Complexity and sustainability: relief and representation of the new urban identity

M. Sepe
C.N.R., DPU Università di Napoli Federico II, Naples, Italy

Abstract

The new urban facts of the territory are not easily identifiable, not representable through a traditional planimetric relief, inexplicable with the common terminology, and are often invisible. At the same time, other elements of the territory exist whose identification is entrusted only to the sensitive perception that becomes an analysis of measures and a reference for planning. As a matter of fact, the contemporary city is the place of the complexity, the simultaneity and instability that determine situations of transivity and transformation. Therefore, researchers have developed, from other disciplines, ways to see, research, explain, and represent the city and the natural, mental, and virtual places in which we live, constructing proper methodologies of transversal and multilevel decodification and analysis. In order to give suitable terms and explain these new sites, several studies have experimental maps, words and multimedia images, hypertext, and software able to render this complexity and to permit the readability that, in most cases, have resulted in new interpretations and intersections of urban facts.

Starting from this premise, the aim of this work is to illustrate the analysis methodology of the sensitive relief and the results of the first experimentation on the urban areas of Naples.

In such a complex and diversified situation, the proposed sensitive relief individualizes those elements that have value for the identification of the place, that are able to provoke transformations, also cultural, and to influence the sustainable city construction. The final product is a complex map and the relative legend processing, which are intended to integrate traditional planimetry, support architects and planners in the sustainable process of construction of the city, and communicate with the common citizens and users of the places.

Keywords: contemporary urban landscape, sustainable city construction, cultural identity, sensitive relief, complex mapping.
1 Introduction

The contemporary city is the site of complexity, simultaneity and instability that give rise to situations of transience and transformation [1–5]. The change in interpersonal relationships and intergenerational gaps, new demands connected to this change, technological development and the globalisation process have transformed the places in the urban landscape [6]; new types of spaces have arisen and the way those already existing are used has been modified. As a matter of fact, the city is not an artificial construct: the city is a set of moods, habits, customs and lifestyles; there are various interrelations between these elements and they cannot be easily read in a singular and unique way, but in their conversion into the identity of the places and the identification of the city. Traditional cartography is still unable to represent such new places. Researchers have therefore developed, from other disciplines, ways to see, research, explain and represent the city and the natural, mental, virtual places in which we live, constructing proper methods of transversal, multilevel decodification and analysis. In order to give suitable terms and explain such new sites, researchers proposed maps, words and multimedia images, hypertext, and software able to render this complexity and to permit the readability of the contemporary sites [7–9].

The sensitive relief proposed here allows contemporary urban components to be identified and studied utilizing multimedia tools and perceptive analysis [10]. The method, consisting of five phases and a preliminary one, aims to produce a complex map that provides a complex, but immediately understandable, reading of the sites, and may constitute both a tool of knowledge for citizens and an integrated and sustainable town planning support at different scales for professionals and administrators.

2 Methodology

Phase 0 of the proposed method consists of the construction of the grid required for the operations that are to be implemented later. Different types of database have to be created to contain the different types of data collected: there are data from the anticipatory analysis (sketches, poems, collages, etc...); the denominative and perceptive (through words), the graphical (signs and symbols), the photographic (fixed images), the video (moving images) reliefs; the elements deduced from the study of traditional planimetries (graphic signs, symbols etc...); and the questionnaire administered to visitors to the places in question (sketches, words, etc...). It is necessary to decide the categories of elements to analyze, which are connected in a particular way to the urban events identified above, and the corresponding measurement parameters. Moreover, it is necessary to establish, in the space of a year (chosen as a reference period for urban changes), which days are the most significant and the time slices for the relief.

The first phase is devoted to anticipatory analysis aimed at the first investigation of the place; after the preliminary choice of the city and of the part or parts to be analyzed, the idea about that particular area can be described using
any type of instrument or tool of expression, using the information known before
the first inspection. These notes could be represented in different ways and the
result of this phase will be a map of the ideas emerging.

