

Developing an Indicator Evaluation System to Assess Cities' Identity

Peian Yao, Paria Bagheri Moghaddam, and Martina Corti

Abstract

As an ongoing subject, city identity has been researched in a range of disciplines and contexts, such as sociology, anthropology, urban planning, cultural tourism, design and art. The social and economic value of city identity as a strategic dimension of cultural and creative competition between countries is increasingly being recognized. (Anholt, What is competitive identity? In *Competitive identity: The new brand management for nations, cities and regions*, pp. 1–23, 2007). However, in the current search for strategies to make cities identifiable, liveable and inclusive, research projects have been undertaken in different disciplines, dimensions and fields of knowledge, yet there is no specific way to analyze and observe city identity, nor can research efforts from different disciplinary backgrounds lead to common discussions or collaborations. The paper aims to develop a method and approach to assess or measure elements of urban identity with the aim of developing a methodology for observing, analyzing and evaluating city cultural identity. Enable specialists from different disciplines to carry out a quantitative-based analysis of city identity. Against this backdrop, this paper will firstly define the cultural identity elements of the cities through the literature review, in order to develop an indicators system of city identity. Secondly, the appropriate evaluation criteria

for the indicators are discussed based on the categories of the elements in the indicator system, including the qualitative and quantitative evaluation aspects. By doing this, the article aims at filling a research gap in current literature as it is the first attempt to systematically investigate the components of city identity on a wider scale, forming a framework for a structured insight into city identity. It contributes to a broader interest in the debate on the topic of urban identity.

Keywords

City space · Cultural heritage · City identity · Indicator evaluation system

1 Introduction

In the existing literature, research on city identity has been conducted both qualitatively and quantitatively. The main issues addressed in the qualitative literature include: exploring the meaning of city identity (Cheshmehzangi, 2020; Riza et al., 2012). How certain elements of urban space contribute to the formation of urban identity (ER, 2019; Onay, 2012; Samir & Arayici, 2015; Sofianto et al., 2021). Some studies investigate urban space, social well-being, and ethnic identity in the social and human sciences (Kotradyová, 2019). Quantitative studies on urban identity are mainly concerned with: comprehensive evaluation of indicators for a city, (Kiani et al., 2019; Martín et al., 2019). Statistical study through the collecting of data pertaining to city identity (Anastasiou et al., 2021; Sönmez, 2020). There are also studies on urban identity that cover topics such as city branding, city reputation and place marketing. Their research on urban identity content uses a combination of methods ranging from big data analysis to deep learning and other technological tools (Andéhn et al., 2014; Yan et al., 2021; Zhang et al., 2019). These have contributed

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directly or indirectly to the development of knowledge about city identity from different fields of study.

However, city identity has always been an abstract notion, with few concrete explanations in various fields and a lack of quantitative observation and evaluation methodologies. Regarding city identity, the design discipline focuses mostly on its cultural aspects. Due to the absence of a defined content, however, it is difficult to create a systematic reference framework of identity features to guide design practice, resulting in a lack of awareness of city identity by professionals, this increases the risk that cities will replicate one another.

In order to address this issue, the authors have sought to construct a system of indicators for the evaluation of urban identity, with the goal of achieving a thorough generalization of the subject-related factors based on previous studies. In order to determine the criteria for measurement and evaluation, a distinction is created between quantitative and qualitative analyses of the many forms of elements that comprise identity in urban space.

2 Literature Research

It all starts with the question of which elements of a city are considered to constitute a city's identity in past studies of urban identity. Which of these elements are more commonly mentioned, and which are less studied. To answer these concerns, the authors used a method of literature review to generalize the components of city identity by analyzing the existing literature on the subject. The result is a set of indicators using which professionals can obtain quantitative and qualitative observations on urban identity.

The authors searched the bibliographies of Google Scholar, ScienceDirect and CNKI for relevant references. Used keywords “city identity”, “city image”, “city branding”, “city reputation”, “place marketing”, “cultural identity”, search in CNKI using the conjunctions “and”, “or”. In order to broaden the scope of the search and to search more comprehensively for relevant factors, keywords such as “cultural tourism” and “urban heritage” were also used.

The final search included books, dissertations, journals and conference papers. A total of 197 references with the highest relevance were selected. The authors read further through this literature and eventually selected 137 useful articles. The authors further classified the obtained documents and the initial data to obtain a set of elements that influence the identity of the city, and sorted in descending order of mentions. The results are given in Table 1.

