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Introduction: Sustainable Design

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Introduction

Celebrating 50 years of the DRS conference provides an opportunity to reflect on 50 years (ish) of sustainability. Since the publication of Carson's *Silent Spring* in 1962, which started the environmental movement by forcing governments and businesses to confront the dangers of pesticides, there have been three waves of activity that has helped form our understanding of design for sustainability (Bhamra and Lofthouse, 2007). The 60s and 70s saw the birth of the green movement, focussed on driving change that had a positive impact on natural systems. Key milestones included the formation of Friends of the Earth, Greenpeace and the United Nations Environment Programme (UNEP) and from a Design perspective the publication of *Design for the Real World* (Papanek, 1972) and *Small is Beautiful* (Schumacher, 1973), introducing the idea of appropriate technology.

The second wave occurred in the 80s, driven by a number of crisis' including the Bhopal and Chernobyl disasters. This prompted a range of environmental and social goals to be set out, including Agenda 21, and the Kyoto Protocol, as well as the development of legislation and safety standards. This period of time also saw social issues such as health, population and inequality come to the foreground. In 1987 the term Sustainable Development was first used in the Bruntland Report, and was defined as '...development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987). This definition is still widely used today and is the definition used by the Sustainability SIG of the DRS.

The third wave began at the turn of this millennium which has seen greater focus on social and economic issues, as well as renewed effort in terms of environmental change. It has also highlighted the slow progress of sustainability goals and the need for sustained and impactful activity. For example, the need for greater progress towards social sustainability was highlighted in January with the adoption of the *2030 agenda for sustainable development* and 17 Sustainable Development Goals (SDGs) by all UN member states due to



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the lack of success in tackling the Millennium Development Goals (MDGs) outlined in 2000 (United Nations, 2016). The need for continued action towards environmental sustainability was made clear by a report by the Intergovernmental Panel on Climate Change (IPCC) that states that the unrestricted use of fossil fuels should be phased out by 2100 if the world is to avoid dangerous climate change of 2°C highlighted in 2009 (IPCC, 2014).

More and more commonly sustainability is being tackled within a global development agenda, which encompasses the three pillars of sustainability (economic, environmental and social) and also brings in ethics and a view of the world as being increasingly connected through global economies, politics, technological advances, climate change and heightened awareness of inequalities around the world. Approaches used to address design for sustainability have also seen much change alongside the broadening of the agenda, with Circular Economy principles, Design for Behavior Change, Ethics, Systems approaches, and Service Design being paid more and more attention in recent years.

Papers

The papers in the Sustainability SIG stream continue the overarching DRS theme by reflecting on the evolution of design for sustainability and discussions around more future-focused approaches. In the Sustainability SIG's main session Ceschin and Gaziulusoy's *Design for Sustainability: An Evolutionary Review* explores the evolution of responses from the design discipline to sustainability issues, showing how approaches have expanded from technical and product-centric focus towards large scale systems level changes taking a socio-technical approach. Roy also looks at the evolution of sustainable design through focusing on six popular consumer products. The paper uses lessons from the successes and failures of examples of these products to draw out guidelines on how to design successful new products and to design for the environment. It concludes with trends and sustainability challenges for future consumer product design and innovation. These two papers are followed by Darzentas and Darzentas who discusses more contemporary approaches to sustainable design by positing that service design should follow a systems thinking approach to reflect the human-centered nature of the domain.

Increasingly sustainable design researchers, and organisations, are recognising an opportunity to develop business models that specifically address sustainable development challenges. Sustainable business models aim to deliver environmental, social and economic benefits whilst still creating value for consumers and stakeholders. The next set of papers presented in the Sustainability SIG stream include papers with a focus on developing sustainable business models.

Following on from Darzentas and Darzentas, Emili *et al* focus on Product Service Systems (PSS) as an example of a sustainable business model in the context of providing small scale and locally based electricity through Distributed Renewable Energy (DRE) systems. They explore the combination of DRE and PSS by presenting a strategic design tool that aims to support the design of sustainable business models for energy.

