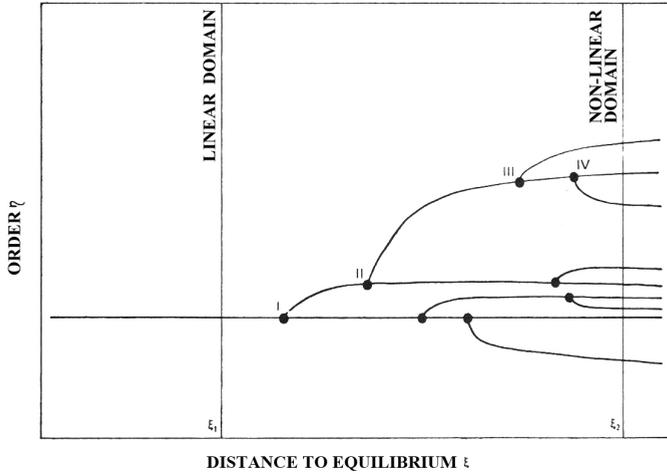


Figure 1: Order by fluctuations. Source: WAGENSBERG, J. (1985), *Ideas sobre la complejidad del mundo*. Barcelona: Tusquets Editores.

Self-organization case 1: 3 October 1993. Battle of Mogadishu.

Macroscopic self-organization of the city awakens in urban systems under conflict. In Mogadishu, autopoietic individuality responded with a self-referential offensive action to prevent the foreign incursion.

In the afternoon of October 3, 75 Rangers and 40 Delta Force commandos left the base located in the vicinity of the Mogadishu Airport to reach their target in the central Wardhiigley (Black Sea) district, near the Bakara market, in the heart of the ‘hostile’ area, fully controlled by the warlord Mohamed Farrah Aidid. The Rangers and Delta Force troops crossed the western part of the city by air, and at 15:42, descended on the intricate street network of Mogadishu (Edwards, 2000).

The plan was to break into a meeting of Habar Gidir clan leaders that two top Aidid’s lieutenants would attend. The target building was on Hawl-

wadig Road, opposite the Olympic Hotel. The instructions were clear: secure the largest possible number of hostages and transport them five kilometres back to base on a convoy of twelve vehicles. This was supposed to be a quick hostage snatch mission, with an estimated duration of thirty minutes.

The Somali interpreted the Special Forces raid on Wardhiigley district as an intrusion into the area controlled by Aidid's militia, and responded to it like antibodies to a virus. The militia took up guns, rifles and RPGs [rocket-propelled grenades], anti-tank weapons designed to shoot down armored vehicles, and went out to meet Ranger and Delta Force troops in an arduous and violent defensive attack.

The militia formed part of the Somali National Army [SNA]. It was comprised of between 1,000 and 12,000 men² and organized into 18 military sectors located throughout the city of Mogadishu.



Figure 2: *Soldiers of Somali Militia in Mogadishu's street. Source: Photography of Jim Stephens in: HUBAND, M. (2001) The Skull beneath the Skin: Africa after the Cold War, Colorado: Westview Press.*

Initially, the mission proceeded well for the Americans. Thanks to a rapid intervention within the target building, twenty-four Somalis linked to Habar Gidir clan, who attended the meeting were taken prisoners. But the mission began to fall apart when a Blackhawk helicopter was hit by militia's RPG and shot down four blocks east of the target building. Just twenty minutes later,

2 The data are equivocal, since the range between 1,000 and 12,000 militiamen is very wide. These data proceed from the U.S. Army, that doesn't know the exact number of casualties and it is important to stress that, apart from the militia, many civilians took up weapons that day.

the second Blackhawk also plummeted to the ground only a kilometer and a half away (Bowden, 1999). Light infantry troops that had been sent to cover the target building were ordered to move to the first crash site and secure it. In order to reach the site, the soldiers had to go through four street blocks – a space packed with Somali guerrillas armed with rifles and machine guns. The convoy holding the twenty-four Somalis received orders to secure the second crash site, but it never made it. All routes from the target building to the second site were blocked, impeding the access to the Blackhawk 6-4. The streets were dotted with improvised barricades, and all the roofs were full of armed Somalis unleashing bursts of fire on their opponents.

The Somali anticipated that the ground troops [who had fast-roped from the Blackhawks helicopters] could not leave the hostile area using helicopters [the streets and public spaces were too narrow for a landing]. Aware of the need for a relief convoy, the guerrillas set up roadblocks across the city. The Somali were continuously opening fire from every building or vehicle at every single intersection in Wardhiigley District. Because of the impossibility to blend into the surroundings, the Rangers and Delta Force troops were sitting ducks for their enemy. The militia controlled the battlefield.