Based on the data, it is evident that the function of new media in the spread of city identity is receiving an increasing amount of attention. Common techniques of communicating city identity include short videos, online platforms,

etc. However, they are not city identity components in and of themselves. The authors excluded 1 and 4 from the scope of the city identity evaluation indicators. Secondly, in the data obtained, the authors have analyzed the elements mentioned, which vary in type and form. There are both material and immaterial elements. Some elements have overlapping content, and some elements contain other elements. For example, ‘Culture’ is a large concept that encompasses other smaller items such as ‘Music’ and ‘Art’. ‘Public facilities’ also includes items such as ‘urban furniture’ and ‘sculpture’. In addition, ‘Athletics’, ‘Gangs’, ‘Spice’, etc., are elements of the identity of individual cities and are not representative, they can be classified as part of a larger category. They can be grouped into broad categories. The use of preliminary data does not allow for the development of a system of indicators for the evaluation of urban identity, so it is necessary to categorize and organize the preliminary data.

Depending on the content and form of the elements, the authors first categorized all elements according to their tangible and intangible forms. With regard to the scope of tangible elements in urban spaces, the authors refer to the definition of tangible cultural heritage from the RICHES resources website. The term “tangible cultural heritage” refers to a society's physical artifacts that are produced, preserved and passed down from generation to generation. It includes artistic creations, architectural heritage (such as buildings and monuments) and other tangible or physical products of human creativity that are significant culturally within a society (RICHES Resources, 2014). The authors classify tangible indicator elements as buildings, squares, streets, museums, theaters, transportation and landmarks, among others. The authors make reference to the concept described in the UNESCO Convention on Intangible Heritage. On its website, UNESCO defines intangible heritage as “the practices, representations, expressions, knowledge, and skills that communities, groups, and in some cases, individuals consider to be part of their cultural heritage” (Intangible Heritage Convention). It is stated that intangible culture is a living force that is “transmitted from generation to generation” and “continuously recreated by communities and groups” in response to its social and natural environment. Important component of community identity, intangible heritage “promotes respect for cultural diversity and human creativity” (UNESCO, 2003). Therefore, the authors categorize events, folklore, festivals, folk songs, religion, etc., as intangible indicators. There is also a category in between, which is not physical and cannot be touched. They can be perceived by the human senses and are classified by the authors as intermediate, such as taste, sound and dialect. The final system of indicators after the classification and hierarchy is given in Table 2.

In Table 2, the authors classify all the elements into several levels of indicators with encompassing relationships:

