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MUSEUM ROUTES IN ITALY

Recently, Istat has undertaken a work of data geo-referencing aimed at providing a growing supply of information for territorial analysis and local development policies. This work intends to propose an operative support for the definition of museum policies at a local level suggesting, through the analysis of the geo-referenced data provided by the "*Survey on museums and similar institutions in 2015*" carried out by ISTAT within the framework of European cultural statistics, some possible actions for the cultural development of the territory.

We identify "museum itineraries" and highlight possible "thematic paths" to enhance those museums that for various reasons are not able to make the most of their potential. The basic hypothesis is to upgrade small museums by identifying paths that from the most attractive "pole" (the most visited museum in the province [sub-regional aggregations of municipalities]) can create "emancipating exchanges" also for museums that are often located in peripheral areas and less reachable. In this perspective both institutions could benefit from it: not only the less frequented museum but also the center of attention of the visitors, as it would be included in a cultural network anchored to the local identity that improves in broader terms the whole territory.

The concept of museum route represents the first step towards the construction of a real museum/cultural network at a local level, with structured objectives and rules.

The updating of the paths, operable at every occasion of the survey on "museum and similar institutions", will also allow verifying the effectiveness of the adopted policies.

Results

The adopted method (see below) produced several geographical units for the analysis.

The first one is the museum *itinerary* defined as the set of stretches of road, which can be traveled by car within 30 minutes, leading from the most visited museum in the province, here called the "main museum", to another museum (Figure 1). The itineraries thus identified are 3,540.

The second is the museum *route*, defined as the set of itineraries designed starting from the main museum (Figure 2). The identified routes are 110 and are named with the name of the most visited museum.

Finally, the *subtended territory* to the museum route, defined as the sum of areas of each Municipality crossed by the itineraries of the route (Figure 2).

