

Faster! Platform: Fast assessment and survey of the territory for evaluation and restoration

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ABSTRACT: The paper presents one of the works resulting from the Summer School “After the Damages” course, offered during July 2020 and organized by the Architecture Department of the University of Ferrara and its research laboratories. Focusing on the urgency of dealing with post-disaster situations in cities and territories, the group of students developed a methodology of fast response, based on the collection, storage and distribution of data that supports the recognition, maintenance and intervention of buildings and places of relevant interest for preservation. As a result, the Faster! platform emerges - Fast Assessment and Survey of the Territory for Evaluation and Restoration.

Based on a holistic approach, integrating varied and integrative knowledge that aids in the perception and understanding of the pre-existences under various aspects, the platform would provide quick and easily accessible information, ideal for a post-disaster situation - but not only. Considering the importance of implementing Conservation Plans, the Faster! platform is able to be continuously updated, providing crucial and supported information for maintenance and future intervention actions. Other fact of great relevance is the possibility for various actors to have access to the data, such as owners, professionals, public bodies and researchers, either to consult it and/or feed it with new information. It also provides rigid access control, so there is confidentiality or general public access (open data resources), depending on the document.

In this paper, the main argument of this proposal is presented, which is the relevance of concentrating these databases in a specific online location, as well as the methodology proposed by the group for its operation. Then, the specifics of data collection and the possible consequences of adopting Faster! is considered. Finally, the evaluation of benefits and obstacles is done, as well as a critical analysis of the proposal presented by the group.

Keywords: conservation, holistic approach, open data, survey, vulnerable places

1 INTRODUCTION: REASONS

The guiding lead of the proposal of the platform Faster! came from the opportunity to develop a joint proposal based on the different backgrounds of the team members, which were

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DOI: 10.1201/9781003253730-39

tangential on some aspects. Faster! stands for “Fast Assessment and Survey of the Territory for Evaluation and Restoration”, which is exactly what it proposes: to act quickly with grounded knowledge collected in time and made easily accessible.

The results of this interdisciplinary experience were elaborated and presented during the After the Damages Summer School, and are now the main object of this article. The Faster! project also echoed the spirit of the course, which had an international approach and sought to bring up for discussion the best and most recent risk management and prevention practices related to the effects of environmental and man-made disasters on territories. Thus, the motto of the proposal presented hereafter reflects the intense debates, the presentations of case studies and the reflections provided by several specialists and researchers in the area. The group of participants of the Summer School “After the Damages” that formulated the proposal presented is composed of Renata Campiotto, Giorgio Matis, Cilisia Ornelas, Nicolò Pini and Flavio Ridolfi.

Understanding the limitations of the time available for effective action to take place in the event of a disaster, especially when it involves assets with cultural value, including buildings, cities and landscapes, the group focused on pre-disaster preparation that could stipulate guidelines for quick and efficient responses. The definition of a strategy applicable to the most diverse cases started from a concept of holistic approach, as reinforced by several authors - one of the main references on this subject today is the “The Seventh Edition Conservation Plan”, a method developed by architectural historian James Semple Kerr (2013). Furthermore, this guideline that in-depth knowledge must guide all decisions to be taken, especially when it comes to cultural heritage, is present in several heritage charters, endorsed by governmental bodies and international councils (ICOMOS, 1964; KÜHL, 2010).

In this way, the Faster! platform aims to be a tool that does not necessarily offer immediate responses, but provides paths to be followed in the most diverse situations - including cultural heritage. It could also work as an extension or addition of a Conservation or Management Plan, for example, but aimed at risk situations that could result in a substantial loss and endanger territories and places - by the rupture or loss of its materiality.

