On 'Normative' Architecture. Notes on the Domination of the Technical-rational Mode of Thinking on Mainstream Architectural Production: A Historical Highlight

Yasser Megahed
De Montfort University
Leicester School of Architecture
Leicester, England
yasser.megahed@dmu.ac.uk

Keywords: *Normative Architecture, Mainstream Architecture, Technical-rationality, Durand, Leslie Martin*

ABSTRACT

The term 'mainstream' or 'normative' practice is often used to describe the model of architectural practice that is often generic in its architectural ambition and tends to appeal to the economic rules of the market. This model of practice follows what can be called a 'technical-rational ideology' that prioritizes discourses of efficiency, audit, and profitable and timely delivery. This paper will highlight some moments in the history of architectural production that paved the way for the domination of the technical-rational ideology on contemporary architectural production, coming across ideas from Jean-Nicolas-Louis Durand and Leslie Martin, and Design Methods that were influential in shaping mainstream architectural practice. The paper concludes with speculations on the future trajectory of the architectural profession in the light of the current prevalence of this ideology.

1. INTRODUCTION

Architecture is a multiple, rich, and varied profession. There are many approaches for practicing architecture that differ in their understanding of the field, their architectural emphasis, intellectual positions, visual and spatial outcomes, in addition to their commercial business models. Within these approaches, what is commonly described as 'mainstream', 'normative' or 'commercial' practice is the model of architectural practice that tends to be generic in its architectural ambition, lacking strong social and civic qualities while often appealing to the economic rules of the market. This model of practice tends to follow an ideology that prioritizes technical and rational discourses of efficiency, audit, and profitable and timely delivery over any other architectural value. This 'technical-rational' ideology has growingly become a significant player in the architectural profession since the last quarter of the 20th Century where a great share of architectural production has become centrally sited within the corporate market. The domination of this ideology has been inflated by the prevailing paradigm of neoliberal global capitalist economy that pushes for a competitive atmosphere of increased production and profit (Murphy, 2016). This ideology has implicitly become the accredited mode of thinking in mainstream professional practice and to different architectural institutions and building regulatory bodies. This is the condition that the architect and theorist Rem Koolhaas described as the era of architectural 'bigness'; the bystander to the explosion of the market economy and globalization that produces generic cities and 'junkspace' (Koolhaas & Foster, 2013).

Donald Schön describes technical-rationality as the mode of practice that involves selecting technical means best suited to solve well-formed instrumental problems by applying theory and technique derived from rational systematic scientific methods (Schön, 1987). In the building construction process, technical-rationality can be described as the peak of applying systems thinking and management theory in construction that understands the construction process through notions of practicality and productivity, represented often by tangible quantitative criteria of quality control (Megahed & Sharr, 2018). This involves following strict codes, regulations, and coordination protocols as well as satisfying the pressing economic requirements of the complex conditions of the globalized world. In this view, buildings have become economic assets whose success is measured by their deliverability and profitability (Cuff, 1992; Gutman, 1988; OMA, Koolhaas, & Mau, 2003).

In addition, another reason for the domination of this mode of thinking is attributed to the growing technical and

technological complexity involved in the contemporary construction process. The process of building production has become – for many in the industry – a scientific and technical process that should be quantitatively controlled and must be translated into risk reduction and profit, and hence cannot be led by the limited knowledge of architects (Hill, Brinkley, Johar, & Foxell, 2010). This is the condition of 'bigness' that Koolhaas describes as the fait accompli *of contemporary architectural production which necessitates surrendering to technologies, to engineers, contractors, and manufacturers (McVicar, 2012). This position has been inflated more by the prevailing paradigm of global capitalist economy that pushes for a competitive atmosphere of increased production and profit (Koolhaas & Foster, 2013).*

For that, the technical-rational mode of thinking has implicitly become the accredited mode of thinking in the mainstream architectural practice and to many building regulatory bodies. The prevalence of this mode of thinking brought about strategies that celebrate generic models of practice and have influenced the construction process to follow a logic of the perfected prototype: 'the default', becoming more client-led and promoting the technical-rational model of the automobile industry as the role model (Cole-Colander, 2003; Kieran & Timberlake, 2003; Woudhuysen & Abley, 2004). Setting this out, this paper will highlight some moments in the history of architectural production that paved the way for the domination of the technical-rational mode of thinking on contemporary architectural production. It will come across attempts to found architectural knowledge in science and mathematical reason by the influential architect and theorist Jean-Nicolas-Louis Durand. The paper will also touch upon the 20th century's different attempts for controlling architectural knowledge including Leslie Martin's typologies and the sixties Design Methods approach that culminated later in many quality and sustainability measures available in the contemporary building industry. The paper will conclude with speculations on the future trajectory of the architectural profession in the light of the current prevalence of the technical-rational ideology across the contemporary architectural production.