Table 1 Summary of urban identity elements from existing literature

No	Elements that related to the city identity	Authors of article and publish years	Research field	Mention times
1	New media and short video	Jing Li (2022), Wei Liu (2022), Ying Liu and Shuang Chen (2022), Jiaming Bao (2022), Rui Wang (2022), Zuo Wang, Huiwen Zhan and Cheng Xiang et al. (2022), Hao Zhang and Linghua Ran (2021), Shuyue Chen (2021), Yidan Tang (2022), Keyi Wei (2022), Xin Sun and Jing Zhang (2022), Hong Zhu (2022), Yawen Zheng (2021), Yue Zhang and Hailong Cai (2022), Jiaxuan Bai, Yuan Cheng and Binghui Sun (2022), Feng Yin (2022), Ling Wu, Chunyao Liu and Jun Du (2022), Zhigang Xia (2021), Jing Yang (2019), Jinping Zhao (2020), Aizhe Li and Xiaoming Chi (2019), Qi Zhou (2021)	Communication and media	22
2	Architecture	Linyan Wang (2014), Yingnan Liu (2020), Hongyu Li (2013), Yang Chao (2013), Mige Riza, Naciye Doratli and Mukaddes Fasli (2012), Zohreh Torabi and Yalda Sima (2013), Adham M. Hany Abulnour and Magdi Wasfi Wissa (2018) Hamed Hyab Samir and Yusuf Arayici (2020), Mige Riza, Naciye Doratli and Mukaddes Fasli (2012), Kunto Sofianto, Agusmanon Yuniadi and Agus Nero Sofyan et al. (2021), Abdulaziz Alzahrani (2022), Ali Salmo, Elena V. Scherbina and Lina Yaser Alibrahim (2021), Nik Mastura Nik Mohammad, Rohana Sham and Azlin Abdul Latif (2015), Imad M. Assali (2017)	Architecture design; sociology; history	14
3	Visual identity	Mengli Zhang (2014), Yang Jin (2020), Anqi Zhang (2020), Yuelin Zhou and Ye He (2021), Xu Han (2016), Xinyi Zhang (2021), Chengliang Ma and Huiliang Guan (2021), Xin Wang (2022), Xiangming Sun (2012), Jinhuan Wu (2019), Xin Zhao and Dangui Xu (2021), Juan Li (2022), Zhao Li (2019), Brian Alvin Hananto (2019), Yu. V. Gorgorova (2019), M. Alaa Mandour (2012)	Design; engineering	13
4	Film and TV, drama	Rui Yao and Wendong Kong (2022), Li Wen and Wanqing Yuan (2022), Xiaoyan Qin (2022), Chang Wang (2021), Zhifua Wang and Kaixue Xue (2022), Lu Li (2018), Xia Li (2022), Katie Milest (2008)	Communication and media; film; sociology	8
5	Culture	Dawei Zhang (2006), Yali Gao and Huadi Liu (2022), Wenting Lv (2022), Biqin Xia and Jiaxiang Wang (2021), Qingling Wang (2021), Lixin Han (2021), M. Alaa Mandour (2012)	communication and media; design; economics and management; arts	7
6	Cultural symbols	Xueqing Yan (2020), Xiaonan Zheng (2020), Zhexuan Wang (2020), Shuhan Yin (2021), Hao Yang (2022), Jing Liu and Wen Wangjun (2022), Jiuyang Lv and Geng Zhang (2022)	Communication and media; architecture design; design;	7
7	Museum	Huang Zhao (2022), Cenwei Kong (2020), Jie Wu (2021), Jiasheng Zhou (2022), Manli Zheng (2014)	Communication and media; design; environmental art design	5
8	Fashion and design	Juan Shan, Linjing Zhu and Yanchi Long (2021), Ping Xu (2007), Clarinda Rodrigues and Holger J. Schmidt (2021), Marina Parente (2016)	Marketing; design	4
9	Art in public spaces	Shuai Wang (2020), Yifan Zhu (2017), Lei Li (2014), Hao Wang (2011)	Art; art history; cultural studies	4
10	Landscape	Elif Sağlık and Abdullah Kelkit (2017), Annibale Salsa (2010), Yuan Feng (2018), Vera D. Damayanti, Hasti Tarekat Dipowijoyo and Jacqueline Rosbergen et al. (2019)	Architecture design; communication and media	4
11	Heritage	Liang Zhang (2022), Xiaohui Hou (2021), Mohamed Badry Kamel Basuny Amer (2018)	Architecture design; communication and media	3
12	Color	Sisi Wu (2014), Chen Xu (2021), Cristina Boeri (2019), Marco Ricciarini and Adelaide Tremori (2020)	Design;	3
13	Infrastructure	Xin Jin, Haochong Li and Zhihui Xi (2022), Yang Wei (2002), Dwi Lindarto Hadinugroho and Eunice Ananda Putri Matondang (2020)	Design; cultural studies; architecture design	3

(continued)

Table 1 (continued)

