Innovation for a Sustainable Fashion Industry: A Design Focused Approach Toward the Development of New Business Models

Anika Kozlowski, Cory Searcy and Michal Bardecki

Abstract This chapter proposes a normative sustainable business model composed of the elements in which a fashion brand would engage. These elements include product sustainability, sustainable supply-chain management, design practice, business innovation, and consumer engagement. The model adopts a systems thinking approach in identifying elements within the fashion system and their organization. Typically within the field of sustainable fashion, the effort has been on technological modifications within the supply chain. Although these efforts can significantly reduce environmental impacts, the outsourced manufacturers are in control, thus limiting the influence of a fashion brand. The emphasis in the model is on those elements within the direct control of the business, particularly design practice. The holistic approach looks at how the design practice can evolve to increase sustainability within the supply chain, the product, innovative business models, and consumer consumption. By shifting focus to the design process, products can be designed to influence consumer behaviour, induce sustainable consumption, and reduce impact from use. Looking beyond the supply chain to include consumer behaviour, the development of sustainability-driven business models can be fostered in support of sustainable production and consumption. This research contributes an analysis of how the design process can support the development of new and competitive business models for a sustainable fashion industry.

Keywords Sustainable fashion · Innovation · New business models

1 Introduction

Sustainability is one of the key issues facing the fashion industry today. This is due to the complex nature of the negative environmental and social impacts associated with fashion apparel throughout its life cycle from production to consumption

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(acquisition, use, and disposal). The industry is composed of many actors forming one of the longest and most complicated industrial chains involving agriculture, chemical fibre production, textile and apparel manufacturing, retail and service sectors, second-hand markets, and waste management (Fletcher 2008; DEFRA 2011). There has been a dramatic reorganization in the industry, especially in supply-chain management, during the last 30 years since its shift to offshore production. Developments within the supply chain have typically focused on technological production efficiencies and cost in order to maintain low-priced products. This has left the current fashion production system to be based on traditional practices and commercial technologies that are not sustainable (Tseng et al. 2013).

What was once a linear system with clear delineation between supplier and customer has developed into a virtual, global, and fragmented system where suppliers have multiple functions (Abernathy et al. 1999; Armstrong and LeHew 2011; Fletcher and Groese 2012). Globalization and the delocalization of production to nations with developing economies, particularly Asia, have eliminated supply-chain transparency and encouraged polluting behaviours (Abernathy et al. 1999; Christmann and Taylor 2001; Welters 2008; Steinberger et al. 2009; Fletcher 2008). The rapid industrialization of Asia has led to exploitation of the environment and labour forces while causing significant pollution problems to air, land, and water due to weak environmental regulation.

Although awareness of the environmental and social impacts and research into sustainable fashion have increased over the last decade, questions remain as to how the concept of sustainability fits within current fashion business, design practices, and consumer consumption. Research has primarily focused on improving supply-chain sustainability through the development of cleaner production technologies (Thorpe 2010).

Addressing sustainability issues in the fashion industry is extremely challenging due to the production–consumption relationship. The globalization of apparel supply chains aided the development of the "fast fashion" business model, which enables consumers to buy fashion apparel in never-before-seen quantities (Gwilt and Rissanen 2011; Siegle 2011; Fletcher and Groese 2012). Fast fashion is characterized by a quick response system or just-in-time manufacturing that allows for short production and distribution lead times enabling a close match of supply with uncertain demand. This supports the retailing of low-cost highly fashionable apparel products that mimic high fashion luxury runway collections (Cachon and Swinney 2011; Fletcher and Groese 2012; Joy et al. 2012). This economic accessibility, although extremely profitable, neglects both the quality of materials used and construction, subsequently increasing the disposability of fashion products (Gwilt and Rissanen 2011; Siegle 2011). Global brands have wielded their economic power and economies of scale to prioritize low price points and create mass availability and volume purchasing while forcing out of business those small producers who cannot compete (Fletcher and Groese 2012). Consumerism is now based on rapid product acquisition and obsolescence and a continually increasing throughput of resources (Fletcher 2010; Fletcher and Groese 2012), and it is exclusively structured around the traditional capitalistic business model. Costs to

society at large from mass production are experienced through increased pollution, resource depletion, and climate change (Esslinger 2011; Fletcher and Groese 2012).

Awareness by key stakeholders of the negative environmental and social impacts of the fashion industry has steadily increased during the last decade. In particular, governments, media, and activists are quite adept at targeting companies to become responsible and accountable for the social consequences of their activities (Porter and Kramer 2006). This increased awareness and concern of key stakeholders has led to a gradual response by the fashion industry to improve the environmental and social impacts of the manufacturing processes (Wong and Taylor 2000; Chen and Burns 2006; Dickson and Eckman 2006; Birtwistle and Moore 2007; Goworek 2011). The response has resulted in corporate social responsibility (CSR) and the principles of sustainability being increasingly implemented into the business strategies of fashion apparel brands to maintain healthy relationships with their stakeholders (Dickson et al. 2009). For the purpose of this chapter, CSR is the application of strategies by a fashion brand to develop sustainability within their brand.