2. THE TECHNICAL-RATIONAL MODE OF THINKING, A HISTORICAL VIEW

The historic origin of the technical-rational mode of thinking can be traced back to the divorce between faith and reason in the Enlightenment Age that culminated in the philosophy of Positivism, the technical-rational epistemology, and the idea of progress (Schön, 2017). In architecture, these intellectual changes in human thoughts were reflected through attempts to found architectural knowledge in science and mathematical reason. This was developed by architects and theorists who researched optimum rules for proportions of classic orders using scientific and experimental methods to achieve what they consider 'natural beauty' (Pérez Gómez, 1983).

2.1 DURAND, THE GODFATHER OF TECHNICAL-RATIONAL ARCHITECTURE

The algebraization of architectural theory and the tireless effort to produce a rational theory in the 17th century and early 18th century had culminated in the theories of the French architect, professor, and theorist of architecture Jean-Nicolas-Louis Durand. His writings best exemplified the transformation of theory into a self-referential instrument for the control of architectural practice in the 19th century (Pérez Gómez, 1983). Durand was concerned with the efficiency and economics of construction and believed that architecture should not be guided by taste and prejudice. As an expensive type of art, architectural design should avoid wasteful expenses, and therefore had to follow a clear and strict rational system that relies on the most convenient and economical disposition.

Durand's system was materialistic in essence, guided by two principles: love of well-being and aversion to pain. He saw these principles, as Dalibor Vesely (2004) puts it, as the natural means of architecture that have guided the process of construction in all architectural history. Durand's value system was radically different from his predecessors. In this system, architecture became self-contained and ruled by categories, which were totally autonomous, and their structure was logical rather than symbolic. They depended on the Vitruvian categories: durability, beauty, and convenience. However, they were conceived as separate independent entities. In his theories, the Vitruvian triangle was understood as a mathematical equation that aims to achieve his principles of love of well-being and aversion to pain. His rational system for architectural design involved symmetrical geometrical forms and simple compositions in which the disposition of the building plan became the main problem that architects should be concerned with, achieving its most appropriate, efficient, and economic combination (Pérez Gómez, 1983).

Another consequence of Durand's influential view was that architecture became almost a sub-professional discipline. With Durand, architecture

became fully understood as formal language or a style where little time was devoted to courses on design and architectural theory. In his writings, a revised curriculum was proposed in which architecture was not even an independent subject, but a part of the course on civil works. The obvious reason was revealed by Durand in his Nouveau précis des leçons d'architecture *(1813), where he pointed out that all types of engineers were not only capable of doing architecture; but also, they have more opportunities to undertake larger commissions (Figures 1 and 2). Accordingly, the specific value of architecture was reduced to decoration, and decoration in the new epistemological context was bound to be considered a trivial, expensive, and relatively useless occupation (Pérez Gómez, 1983).*

Durand's ideas involved emptying architectural knowledge from anything lacking a clear scientific value. The only way out for architecture's knowledge evolution became in efficiency and economy of operations. Accordingly, in his theory, geometrical forms applied to design act merely as a vehicle for ensuring functionality and efficiency (Vesely, 2004). Durand's theory reduced architectural design into formal syntax, based on reason and devoid of any metaphorical intention. Architectural character should be the result of a direct mathematical and rational relation between the final form of a building and the organization of its plan. What Durand brought to architecture was the exclusion of its knowledge to the purely rational reason, following strictly the values of Positivist philosophy. The sole acceptable theories should be about how the objective of architecture, being an art of imitation, brings aesthetics through efficiency (Pérez Gómez, 1983; Villari, 1990). His materialistic premise became basis of the ethics and aesthetics of architecture of the 19th century, and it still underlies many ideological conceptions from the 20th century till now, mainly those of the contemporary technical-rational and mainstream architectural practice.

