

CONSUMER PRODUCT INNOVATION AND SUSTAINABLE DESIGN

The evolution and impacts of
successful products

ROBIN ROY



CONSUMER PRODUCT INNOVATION AND SUSTAINABLE DESIGN

Consumer Product Innovation and Sustainable Design follows the innovation and evolution of consumer products from vacuum cleaners to mobile phones from their original inventions to the present day. It discusses how environmental concerns and legislation have influenced their design and the profound effects these products have had on society and culture. The book also uses the lessons from the successes and failures of examples of these consumer products to draw out practical guidelines for designers, engineers, marketers and managers on how to become more effective at product development, innovation and designing for environmental sustainability.

Robin Roy is Emeritus Professor of Design and Environment at the Open University. Since joining the OU in 1971 as one of the first lecturers in Design, he has chaired and contributed to many OU courses on design, innovation, energy and environment, most recently *Design Essentials; Innovation: Designing for change*; and *Environment: Journeys through a changing world*. In 1979, he founded the Design Innovation Group to research design and innovation management and sustainable design. He has published many books, book chapters, papers and articles on topics ranging from design creativity and the successful management of new product development to environmentally sustainable education systems and consumer adoption of low and zero carbon technologies. He is a Fellow and Council member of the Design Research Society, a former Director of Carbon Connections Ltd. and a Trustee of Powerful Information, a local international development charity.

'Robin Roy has written intriguing histories of a selection of consumer products – washing machines, lamps and lighting, televisions, vacuum cleaners and mobile phones – looking at the patterns of their technical evolution and the causes of success and failure. He puts special emphasis on the environmental impacts of designs including their use of energy and materials. Professor Roy with his lifetime experience of studying product innovation is uniquely qualified to write this book that will fascinate the general reader and be particularly useful in teaching, design and industry.' – *Professor Philip Steadman, Energy Institute, University College London, UK*

'*Consumer Product Innovation and Sustainable Design* is a fascinating and incredibly useful book that builds upon a significant amount of research from the author. Its focus around five types of products provides the reader with both a set of interesting histories but also design case studies which will be particularly useful for students and practitioners. The focus on sustainable design within these case studies helps the reader understand the subject within the context of product innovation. This book should become essential reading for all product designers no matter what career stage they are at.' – *Professor Tracy Bhamra, Loughborough University, UK*

'By combining the archives of *Which?* Magazine with an analysis of the evolution of popular consumer product categories *Consumer Product Innovation and Sustainable Design* reminds us why the things around us have the capacity not just to shape our own lives, but that increasingly it is how a product uses our limited resources efficiently that is the key to success. Robin Roy has produced a book that will be invaluable to product designers and others in thinking innovatively and responsibly in determining tomorrow's good designs.' – *Peter Lloyd, Professor of Design and Associate Dean, University of Brighton, UK*

'*Consumer Product Innovation and Sustainable Design* draws on a huge amount of research and experience from the author and is based on a series of solid cases on the innovation process associated with four consumer products. Of particular note is integration of environmental considerations into the analyses and the final section on lessons for product developers and innovators. This book will be an essential resource for both practitioners and researchers interested in learning lessons on the evolution of innovation of 'active' consumer products.' – *Professor Martin Charter, Director, The Centre for Sustainable Design, University for the Creative Arts, UCA Farnham, UK*

'Robin has taught and researched consumer product innovation and sustainable design for many years. We have to thank him for producing this timely book that gives all of us access to a great archive of information set within a framework that challenges contemporary design practice.' – *Professor Tom Inns, Director, Glasgow School of Art, UK*

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PREFACE

I have always been interested in the design of things, but as a child I was especially fascinated by the historical technologies and products in the Children's and Domestic Appliances galleries at the Science Museum in London. Later this led me to study undergraduate mechanical engineering and then take a master's degree and PhD in design technology at Manchester University under Christopher Jones, one of the originators of systematic design methods and a broad systems approach to design. After briefly working as a trainee in engineering companies in Britain and Sweden, I was fortunate to be appointed in 1971 as one of the first lecturers in Design at the newly founded Open University (OU). The OU pioneered teaching large numbers of home-based adult students via specially produced books, radio and television programmes, supported by local tutorials and residential schools. The Design group at the OU developed an interdisciplinary and project-based approach to teaching design at a distance, which it has maintained to the present day, but now using online multimedia as well as printed books. For my research I founded the Design Innovation Group in 1979, which focused on investigating the successful practice and management of product design and technical innovation in industry and on developing the new field of sustainable design. This research often arose from the work involved in developing the OU distance learning courses and making the associated television programmes, audios and videos.