Figure 1 – Museum itinerary

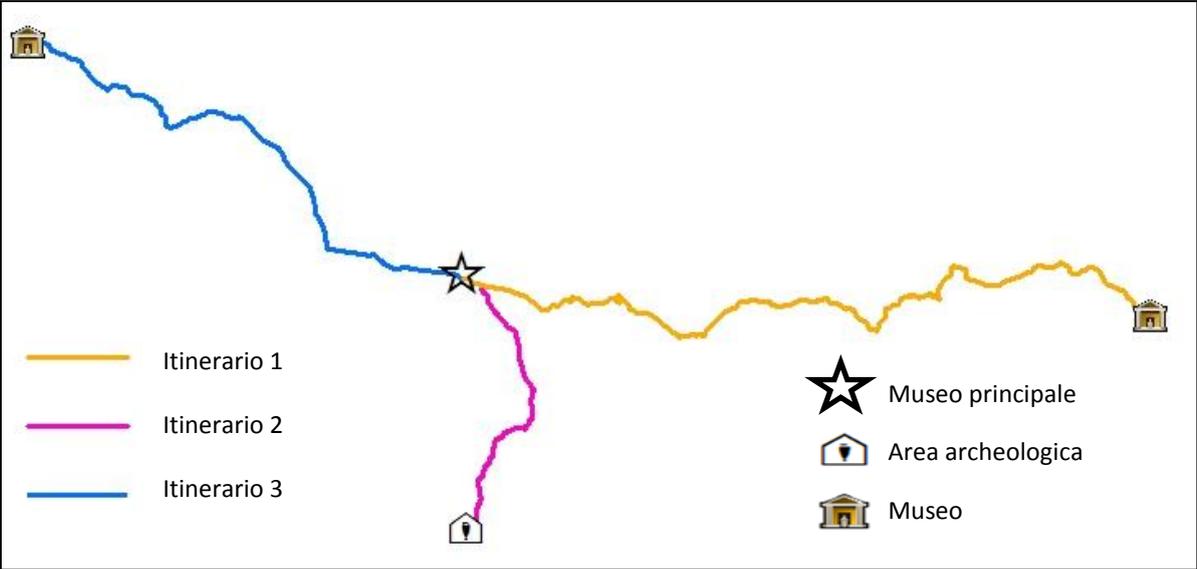
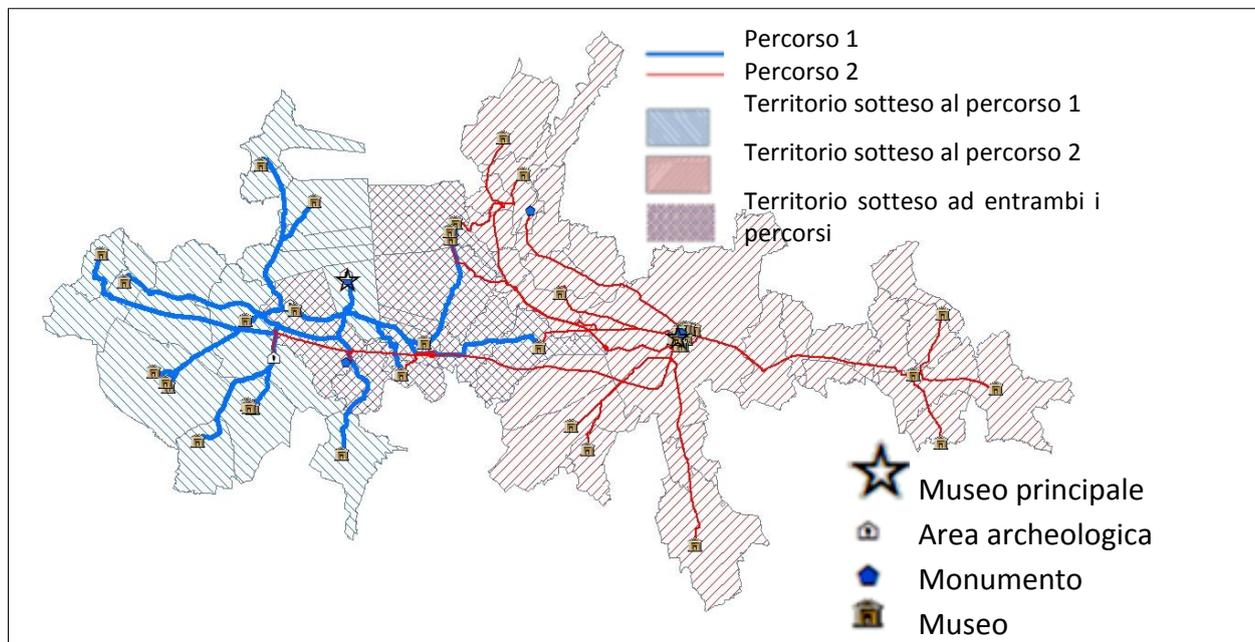


Figure 2 – Museum route and subtended territory



Notice that a museum can happen to be reached from more than one principal museum and therefore contained in more than one route, e.g. in figure 3.

Figure 3 – Partially coincident routes, an example



Each identified route is described by the main variables observed for the reached museums, the presence or absence of protected areas, “Borgo” municipalities, UNESCO sites, and the potential amount of users (resident population and tourist arrivals) of the amenities of the area. To describe each itinerary a punctual spatial information is available (e.g. exact position of the museum, protected areas, etc.) while the 110 routes data and indicators referred to the subtended municipalities areas:

- tourism (Istat, movement of customers in hospitality establishments)
- demography (Istat, Movement and calculation of the annual resident population)
- Unesco sites (Unesco)
- villages (Borghipiùbelliditalia.it, Bandierearancioni.it, borghiaautenticiditalia.it)
- protected natural areas (Ministry of the Environment).

Table 1 shows some summary information about the routes above described.

There are 110 museum routes, corresponding to the 110 most visited museums, one for each province, from which it is possible to visit 2,820 museum institutes (56.7% of all Italian museums) along itineraries that can be traveled in 30 minutes by car.

Table 1 also shows a strong polarization in terms of museums visitors. The identified routes concentrate around one-third of visitors (29.9%) in the 110 most visited museums and 85.4% in all the museums on the itineraries. The museums not reached by the routes are, instead, 2,156, for a basin of 16,094,474 visitors which represents only 14.6% of all visitors of Italian museums.