However, management often develops most of its societal engagement in relation to the economic goals of a company because companies are founded and run for economic purposes (Parnell 2008), with social and environmental considerations being secondary (Freeman and Gilbert 1992), and reiterate the crucial importance of corporate sustainability strategies (Schaltegger et al. 2011). The challenge of CSR and sustainability strategies is to recognize the equal importance of financial sustainability as well as social and environmental sustainability (Parnell 2008). This integration is the target and purpose of the business case for sustainability (Schaltegger et al. 2011; Gwilt and Rissanen 2011).

The supply chain, the production processes, and the fashion apparel products are the elements that have predominated strategies in achieving sustainability within the fashion industry. However, the role of design and business practices, along with consumer behaviours and consumption, must be equally acknowledged. Systematic change of the fashion industry toward a more sustainable future requires a holistic approach (Fletcher and Groese 2012) encompassing all facets and stakeholders. To achieve global sustainability, there must be a fundamental shift in how we produce and consume (Perrels 2008; Pettersen and Boks 2008; Hoffmann 2012). Companies bear a great deal of responsibility for existing production/consumption patterns and can contribute to the change of these patterns through innovations to their products and services (Hoffmann 2012).

Within the industry, there is a growing consensus that sustainability is only possible through a radical transformation of the fashion system as a whole (Kemp 2008; Fletcher and Groese 2012) and that sustainability initiatives must move beyond the supply chain to other areas such as business and product innovation and consumer engagement. This chapter therefore proposes a normative sustainable business model (SBM) composed of the elements in which a fashion apparel brand would engage as they develop sustainability within a fashion brand. These elements include product sustainability, sustainable supply-chain management,

design practice, business innovation, and consumer engagement. The model adopts a systems approach where all elements within the system must be engaged in the shift toward sustainability. The emphasis of this model is on the elements within the direct control of the business, such as design practice, product sustainability, and business innovation, as the fashion apparel brand is the link between production and consumption.

Current sustainability strategies employed by business are deficient in three ways: There is a lack of focus on the consumer; they do not acknowledge the threats of global over-consumption; and they do not take a holistic approach (Sheth et al. 2011). By shifting the focus to the design process, products can be designed to influence consumer behaviour, induce sustainable consumption, and reduce impact from use. Consumer behaviour can have a significant influence on the environmental and social impact of clothing (Fletcher 2008; WBCSD 2008). By focusing on consumer behaviour, the development of innovative sustainability-driven business models can be fostered in support of sustainable production and consumption. One of the most important tools to gain a sustainable competitive advantage is innovation and an innovation-management approach (Teece 2010). This chapter therefore suggests a focus on design practice to translate the principles of sustainability in shaping the development of innovative sustainability-driven business models and inducing sustainable consumption.

2 The Need for a Sustainable Business Model in the Fashion Industry

Teece (2010) defines a business model as the articulation of the logic while providing data and other evidence to demonstrate how a business creates and delivers value to customers. The dominant business model today is based on the neoclassical economic theory, which values the maximization of profits as a primary obligation to shareholders (Stormer 2003; Stubbs and Cocklin 2008). This development of the industrial era functions under a supply side–driven logic that is no longer viable in today's social climate (Teece 2010). The development of sustainability within fashion requires a systematic and holistic approach that considers all stakeholders within the fashion system (Kozlowski et al. 2012), therefore highlighting the need for a business model that has considerations beyond shareholder obligations.

The dominant business model in the apparel industry for the past two decades has been reliant on the perpetual production and consumption of vast amounts of apparel. This business model benefits from large economies of scale that maximize profits with significant negative environmental and social impacts creating an unsustainable apparel system (Fletcher and Grose 2012). Current business models,

from a strategic management perspective, primarily focus on customer value creation (Wirtz 2011) and shareholder obligations (Stormer 2003; Stubbs and Cocklin 2008).

A company looking to develop sustainability and increase sustainability performance would have to transform traditional business models (Schaltegger et al. 2011). Business model modifications for both new and existing models must accommodate the growing relevance of environmental and social issues in business strategies (Schaltegger et al. 2011), thereby driving innovation. However, the shift in the business mandate to sustainability and CSR has yet to occur. Sustainability and CSR continue to be justified through the lens of the neoclassical economic theory (Freeman and Gilbert 1992).