The second phase is that of the five reliefs (surveys); the first relief, the
denominative one, consists in the collection of the data regarding the constructed
elements (presence of monuments, buildings, etc...), the natural elements
(presence of urban green areas, trees, animals etc...), the transportation mode
(presence or passing of cars, buses etc...), and the people (presence of tourists,
residents, etc...). The localization of all these signalled elements, and the type
and amount, expressed as a low, medium or high percentage, are indicated.
Alongside the denominative database is the cognitive one that constitutes a kind
of flexible input, where it is possible to insert elements that are not decided
previously but deduced during inspection. The second relief is perceptive, in
which a survey is carried out on the smell, sound, taste, touch, visual sensations,
and of the global perception, focusing on the localization, type, amount (present
in low, medium, high percentage) and the quality (non-influential, pleasant,
annoying perceived feeling). The survey of the amount and quality of the data,
the three options regarding, respectively, the percentage of presence and the
feelings induced, are intended to summarise the processing of data, however
during collection this can be extended. The next relief is the graphical one that
consists of sketching the places; the sketches will represent the area in question
according to a visual-perceptive standpoint and will be supported by annotations
where necessary. This operation constitutes a preliminary study for the
construction of the graphical symbols for the sensitive map. Photographic and
video reliefs of the whole study area are carried out, taking care to record the
state of the facts rather than the interpretation of the places. The product of the
five reliefs is a map visualizing the results obtained from the different reliefs.

The third phase is the analysis of the traditional cartography of the selected
sites of the city. The types of maps used in this phase are derived from different
disciplines and depend on the nature of the place. The study is effected at the
urban scale, in order to identify the characteristic elements and their relationships
with that particular area, and at the aerial scale, in order to identify the
relationships between the site and the whole city. The result of this phase is a
map with the identification of the components required for the description of the
site that can be found only through a traditional planimetric reading.

The fourth phase is that of the questionnaire administered to visitors to the
area with the aim of gaining an idea of the place perceived by those who are not
involved in the study and are not specialists in related fields, but only perceive
the site as users, at various levels: the inhabitant, the passer-by, the tourist. The
questionnaire consists of questions asked on the basis of images of the area and
an inspection visit with the interviewee. The information deduced from the
questionnaire will be transferred onto a map that, like the previous ones, will
constitute the basis for the construction of the complex map.

The fifth phase is that of assembling the collected information. In this phase,
we test the maps produced, the congruence of the various collected data, and
choose the useful elements to construct the final map. The recorded data
represent the basis for the construction of the graphical system to represent the elements of the urban landscape and the elaboration of the complex map.

2.1 The experimentation. The case study of Naples

In order to test the method, the chosen area in the city of Naples includes the quarters of Chiaia and San Ferdinando, especially Piazza dei Martiri, Piazza Plebiscito and Galleria Umberto I. Regarding the time schedules, the morning and afternoon slices were chosen whilst, in terms of days, surveys were conducted during one weekday, one semi-holiday (Saturdays) and one holiday (Sundays, Christmas, Easter etc.).

We begin with the first phase: the instrument used to analyse the expectations is the written word whose results are summarised below.

Regarding the anticipatory analysis concerning the survey of the morning time slice: Via Calabritto is a road used mostly for commercial purposes with high fashion and jewellery shops; Piazza Santa Caterina is a place mostly for passing through with no very precise connotation. The innovative element is the new bookstore, a place of new socialization because of its multiple functions; Piazza dei Martiri is a place with a mix of residential buildings, offices, etc...; it has a clear, delineated conformation. It constitutes quite a counterpoint to Piazza Trieste e Trento; Via Chiaia is a road mostly for residential and commercial use. It has no great interest from the architectural point of view. It is a place for walking and shopping; Piazza Trieste e Trento - Piazza Plebiscito - Galleria Umberto I area with the historical monuments and empty spaces represents a place where users of the zone or the city can socialize, and also for tourists. It could be interesting to understand its dynamics, above all in relation to other places for socialization.

Regarding the survey in the afternoon hours: in Via Calabritto, there will be more pedestrian traffic than in the morning and the users will be of different types; Piazza dei Martiri, in the afternoon will be populated by a larger number of professional people; in Piazza Santa Caterina, the spaces in front of the new bookstore will be more crowded than in the morning hours; Via Chiaia, should not give rise to too many changes in terms of perception; in Piazza Trieste e Trento - Piazza Plebiscito - Galleria Umberto I area, there will probably be a smaller quantity of tourists and schoolchildren, but a larger number of professional people.

