Conclusions

The book introduces a small part of the vast and constantly growing horizon of ICT and IT pervasiveness in architecture and urban planning. However, it proposes an interpretative key which focuses on three areas (eras) that, though interconnected and generally interrelated in reality, can define three keys of innovation that can be connected to many new macro-knowledge and digerate professional figures. On the one hand, the relationship with advanced modelling, virtualization and real-time rendering horizons is analysed while, on the other hand, the relationship with mass-customized materialization, 3-D printing, and contour manufacturing that leads to Industry 4.0 is analysed. Finally, the field of data analysis, data production and IoT (Internet of Things), which links all areas, but also opens up new and unexpected horizons and professional fields in building design and operation is introduced. The boundaries between ICT and architecture are narrowed. Several of my ICT students have, in fact, demonstrated an incredible ability to solve design problems thus paving the way for an entry into the world of architecture, while some of my architecture students have dealt with ICT problems in their dissertations thus working in a totally hybridised reality. As has been stated by several authors this is the time to surf the ICT innovation wave in order to avoid the risk of the extinction of architects. New tools are opening up incredible new horizons, but have to be used in a conscious way. The design culture has in fact to open out to ICT culture and knowledge because methodologies are not always the same as in the paper-based or traditional CAD worlds. Never before has it been more vital to understand and manage technical potentialities in both the architectural and the ICT fields. ITs allow us to improve the architectural world, but like any technology they can become a nightmare or lead to wrong or inaccurate results if not used well. As scientists, designers and technicians, we are part of this innovation and we are linked together through joint responsibility.

As can been envisaged by the proposed samples, the real limit to the integration of IT and ICT within the architectural sector is mainly function of our imagination, vision, and ability to manage interdisciplinary knowledge. This innovation is showing a very large potential for increasing the efficiency in the entire building

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process, from early-design stages, to maintenance and building operational phases, including construction processes, and end of life. All of these aspects can be coupled with specific digital implications. Connected network of sensors may feed neural networks to predict and operated in advanced building systems e.g. for comfort purposes; computational tools may be used to optimise design choices, produce mass customized building forms and components using materials in a totally innovative way. Nevertheless, it is essential to also consider the social implications of ICT pervasiveness in our society and in living spaces, suggesting conscious visions and having the ability in being designers, architects, engineers in the digital eras by also considering our responsibilities.