As part of my interest in products and their evolving design, I subscribed to the British consumer magazine, *Which?* This publication provides a unique record of how consumer products available in Britain have changed over almost 60 years. In my position as an Emeritus Professor of Design and Environment at the OU, I had the opportunity to make use of my *Which?* archive. The idea for this book was to use my *Which?* collection as a way of tracking the innovation and evolution of a number of consumer durable products, such as washing machines, vacuum cleaners, television equipment and mobile phones. However, I quickly realised

that although *Which?* was a useful basic source, tracking the evolution of such products from their invention in the nineteenth and early twentieth centuries to the present required a considerable amount of additional research and scholarship making use of many other printed and online resources and visiting museums and shops. Arising from my work on sustainable design I was also interested in discovering whether, why and when environmental concerns and regulations influenced the design of these products; what socio-economic and cultural factors influenced their development; and what the products' impacts on the environment and society were.

My aim in writing the book was to use the product case studies to provide general conclusions about patterns of technical innovation and design evolution and the extent to which these patterns fitted existing theories of innovation and design. A more practical aim, linked to my earlier work on successful design and innovation, was to make use of the empirical information from the product case studies to provide lessons and guidelines for designers, engineers, innovators, managers and marketers, as well as for educators of these professions. I hope that these groups will find the book useful as well as interesting.

In writing the book I have discovered that there are many individuals who are so fascinated with certain technologies and products that they collect them, make websites cataloguing and describing them, and even set up museums to show them to the public. There are collections, websites and museums for washing machines, vacuum cleaners, lamps, televisions and mobile phones, which I have found to be most valuable in writing this book. I hope that such collectors, and people who are simply curious about the history and design of consumer products, might find this book interesting and useful too.

Robin Roy

Milton Keynes, February 2015

For June, Alex, Linda, Ella, Joe and Olivia

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I want to especially thank my partner, June Payne, for proofreading and commenting on draft chapters and for patiently waiting for jobs in the house and garden to be done while I spent many months researching and writing the book.

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PATTERNS OF INNOVATION

The inspiration for this book was my collection of the British consumer magazine, *Which?* The magazine publishes independent test reports, advice and other information to the over 640,000 consumers who currently subscribe to it to help them choose goods and services that perform well and offer good value for money. *Which?* magazine publishes test reports and articles on goods and services ranging from consumer durables such as washing machines, televisions and light bulbs and consumable items such as food, batteries and laundry detergents to services such as hospitals, banks, airlines and financial advisers. Since 1996 the scope of the magazine has been supplemented and extended by reports and advice on a similar range of goods and services on the *Which?* website.

The magazine was first launched in London in 1957 by the then newly founded Consumers' Association and has been published continuously ever since. It is now published by Which? Ltd., the commercial arm of the Which? Group. The Consumers' Association, the charitable arm of the Group, carries out other activities, such as carrying out the product tests and campaigning on consumer issues.

For my research and teaching in the field of product design, I have for many years studied the technical and design evolution of consumer products such as washing machines and bicycles (see e.g. Roy, 1980; Roy, 1999; Roy and Tovey, 2012). I therefore kept my collection of *Which?* magazines because it, together with the *Which?* website, provides a unique written and pictorial record of how such products have changed over almost 60 years, which I felt would provide the basis for an interesting and useful book. As well as identifying patterns of innovation and evolution of consumer products, I was interested in whether, when, why and how environmental criteria such as improved energy efficiency became part of their technical specification. I also wanted to discover more about the socio-economic, cultural and political influences on and impacts of consumer product innovations (see e.g. Roy, 1994; Smith, Roy and Potter, 1996; Roy, 1997).