Many companies are beginning to integrate the principles of sustainability into their business strategies (Gobble 2012). Research shows the integration and development of sustainability within business produces organizational and technological innovations that yield both top- and bottom-line returns (Nidumolu et al. 2009). Innovations are deliberate interventions designed to initiate and establish future developments concerning technology, economics, and social practices. Smart, top-performing companies are using sustainability as a frontier driver for innovation (Nidumolu et al. 2009) and as a source for opportunity and long-term competitive advantage (Verganti 2009; Gobble 2012). Therefore, business models can be the strategic leadership asset to drive and integrate sustainability and innovation within an organization (Chesbrough 2010; Schaltegger et al. 2011). Mitchell and Coles (2003) analyzed 100 outperforming public companies and found one common feature:

> … it was clear that perennial top performers were frequently making fundamental improvements in several dimensions… of their business models at once for serving their customers, end users and other important stakeholders (such as employees, partners, suppliers, distributors, lenders, shareholders, and the communities the company serves). The most effective companies were making these multidimensional business model shifts every two to four years. (Mitchell and Coles 2003, p. 16)

Innovation will therefore play a key role in delivering solutions that are both sustainable and competitive (WBCSD 2010; Gobble 2012). This reinforces the notion that a transformation to sustainable business models is key for a sustainable fashion industry and that they must continue to evolve. This is necessary for fashion businesses to maintain competitive advantage and remain viable in this changing global market as they struggle to deal effectively with increasing social and environmental impacts and deliver consumer value through innovation. CSR and the principles of sustainability can form the core of business models because only companies that make sustainability a goal achieve a competitive advantage. That means rethinking business models as well as products, technologies, and processes (Nidumolu et al. 2009).

3 A Sustainable Business Model for the Fashion Industry

This chapter proposes a normative theoretical framework composed of the elements in which a fashion brand could engage into to develop sustainability within their business. The model (Fig. 1) is based on a systems approach. Meadows (2008) describes a system as an interconnected set of elements that are coherently organized in a manner that achieves something and creates its own pattern of behavior over time. Application of Meadows' definition to the apparel industry is logical because the apparel industry is a functioning system with interconnected elements and its own set of distinct behavioural patterns. Meadows explains that once the structure of a system is identified and understood, the relationship between structure and behaviour can be explored. Understanding the relationship between structure and behavior allows for an understanding of how the system works, what makes the system produce poor results, and how to alter the system for better behaviour patterns (Meadows 2008)

The model (Fig. 1) is intended to promote the development of sustainable business models (SBM) in support of a sustainable fashion system. The key driver of this proposed SBM is the implementation of innovative socially relevant design (ISRD) within the fashion apparel design practice, which looks to redefine the role of design and designer. ISRD is a holistic multidimensional, cross-disciplinary collaborative approach to fashion design that at its core has a socially relevant purpose. The context of the term "socially relevant" allows for the inclusion of a diverse set of factors beyond the three dimensions of sustainability to be considered with the design practice such as factors such as stylistic and/or technological

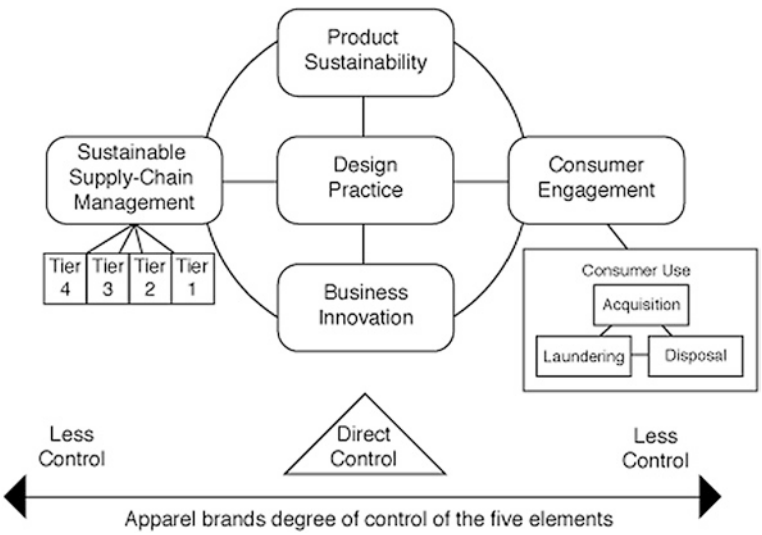

Fig. 1 Innovative design-driven sustainable business model

innovation and cultural and global trends in developing sustainability within a fashion apparel brand. The idea of social relevance to sustainability is based on the rationale that value is a fundamental aspect of sustainability (Laszlo 2008) and sustainable design (Chapman 2005; Tseng and Ho 2013). Innovation arises from good design, and innovation can drive sustainability. What is considered to be "good design" remains a subjective notion, but it can be attributed to how relevant and valuable design is within society, to a fashion brand, and/or to consumers. Value in turn is created through socially relevant factors such as quality, aesthetics, taste, novelty, trends, culture, style, ethics, emotional durability, symbolism, and technological performance.