Let us move on to the second phase and to the first two reliefs, denominative and perceptive, whose information collected through the database and some related observations are reported in synthesis.

In the course of the surveys, various types of characteristics were found regarding the squares: Piazza dei Martiri looks like a place where people pass through (residents, traders, shoppers) rather than a place for socialization. Even though there is a monument in the centre of the piazza, it does not change the life of the site as it is fenced off and there is nowhere to sit down. Paradoxically the visual element consisting of the large advertising hoarding covering the scaffolding on the façade of a palazzo catalyzes the eye of the observer more than the monument. The same happens for Piazza Plebiscito where, in spite of
the presence of monumental buildings like the church of San Francesco di Paola and the Royal Palace, it creates an empty space in between, delimited by two buildings in symmetrical position, that make it a place for the passing of tourists, of people heading for other destinations, of schoolchildren, rather than a place for socialization. No natural elements are noted except the background towards Via Marina, the view of Vesuvius and the sea, but it seems that they do not directly connote this space. The only natural element of the square consists of the presence of pigeons on the pavement in front of San Francesco di Paola church. Piazza Trieste e Trento appears instead the closest to the concept of a public square as a place of events and socialization. Numerous elements of connotation are found there: a fountain to the centre, which catalyzes from the visual point of view (it lies in the centre of the square) and from the acoustic one because of the sound of the water; the church of San Ferdinando, the prospect on Via Chiaia, Via Toledo, Piazza Plebiscito, the San Carlo Theatre; the historical Café Gambrinus and the other pavement cafés. The noise from vehicles is so great as to block out the sound of the water. Another observed sound is that of the church bell that rings approximately every 15 minutes. There is also the element of the large advertising panel that covers church restoration works. The pace of the place is quite calm and different kinds of people are observed: from mothers with prams, to beggars, tourists, passers-by, professionals, and artists. The police and an ambulance are stationed in the centre between the two squares, and a small electronic billboard displays the latest news, while another gives information on bus timetables. Regarding the Galleria Umberto I, the following may be noted: the gallery constitutes a typical space for socialization and trade, the people have a rather hectic pace and the general perception of the place is not of serenity. There are also various background noises that contribute to this slight state of uneasiness. Smells of baking come from cafés and shops that sell typical pastries, a required stop for many tourists.

In Via Chiaia, there are no annotations of interest within this analysis, perhaps because of its homogeneity of functions. It should be noted that this road is situated particularly towards the outside: the Spanish quarters, the deep courts of the buildings, the stairs, the Chiaia bridge. It looks like a façade, but true life was played out inside such places. Travelling over again Via Chiaia in the opposite direction to that which was covered at the beginning of the relief, from Piazza Plebiscito to Via Calabritto little or nothing seems to change in spite of the opening of the stores. Perhaps a slight increase in the pedestrian flow. The same holds for Piazza Santa Caterina, Piazza dei Martiri and Via Calabritto. The fact that at almost noon there was nobody in the squares created some doubts. So we went into the new bookstore in Piazza Santa Caterina and found quite a notable concentration of people: a climatized space, a slight smell of cafés, the bookcase sector, the CD sector with the possibility of listening, a video screen; spaces for breaks, a sofa and small tables for the bar have catalyzed the flow of customers. It is a space where the people go in order to relax, allowing themselves the luxury of calming their pace of life, perhaps because they can relax without feeling the guilt imposed by a society with a hectic pace (the break has cultural aims). Moreover, outside the bookstore we are still within the city walls, unlike
the case of some megastores constructed in the city suburbs. During the survey, other data were gathered about the pace of life and times of the city. These elements were observed to be part of the identification of a site: two places with the opposite pace of life are, for example, the Galleria Umberto I (hectic) and the Piazza Santa Caterina bookstore (quiet). Another interesting category is the weather; during the day the weather often changed and at the same time also the way to perceive the places. A common element among the open places concerns the porphyry pavement, which represents a strong element of tactile perception, and the presence of quite homogeneous urban furniture.