2 METHODOLOGY AND TOOLS

The beginning of the discussions towards the conception of a platform that could manage specific information about a given asset involved what would be the data to be collected. Even though each building or place has its own peculiar characteristics and values, with different forms of approach and apprehension, the team started to list some of the main means of survey that could assist in this stage of data collection to be carried out. The understanding of survey procedures as fundamental not only to intervene, but essentially to know and guide decisions, was indispensable to justify the proposal. It must be stressed also that the data collected, intended to be continuously updated, constitutes a memory of that site - in this sense, the Faster! platform could also be seen as a time machine, where data on different moments and situations can be accessed for any usage. Taking into account the theme of post-disaster solutions in cultural heritage, the proposal is structured in the following context: before, during and after an adverse event, as illustrated below (Figures 1–2). However, it is worth noting that this methodology would be applied in the most diverse cases, both in vulnerable places and where there is no foreseen disaster.

The main categories of data to structure a database on the Faster! platform are: Archival and Cadastral data; Surveys data; Common people’s data.

For this, the methodology proposed by the MARBH program (Methodology for the Assessment of the Residential Built Heritage - created at FEUP/ Portugal in a Ph.D research and continues to be developed as a user-friendly digital app) was used as a reference (Ornelas et al., 2020 and 2016). The MARBH methodology offers quantitative assessment of items and/ or indicators on the following dimensions: Heritage, Technical and Social (Table 1), providing innovative, systematic and updated information that contributes to a cohesive assessment and monitoring of the built heritage at different scales and dimensions. In particular, if integrated or combined with ICT tools, MARBH can become a user-friendly assessment tool

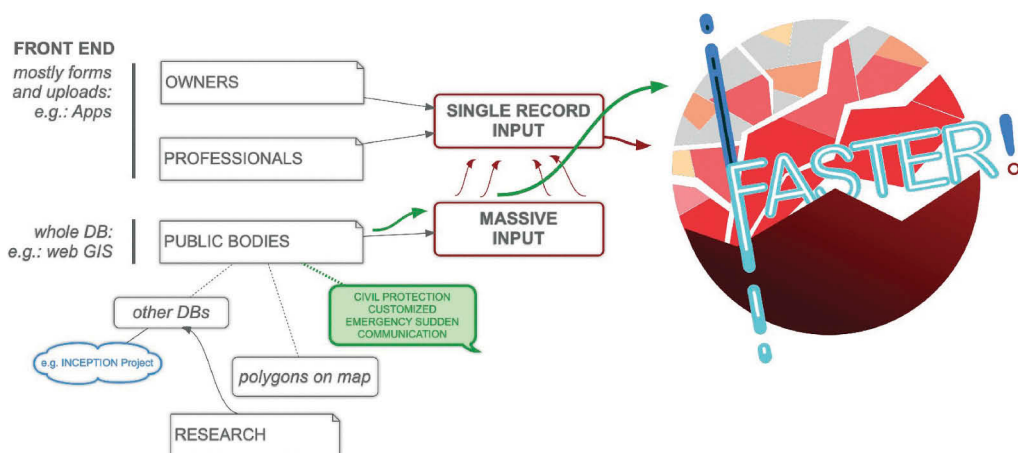


Figure 1. Scheme showing ways to feed the platform with inputs: contributions from owners, professionals and public bodies, in addition to other pre-existing databases. These data are continually added to the Faster! platform, which becomes more complete over time - pre-disaster situation. Elaboration: Flavio Ridolfi, 2020.