The model is organized by the degree of control that a fashion brand has over the various elements. Elements such as design practice, business innovation, and product sustainability are directly controlled by an apparel brand. Brands have varying degrees of influence and control over supply-chain sustainability and consumer engagement. The supply chain consists of phases from raw-material acquisition to the retail environment. Apparel brands typically subcontract manufacturing of fashion products to suppliers who are usually located in developing nations (Jones 2006; Fletcher 2008; Sherman 2009). The supply chain can be further segmented into tiers as illustrated in Fig. 1. Apparel brands typically organize suppliers into tiers for organizational purposes. Tier 1 (manufacturing) is where apparel brands will typically have a moderate to high influence. In tier 2 (outsourced processes), tier 3 (textile and fibre processing/mills), and tier 4 (raw materials), the lack of control increases and transparency decreases (Jones 2006; Fletcher 2008; Lim and Phillips 2008). The difficulty in exerting influence over tier-2 through -4 suppliers is that apparel brands do not deal directly with them, a disadvantage of a fragmented supply chain. Moving toward the other end of the value chain, once a product is sold to the consumer, the apparel brand virtually loses all control over the rest of the product life cycle. This lack of influence and control over apparel products end-of-life creates challenges in implementing sustainability initiatives and actions.

Although the apparel systems model is holistic in its approach, it is imperative to have a complete understanding of the five elements. Addressing problems within the individual elements, while recognizing its interconnections in the system, a new system can begin to be developed. Addressing the problems within a single element will not significantly alter the system. If a product is sustainable, but the system itself is not sustainable, the full potential of the product is underutilized. For example, a biodegradable t-shirt cannot simply be discarded but must be composted under ideal conditions (Fletcher and Grose 2012). Benefits arising from improvements to the sustainability of apparel products are subject to restrictions by the production system, the business models that market and sell apparel products, and the behaviours of consumers who purchase these apparel products. Therefore, all elements within the apparel system require transformation to achieve whole-system transformation.

The approach of this sustainable business model has foundations in a systems-level description. Stubbs and Cocklin (2008) note SBMs can be conceptualized

in various ways. Just as there is no consensual definition as to what sustainable fashion is, there are no sufficient answers as to what a sustainable business model might be (Stubbs and Cocklin 2008). What this does offer is the flexibility and freedom to develop sustainability within a fashion brand by fostering design-driven innovation. Therefore, the model emphasizes the need for fashion brands and designers to challenge the bounds of traditional design practice.

3.1 Design Practice

Modifications in the design phase and product development processes are key phases: Decisions made at this stage determine more than 70 % of the product development costs and manufacturing and significantly impact end-of-life management (Waage 2007). These processes present many opportunities for designers to introduce and integrate the dimensions of sustainability (Dickson et al. 2009; Armstrong and LeHew 2011). However, sustainable approaches to design and product development are still relatively new (Walker 2006). Technological efficiencies within the supply chain remain the dominant output of environmentally responsible considerations made during design and product development.

The Centre for Sustainable Fashion (2008) found that although designers are becoming more aware of and rethinking their role in creating sustainable fashion, they are finding it difficult to work within a sustainable framework. This could be due to the fact that research shows characteristics such as colour, style, price, and fit, as opposed to social or environmental considerations, are the strongest predictors for apparel acquisition by consumers (Dickson and Littrell 1996; Kim and Damhorst 1998, 1999; Shaw and Tomolillo 2004; Joergens 2006). Predefined product types whose reliance for differentiation and value rests solely on either technological or stylistic indicators limits the user's emotional experience. The moment a newer model is released ensures perceived product obsolescence and loss of meaning (Chapman 2005).

A challenge for designers will be to approach design with a systems view where the relationships between producers and consumers are better understood. It is not only important for designers to consider consumer behaviours and patterns but to also explore options in engaging the consumer to develop greater meaning and value to both product and process. Papanek (1971) advocated that the most important aspect about design was how it related to people. By repositioning and engaging consumers within a collaborative action role, they can participate in an open-ended design process and an open-source design system. Consumers evolve to active subjects within the process, becoming co-designers or co-producers, thereby changing the power relationship between consumers and fashion creators (Fletcher and Grose 2012; Meroni 2012). This allows for the nurturing of new relationships and trust and for the consumer to have more control over the institutions and technologies that affect their lives (Fletcher and Grose 2012).