Table 1 - Museums and similar institutions in museums routes
Year 2015 (absolute and percentage values)

Museums	Museums and similar		Admissions	
	Number	%	Number	%
Museums included in the routes	2.820	56,7	94.472.791	85,4
<i>Most visited museums included in the routes</i>	110	2,2	33.018.148	29,9
<i>Other museums included in the routes</i>	2.710	54,5	61.454.643	55,6
Museums not included in the routes	2.156	43,3	16.094.474	14,6
Total museums in Italy	4.976	100	110.567.265	100

Source: Elaborations on Istat data

In each itinerary there is an average of 33 museums but the range is extremely large: from 3 to 139 institutions. This is due to several considerations, including the historical-cultural identity that is largely varied in the country and the morphology which influences the extension of the routes within 30 minutes driving time and therefore the number of museums: routes located in the plains will have a greater linear extension since the road networks will be more developed and more easily drove through than those located in mountain areas.

Table 2 - Museums and similar institutions in museums routes by main type
Year 2015 (absolute and percentage values)

Museums	Museum typology							
	Museum, gallery	Archeological site or park	Monument	Total	Museum, gallery	Archeological site or park	Monument	Total
Museums included in the routes	2.373	146	301	2.820	84,1	5,2	10,7	100
<i>Most visited museums included in the routes</i>	65	12	33	110	59,1	10,9	30,0	100
<i>Other museums included in the routes</i>	2.308	134	268	2.710	85,2	4,9	9,9	100
Museums not included in the routes	1.785	136	235	2.156	82,8	6,3	10,9	100
Total museums in Italy	4.158	282	536	4.976	83,6	5,7	10,8	100

Source: Elaborations on Istat data

Table 2 provides information about the types of museum institutes included in the itineraries: 59.1% are museums, 30% monuments or monumental complexes and 10.9% archaeological areas or archaeological parks, in line with national averages.

The legal form (table 3) does not appear to be a discriminating factor for museums included in museum routes compared to not included ones. The total number of institutions present in the identified routes shows features in line with the national value, with 61.4% of public museums and 38.6% private ones. However, this homogeneity disappears when we look at the 110 most visited museums of the routes. As much as 71.8% of principal museums have a legal form of a private nature, a share that drops to 37.2% for the other museums included in the museum itineraries.

Table 3 - Museums and similar institutions in museums routes by legal form
Year 2015 (absolute and percentage values)

Musei	Legal form					
	Number			%		
	Public	Private	Total	Public	Private	Total
Museums included in the routes	1.728	1.086	2.814	61,4	38,6	100
<i>Most visited museums included in the routes</i>	31	79,0	110	28,2	71,8	100
<i>Other museums included in the routes</i>	1.697	1.007,0	2.704	62,8	37,2	100
Museums not included in the routes	1.462	688	2.150	68,0	32,0	100
Total museums in Italy	3.190	1.774	4.964	64,3	35,7	100

Source: Elaborations on Istat data

As for the presence of protected natural areas, villages certified as “Borgo”, and UNESCO sites, all routes have at least one green area, 67.3% of them pass through municipalities having one or more "Borgo" in their territory and 56.4% cross municipalities with UNESCO World Heritage Sites (United Nations Educational, Scientific and Cultural Organization). 40% of the routes include all the three facilities (Table 4).

Table 4 - Museums routes crossing protected natural areas, "Borgo" municipalities and UNESCO sites
Year 2015 (absolute and percentage values)

Routes	Number	%
Routes with protected natural areas	110	100
Routes with "Borgo" municipalities	74	67,3
Routes with Unesco sites	62	56,4
Routes with protected natural areas, "Borgo" municipalities and Unesco sites	44	40,0

Source: Elaboration on Anci, Touring Club Italiano, “Borghi Autentici d’Italia”, Ministero dell’Ambiente, UNESCO data.