2.2 MODERN FORMS OF TECHNICAL-RATIONAL THINKING IN ARCHITECTURE

Durand's theories are already a theory of architecture in the contemporary sense. It is filled with the modern obsession with efficiency, control, and quantifiable categories, thoroughly specialized and composed of prescriptive laws that purposely avoid all reference to philosophy or metaphor. His ideas had found similar resonance in the 20th century's approaches towards scientizing architectural knowledge best exemplified in Leslie Martin's typologies and the in the categorical format of architectural data and standard books. This century also witnessed the attempts to control the design process through Design Methods and Maps of Design that culminated later in some of the quality and sustainability measures commonly used in the contemporary building industry. This idea of audit and control also found a fertile soil in the deployment of management theory and systems thinking in building production as well as with the introduction of Computer Aided Drawing/Design (CAD) and later through Building Information Modelling (BIM) methodologies. In a way, as the science philosopher Ian Hacking (1983) points out, the 20th century has witnessed the emergence of the exact sciences that marked the transition from the experiments of the natural sciences to the mass application of the modern age. Therefore, this period is considered the official showcase for the different attempts to quantify and control architectural knowledge mainly from a managerial and quality control point of view (Hughes, 2014).

2.2.1 LESLIE MARTIN'S SCIENTIFIC MODEL OF ARCHITECTURE

The post-War era is the millstone for the clear move towards technical-rational thinking in architecture. This was an era of seemingly unstoppable technological progress and optimism. This optimism bore witness to the flourishing of Modernist architecture after WWII, accompanied by various attempts in the building industry to seek greater levels of productivity and precision in construction (Frampton, 2007). The foundational values of this period were centered upon ideas of rational, functional, and practical approaches to constructing space. This period offered a new level of material efficiency, at low-cost, with simple construction and easy maintenance (Hughes, 2014). These values were manifest in rationally planned buildings, decoratively mute and in line with Modernist design principles (Jencks, 1987). In the UK, this atmosphere was reflected in the RIBA influential 1958 Oxford Conference on architectural education. At this time, architectural education was accused of being not properly scientific. Design was seen as a defective science that can be fixed only by the proper application of rational and scientific methods. The recommendation of this conference was that architecture should become objective and scientific (Crinson & Lubbock, 1994). Sir John Leslie Martin masterminded and chaired the Oxford Conference and was able to record great support of his suggestion that architecture should become a graduate profession (Sharr, 2010). Consequently, the architectural curriculum was changed and design science became a major part of architectural studies.

Martin promoted a scientific model of architecture that was particularly influential in Britain in the late sixties and early seventies. He advocated a theory that connects form, typology, and reason. His classification of form was in relation to the building type: housing, libraries, or auditoria. To him, ideal type forms transcend styles and architectural history. They have their own logics that integrate constructional, sociological, and environmental factors (Sharr, 2010). In his 1983 monograph Buildings and Ideas: 1933–1983, *Martin researched how buildings contribute to the development of the relevant type towards perfection. The knowledge of the architectural profession was thus constituted by best practice in each type, in relation to idealized land use, optimized functions, appropriate construction systems, and balanced environmental performance. Martin suggested a diagrammatic approach to the functional appropriateness of form where he measured the success of formal typologies based on functional efficiency, compact planning, and economic construction (Figure 3). For Martin, such design solutions were distinguished by their mathematical rigor. The terms order, coherence, reason, and appropriateness were symbols of highest praise in his vocabulary. A good design proposition was attributed to the intellectual coherence of an impermeably formulated equation. Martin founded an orthogonally planned logical world that is derived from formal geometrical analysis (Sharr, 2010). Interestingly, in this book Martin attributed his conception of type to 19th century studies by Durand (1983).*

Although the influence that Martin exerted over the profession in the UK lost its bright by the mid-seventies, the immense influence that he held for a time in professional, governmental, and academic circles, and the legacies of his science of architectural form remain pervasive. Contemporary building industry – in the UK and beyond – still advocates the same positivist agenda of economic rationality, optimum functional performance, and quantifiable decision-making in which Martin played his part in institutionalizing. Architects still resort to building type precedent to the abstract analysis of form and associated environmental studies. Another manifestation of Martin's influence can be seen in many architectural data books commonly used by architects as essential references in building design such as: Time Saver, Metric Handbook, Architect's Pocket Book, Neufert's Architects' Data, *etc. These books are organized according to different building typologies using a blend of drawings of buildings prototypes around spatial requirements, ergonomics, and functional building layouts similar to those of Martin (Sharr, 2010).*

2.2.2 DESIGN METHODS AND MAPS

Another approach for scientizing architecture is the sixties Design Methods. They were attempts to apply methods from Operational Research on the field of design. They were advocated by Geoffrey Broadbent, John Christopher Jones, and Christopher Alexander under the notion of 'design as science', which was often termed 'design methods', or 'design maps' (Broadbent & Ward, 1969). In these methods, different maps were created to describe and control the activity of design. These maps shared an idea of externalizing the design process and making public the private thinking of designers. The contemporary version of these maps can be seen in the RIBA Architectural Practice and Management stages of work (Figure 4) (Lawson, 2014).