Somali guerrillas acted autonomously. Their strategy was to swarm from every possible point of urban geometry – roofs, windows, doors and abandoned buildings – towards the crash sites of both helicopters. Out in the streets, the militiamen were shouting <<Kasoobaxa guryaha oo iska celsa cadowga! >> [<< Come out and defend your homes! >>] through megaphones (Edwards, op. cit.). Opposing militia clans, armed civilians and looters came together to fight the American platoons. Militia shared their weapons with civilians and looters and all of them converged on the areas surrounding the coordinates where U.S. troops held their positions.

Many of the Somalis who fought during those eighteen hours had no combat experience – their tactics were primitive. However, this did not interfere with their ability of concealment. They would hide behind cars parked in the middle of the road or behind corners of narrow streets, discharging all their ammunition to bewildered and dazed troops. Wherever they moved, U.S. soldiers were ambushed by armed Somalis³, appearing from every possible place in the urban geometry of the built environment.

3 Somali artillery was a mixture of USSR assault rifles and NATO mines, machine guns and RPG-7s.

Eighteen hours have passed since Blackhawks first overflew Mogadishu and Rangers slid from helicopters, until their return to protected area. Soldiers spent the night in the city without knowing how long they would remain on a mission that was not supposed to take longer than thirty minutes. The uncertainty of combat claimed a number of casualties.

In the battle of October 3, the urban system of Mogadishu received such an intense stimulus that it abandoned its steady state in order to survive (Wagensberg, op. cit.). The environmental stimulus caused the bifurcations that keep the system away from its steady state – close to equilibrium – to move further away, ending up in an exceptional state where not only the survival of individuality but also its next state was at stake. In any case, this state led to a consequent change process, the essence of change, since change of state involves a change in the structure of the system.

The first stimulus was the incursion of Task Force Ranger in the heart of the Wardhiigley district. This stimulus, understood as a system of exchange of matter, energy and information, is scarce when compared to the entire city system. However, the environment caused irreversible fluctuation within the urban system. Observation of interference triggered the order by fluctuations, moving away from any situation of stability. The complex system agreed to an unstable state of multiple options and proceeded to self-regulation. Inevitably, out of all possible bifurcations, the system followed a non-predetermined path. The possible change is multifaceted and unpredictable; multiple possible states are part of the uncertainty of change (ibid.).

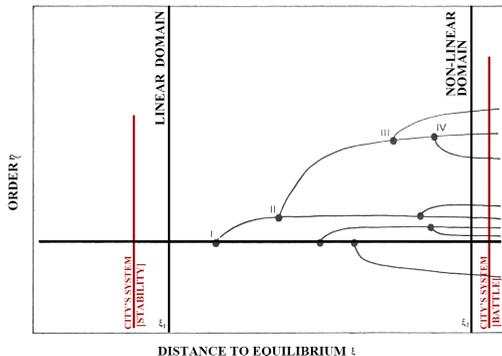


Figure 3: Order by fluctuations and the Battle of Mogadishu. Source: WAGENSBERG, J. (1985) *Ideas sobre la complejidad del mundo*. Barcelona: Tusquets Editores.

The stimulus triggers an inexorable process of self-regulation, which an autopoietic individuality should integrate into the organization of its own system – a capacity that emerges from its autonomy.

The increased uncertainty, caused by the environmental factors, is inevitably compensated by the system, which has several options, as mentioned earlier. In the case of the Battle of Mogadishu, the city replied to increased uncertainty caused by the environment with an increase of its complexity, i.e. an increase of available states of its identity. The city with a pulsing capacity of combat quickly activated its ability and, without losing the identity, the system of the city enabled its subsystems to become agents in the battle – the city changed its state and its relational field has incremented. Increased uncertainty was compensated with an ability of anticipation, which was embodied in the existence of the Mogadishu militia or the pre-establishment of certain signals, such as burning tires. The urban space also acted as an essential part of the battle – the more heterogeneous, diverse and complex space is, the better chance of survival a swarm has. In that sense, relational and topological components are the key to a force deployment of a self-referential and self-organized swarm.