In order to achieve a more effective description of the routes specificities, a context analysis was carried out, aiming also at assessing the potential amount of users of the amenities of the areas.

Table 5 shows the 110 routes sorted by visitors number and provides information about population, area, number of museums, arrivals in tourist facilities of the territory subtended to each route.

The routes with the greatest number of tourist arrivals are not necessarily those with the greatest number of museum visitors and vice versa. This is the case, for example, of the museum route of Rimini, where in 2015 we find only 702,062 museum visitors but a good 5,244,818 tourist arrivals. In the route of Farfa there are just 37,073 visitors of local museums despite the potential expressed by the large number of tourist arrivals (8,946,355) due to the proximity to metropolitan city of Rome. On the other side, the route with the archaeological site of Pompeii (the fourth most visited museum in Italy) has over 6 million visitors but only 1,917,028 tourist arrivals in 2016.

Table 5 - Museum routes in Italy: population, area, number of museums, museum admissions, tourist arrivals.

Main museum of the route	Province	Population (a)	Area (Kmq) (a)	Number of museums (b)	Number of admissions (b)	Tourist arrivals (a)
Pantheon	Roma	3.052.956	1.633	126	20.894.320	9.309.446
Galleria degli Uffizi e Corridoio Vasariano	Firenze	956.788	1.357	101	14.642.592	4.753.421
Villa Medicea di Poggio a Caiano e Giardino	Prato	1.262.702	1.973	139	10.312.801	5.323.940
Scavi di Pompei	Napoli	1.993.220	531	53	6.320.947	1.917.028
Museo Nazionale della Scienza e della Tecnologia "L. da Vinci"	Milano	3.443.589	1.456	99	5.085.943	7.087.977
Museo e Tesoro del Duomo di Monza	Monza e della Brianza	3.177.718	1.083	83	4.899.654	6.841.357
Museo delle Antichità Egizie	Torino	1.521.580	1.065	69	4.289.080	1.551.137
Palazzo Ducale	Venezia	261.905	416	20	4.158.464	4.645.567
Reggia di Caserta	Caserta	2.351.527	1.002	65	4.100.199	1.635.174
Complesso Museale ed Archeologico della Cattedrale di Lucca	Lucca	1.049.746	2.275	80	3.865.225	2.741.462
Cattedrale di Santa Maria	Pisa	704.358	1.416	50	3.531.582	1.758.044
Museo di Storia Naturale del Mediterraneo	Livorno	553.660	1.318	33	3.325.597	1.291.538
Anfiteatro Arena	Verona	628.290	1.241	32	1.935.890	3.800.754
Museo Storico Artistico "Morando Bolognini"	Lodi	1.951.909	1.220	51	1.688.967	5.712.377
Museo dell'Opera della Metropolitana di Siena	Siena	152.530	1.123	39	1.674.632	784.637
Parco del Castello di Miramare	Trieste	275.269	269	50	1.538.514	485.585
Museo delle Scienze	Trento	360.758	1.680	45	1.443.213	1.274.695