No	Elements that related to the city identity	Authors of article and publish years	Research field	Mention times
14	Folk music and music	Shuai Zhang (2020), Xuemei Luo (2019), Aksa Noya (2020)	Music	3
15	Square	Basak Damla Erdogan and Hatice Ayatac (2012), Nurettin ÖZGEN (2013)	Architecture design; geography	2
16	Traditional painting and art	Hailong Wang and Yafang Zhu (2019), Noa Yuval-Hacham (2019)	Art	2
17	Perception and memory	Maria Popczyk (2013), Damiano Razzoli, Fabrizio Montanari and Graziano di Paola (2020)	Anthropology	2
18	Materials	Paulina Dorota Lis (2014), Nilufer Saglar Onay (2012)	Architectural design	2
19	Food	Riccardo Pravettoni (2018), Peian Yao, Anqi Cheng and Stefano Follesa (2020)	Anthropology; design	2
20	Landmark	Pengfei Li (2022), Mohammad Ali Danesh Sedigh and Parnaz Goodarzarparvari (2018)	Architecture design; design	2
21	Historic street	Xunfei Mu (2020), Zhaomo Zhang (2019)	Architecture design; communication and media	2
22	City furniture	Wei Hao (2019), Xinlu Song (2021)	Design	2
23	Events and activities	Yating Yang (2021), Ming Chen and Siyi Wang (2022)	Communication and media; economic management	2
24	Celebrities	Xiaolu Wang (2019), Eli Jamilah Mihaardja, Prima Mulyasari Agustini and M. Bisryi (2019)	Art; sociology	2
25	Theaters	Li Yilun (2020), Sijie Qi (2022)	Arts industry and management; film arts	2
26	Rail transport	Xiaolong Huang (2021), Nianli Zhang (2021)	Communication and media; art	2
27	Handicraft	Marie Geneviève Cyr (2014), Birnaz ER (2018)	Fashion; art	2
28	Garden and park	Caimei Hong (2021), Lucie Poláčková (2014)	Landscape design	2
29	Bookstore	Xiaojing Jia (2019), Fangyuan Xiong (2019)	Communication and media	2
30	Sounds	Mengli Zhang (2014)	Design	1
31	Olfactory	Mengli Zhang (2014)	Communication and media	1
32	Mascot	Anjiao Xu, Yujie Jiang and Chun Zhong (2022)	Design	1
33	Road signs	Baopen Jin (2021)	Design	1
34	Literature	Kun Zhao (2012)	Literature	1
35	Religious events	Zohreh Torabi and Yalda Sima (2013)	Urban planning	1
36	Dialects	Manlu Wang (2021)	Linguistics	1
37	Road name	Ya'nan Zhu (2020)	Urban planning	1
38	Sculpture	Bowen Li (2019)	Art	1
39	Athletics	YanJun Huang (2021)	Physical education	1
40	Linguistic landscape	Jiali Zhong and Meilan Liu (2022)	Linguistics	1
41	Gangs	Alistair Fraser (2015)	Sociology	1
42	Spice	Dewi Kumorath (2022)	Design	1

Table 2 Indicators system for the evaluation of city identity elements

Indicator lever 1	Indicator lever 2	Indicator lever 3	Indicator description
Identity elements of city space	Tangible	City system	Architecture; squares; streets; museums; theaters; transport; landmarks; et al.
		City nature	Plants; landscapes; animals; greenery; et al.
		City infrastructure	Public space art; Street furniture; et al.
		City symbols	Patterns; materials; colors; skylines; architectural types and decoration; road signs; et al.
	Intermediate	City perception	The five senses (eyesight; aural; olfaction; tactility; taste)), et al.
		Historical and heritage	Handicrafts; dialects; road names; famous people; et al.
		Art and literature	Music; traditional painting; street art; poetry; literature; bookshop; et al.
		Life quality	Design; fashion; et al.
	Intangible	Traditional memories	Folk tales; festivals; ballads; et al.
		Life rituals	Lifestyle; poetic elements; religion; spirituality; et al.
		Events	Festive celebrations), religious events; significant events; et al.

the highest level is the level 1. Identity elements of city space, which is also the target level. The second level is the indicator level 2, which contains three broad categories: Tangible, Intermediate and Intangible. The third is indicator level 3, which contains the 11 categories of all the identity elements of the city space. Each level 3 indicator corresponds to the corresponding indicator level 2. Lastly, there is a description of the indicators corresponding to each indicator level 3, which includes specific things. It is the smallest individual component of the city identity evaluation system. Within a quantitative and fixed framework, these smallest individuals can be refined, extended or changed. There are no implications for the evaluation system.

The final indicator evaluation system can function as a standardized evaluation system for each city. The evaluation of these indicators is also an evaluation of the spatial identity of the city. It can provide data on the quality of the spatial identity of the city as reference data.

3 Quantitative and Qualitative Assessment of City Identity

Having obtained a system of indicators, the authors consider that different methods of assessment are needed for different types of indicators. Some need to be evaluated quantitatively and some need to be evaluated qualitatively. Quantitative evaluation includes: Quantity, Scale and Diffusion, Time. Qualitative evaluation includes: Distinctiveness, Aesthetic characteristics, Narrativity, Visual

unity, Inclusivity. These are the various ways in which the identity elements of a city can be evaluated in a comprehensive way. The specific approach is summarized in Fig. 1.

