

'A dialogue between the real-world and the operational model' – The realities of design in Bruce Archer's 1968 doctoral thesis

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The article centres on a single document, the 1968 doctoral thesis of L. Bruce Archer. It traces Archer's earlier publications and the sources that informed and inspired his thinking as a way of understanding his influential work at the Royal College of Art from 1962. Analysis suggests that Archer's ambition for a rigorous 'science of design' inspired by linear algorithmic approaches was increasingly threatened with disruption by his experience of large, complex design projects. Reflecting on Archer's engagement with other models of designing, the article ends with Archer's retrospective view and an account of his significantly altered opinions. Archer is located as both a theorist and someone fascinated by the commercial and practical aspects of designing.

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This article is centred on a single document, the 1968 doctoral thesis of L. Bruce Archer, entitled *The Structure of Design Processes*. At the Royal College of Art (RCA) for 27 years, Archer was a key figure in early Design Research and a driving force behind the attempt in the 1960s to be rigorous, and in particular 'systematic', about the nature and practice of designing. He sought to establish a philosophy of design (Archer, 1981a, p. 33), even a 'science of design' (Archer, 1968: foreword), a phrase often associated with Herbert Simon's *Sciences of the Artificial* (Simon, 1969; Cross, 2001). Essential to this science was an understanding that Design Research was the study, not only of design's methods, but also of its ontology as a discipline and an activity. Archer was a vital contributor to the work of the Design Council, as a member of Council for ten years and of many of its committees. Partly through his work with Michael Farr, a design management entrepreneur and editor for many years of *Design* magazine, Archer engaged deeply with the commercial world; in the acknowledgements section of his thesis he thanks Farr for giving him 'many opportunities to put his theories to the test' (Archer, 1968). Archer lectured extensively to business audiences. His influence extended internationally through his work

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in Germany, the United States, Canada, Turkey, India and elsewhere. Archer acknowledged that he learned more from such interactions than he might have realised at the time (Archer, 1981b).

Archer wanted to grasp the nature of design as well as find better ways of designing. Of these two ambitions, he favoured the first. Christopher Frayling, who held a variety of roles at the RCA from 1979 to 2009, recalls Archer insisting, 'I am not doing this to help practising designers. I am doing this to completely understand the design process' (Frayling, 2013). Archer's doctoral thesis exemplifies a tension between theory and practice that is still with us. Subtle features within it indicate the beginnings of a change in his thinking that later led to a radical reformation of his views, derived from his increasing real-world experience. J Christopher Jones, in an article for *Design* (Jones, 1966), complains of 'substantial but not always very practical publications', 'both vague and dogmatic, [with] little reference to the work of practising designers'. Archer's thinking about design during this period was increasingly affected by practical design projects.

We will not rehearse here the many criticisms of 'design methods' that have been made over the years, a rebellion initiated early on by Jones (1969) and Alexander (1971). These debates have been discussed by Cross (1993, 2007), Glanville (1999), Dorst (2003), Bayazit (2004), Margolin (2010), Pavitt (2012) and many others. Our topic is instead the changes generated within Archer's own thinking and his attempts to match his theories to the messy realities he encountered.

When Archer completed his thesis in 1968 he was 46 and had worked at the RCA since 1962, first in the School of Industrial Design as a researcher invited by Misha Black. He later became Research Professor of the newly named 'Department of Design Research' (DDR) in 1972–73; this Department should not be confused with the Design Research Unit, a commercial consultancy co-founded by Black (Cotton, 2010). Prior to the RCA, Archer had worked for a year at the Hochschule für Gestaltung Ulm with Horst Rittel among others (Krippendorff, 2008). The Hochschule has been characterised by Woodham (1997: p. 180) as moving from intuition to method, from component to system, from product to process, and from individual to interdisciplinary approaches – all features of Archer's later thinking. Archer's own education had been in mechanical engineering at what is now City, University of London. In an article for the RCA's *Ark* magazine (Archer, 1972a), Archer said 'he was a painter before being drafted into industry by the then Ministry of Labour'. Serving in World War II from 1941 to 1944, he was discharged on medical grounds. By 1953 he had set up an engineering consultancy and was teaching in the evening at the Central School of Art and Design; he was a full-time lecturer there by 1957 and concurrently writing articles for *Design* magazine, promoting what he called 'a rational approach to design'. It was from the Central School that

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