Museo della Sanità e dell'Assistenza	Bologna	651.582	1.020	65	1.145.898	1.683.704
Galata Museo del Mare	Genova	904.797	1.263	108	1.106.451	1.668.727
Museo Arcivescovile	Ravenna	631.988	2.275	67	1.033.618	2.406.649
Museo Archeologico dell'Alto Adige	Bolzano/Bozen	355.070	2.021	49	959.920	2.911.444
Musei Civici di Padova	Padova	1.142.757	1.561	56	957.956	6.865.480
Abbazia di Casamari	Frosinone	284.080	1.178	24	861.029	83.793
Museo Ferrari - Maranello	Modena	509.523	1.071	43	843.623	561.401
Parco Archeologico di Naxos	Messina	650.380	759	18	823.551	1.168.121
Castello di Racconigi	Cuneo	1.278.526	1.618	40	792.075	1.380.263
Castello Scaligero	Brescia	269.058	828	27	765.407	2.976.518
Teatro Farnese	Parma	648.633	2.002	78	749.931	742.297
Parco Archeologico e Paesaggistico della Valle dei Templi	Agrigento	185.896	880	10	735.493	202.360
Chiostro Santa Maria La Nuova	Palermo	962.690	1.214	39	729.763	623.187
Museo della Città "Luigi Tonini"	Rimini	609.803	1.187	52	702.062	5.244.818
Area Archeo della Neapolis e Orecchio di Dioniso	Siracusa	277.385	1.196	14	645.556	379.835
Museo Storico della Perugia	Perugia	397.728	2.022	63	625.810	1.276.493
M.A.B.- Museo all'aperto Bilotti	Cosenza	222.366	1.045	24	594.069	165.030
Eremo di Santa Caterina del Sasso Ballaro	Varese	322.332	749	34	582.890	1.175.967
Rocca demaniale	Pesaro e Urbino	512.418	876	46	565.736	3.929.589
Complesso Museale Palazzo Ducale di Mantova	Mantova	312.514	1.426	24	564.958	441.456
Basilica Patriarcale	Udine	201.060	831	28	564.733	240.980
Castello di Gorizia - Museo del Medioevo Goriziano	Gorizia	162.341	527	28	560.438	222.952
Museo Artistico e Storico di Palazzo Borromeo	Verbano-Cusio-Ossola	124.281	410	24	558.870	685.830
Parco Monumentale di Pinocchio	Pistoia	680.191	1.461	53	553.092	1.300.109
Museo di San Gerardo	Avellino	56.658	912	12	534.052	10.580
Basilica di San Francesco	Viterbo	180.848	1.663	29	512.494	191.746
Museo Diocesano di Amalfi	Salerno	313.874	213	21	503.255	502.214
Parco Archeologico di Segesta	Trapani	293.666	1.904	13	487.933	248.068
Accademia dei Concordi	Rovigo	627.768	1.700	41	486.195	1.319.587
Pozzo di San Patrizio	Terni	69.107	1.207	27	481.196	264.852
Castello Estense	Ferrara	785.659	2.599	40	477.032	1.733.389
Teatro Olimpico	Vicenza	945.081	1.622	61	475.926	1.300.763
Casa Museo Villa Monastero	Lecco	150.129	729	18	446.042	432.926
Forte di Bard	Valle d'Aosta/Vallée d'A	29.991	443	15	427.207	130.621
Castel del Monte	Barletta-Andria-Trani	446.182	1.701	18	396.951	143.556
Musei Civici - Palazzo dei Musei	Reggio nell'Emilia	886.450	1.639	37	393.375	967.624
Museo Regionale Villa Romana del Casale di Piazza Armerina	Enna	95.963	1.283	12	383.347	73.385
Ente Villa Carlotta	Como	49.669	331	14	380.438	337.727