3.1 Quantitative Evaluation Factors

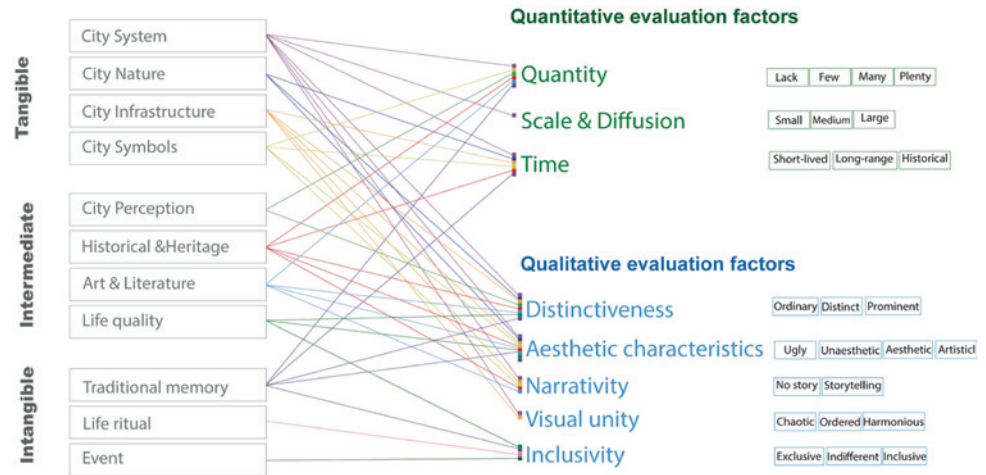
3.1.1 Quantity

The assessment of whether a city has a strong identity starts with the number of identity elements in the city. The more identity elements a city has, whether tangible or intangible, the more likely it is that the city has a strong identity. The number of identity elements can be used as a reference for the magnitude of a city's identity. It represents the extent of a city's identity elements.

3.1.2 Scale and Diffusion

In addition to the number of identity elements, the size of the elements is also a reference factor, especially the size of the tangible elements. Large-scale identity elements are clearly more visually appealing than small-scale identity elements. The authors consider that there are three classes of urban space: small-, medium- and large-scale elements, which are characterized by: Large scale-with more recognizable value. Examples include: buildings, monuments, squares, streets, museums, gardens. It is noted that large objects in space are often the first elements that people notice. These large-scale features may be seen as the most intuitive conditions for the

Fig. 1 Classification of city identity elements and their quantitative and qualitative evaluation factors. *Source* Author



character of urban space, shaping the character and quality of the urban landscape in the first place; Medium scale-more contact with people. For example, elements such as street furniture, street facilities, street decorations (shop signs, etc.), which are smaller than buildings. However, these are the things that urban dwellers come into meet with most often. They have the greatest impact on the human experience; small scale-providing a variety of rich perceptual experiences that add diversity to the space. For example, urban symbols, frontal patterns in spaces, decorations, signs, street names, street art. These subtle elements enrich the perceptual experience and reflect the cultural diversity of the space. They contribute to the narrative capacity of the urban space.

3.1.3 Time

The duration of the element in the urban space is also an important factor. Identity has both a fixed and a dynamic aspect. If identity only has a fixed architecture, then it has a consistent continuation throughout history. For example, architectural identity has both fixed and dynamic aspects in each historical period. People first perceive the actions and events provided by the forms and patterns of the physical environment. Then the features of shape, level and form capture people's attention and are perceived. The longer the duration can be considered, the more it affects urban identity and the less it affects it.

3.2 Qualitative Evaluation Factors

3.2.1 Distinctiveness

In addition to the quantity of urban identity elements, their uniqueness is also an important factor to assess. The uniqueness of identity elements distinguishes a place from other places. This uniqueness is formed by the involvement of culture, history and human activity over a long period of

time. A city with a strong identity reflects a strong sense of individuality and self-confidence and is of great value.

3.2.2 Aesthetic Characteristics

Elements of urban identity, such as architecture, parks and public facilities embody aesthetic characteristics that often reflect the local history, culture and aesthetics, the artistry and charm of the space. The aesthetic characteristics of elements are reflected in, e.g., the form and decoration of buildings, sculptures, art installations or materials in public spaces, patterns, colors, landscapes, traditional costumes in spaces, etc.

3.2.3 Narrativity

The narrative nature of identity elements is inseparable from the memory of the everyday life of the inhabitants of a place. They are distinctive due to the differences of people. Spatial elements have a sense of authenticity in the world of human experience. Historically, cities have told micro-stories: place names, monuments, nameplates, murals, writing on walls, conversations about people, ordinary life and events. We attribute to narrative the ability to understand, interpret and represent, by giving form to reality, real or fantasy stories. Our attachment to place is actually achieved through the identification of those elements of affinity that involve our imagination.

