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RESCCUE RAF app –an IT solution for digital interactive urban resilience assessment

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Climate change (CC) adaptation plays an important role in city and services management and resilience building, targeting the mitigation and adaptation to potential hazards in urban areas. Information technologies can play a leading role to promote fast adoption of the most relevant measures towards CC preparedness. In this paper, a web application is presented with the objective of empowering city and services managers with an accessible and reliable tool. The RESCCUE RAF App materializes a detailed CC resilience evaluation methodology with a user-friendly Web interface. It provides an evaluation of city resilience to CC impacts and urban systems vulnerabilities allowing to assess multi-sector dependencies under multiple CC scenarios. This app is integrated as a service of the Portuguese Infrastructures Roadmap, under the Infraestrutura Nacional de Computação Distribuída (INCD) infrastructure initiative that provides to the app the resources for data computation and storage, and assures its scalability to handle multiple user requests as well as database storage growth. The information provided by this app empowers city and urban services managers with an assessment allowing to know where they stand and to identify the resilience gaps, thus supporting decision on the most advantageous investments on the city and services and planning to cope with future challenges. Three case studies are being carried out in different cities (Barcelona, Lisbon and Bristol). The access to the application is made using credentials given upon request, to ensure data confidentiality. Inside the user's area, the user can fill, in an interactive way, detailed information about the selected city, regarding multiple aspects such as financial plan per service, date of last review of the City Master Plan, history of climate hazards in the city or level of dependency between services. This information is then processed and several indicators are calculated on-the-fly. The assessment allows to identify development levels, ranging from the whole city to a more detailed assessment regarding a specific service. Data is stored at INCD's in RESCCUE RAF app database and can be easily analyzed and extracted by the user. These results support the city and services managers in making effective decisions to plan city resilience enhancement. In this paper, a detailed presentation of the architecture and computational choices behind the RESCCUE RAF App and its Web interface and their integration in the INCD infrastructure will be presented. Given its importance, generic nature and flexible structure, the RESCCUE RAF App can be extended to other cities and, in the future, to other urban services or hazards, taking advantage of the INCD e-infrastructure. This complete and in-depth assessment of city resilience to CC challenges at Portuguese, Iberian and European scale is fundamental to plan CC adaptation and strategies implementation, preventing both human and material losses as well as environmental damages.

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