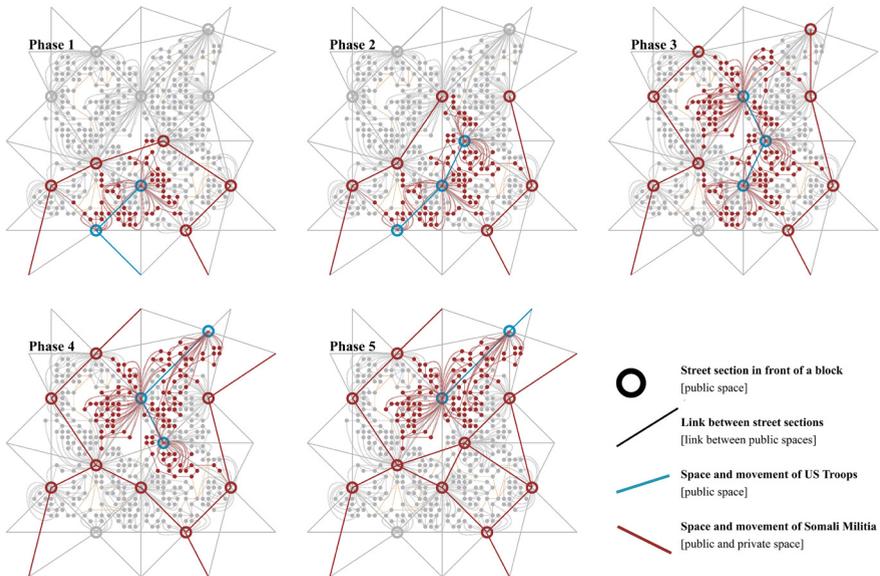
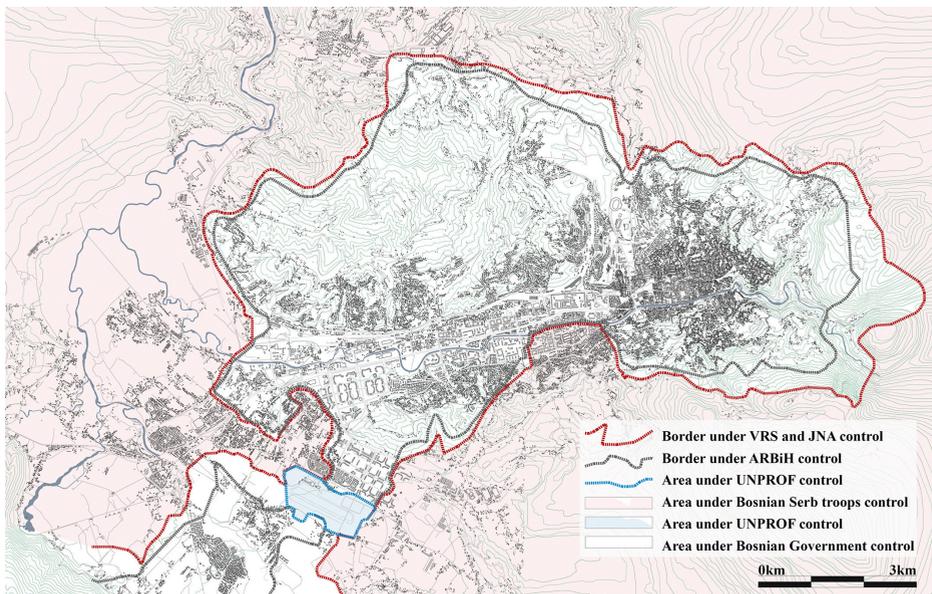


Figure 4: Graph representation of self-organization in the Battle of Mogadishu through a topological approach. Source: (AQUILUÉ, I.; RUIZ, J., 2012).

Self-organization case 2: 1992-1995. The Siege of Sarajevo.

In the light of the combination of growing environmental uncertainty and increased entropy⁴ of the city, the system's adaptability is activated. This need for transformation by means of new and precarious structures leads again to the emergence of self-organization concept.

One of the main determinants of changes in the urban structure of the city of Sarajevo was the alteration of its state at the beginning of the siege. When the Sarajevo-Romanija Corps (a unit of the Army of the Republika Srpska – VRS), supported by the Yugoslav People's Army – JNA (UN, 1994) and paramilitary forces (Donia, 2006) laid siege to the city, supply and mobility patterns were completely altered.



Map 1: *Map of the Siege of Sarajevo. Source: the authors.*

4 In conventional situations, cities steal order from their environment through negative entropy flow. In the case of siege, supply cut interrupts this flow, so the entropy (“disorder”) within the system increases.

Snipers took position in some of the buildings occupied by Bosnian Serb troops and artillery, mortars, tanks and missiles were placed on the hills surrounding the city. Short-circuit of gas, water and electricity lines, as well as blockade of accesses to the city, resulted in the modification of its structural system, its energy, its flows and the use of its roads. Isolation was a powerful weapon and one of the main goals of the attacking side.