3.2.4 Visual Unity

The strong visual coherence of the elements in urban space contributes to a strong city identity. Form and color elements in city space are symbolized in the human consciousness, thus creating a unified identity. Studies have shown that over 70% of the body's sensory receivers are concentrated in the eyes, and that humans use their eyes in conjunction with other organs to identify objective objects in most cases. To a large extent, visual perception factors such as field of view, perspective and visual balance will have a significant impact on the layout, size, proportion and color

of the orientation facilities (Bao, & Wang, 2007). People always prefer to be in a comfortable and attractive space to perform various activities.

3.2.5 Inclusivity

The infectiousness of city spaces is reflected in the impact of festivals, events and rituals on people. The ability to include people in the city space, whether they are visitors or local residents. A positive experience for different cultural backgrounds, ages and social classes.

4 City of Florence as a Case Study

The article uses the evaluation of Florence's city identity as a case study to test the indicator system and evaluation method and to provide preliminary indications. Here, the article presents it not as an exhaustive survey but as an experiment. Florence's historic center was inscribed on the UNESCO World Heritage List on 17 December 1982. The history center is considered as "a unique artistic achievement of its kind, a masterpiece of work, the result of a continuous creation lasted for over six centuries", The Florentines have been able to preserve the old building processes by utilizing traditional building materials such as "pietra forte," "pietra serena," plasters and frescoes.

The purpose of this process was to experiment with the analysis of a city's identity in conjunction with the use of indicators and evaluation factors, and to provide insights into the feasibility of data-based urban identity research. Ultimately, the specific identity elements observed were content and evaluated as shown in Fig. 2.

The analysis shows that the identity of the city of Florence is the highest in terms of the evaluation factors Quantity, Scale and Diffusion and Time. They are also characterized by the highest in terms of Distinctiveness, Aesthetic characteristics, Narrativity, Visual unity and Inclusivity.

This process presents a preliminary approach to looking at the elements of identity in the city in a different dimension. The content of the observations will vary from city to city. The case of Florence's identity elements is not exhaustive and does not represent the result of a complete evaluation but rather a process that provides a method.

The results of this process analysis show that the indicators system and evaluation factors can be useful for systematic and in-depth observation and exploration of the elements of urban identity. Some possibilities for future research are offered.

5 Findings

This is an attempt to analyze, in a broad sense, the framework system that influences the elements of urban identity. The results of the analysis indicate that this process is

necessary. The index evaluation system of urban identity can be called an effective approach that helps researchers understand the identity of different cities and the factors that influence urban identity in more detailed and refined ways. It can also facilitate comparisons and promote models between different city identities, and it can unleash the enormous potential of cultural elements in cities.

Firstly, the indicator evaluation system provides a perspective on how people view urban identity. It can reflect how the diversity of elements in a city affects the quality of urban identity. Secondly, the indicator evaluation system also allows for continuing and expanding knowledge on, e.g., the quality of urban space, local attachments and cultural heritage. The theoretical framework of urban space as culture and collective memory is supported by the ways of seeing provided by the indicator evaluation system. Lastly, the process of observing the case cities indicates the operationalization of the framework for the indicator evaluation system in urban areas. The indicator system facilitated the observers' active exploration of the city's cultural context and provided a more comprehensive foundation for the analysis.

This process of analysis demonstrates that the system of evaluation indicators is a thorough and conclusive system of indicators. It is appropriate for addressing concerns pertaining to the quality of urban identity or urban cultural diversity. Due to the continuous progress of research in this field, it cannot be ruled out that the system may include more indicators that can be refined. Or due to the development of the research, some of the links between them may be adjusted. But any modification or updating of the content of the indicator descriptions will not affect the structure of the methodology. The indicator evaluation system can be utilized as a set of procedures or tools for organizing urban cultural identity investigation. It presents numerous opportunities for future investigation. It helps give a starting point and a foundation on which researchers from various research backgrounds can collaborate and analyze the subject.