The use of a concept such as ISRD can aid designers to evolve and integrate a holistic multidimensional, cross-disciplinary collaborative approach to sustainable fashion apparel as a system. ISRD looks at all socially relevant issues such as environmental responsibility, labour impacts, consumer engagement and consumption, technological innovations, social movements and trends, co-creation, social media, stakeholders, and economical aspects. The idea is to not limit the designer to "aesthetic" design inspiration but to explore socially relevant issues and developments beyond the fashion industry. "The way designers conceive of the nature and purpose of design will affect their practice" (Galle 2011: 81). There is no "right way" to design, especially within a creative field such as fashion. There is a common set of elements or stages a designer will employ; however, these are adaptable and unique to individual designers (Stone 2012). Papanek (1971) states, "design has become the most powerful tool with which man shapes his tools and environments and, by extension, society and himself" (p. ix). Design in essence can become a tool to drive innovation in sustainable business, product, and consumption while challenging the boundaries of the design practice. Although concepts such as designing for "slow fashion" promotes the purchase of fashion apparel that is of high quality, durable, and generally made locally in small production runs, it does not address the issue of over-consumption.

Media platforms such as Instagram, Twitter, and Facebook allow for new ways to engage with consumers, collect data, and develop brand loyalty. Information collected along with the higher level of consumer engagement offers opportunities to develop sustainable business models through innovation and design. A better understanding of consumer behaviour with fashion apparel and a higher level of engagement can drive fashion design in a new direction, one built on the principles of developing a sustainable fashion system. The key challenge for designers will be to design fashion apparel that can alter consumer behaviours in favor of sustainability while fulfilling the desire of fashion participation. Technological advancements, such as 3D or 4D printing, could play a fundamental role in developing sustainable business models, new services and products. The ISRD approach promotes cross-disciplinary product development where fashion designers are encouraged to work with non-designers, such as textile chemists, scientists, artists, and/or biomechanical engineers, to create innovative sustainable products, SBM, and new services.

3.2 Product Sustainability

Product sustainability is the easiest aspect to alter for an apparel brand because this is where a company has the most and direct control through design and product development (Armstrong and LeHew 2011; Fletcher and Grose 2012). Transforming product sustainability may be achieved via various aspects such as fibre/textile selection, processing methods, use behaviours, and reuse/recycle strategies. Fibre/textile selection is often the first step that designers and product

developers can take in reducing the environmental impact of a garment because it is quick and can be on the sales floor within months. Within the field of sustainable product design, the focus has been strongly on the supply side. This includes solutions to lower impacts through design-for-disassembly, recyclability, use of environmentally conscious materials, and dematerialization (Wever et al. 2008). Environmentally preferred fibres/textiles can significantly reduce the environmental impact and increase the resourcefulness of an apparel product throughout the garment's life-cycle without change to design practice or product development processes (Graedel and Allenby 1995; Ljungberg 2007; Fletcher and Grose 2012). Costs are lowered through the development of environmentally friendly products due to decreased inputs. This process yields better products and enables new business opportunities (Nidumolu et al. 2009).

Alternative fibre/material selection can be limited by the supply chain and the business system to which the fibres/materials belong. Offering consumers an alternative choice is not dealing with the deeper issues such as increasing consumption rates, patterns, and behaviours (Fletcher and Grose 2012). Verganti (2009) highlights an interesting aspect concerning products: People do not buy products, they buy meanings. Verganti suggests that firms look beyond the performance and aesthetic functions of a product to better understand the meaning users attribute to products. A better understanding of attributed meanings can drive innovation in creating sustainable products, value, and new business opportunities. Champan (2009) also advocates that by creating an emotional attachment through value and meaning can lead to greater product durability and longevity or a more sustainable product. A product can be perceived to be irreplaceable due to meaning, value, and emotional attachment (Chapman 2005). Meaning and emotional attachment can be created through strategies such as customization or co-creation with the user (Chapman 2009), which alternatively can create new business opportunities for firms.

Product sustainability is quite variable because it can range from a simple shift to an environmentally preferred material to altering product characteristics such as how a consumer may use the product and product end-of-life strategies. However, the underlying goal is the need to move beyond life extension to resolve issues concerning use and disposal.

3.3 Consumer Engagement

Engaging with stakeholders such as consumers can help in establishing a vision for social responsibility (Dickson et al. 2009). This process is fundamental for improving social responsibility and, in turn, sustainable development. Achieving sustainability requires all participants in the apparel system to recognize that extrapolating on the current system will not work because the current system and the relationship between consumers, apparel brands, and apparel products is the very antithesis of sustainability (Fletcher and Grose 2012).

It is not just behaviours that have changed but also how consumers have defined value. Stylistic innovation, a core output of the fashion industry, has high symbolic value leading to and encouraging conspicuous consumption (Tran 2010). Consumers have learned to value quantity and attribute little value to the resources needed to produce their goods. Altering value, informing and creating awareness, consumers can learn how to make more sustainable choices in the purchase, use, care of, and disposal of apparel items.