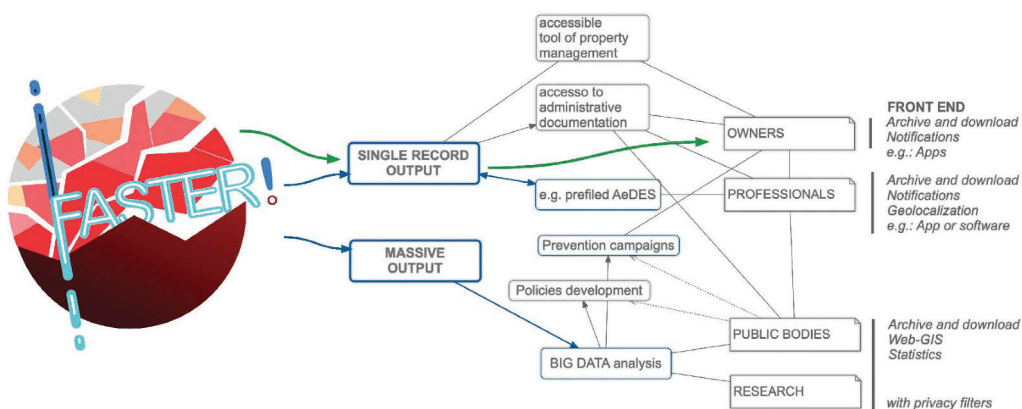


Figure 2. Scheme showing the outputs of the platform: in this case, both for a quick response in a disaster situation, as well as for eventual maintenance, intervention and research needs. Elaboration: Flavio Ridolfi, 2020.

for technicians and experts in the field of the rehabilitation and intervention on urban and built heritage, able to support digital databases. Finally, MARBH's characteristics make it also an interesting methodology to be included in a future HIA procedure, in a knowledge step, helping monitor the effect of the rising urban threats in World Heritage sites – and can also be embedded in the Faster! platform.

From the continuous updating and evaluation of these data, a synchronous monitoring of different buildings, places or landscapes could be carried out, providing clues for possible and eventual disasters (when comparing different results arising from structural analyses, for example), and even devaluation due to lack of maintenance.

Another aspect taken into consideration during the development of the platform concerns the different levels of access, whether to feed data or to disseminate it. At first, four main levels of access were defined depending on the user category, corresponding to four different modalities of viewing and exporting data, depending on the scopes:

Table 1. Adaptation of the MARBH tool (Methodology for the Assessment of the Residential Built Heritage – FEUP/Portugal, Cilisia Ornelas). The multiplicity of different types of surveys, such as the ones adopted by MARBH program was used as a reference to create the database to feed the Faster! platform system.

Part 1 – Heritage Dimension	Part 2 – Technical Dimension	Part 3 – Social Dimension
Particular Characteristics of Buildings	Safety and Housing Conditions	Residential Satisfaction
• Morphology/ Typology	• Structural Safety	
• External Elements	• Fire Safety	• Residents’ Profile
• Interior Elements	• Safety to Normal Use	• Residents’ Perception of Buildings and Dwellings
• Materials Techniques	• Housing Conditions and Comfort	• Residents’ Perception of Residential Area

Source

Adapted from Ornelas, Cilisia & Guedes, João & Sousa, Fernanda & Breda-Vázquez, Isabel. 2020. “Supporting Residential Built Heritage Rehabilitation through an Integrated Assessment”. *International Journal of Architectural Heritage*. 1-14.

Another aspect taken into consideration during the development of the platform concerns the different levels of access, whether to feed data or to disseminate it. At first, four main levels of access were defined depending on the user category, corresponding to four different modalities of viewing and exporting data, depending on the scopes:

- Level 1: Owners (common user) → access to web pages, apps, forms, questionnaires;
- Level 2: Professionals → access to web pages, apps, dedicated softwares;
- Level 3: Public administration → access to dedicated softwares, massive database statistics;
- Level 4: Research → access to all of the above (with privacy/disclosure filters).

The approach of the “Italian Protezione Civile” towards urgent data management was also taken into consideration and is somehow intended to be integrated in the larger database of Faster!. The AeDES (“Agibilità E Danno nell’Emergenza Sismica”) method allows to standardize the collection of post-earthquake damage surveys, as well as to make results unified. “Erikus” software allows to prepare the ground for such surveys and to put the data on a GIS database making them easily accessible from different locations. In this manner, Faster! database accommodates and unifies data and keeps a modular approach towards other systems in order to fit into existing methodologies and to be customized for different usages (Figure 3).

When thinking about a post-disaster situation, fast solutions for the recovery of a place or an entire territory are needed and respective information about the affected area must be immediately available, in order to support the actions with a technical basis. This is also why it is essential that this system be allocated in a digital repository.