Regarding, instead, the third relief, i.e. the graphic one, sketches were executed about the perception of the places and the first useful signs were drawn to construct the system of symbols.

As for the photographic relief, approximately 200 photographs were shot during the various surveys and in all the sites in question, recording whatever element might be useful to the aims of the analysis.

Regarding the last relief, that of video, the footage had two functions: to record data regarding also the pace and times of the places and to record sounds.

The third phase concerns the analysis of traditional planimetry of the area at a scale of 1:1000 and 1:10,000. In the analysis at an urban scale the interesting elements concern especially the kind of system and morphology of the places, the presence of axial roads and interruptions of continuity, of monuments of historical and cultural interest, of green spaces; while, in the analysis at the areal scale we highlight where the area is bounded by the sea, the public park of the Villa Comunale, Vesuvius, Sant'Elmo castle, the places of historical and cultural interest, the main roads, and the various viewpoints.

The fourth phase concerns the questionnaire; the questions which the users of the place were asked during a survey are: What elements in this area strike you (people, things, etc...)? Can you see one or more elements that arouse a particular sensation or that reminds you of an important moment for any reason? Are there elements that disturb you? If something in these places could be changed, what would you change and why? Could you compare this area to another area of Naples or to another city? If so, which and why? Which of these images do you prefer and why?

The interviewees are not informed beforehand about the specific reason for the survey. It is only generically explained that it concerns research into the cultural characteristics of that particular place, in order to obtain responses that are not aimed at an objective, but spontaneous. The questionnaire, which is expected to last approximately 30 minutes, includes not only short questions on personal data (age, kind of profession, use of the place, etc..) but also seven questions concerning the general perception and personal idea of the place, through a survey and the viewing of some images.

Briefly, the responses to the questionnaire show the following: Piazza Plebiscito and its monuments are the elements that mainly strike respondents; Piazza dei Martiri is an area that provokes a sense of solitude, Via Chiaia of chaos, Piazza Plebiscito of empty space, Piazza Trieste e Trento of a metropolis; an annoyance factor is the noise in Piazza Trieste e Trento; Piazza Plebiscito is a
place that provokes a strong feeling; the areas that would be changed are Via Chiaia, the organization of Piazza Plebiscito and the space between Piazza Trieste e Trento and the Royal Palace; the study area reminds interviewees partly of Genoa, partly Venice, and in general of maritime cities, due to the presence of the sea - even though the sea is barely seen, but it is just perceived - and the monumental area.

The **fifth phase** consists in reprocessing the collected data to construct the system of symbols to represent the different elements of the contemporary urban landscape and create the map. The shape of the symbols was created bearing in mind two components: the signs of the graphical relief and the comparison of the sign with the meaning. Another criterion adopted concerns the size of the symbols; three sizes were designed (small, medium or large) referring to the various percentages quantifying the presence of that given element (slight, medium or considerable). We also matched the symbol with a number in order to indicate in the legend the element to which it referred. Finally it was decided to summarise the feelings about the elements of the perception in non-influential, pleasant, annoying and to place beside each number the first letter of such words in order to indicate them. The strong and contrasting colours that were used, aim to attract and activate the visual perception and overall perceptions. The full or half-full closed circles are symbols that were chosen in order to visualize the concept of space, linked to the idea of a circumscribed area. For the places of casual socialization, instead of a precise shape, we chose an imprecise curved shape, which recalls the idea of aggregation. The uncoloured square is used to recall the sense of empty space. The concave-convex symbol is studied in order to recall the concept of the place that receives and rejects at the same time. The square with the coloured vertical bands and in the centre an uncoloured band was used to indicate a limit and/or boundary. Two square horizontal brackets open towards the outside were used to indicate a place whose life happens beyond its cartographic boundary.

