

Sustainable Development in Architecture: Rediscovering Its Relevance

by Dr Marco Macagnano

In today's business environment we have come to hear the words 'sustainable development' at almost every turn. The term is loosely used when attempting to communicate some form of commitment to environmental values. But have we lost sight of the original intentions of this term, and is it truly relevant anymore?

I have been fortunate to have spent the past number of years deeply involved in Doctoral research into the future of the architectural profession. In my research I primarily considered the implications of the 4th Industrial Revolution on process and product, delving into what will give our buildings continual relevance and resilience in the context of Smart Cities, the internet of things, even virtual cyberspace. In a world where the future's solutions are presented through technological intervention, one has to ask: will architecture continue to play a role of importance in the future? The answer to this question requires investigation into a term that defines 'future importance' at its core.

Sustainable Development, as a concept, has been with us for many years. We would need to look all the way back to 1987, where the term was established by the

UN and given a very broad, yet important definition in the Brundtland Report. In this report, Sustainable Development was defined as development that meets the needs of present and future generations. Simple, yet poignant.

In 1994 the 'triple bottom line' was coined by businessman and author John Elkington, giving rise to the widely-known and accepted criteria: Social, Economic and Environmental. It was proposed that the consideration of these three criteria would create conditions for sustainable development. What was revolutionary about this approach was that it finally gave the masses a basis to quantify success. Each of these criteria could be subdivided, split into targets, and theoretically measured. It removed some of the vagueness and gave an abstract concept such as sustainability a 'face'. These criteria were well-considered and broad enough to warrant application in virtually every industry. However, in the decades that followed, sustainable development has been watered-down as a concept, often limited by association to green building and resource-efficient technologies. As it turns out, the triple bottom line criteria were still too vague to implement. It is difficult to measure or simulate social

impact, but it is easier to simulate energy savings and CO2 levels. This creates the natural conditions for reliance on rating tools with a green building focus. These are extremely important and valuable, but must be considered as an important piece of a much larger puzzle.

As an architect, I can sympathise with this difficulty in implementation. Embarking upon a design process that emphasises fast and effective results within short time periods, it is difficult to consider what the true long-term social implications a development might have on its immediate context, let alone how this will shape the design of a façade. The truth is that the generic architectural process is not geared to incorporate this data at the onset, often requiring post-design intervention and development with a 'hit-and-hope' approach that the building will continue to do the job in the long-term. What I have come to realise is that architecture is limited by its approach to buildings as products designed for a fixed moment in time – in other words, temporal and spatial scale.

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A building is an asset into which tremendous time and money is allocated in order that it fulfil an operational mandate that is enriching to the quality of life of its occupants and users, symbiotic with its environment (urban and natural), and financially viable to its owner.

The question is: how do we do this? This requires a re-think of the goal, and of the process. Firstly, the goal of sustainable development is still a relevant one. It forces us to consider the long term implications of what we do on a multi-criteria basis. However, the triple bottom line is incomplete. Not only are the criteria too broad for adequate implementation and measurement, these were considered in an era pre-dating the Information Age. The most notable revolution of our generation that has shaped entire knowledge-based economies and societies is, as yet, under-represented in architectural and sustainable design. For this reason, the Smart City conversation has drifted away from urban planning and architecture towards the Internet of Things (IoT) retrofit to augment and enhance the redundant physical city. Architecture needs to embrace the needs of knowledge-based development as a critical criterion if our buildings are to last for generations that follow. Are our urban environments enabling knowledge-sharing (between users, between buildings, and between users and buildings) to create responsive and adaptable environments? If we begin to ask this question we find ourselves

transitioning from think about buildings as products, to buildings as systems. We no longer ask ourselves if buildings are functional, but if buildings are usable. And by recognising that architecture is human-centric we begin to query the significance of an intervention on later generations. We are therefore also primed to provide our clients not only with physical assets, but information assets that are participant to the future's Smart Cities.

Secondly, an evolution of architectural process is required. As an industry that is notoriously slow to adapt (after all, BIM is already a decades-old technology) this is truly the greatest challenge. Within this evolution of process it becomes clear that an integrated approach towards systems-design is required. This achieves a number of things: a framework for rigorous testing and simulation (enabled through computational design and Artificial Intelligence), knowledge feedback loops and, importantly, the integration of various tools and ratings systems to interrogate the architectural solution according to multiple criteria.

Is sustainable development still relevant? I think it is. However it could be that our predisposition to simplify it or even venture into the discovery of alternatives resulted from the fact that we haven't taken the time to recognise it as a concept that requires industry focus and customisation. Ultimately, this remains in the aim of realising architectural solutions that meet the needs of future generations within ecological constraints.