3 OUTCOMES

From the implementation of the Faster! platform, people request in the emergency is simpler, possibly without a paper form, and it’s not needed to collect them by employees or volunteers. Since it is programmed as a reliable system based on different types of integrated surveys, investigation and analytical techniques (avoiding the problem of discordant Cartography tables), its front ends are customized depending on the public - such as different kinds of institutions, professionals and private subjects.

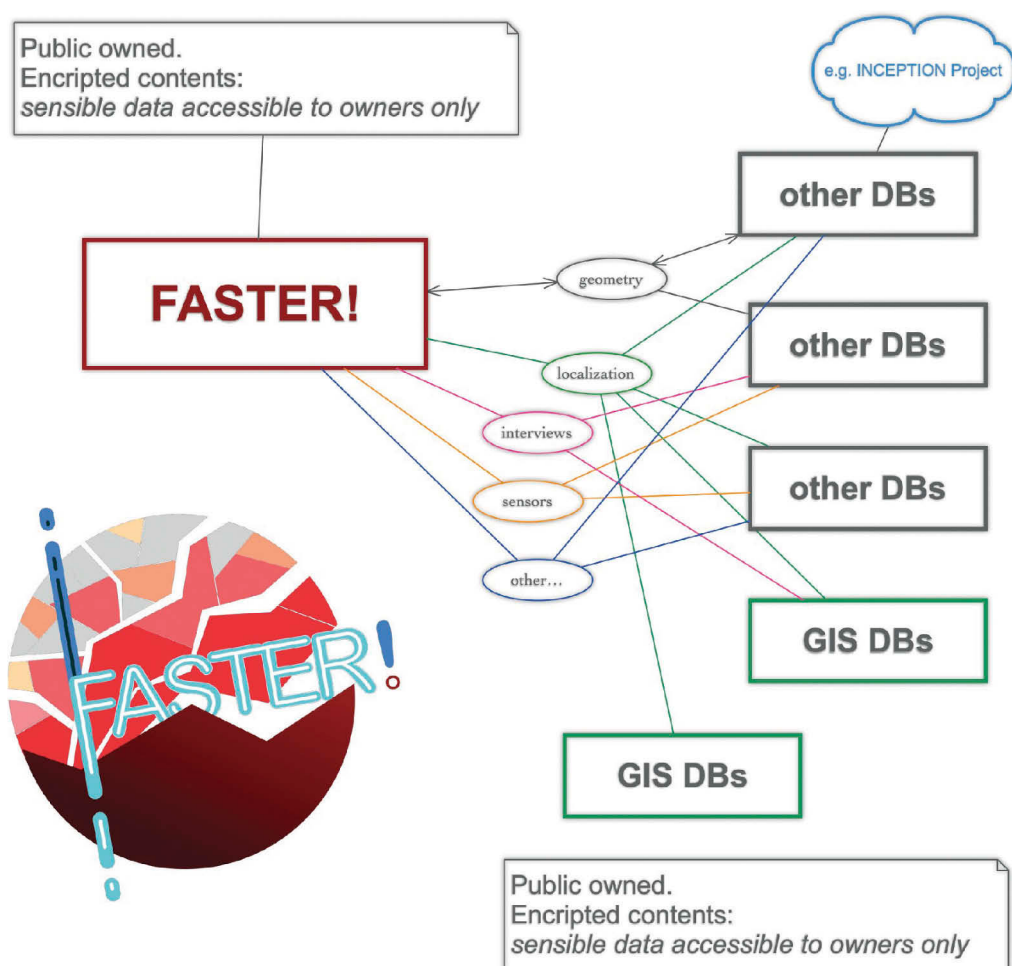


Figure 3. Scheme of the modular integration of Faster! with pre-existing databases. Elaboration: Flavio Ridolfi, 2020.