Hethorn and Ulasewicz (2008) mention that the role of apparel brands within the market, and ultimately the consumer, must be viewed differently to progress toward sustainability. Hethorn and Ulasewicz specifically promote a holistic approach to defining consumer preferences and how successful sustainable fashion requires that the consumer be placed as a focal point in the design process. Gaining insight into environmentally friendly apparel-consumption behaviours (acquisition, use, and disposal) will aid apparel brands in developing strategies that promote these behaviours (Connell 2010).

Hethorn and Ulasewicz (2008) argue that fashion is an excellent platform by which to create awareness for sustainability because it is ubiquitous and is embedded in a system of communication. With the rising popularity of social media, today's consumers can significantly influence the design and product development process along with marketing strategies. For example, a growing trend of authenticity and a return to value of traditional craftsmanship can be seen at the core of the DIY movement. There is an opportunity for designers and fashion brands to strategically utilize these growing social trends to their advantage. The rise of co-creation not only involves the consumer in the process but allows for greater access to consumer needs, behaviours, and wants, subsequently leading to the creation of greater-valued products. A better understanding of the consumer and consumer engagement through co-creation processes is a driver for innovative sustainable products and services. As Yoo et al. (2009) point out, consumers can interact, collaborate, coordinate, and co-create with fashion brands because digital technology has radically reduced the cost of communication. Integrating the principles of sustainability into the design process becomes a manageable task with the evolution of these new communication media, which allow for a better understanding of consumer behaviours, needs, and wants. Ideas such as Jonathan Chapman's (2009) design for emotional durability, where attempts to associate value and meaning to consumer products by creating an emotional connection, is clearly more feasible in a co-creative process.

3.4 Sustainable Supply-Chain Management

Despite sustainable supply-chain management gaining prominence in CSR strategies, there are still many questions as to what a sustainable supply-chain is and what are its defining characteristics. Key characteristics mentioned in the literature are transparency, development of codes of conduct, auditing, and capacity

building (Wong and Taylor 2000; Allwood et al. 2006; Carter and Rogers 2008; Fletcher 2008; Bhaduri and Ha-Brookshire 2011; GRI 2011). Transparency is a significant factor in developing a sustainable supply chain. It allows consumers to see how and where the products that they purchase are produced (NICE 2012). Transparency engages stakeholders as to the business practices of an apparel brand and allows for accountability.

Gobble (2012) states, changes to the supply chain, such as reducing waste and streamlining process for energy efficiency, do not transform the system; they simply reshape it. True innovation requires a disruption in the current system to achieve sustainability. Changes to develop a sustainable supply chain will stem from the creation of innovative sustainable products, design practice, and business models. Innovation within these elements will dictate product development and manufacturing. At this point fashion brands can re-evaluate current supply-chain practices and look to develop sustainable production methods that better suit sustainable product innovation. Designers may also work in tandem with manufacturers, which could alternatively drive innovation in sustainable product development. Engaging stakeholders within the supply chain offers opportunities to co-create new process, value, and products that further the sustainability agenda.

3.5 Business Innovation

Although financial responsibility is a vital element of any business, this particular aspect does not require transformation. The responsibility to remain profitable is a core business operation. Within sustainability, financial responsibility is viewed as being equally important as environmental and social responsibility. Therefore, innovation in developing alternative business models and strategies to diversify revenue streams is as vital as innovative sustainable product development. Porter and Kramer (2006) state:

> Strategic CSR moves beyond good corporate citizenship and mitigating harmful value chain impacts to mount a small number of initiatives whose social and business benefits are large and distinctive. Strategic CSR involves both inside-out and outside-in dimensions working in tandem. It is here that the opportunities for shared value truly lie. Many opportunities to pioneer innovations to benefit both society and a company's own competitiveness can arise in the product offering and the value chain (p. 88).

For example, Nike has been quite successful in creating new business practices by developing innovative products through the co-creation of value and sustainability initiatives (Ramaswamy 2008, 2009; Rodrigues et al. 2011; Gobble 2012). Innovation is not only a strategic long-term competitive advantage (Verganti 2009); it is at the core of creating a sustainable society (Schaltegger et al. 2011; Gobble 2012; Seebode et al. 2012). The model presented in Fig. 2 seeks to examine and redefine the role of design on business from an innovation perspective in developing sustainable practices within a fashion brand.