While the debate about using Design Methods and maps in architecture is no longer prevailing, the dominating discourse of the contemporary architectural profession is still influenced by it. The current approaches of quality measures, design quality indicators (DQI), and building performance measures can be seen as an outcome of these attempts to control the design process (Cole-Colander, 2003). Another example for this could be found in the widely-used sustainability awarding systems such as LEED or BREEAM, which understand buildings performance through clear quantitative criteria. These tools commonly focus on tangible issues of the building process that can be quantifiable, shared, and objectively comparable to rational standards (Prasad, 2004). For legislators, they offer such simple numerical tests that give clear results about quality and performance (Lawson, 2014). In this view, architecture needs to be bounded a rational process that allows its outcomes to be scrutinized, where quantifiable measurements are the definer of success (Cole-Colander, 2003).

3. THE CURRENT DOMINATION OF THE TECHNICAL-RATIONAL MODE OF THINKING ON ARCHITECTURAL PRODUCTION

Along with the increasing influence of ideas of rationalizing and quantifying architectural thoughts, from the late seventies, a large segment of architectural practice has become involved with the corporate market (Murphy, 2016). The predominant conditions of corporate values have brought construction projects of larger scale and the deployment of more complex means of production that have, to a big extent, changed mainstream architectural practice (McElroy, 1984).

This new condition of architectural production has effectively directed the architectural profession towards its current status quo, dominated by the technical-rational mode of thinking.

An example of this influence can be seen in the current common understanding of the concept of the architectural detail. With the globally-scaled building industry and the prevailing corporate economic values, the architectural detail became a key factor for ensuring quality and controlling risk and efficiency. It became bound to notions of standardization, mass production, and the idea of the perfected prototype. In the contemporary building process, it is not uncommon for architects to select a detail from a stock of standard repetitive items from a manufacturer catalogue or at least to use their configurations as basis for developing one's own detail to a construction problem (McVicar, 2012). Consequently, the role of the architect has gradually become defined in the in the act of assembling pre-existing, pre-tested standardized components, which is seen for many in the construction industry as the natural evolution of the role of the architect in the building process (Cole-Colander, 2003; Kieran & Timberlake, 2003; Woudhuysen & Abley, 2004). This view, however, tends to empty the architects' role from its spatial, cultural, and humanistic narrative, confining it to issues of aesthetics, a vague term that may suggest an unscientific artistic whim, compared to what is considered the 'hard' knowledge of the technical-rational actors of the industry.

4. CONCLUSION

The previous highlights acted as a baseline for formulating some of the principles of contemporary mainstream building production. These principles evolved to form the ethos of the current technical-rational ideology that dominates the contemporary construction industry. The paper highlighted some moments that have influenced this domination and helped translating the values of the technical-rational ideology into the norms, standards, bureaucracy, and traditions of mainstream architectural practice. The values of this ideology have implicitly and sometimes explicitly promoted a unified model of practice that led a large segment of architectural practice to restrict itself to the mandates of an economic model that favors strategies that adopt the form of the generic and normed. This domination in turn has created a supposed authority of the technical-rational worldview, allowing it the lead in deciding strategies about the path of the profession and affecting the intellectual directions of many architectural bodies such as RIBA and AIA, among others (Broshar, Strong, & Friedman, 2010; Robinson, Jamieson, Worthington, & Cole-Colander, 2010). Accordingly, reading the status quo of the contemporary architectural profession, it seems more probable that its future trajectory would be an extension of the current domination of the technical-rational values. This future, whilst carrying some benign benefits, however, would naturalize the 'normative' generic architecture as the expected and accepted mode of practice. It would then lead to marginalizing many of the unique values that architectural knowledge can add to the process of building production. Regardless, this scenario could be changed by acknowledging this technical-rational future, however, resisting it through promoting and marketing the diverse and rich modes of thinking available in the architectural field as indispensable to the improvement of the built environment instead of promoting a singular 'normative' mode of practicing architecture even if dominant and prevailing. m

REFERENCES

BROADBENT, G., & WARD, A. (Eds.). (1969). *Design Methods in Architecture (No. 6)*. Lund Humphries.