It allows a multi-scale analysis with different and complex graphic and thematic charts being generated as outcomes. At the same time, it is a shared storage of detailed and precise information and data for better knowledge, functioning as a time machine - always updated. In the case of damage survey, Faster! data management provides an improved DPC system (Figure 4).

4 DISCUSSION

The Faster! platform represents an attempt to develop a methodological and practical tool to manage already existing knowledge and increase data available on different levels within a single system, embracing both landscape and built environment.

Its possible applicability to different scopes - from prevention to research - is certainly a major pro, opening for its adoption but a wide plethora of professionals and unspecialized-users. The automatization of process as well as the modularity of the information help the platform to be a user-friendly tool, in accordance of course with the different goals for which it is employed and to the expertise and experience of the user. Faster! ultimately represents the

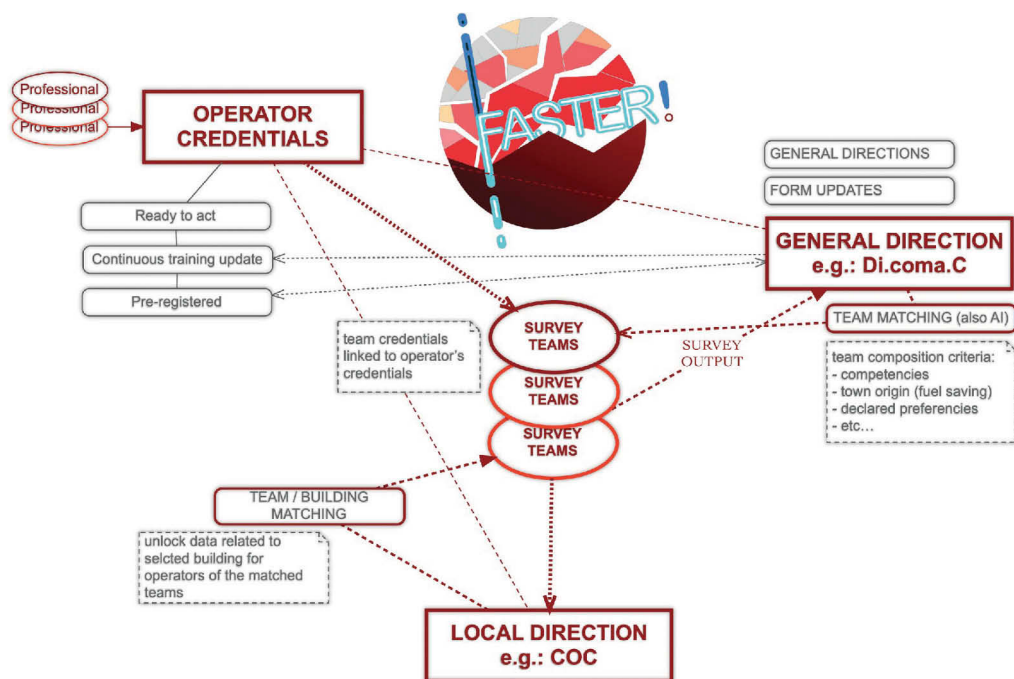


Figure 4. Scheme showing a model of Faster! emergency management for what concerns large scale damage survey. Elaboration: Flavio Ridolfi, 2020.

opportunity of unifying the documentation process, also integrating statistics and big data within a single platform. At the same time, being accessible to different profiles of users, it is potentially an important asset to implement policies and campaigns and enhance participatory processes.

Clearly, a similar platform presents different potential weaknesses which require careful analyses. A first, more technical aspect is the application of universal standards codes: this is an element which potentially would limit the loss of information, making data more accessible. The following issues are more related to the proper implementation of the platform and the engagement of different “actors”.

In fact, the data collection process is highly dependent on users: gathering and maintaining the database up-to-date requires a constant and organized effort, and should not be left as an individual initiative. Parallely, data collection might also generate privacy issues, if owners of lands or buildings are not directly involved in the processes. To this concern, the definition of a precise legal framework, and eventually its adaptation to specific contexts, is of primary importance.