Many researchers have been working in the domain of fashion and textiles, and we are lucky enough to have two papers with this focus. Oxborrow and Claxton; and McLaren *et al* both focus on clothing longevity from a business perspective. Oxborrow and Claxton explore the design and supply chain implications of clothing longevity and identify conflicting priorities between commercial and sustainable practice that need to be addressed to reduce the environmental impact of clothing. Although McLaren *et al* focus on consumer perspectives and practices and their effect on clothing longevity, their conclusions address how these factors can influence product design practice in the fashion industry.

Barnes Hofmeister and Keitsch look at practice-orientated design models through a comparative case study of urban cycling. They explore the dissonances between visions, planning and execution in urban mobility and propose a practice-orientated model that takes into account mutual influences and reflects the complexity of the design space. They conclude that the model can help planners and designers to grasp urban complexity within systemic relationships and move towards practice-orientated design.

The final paper in this session, from Quam, moves away from business approaches to look at design education's integral role in the literacy of sustainability and presents a framework for introducing sustainability into the curriculum but in a manner that shifts from looking at competences to a more profession-specific vision for sustainability literacy.

The increasing focus on more socio-technical approaches to design is reflected throughout the sustainability SIG stream this year, but the final five papers have a specific focus on design driven by/or focused on the consumer.

With the aim of extending product lifetimes, Haug discusses the design of more durable products by considering emotional perspectives and their effect on product durability through an analysis of the causes of product replacement. He proposes a number of methods to develop more resilient consumer products based on this improved understanding. Mok *et al* also focus on emotional responses and consider the use of a value sensitive design framework to balance conflicting values of solar technology and cultural heritage. They use this framework to illustrate how compromise can be found among seemingly conflicting values. Lahusen *et al*; and Hesselgren and Hasselqvist focus on consumer practices. Lahusen *et al* consider consumer practice within 'everyday life' and present methods and tools for understanding the potential for a possible transformation towards a more sustainable 'everyday life'. Hesselgren and Hasselqvist posit that for sustainable practices to emerge, they have to be tried out. Their conclusions, based on a case study of urban cycling, focus on designing enabling ecosystems and inspiring consumers to make sustainable lifestyle choices. Finally Baek *et al* introduce a framework for developing service design strategies to foster collaborative communities and support social innovation. They utilise co-design workshops to generate design strategies and discuss the effectiveness of the framework and its implications to the design of sustainable services.

About the Sustainability Special Interest Group

The Sustainability SIG provides an international platform for researchers, design practitioners, design educators, students and the general public to exchange knowledge about design for sustainability. The Sustainability SIG community connects through an online community (LinkedIn® Group @SustainabilitySIG) and through a program of events and strands at international conferences. The main aims of the SIG are:

- Bringing members together
- Creation of an international forum for discussion
- Build a large sustainable design research group network and bringing new members to the DRS
- Raise the level of sustainable design research, link researchers and promote collaborations
- Provide peer support for research in sustainable design
- Provide a platform for the dissemination of sustainable design research to industry and vice versa and promote collaborations between industry and academia
- Provide a platform for industry and academia to access expertise from one another
- Create a new platform for Sustainable Design network activities
- Forge relationships with other design research organisations
- Create a large body of researchers to help drive policy and funding agendas
- Engage with public engagement activities

Sustainability SIG is convened by Dr Rhoda Trimmingham, Dr Carolina Escobar-Tello, Dr Dan Lockton and Dr Fiona Charnley.

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About the Author:

Dr Rhoda Trimingham is a Senior Lecturer Loughborough Design School and a member of the Sustainable Design Research Group. She also convenes the Sustainability Special Interest Group (SIG) for the Design Research Society (DRS).

Her research interests lie in sustainable design generally but specifically sustainable packaging, developing methods and tools for designers, design for global development, design education and moving from products to services and systems.