BROSHAR, M., STRONG, N., & FRIEDMAN, D. S. (2010). *Report on Integrated Practice* [Report]. American Institute of Architects.

COLE-COLANDER, C. (2003). Designing the Customer Experience. *Building Research & Information*, 31(5), 357–366. https://doi.org/10.1080/0961321032000088025

CRINSON, M., & LUBBOCK, J. (1994). *Architecture: Art or Profession? Three Hundred Years of Architectural Education in Britain*. Manchester University Press.

CUFF, D. (1992). *Architecture: The Story of Practice*. MIT Press.

DURAND, J. N. L. (1813). *Nouveau précis des leçons d'architecture données à l'École imperiale polytechnique*. Retrieved from http://archive.org/details/gri_00013331250122336 78

FRAMPTON, K. (2007). *Modern Architecture: A Critical History*. Thames & Hudson.

GUTMAN, R. (1988). *Architectural Practice: A Critical View*. Princeton Architectural Press.

HILL, S., BRINKLEY, I., JOHAR, I., & FOXELL, S. (2010). *Risk, Entrepreneurialism, Practice and the Professional Institute* [Building Futures Report]. RIBA.

HACKING, I. (1983). *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science*. Cambridge University Press.

HUGHES, F. (2014). *The Architecture of Error: Matter, Measure, and the Misadventures of Precision*. MIT Press.

JENCKS, C. (1987). *Le Corbusier and the Tragic View of Architecture*. Penguin.

KIERAN, S., & TIMBERLAKE, J. (2003). *Refabricating Architecture: How Manufacturing Methodologies are Poised to Transform Building Construction*. McGraw-Hill Education.

KOOLHAAS, R., & FOSTER, H. (2013). *Junkspace with Running Room*. Notting Hill.

LAWSON, B. (2014). *How Designers Think: The Design Process Demystified*. Routledge.

MARTIN, J. L. (1983). *Buildings and Ideas: 1933–1983*. Cambridge University Press.

MCELROY, M. (1984). Marketing: How Big Corporations Choose Design Firms. *Architectural Record, 172*(7), 45 -47.

MCVICAR, M. (2012). God is in the Details' / 'The Detail is Moot': A Meeting Between Mies and Koolhaas. In A. Sharr (Ed.), *Reading Architecture and Culture: Researching Buildings, Spaces and Documents* (pp. 165-178). Routledge.

MEGAHED, Y., & SHARR, A. (2018). Practiceopolis: From an Imaginary City to a Graphic Novel. *Journal of Architectural Education, 72*(1), 146–166. https://doi.org/10.1080/10464883.2018.1410670

MURPHY, D. (2016). *Last Futures: Nature, Technology and the End of Architecture*. Verso.

OMA, KOOLHAAS, R., & MAU, B. (2003). *S, M, L, XL* (J. Sigler, Ed.). The Monacelli Press.

PÉREZ GÓMEZ, A. (1983). *Architecture and the Crises of Modern Science*. MIT Press.

PRASAD, S. (2004). Inclusive Maps. In S. Macmillan (Ed.), *Designing Better Building: Quality and Value in the Built Environment* (pp. 175–184). Taylor & Francis.

ROBINSON, D., JAMIESON, C., WORTHINGTON, J., & COLE, C. (2010). *The Future for Architects?* [Building Futures Report]. RIBA.

SCHÖN, D. A. (1987). *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions*. Jossey-Bass.

SCHÖN, D. A. (2017). *The Reflective Practitioner: How Professionals Think in Action*. Routledge.

SHARR, A. (2010). Leslie Martin and the Science of Architectural Form. In A. Dutoit, J. Odgers, & A. Sharr (Eds.), *Quality out of Control: Standards for Measuring Architecture* (pp. 67-78). Routledge.

VESELY, D. (2004). *Architecture in the Age of Divided Representation: The Question of Creativity in the Shadow of Production*. MIT Press.

VILLARI, S. (1990). *J.N.L. Durand (1760-1834): Art and Science of Architecture*. Rizzoli.

WOUDHUYSEN, J., & ABLEY, I. (2004). *Why is Construction so Backward?* Wiley-Academy.