It is evident that the involvement of public bodies is vital, either in terms of interest in the adoption of new tools and in the formation of specialists. As mentioned, the implementation and adoption of the platform cannot rely entirely on individual initiatives, and consequently the role of public administrations is crucial to its success. If the platform is not systematically adopted and is not regularly updated, the risk is to have a frozen picture, preventing us from effectively monitoring natural and human processes taking place. Similarly, if its use is limited to extremely specific purposes or tied to a flattened approach, it might cause an irregular application of the methodology and of the tool, resulting in a lower amount of data collected and once more, importantly affecting the effectiveness of the platform. In any case, Faster! adaptability and holistic approach make it an extremely valuable tool to pursue different goals. In a shorter term, its “preventive” nature is most evident, contributing to limit the loss of information in case of destruction following natural or human hazards, as well as to

mitigate damages. In the medium- term, it would help develop proper prevention plans, not only to mitigate eventual damages, but to potentially avoid certain types of emergencies.

Furthermore, it could represent an important tool to increment “historical” knowledge in local building techniques and landscape exploitation strategies. This latter aspect appears to be particularly interesting for its long-term potential: in fact, it might well contribute to trigger local community activities through the implementation of more sustainable socio-economic development plans.

To this concern, the contextual promotion of the platform by International Organizations (e.g., UNESCO or ICOMOS) could be taken into consideration. *Faster!* would represent a useful instrument to evaluate potential new World Heritage cultural landscapes or identify potential dangers to already enlisted sites. Indeed, as a consequence of climatic change and unsustainable exploitation practices, more and more geographical regions are exposed to increasingly frequent natural hazards which could lead to the complete loss or widespread destruction of important landscapes and settlements, either ancient or modern. As mentioned, *Faster!* is though primarily as a preventive tool, aiming to prevent or limit damages and information loss, but is an important support to develop - and or in certain cases integrated/update - valorization and conservation plans. Moreover, it would represent an important tool for International Organizations and States to better manage and coordinate the candidature process to WH Tentative List and WH List, prioritizing those properties more exposed to human and natural hazards.

To conclude, *Faster!* represents an important asset for different users and different purposes. It could surely find an important application in the immediate aftermath of natural and human hazardous events, but it would be an even more precious resource as a preventive tool, to limit damages and develop a more sustainable future.

AUTHORS CONTRIBUTION

Given the multidisciplinary nature of the Summer School “After the Damages”, the different backgrounds of the authors contributed so that the proposal presented addressed different perspectives. In this way, after several meetings and brainstorming sessions, the group jointly decided to deal with a theme that was the common point among their academic and professional experiences, which is the need for accurate documentation of cultural heritage and sites. The personal experience of each of the authors was fundamental for the theoretical approach, methodology and applicability of the proposed platform.

In this paper, the vector illustrations of the methodology were made by Flavio Ridolfi; the writing-original draft preparation was done by Renata Campiotto and Nicolò Pini; and the writing-review and editing by Flavio Ridolfi and Cilisia Ornelas. All authors have read and agreed to the published version of the manuscript.

ACKNOWLEDGMENTS

The participation of all authors in the Summer School “After the Damages” 2020 Edition would not be possible without the support of all partner institutions: the Department of Architecture of the University of Ferrara, the DIAPReM Centre, the Labora.R.A., LEM and TekneHub research laboratories, the Department of Engineering and Architecture of the University of Parma, the “Enzo Ferrari” Engineering Department of the University of Modena and Reggio Emilia, the Regional Agency for Reconstruction Sisma 2012, the Authority for Archaeology, Fine Arts and Landscape MiBACT and the Institute for Artistic, Cultural and Natural Heritage of the Emilia- Romagna Region.. This paper was carried out with the support of the São Paulo Research Foundation, FAPESP (Direct Doctorate Scholarship - Process no. 2019/10406-0 of Ph.D Candidate Renata Cima Campiotto).

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