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Main museum of the route	Province	Population (a)	Area (Kmq) (a)	Number of museums (b)	Number of admissions (b)	Tourist arrivals (a)
Museo Preistorico della Val Varatella "Nino Lamboglia"	Savona	277.603	681	43	370.721	1.461.305
Sacrario Militare di Cima Grappa	Treviso	333.588	869	32	352.218	240.446
Basilica di S. Francesco - Affreschi di Piero Della Francesca	Arezzo	299.939	2.374	44	337.202	389.479
Casa Leopardi	Macerata	425.221	1.240	61	332.306	690.983
Museo Civico Castello Ursino	Catania	683.397	816	22	329.299	690.528
Museo Civico di Scienze Naturali "Enrico Caffi"	Bergamo	446.172	388	21	319.644	593.647
Mam - Museo d'Arte sul Mare	Ascoli Piceno	354.965	1.098	69	302.655	848.259
Museo della Vita Contadina nell'Ottocento	Asti	57.233	255	13	271.382	12.628
Museo Archeologico Nazionale	Cagliari	238.633	462	25	263.437	251.029
Castello Malaspina	Massa-Carrara	472.756	775	38	249.067	1.159.461
Museo Archeologico Nazionale	Reggio di Calabria	245.048	493	17	225.741	128.804
Museo della Rocca Viscontea di Castell Arquato	Piacenza	252.320	1.289	27	219.974	360.418
Fortezza e Museo delle Armi e Mappe Antiche	Teramo	281.369	942	33	210.206	372.089
Pinacoteca Civica "Bruno Molajoli"	Ancona	137.107	1.661	36	208.396	179.273
Museo Tecnico Navale della Marina Militare	La Spezia	405.808	1.456	40	205.943	999.983
Area Archeologica Su Nuraxi di Barumini	Medio Campidano	74.959	1.425	38	202.598	28.653
Castello Svevo	Bari	731.939	1.061	24	202.522	554.942
Area Archeologica di Tharros	Oristano	49.143	312	7	190.196	72.070
Castello Sforzesco Visconteo	Pavia	331.973	707	14	179.891	165.189
Museo Civico di Storia Naturale	Cremona	356.694	1.443	32	175.813	295.872
Museo Casa Natale di Gabriele D Annunzio	Pescara	472.725	1.002	30	168.861	595.809
Sacro Monte di Crea	Alessandria	159.553	910	23	168.194	101.164
Pinacoteca Civica	Fermo	283.079	759	43	166.863	599.635
Museo Abbazia Benedettina di Santa Maria in Silvis	Pordenone	447.380	1.644	37	152.588	381.242
Man - Museo d'Arte Provincia di Nuoro	Nuoro	60.385	892	13	142.794	92.784
Museo Archeologico Nazionale	Taranto	391.525	1.094	10	142.501	143.920
Storica Casa Grotta di Vico Solitario	Matera	146.203	985	10	141.874	262.410
Museo Nazionale Archeologico di Egnazia "Giuseppe Andreassi"	Brindisi	257.541	1.164	12	138.832	586.117
Abbazia di Fossanova	Latina	281.629	1.171	23	132.838	220.675
Torre Angioina del Castello di Le Castella	Crotone	103.219	556	6	124.134	130.754
Museo della Battaglia	Chieti	395.991	546	19	120.425	449.928
Ricetto Candelo - Ecomuseo della Vitivinicoltura	Biella	193.381	850	29	119.149	94.424
Museo Camillo Leone	Vercelli	289.094	1.224	22	109.619	156.851
Museo e Parco Archeologico Nazionale di Scolacium	Catanzaro	163.901	592	10	108.091	145.734
Museo Archeologico Nazionale del Melfese "Massimo Pallottino"	Potenza	77.390	953	9	106.636	45.150
Mostra di Cultura Ebraica "Associazione La Piccola Gerusalemme"	Grosseto	40.127	1.257	17	103.671	168.677
Galleria D'Arte Moderna "Paolo e Adele Giannoni"	Novara	306.374	825	19	103.562	173.765
Museo Provinciale Murattiano	Vibo Valentia	182.374	806	18	99.491	265.777
Area Archeologica di Cava d'Ispica	Ragusa	216.853	1.621	12	90.151	277.608
Museo dei Misteri	Campobasso	92.222	878	17	89.719	26.749
Giardini Botanici Hanbury - Centro Universitario di Servizi	Imperia	128.961	338	19	82.057	466.720
Compendio Garibaldino di Caprera	Olbia-Tempio	11.248	52	3	81.040	39.972
Museo Archeologico Nazionale del Sannio Caudino	Benevento	174.796	421	9	73.151	25.715
Area Archeologica di Alba Fucens	L'Aquila	75.607	677	10	69.426	17.237
Museo Storico della Campana "Giovanni Paolo II"	Isernia	17.632	585	10	66.393	1.812
Museo della Grande Guerra In Marmolada - Onlus	Belluno	17.858	582	6	65.467	422.275
Museo dell Intreccio Mediterraneo	Sassari	170.493	1.015	8	63.502	146.391
Porto Flavia	Carbonia-Iglesias	64.534	558	11	60.885	28.692
Idro - Ecomuseo delle Acque di Ridracoli	Forli-Cesena	12.597	446	3	52.576	103.229
Frantoi Ipogei di Palazzo Granafai	Lecce	143.092	457	12	50.574	241.549
Musei della Basilica Santuario San Michele Arcangelo	Foggia	103.103	935	7	44.505	342.889
Abbazia di Farfa	Rieti	2.964.244	1.761	11	37.073	8.946.355
Museo Diocesano del Seminario Vescovile "G. Speciale"	Caltanissetta	181.713	1.433	10	29.042	65.843
Palazzo Vertemate Franchi	Sondrio	18.279	379	6	22.006	28.418
Parco Archeologico e Naturalistico del Taccu di Osini	Ogliastro	9.075	293	3	13.645	5.456