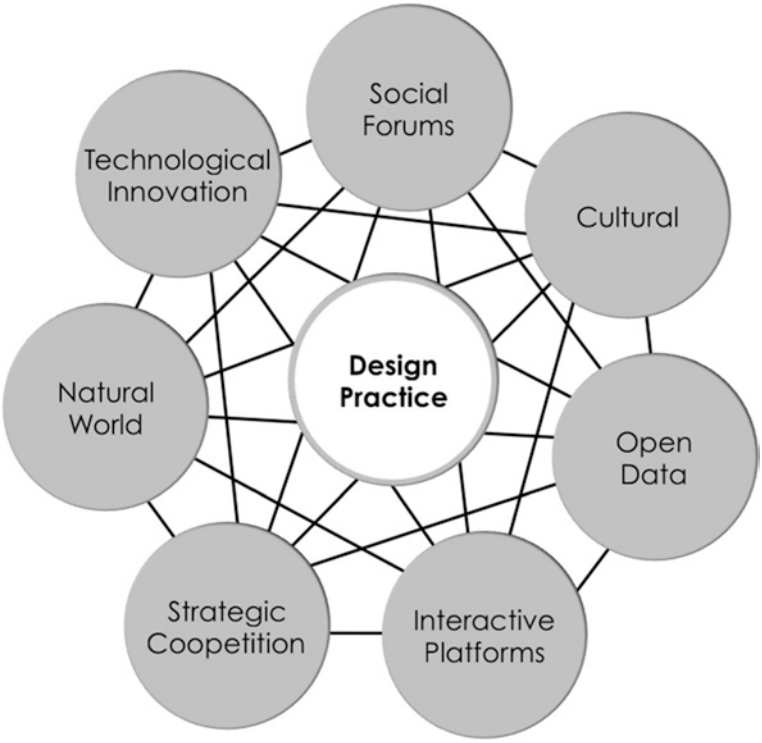

Fig. 2 Application of ISRD using trends in relevant areas to inform design practice

4 An Example on ISRD

A model of how ISRD may be applied to design practice is presented in Fig. 2. This model relates to Fig. 1 by focusing on the design-practice element, an area where a fashion brand exerts a great level of control. The emphasis on design is based on the assumption that those interested in formulating sustainable practices should begin in areas where they wield a higher degree of control.

The model in Fig. 2 advocates the observation and interpretation of trends and societal developments (which are culturally and socially significant to a fashion brand and their consumer market) to inform and transform current design practices. The idea is to identify trends and developments that may be relevant to the various elements within the sustainable fashion system (i.e., consumer engagement, sustainable supply-chain management, business innovation, and product sustainability) and how they interact or may influence one another. It is an iterative process drawing on Baudrillard's (2007) notion to observe, interpret, and transform.

The seven areas highlighted in the Fig. 2 (technological innovation, social forums, cultural trends, open data, interactive platforms, strategic coopetition, and the natural world) have been chosen due to their relevance in today's global market place, design industries, and society at large. They are broad in scope to ensure encapsulation of macro (global) and micro (local) trends that would be socially significant to a fashion brand and their consumer market. This model applies the same holistic view and systems thinking theoretical framework as the model in Fig. 1. These areas are not isolated nor do they function in isolation within society or an individual's personal microcosm. For example, the success and use of open data works in tandem with interactive platforms and social forums. The rise and use of open data is also a recent cultural trend and is present in many different forms and industries. Applying a holistic view to trends within these seven areas and determining how they could function within the fashion system can be the driver for innovation and the development of new sustainable products, services, and business strategies.

To demonstrate the application of the model, consider its application in the context of fast fashion. The fast-fashion consumer primarily engages in the rapid consumption of low-cost, trend-driven fashion and enjoys the continuous replenishment of new fashion products. Fast fashion has been demonized as being highly unsustainable due to its low-quality, low-price disposable nature. It can be argued, however, that certain features of this model are sustainable due to its ability to reproduce on-trend items in weeks as opposed to preplanning months in advance (Armstrong and LeHew 2011). The longer the time frame between conception and the retail floor, the higher the risk a fast-fashion product may not sell. Fast fashion is increasingly responding to consumer desires while dramatically reducing the time-to-market and on-hand inventory aspects. However, it is unclear whether the ability to respond to consumer desires is measured by the retailer's capacity to offer the latest trends within weeks to days of the original inception and whether this reduces the amount of styles that do not sell (Armstrong and LeHew 2011). This is a problem plagued by all commercial products because there is no clear method to accurately predict what a consumer will buy.

When looking at how recent trends in **technological innovations** may inform and transform fast fashion design practices, one may look to 3D printing. The use of 3D printing is rapidly expanding, and one day 3D printers may be a ubiquitous home product such as the paper printer. The use of 3D printers moves the mode of production from the fashion brand into the hands of the consumer. This may correspondingly satisfy the growing cultural trend of DIY (do-it-yourself) consumers that has propagated through social forums such as Facebook, Instagram, and fashion blogs. When looking at social forums and cultural trends such as DIY, designs are available for consumers to download free of charge to be printed with various 3D printers.