For the symbols connected to perception, two fundamental types were created: one for permanent perceptions and one for transient ones, the former being denoted by symbols with a full line and colour, the latter with a dotted line and half-coloured. The ten perception symbols recall shapes of body parts connected to the respective actions of seeing, touching, smelling, feeling and tasting. For the symbols denoting pace, we used signs that recall the speed to which they refer and the perceptions that derive from them. For the symbols of the natural elements we used the stylised real reference image. Once the symbols were created, they were inserted in the map, whose graphical basis consists of the area boundary, placing them in the point where they were found. The map aims to represent the identified elements of the urban landscape and is supported by a legend, Fig. 1.
Figure 1: The complex map.
2.2 Observations on the method

The proposed method of sensitive relief has some focal points. The difficulties found in the first phase concerned the choice of the most suitable tool of expression to represent the anticipatory analysis: in this phase the type of these observations appears vague and without much sense. It is worth noting at the end of the analytical process that such annotations may be useful for the purpose of understanding the place in question.

In the second and fourth phase of the analysis, attention must always be paid to collect data deduced by the specific instrument used for each relief and not given by logical deduction or by previous knowledge of the place. It has been found that the different kinds of relief and visitor interviews should be performed at the same time to obtain comparable and overlappable results.

The parts of the relief that involved greater execution times were those concerning the mapping of the senses of taste, smell and touch. In these cases we performed tasks by comparison and deduction, describing and measuring these perception elements in part approximately and in part in relation to other senses such as sight and hearing. The unpredictability of the obtained results is not thought to prejudice the analysis, because the final perception of the place is created by a sum of perceptions and not a single one, unless there is such an important component as to overwhelm the others and, at this point, thanks to its exceptional nature, it becomes simpler to find and measure. We also discovered the existence of two categories not considered when constructing the analytical grid: pace of life and times of the city. There are different paces and times, such as those of people and of events that create greater differences between places; pace is related to the division of time (hours, minutes...) but also to the inner time of the individual. Several factors may cause it to differ, which may go as far as to characterize a place, a population or a city. Pace in the contemporary city is faster on the whole, but it is difficult to assess how much the variance depends on external factors due to new technologies, or on a different organization of the city or on inner factors and to what extent such differences overlap and intersect.

As regards the interviews of site users, the kind and number of the interviewees must be checked and catalogued precisely so as to obtain more comparable and useful results. The third phase involved some difficulty in the choice of elements to be noted. It was scheduled after the survey phase so as not to be affected by previous knowledge of the planimetry during the surveys. However, in the same way care had to be taken to read the traditional maps objectively, without being influenced by the previous interpretation of the place (made by surveys).

Regarding the end product, i.e. the map, the difficulty in this part of the analysis lies in assembling the different kinds of data and maps and in transforming them into a unique system of graphical symbols. To verify the congruence of the collected data, we require a continuous overlapping of collected data of the same nature from the analysis of expectations, analysis of traditional maps and from surveys, and from data collected by using different instruments. It was observed that in the zones where there was greater incongruence due to non-comparable information, this often means that such
urban areas have experienced new events and situations and are thus of greater interest to analyze.

3 Conclusion

Contemporary cultural trends are reflected in the organization of the area, creating new dynamics of places and different types of spaces that cannot be expressed with a traditional map; as a matter of fact, the elements characterising a sustainable approach to the city development seem not to interact in an integrated manner with the complex articulations of the territory. The aim of this work was to elaborate a method of analysis in order to identify new elements of the urban landscape which have value for the identification of the place, are able to provoke transformations also cultural and to influence the sustainable city construction, and create a map able to represent those new elements and the complexity of the places. Preliminary experiments are under way and the results of the investigation of Naples are explained in detail. The crucial points found during the experiments concern: the construction of a database which is as flexible as possible and able to collect different kind of data (mainly multimedia); the choice of the name of the categories, on which to address the observation; the parameters to be used to compare the selected elements; attention to collecting the data observed using the different tools of the relief and not using the logical conclusions deriving from the use of that particular tool.

The complex map is proposed both as a tool of knowledge for citizens and an integrated and sustainable town planning support for guiding policy choices on the part of planners and administrators. Constructing the map in question was useful to ascertain the validity of the method used. However, we believe it is possible to use this method to generate other kinds of maps and symbols, and create indices able to transform the data contained in such maps into active indicators.

References