Source: Elaborations on Istat data

(a) Year 2016

(b) Year 2015

Information Gap filled

Currently, information on museum heritage is spread according to traditional administrative geographies. In identifying non-administrative geographies, the study provide a more accurate and consistent spatial reading of the phenomenon analyzed. There are many actors potentially interested in this information: local and national administrators and policy makers, economic operators involved in tourist services management, researchers involved in the study of the relationships of cultural phenomena with the territory.

Innovation

The main innovations can be identified in:

- original method of identifying the routes which, starting from the geographic coordinates of the most visited museum, defines all the itineraries linking it to the other museums within a maximum 30 minutes driving time, thus representing accurate routes beyond administrative boundaries. It should be pointed out that the route is a "variable geometry" spatial unit of analysis, expressed in travel time. Travel time is firstly fixed to 30 minutes but may later vary according to the different local specificities (e.g. morphology and accessibility) or peculiar information needs;
- enhancement of the information already existing in the "Museums and similar institutions Survey" (2015). The method allows us to present the survey data concerning new geographies also linking them to other sources (e.g., tourism data, environmental data, demographic data, etc.).

Method

The "Survey on museums and similar institutions in 2015" conducted by ISTAT within the framework of European cultural statistics has, for the first time, positioned the objects of the survey on the territory. The steps of the geo-coding and geo-referencing process with the technology available at that time first involved coding the enumeration areas with the help of the National Archive of Civic Numbers and Urban Roads (ANNCSU) set up in compliance with current legislation (DPCM 12 May 2016 "Census of the population and national archive of street numbers and urban streets", published in GUSG No. 167 of 19 July 2016). Museums, archaeological areas, and monuments have subsequently been geo-referenced using automatic procedures integrated with operator interventions.

The geographic references, assigned to each structure, concern the normalized address, the enumeration areas, the cell of regular European grid 1 km side, as a minimum territorial reference for each statistical information, the coordinates of the corresponding access to the address in the reference system WGS84 projected in UTM32N. The geo-referencing and the

geo-coding realized allow a direct comparison with territorial information coming from other sources, at different levels of detail.

Starting from the geographic coordinates of the most attractive museum (main museum), all the itineraries connecting to other museums within 30 minutes driving time are identified, even in case of temporary traffic restrictions (for example limited traffic areas in some urban centers). To draw the itineraries, the Tom-Tom road graph was used in the March 2018 version inside the ArcMap Network Analyst tool. In this way, the representation of the routes is not dependent on administrative boundaries.

The routes are analyzed and characterized for their spatial aspects both regarding each other and to the territory, they pass through using the G.I.S. (e.g. number of museums reachable, population, tourist services, proximity to protected natural areas and other amenities).

The geographies obtained (itineraries, routes) are also described by linking the surveyed data on the Museums with those available at municipal level about tourism (*Istat, Movement of customers in hospitality establishments*), demography (*Istat, Movement and calculation of the annual resident population*), Unesco sites (*Unesco*), "Borgo" municipalities (*I borghi più belli d'Italia, Bandiere Arancioni*, etc.), protected natural areas (*Ministry of the Environment*).

The proposed methodology also allow the definition of urban routes by means of transport (pedestrian, bicycle, ...) in some urban contexts. Furthermore, it will be possible to develop indicators on the degree of internal connectivity and the concentration of the branches of the route in order to assess the different degree of accessibility and use of each route.

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