Life conditions were appalling, water and electricity supply was intermittent, access to the city by conventional routes (roads and railways) was cut, public transport barely worked and the gas supply was almost nonexistent. The paradigm shift of subsistence led to a transformation in the urban life of the civilian population. Under such circumstances, various patterns of self-referential organization, driven by social and spatial elements of the urban system emerged.

These disturbances produced variations in the use of both private and public space, since the necessary self-organization of everyday survival activities led to a transmutation of their relation to space. These activities were highly constrained by the lack of energy and food supply, obstructed communication channels and restricted flow of people and vehicles. In this sense, mobility on the main roads was badly affected by the difficult use of motor vehicles and the exposure to the snipers (Razović and Wagner, 1993). Barricades began to appear in the streets (set up with cars, containers or bags) (Barranco, 2002). The new morphology of flows through the public space and the awareness of the existence of snipers conditioned the routs, varying its usual course.

The change of activities has distorted the urban space, not only changing the circulation patterns in it but also its original use. In residential buildings, the living room and hallways became firewood stores and community space lost its main functions. Residents were fully aware that every time they would hear the whistle of a missile or a grenade detonation, they would have to run down the stairwell, and take shelter in the building's basement (Razović and Wagner, Op. cit.). Similarly, people moved within the city mostly through the corridors in the lower parts of the buildings⁵. Exposed parts were an easy target for snipers, mortars and missiles, due to the location of the Bosnian Serb troops in the surrounding hills.

5 Information obtained in an interview with an engineer Midhat Aganović, 21 February 2014.



Figure 5: *Self-organization and provision of supplies in Sarajevo. Source: Photography by Miquel Ruiz in: Ruiz, M. (2002), Sarajevo, Col·legi d'Arquitectes de Catalunya, Demarcació de Girona, Delegació Alt Empordà, Figueres.*

Changes in the meaning of space also led to variations in its public use. Some houses became schools for small number of students; city parks lost all the trees and were replaced by cemeteries. The environment was modified on a large scale and urban life under siege emphasized supply networks between the civilian and surroundings. Self-organization of space, which resulted in new uses, together with self-referentiality of the social system made possible the survival of the urban system.

In fact, the lack of resources and the inability of the current administration to manage short-circuited supply networks resulted in a situation where organization plans and decisions were kept between non-hierarchical system elements and linked to the direct environment. The social and spatial self-organization increased the number of available states that had disappeared after the collapse of the socialist infrastructure and, therefore, became a paradigm of spatial management.



Figure 6: *View of the Bosnian Parliament in Sarajevo. Source: Photography of Miquel Ruiz in: RUIZ, M. (2002) Sarajevo. Figueres: Col·legi d'Arquitectes de Catalunya, Demarcació de Girona, Delegació Alt Empordà.*

In terms of complexity, the system's adaptability to shortage of supplies led to an increase of its complexity. The creation of new networks of self-organization was an adaptation factor that led to new available states, since the previous ones had been destroyed. Furthermore, in order to survive, the city has to anticipate not only armed defense, but also the strategies of mobility and use of space, clearly related to social systems. Open and public spaces changed their meaning, since the system had to adapt to environmental aggressions.

Conclusions

The post-traumatic condition is *tabula rasa*: “when the normal run of things is traumatically interrupted, the field is then opened up for a discursive ideological competition” (Žižek, 2009). This vacuum, without any mechanism of control, may be exposed and vulnerable to entry of predator systems that seek to dominate and try to erase trauma from memory, imposing order through the frantic reconstruction and its imaginary. But at the same time, the resilience mechanisms of the urban system – its ability to adapt to violent disruptions – are exposed and rendered visible in the urban and social fabric (Burke, op. cit.).

Therefore, the processes of self-organization and increase in the com-

plexity are powerful survival mechanisms of the urban system; moreover, they are able to fill in the void left by traumatic disruption and discontinuity, allowing the reestablishment of links between spatial and collective memory.

The field of urban complexity allows to connect trauma and self-organization. Despite the fact that adaptation to urban conflict does not always occur through self-referential processes, trauma and adaptability often cause production of autopoietic systems. In that sense, both Mogadishu insurgents and Sarajevo besieged civilians generated trauma-induced self-referential relational fields through complex processes, caused by the possible states to which the systems were subjected.

These possible states of the complex urban system enable its elements to be produced and organized autonomously. The acceleration of the elements, produced by the trauma, modifies the system's stable states, and thus determines its possible states, causing divergent urban futures, subjected to the post-traumatic condition.

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