Cultural trends, such as DIY, co-creation, artisanal and traditional craftsmanship and hacketivism (which is rooted with classic DIY) (von Busch and Palmas 2006), are increasing in popularity as consumers look to engage and participate in fashion in a more meaningful manner. These trends may have arisen as a backlash to the oversaturated offshore mass production of fashion. A common theme is the

flexibility to individualize and/or customize apparel while allowing consumers to reconnect and engage in practices that were once a ubiquitous practice and form of knowledge. **Social forums** include communication mechanisms, such as blogs, Facebook or Instagram, or other common technological tools where consumers can share information on a variety of subjects and issues in many different forms (i.e., written text, images, or photographs). These tools have popularized individual fashion styling, naturally proliferating and popularizing the DIY movement and a return to traditional craftsmanship techniques to further personalize one's style.

A fashion brand may look to create its own **open-data** platform by engaging with consumers through an **interactive platform** tool that is either created by the brand (e.g. Nike+) or currently exists (e.g., Instagram). The Nike+ website is an interactive platform that engages consumers through an innovative service creating an online community where runners voluntarily share information, thus creating an open-data forum. Privacy levels for sharing within the community are set by the consumer, and Nike collects all of the data provided through the Nike+ service platform. A company cannot improve what it cannot measure, and open data allows for consumer activity to be measured.

The development of Nike+ website, service, and the *Nike+ iPod Sports Kit* adds value to the brand image through the implementation of a **strategic coopetition** with Apple. Coopetition can be defined as the simultaneous cooperation and competition between companies to achieve mutual gains and competitive advantages (Brandenburger and Nabeluff 1996). There is an implication of knowledge sharing for the use of competitive advantage, and any knowledge gained or released from the union may be used to compete (Levy et al. 2003). The strategic coopetition between Nike and Apple created the joint communication of brand image, reputation, and credibility by capitalizing on the homogenous and convergent lifestyles of consumers in the global marketplace (Rodrigues et al. 2011). As observations of relevant social trends, such as the increasing urban running trend in the case of Nike, enter the design process, a fashion brand can investigate how they might interpret and transform these trends into a sustainable business strategy, new services, and/or product.

A fashion brand could also look to develop personalized designs with consumers through a collaborative approach using a social **interactive platform**. The consumer would no longer be purchasing a product but a design, such as a fashion shoe, that is downloaded and printed by the consumer. The fashion brand may even enter into a membership relationship where a biopolymer, inspired by the **natural world**, that could be continuously recycled is sold to the consumer at a frequency of their choice. The membership terms may be that the biopolymer for printing is sent every week to satisfy the fashion craving of a fast-fashion consumer where the consumer can print as many shoes as they chose and return those no longer wanted to be recycled, thus closing the production-consumption loop. The fashion brand has eliminated the need to produce the product themselves, focusing on raw materials only and has now developed a new business service that binds the consumer for a length of time to the particular service offered.

This example highlights the mutual benefits to be gained by both the consumer and fashion brand. The needs of the fast-fashion consumer are satisfied through the offering of a new service while they are simultaneously engaged in the design and product-development process. The offering of a service by the fashion brand allows the consumer to directly participate in the production process and allows the fashion brand to pursue innovation within design and business strategies. By engaging with the consumer, the fashion brand is able to gain information that can be translated to data in support of innovation and sustainability. ISRD provides the framework to guide the design practice in developing innovative and sustainability driven business strategies and products that ultimately provide a means for sustainable consumption that is financially viable.

5 Conclusion

Sustainability in the fashion industry has become recognized as an important issue due to increasing awareness of the negative environmental and social impacts of fashion. Recent literature suggests the need for systemic change in the sustainable development of the fashion industry where initiatives must move beyond the supply chain to other areas such as business innovation, sustainable consumption, and consumer engagement. This chapter highlights the need for systemic change within the fashion industry in support of sustainability. To translate the principles of sustainability, there is a focus on design practice with the aim to develop innovative sustainability-driven business models that induce sustainable consumption. This research contributes an analysis of how the design process can support the development of new and competitive business models for a sustainable fashion industry. This chapter proposes a model based on a theoretical systems-thinking framework to guide the design practice.

Currently the ISRD model is a theoretical construct that is broad in scope and limited in its ability to provide a detailed process for its application. ISRD does, however, provide flexibility in its application to any area within the fashion industry. The theoretical foundation would benefit from further research on consumer engagement and adaptability within organizational cultures in the fashion industry. Ultimately, ISRD aims to achieve sustainability within the fashion system through a systems-thinking approach of a design practice that supports innovation.

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