6 Conclusion

Each city has its own specific and diverse identity components that constantly communicate stories to the audience. The elements of identity are diverse, and therefore the criteria for evaluation should be diverse as well. Without any method or approach to reveal and measure them, without a system of observation, evaluation or management, a large number of city identity elements cannot be properly observed. As a result, they are neglected, destroyed and eventually disappear. The authors argue for a data-based observation of the elements of city identity. This will lead to the establishment of a rational system for the conservation

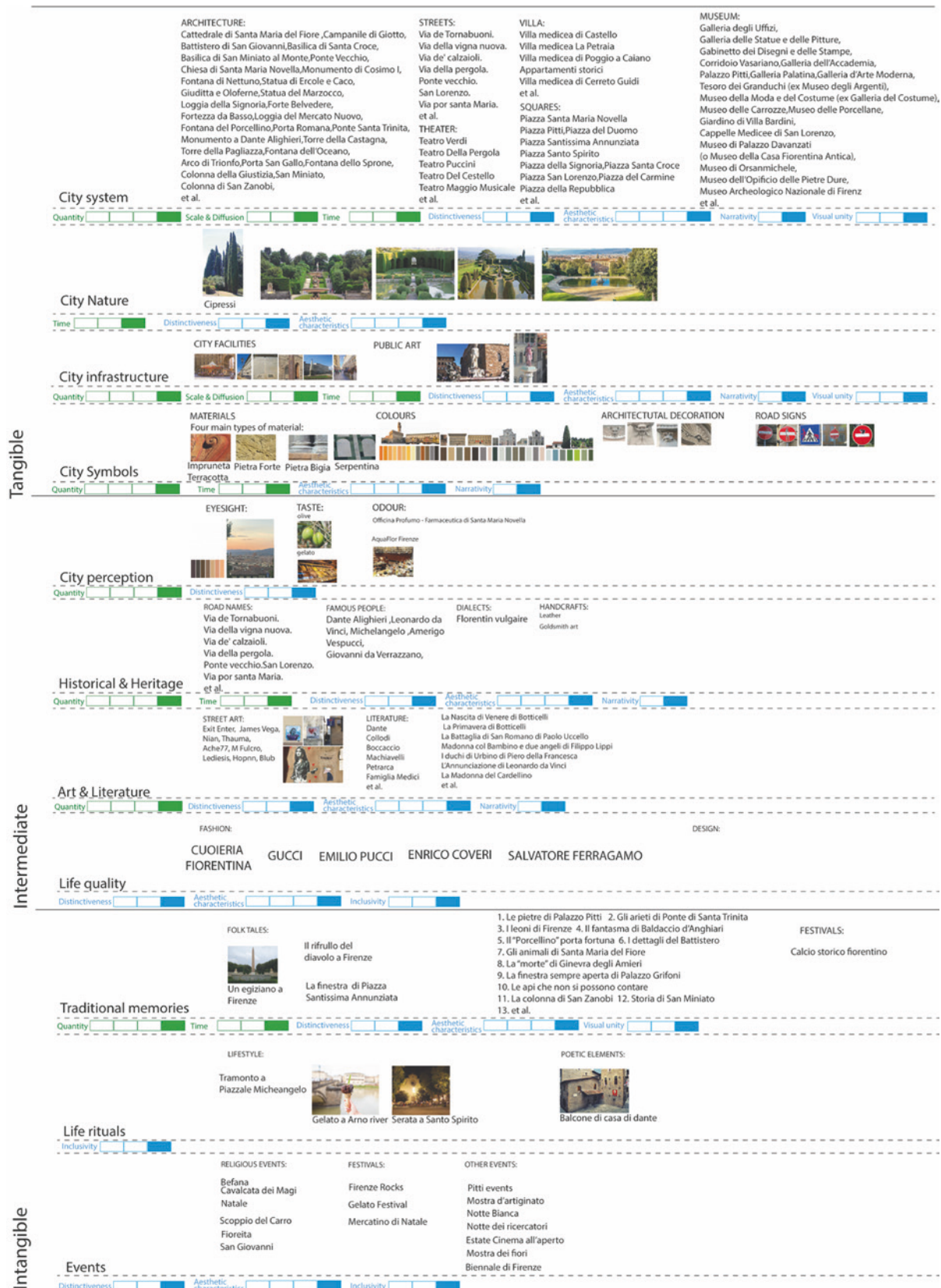


Fig. 2 Framework of city identity elements evaluation system. *Source* Author

and management of city identity, aiming to promote the conservation of the city's cultural diversity. This will enable a sustainable resource for urban development.

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