

Sustainable Consumption of Information Technologies

The Case of Smartphones



Sustainable Consumption

Sustainable consumption can be defined as “consumption patterns that simultaneously optimize environmental, social and economic consequences of acquisition, use and disposition in order to meet needs of current and future generations” (Phipps et al., 2013, p. 1227).



What is Sustainable Consumption?

- „Fuzzy Concept“. Many different definitions exist. (Reisch, 1998)
- Sustainable Consumption addresses the demand side of sustainability (Connolly & Prothero, 2003)

Global Smartphone Market

- Over 1.5 billion smartphones were sold in 2018 (Gartner, 2018)
- Generated over 500 Billion Dollars in Revenue (GfK, 2018)
- 30 countries achieve a smartphone penetration rate of over 50% (Newzoo's Global Mobile Market Report 2018)
- Global number of smartphone users has reached 3 Billion in 2018 (Newzoo's Global Mobile Market Report 2018)

Sustainability of Smartphone Consumption

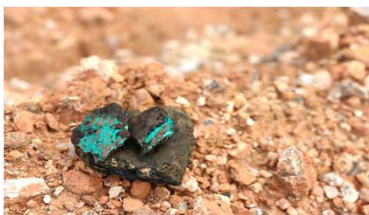
During the production process a new phone generates up to 200 times its weight in waste (Palano et al., 2006). Many components do not become recycled but end up in landfills.

In Germany, Smartphones generated over 2273 t of mobile phone waste in 2010 of which only 5% was collected by official return and collection systems (Chancerel, 2010)



Sustainability of Smartphone Consumption

- Smartphone production relies on mining of minerals in regions dominated by armed conflicts. Mining revenues become used to finance war efforts (Taffel, 2015; Osburg, 2016)



Sustainability of Smartphone Consumption

- Outsourcing of electronics production can enable poor working conditions in supplier firms (Chan, 2013; Nadvi & Reichert, 2015)
- Smartphones have relative short product lives until they are replaced (Palano et al., 2013). In many countries the average life cycle is under two years (Kantar Worldpanel, 2016)

Smartphone life-cycles by country

	USA	China	EU5	France	Germany	Great Britain	Italy	Spain
2016	22.7	20.2	21.6	22.2	20.3	23.4	21.6	20.5
2015	21.6	19.5	20.4	21.6	18.8	23.5	17.7	20.0
2014	20.9	21.8	19.5	19.4	18.2	22.0	18.7	18.2
2013	20.5	18.6	18.3	18.0	17.1	20.0	18.6	16.6

Source: Kantar Worldpanel ComTech February 2017

Another Issue: Unhealthy Usage

Research is not clear on whether excessive mobile phone use can be classified as an addiction

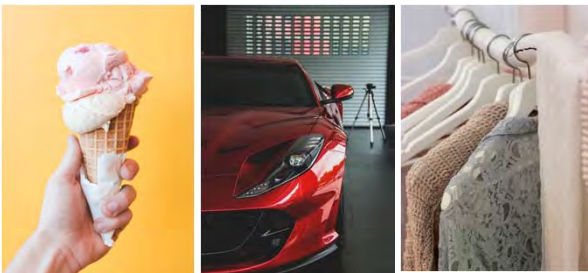
However, problematic consequences of smartphone use can occur

Examples (Gutierrez, de Fonseca, and Rubio, 2016):

- muscle pain
- sleep disturbances
- reliance on smartphones to counteract bad moods

Social phenomena that have connections to smartphone use:
Nomophobia, FOMO, Textlety

Why do we consume goods?



Reasons for Consumption (Jackson, 2005)

- Satisfaction of needs (consumption fulfills a function)
- Desire (more emotionally motivated. Sometimes also status related)
- Convenience and habit
- Identity
- Social conversation (e.g. marketing services; Douglas & Isherwood, 1972)
- Symbolism

Desire



• Social conversation



iPhone 5
Loving it is easy.
That's why so many people do.

?



patagonia

REDUCE
We make useful gear that lasts a long time. You don't buy what you don't need.

REPAIR
We help you repair your Patagonia gear. You pledge to fix what's broken.

REUSE
We help find a home for Patagonia gear you no longer need. You sell or pass it on.

RECYCLE
We will take back your Patagonia gear that is worn out. You pledge to send your stuff out of the landfill and incinerator.

REIMAGINE
TOGETHER we reimagine a world where we take only what nature can replace.


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FAIRPHONE Phone Story Community Support

The modular phone that's built to last


We've created the world's first ethical, modular smartphone. You shouldn't have to choose between a great phone and a fair supply chain.

[Explore the Fairphone 2](#)





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Modelling (Sustainable) Consumer Behavior


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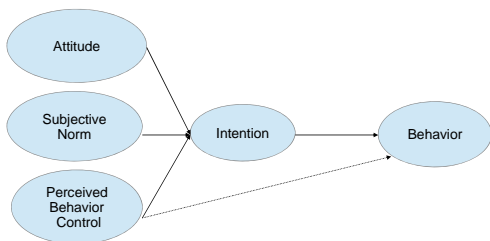
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Why Models?

- Allow to explain and predict consumer behavior based on measurable factors
- Can be applied to a variety of contexts
- Can quantify not only the strengths of certain factors but also the associations between them

Theory of Planned Behavior (Ajzen, 1991)



Theory of Planned Behavior

- Theory has been applied to a large variety of consumption contexts (Armitage & Conner, 2001)
- Examples: Sustainable Consumption (Paul, Modi, and Patel, 2016), Water Conservation (Lam, 1999), Use of Social Networking (Pelling & White, 2009)

Theory of Planned Behavior

- No explicit modelling of emotions, norms, habits or values as influences on intention
- Gap between behavior and intention remains (Sheeran & Webb, 2016)
- Normative component could be extended (Armitage & Conner, 2001)

Other influences on sustainable consumption

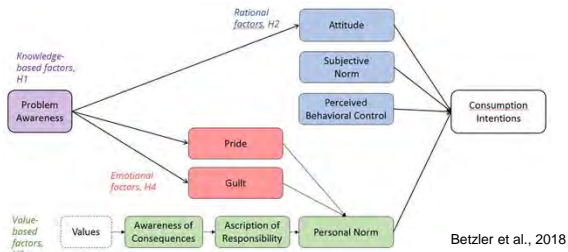
- Values and Awareness (e.g. Value-Belief-Norm Theory; Stern, 2000)
- Emotions such as Pride and Guilt
- Social Context and Culture
- Emotions

Emotions are of central importance in marketing (Bagozzi, Gopinath, & Nyer, 1999).

- Influence on processing of information
- Guide responses to marketing messages
- Can serve as measures of consumer welfare



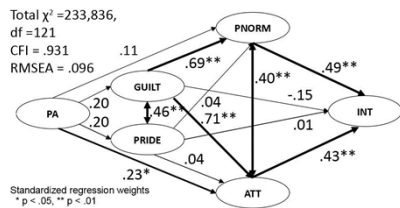
An integrative model approach on sustainable consumption of ICT



Betzler et al., 2018

An integrative model approach on sustainable consumption of ICT

Figure 4: Path Coefficients and Fit of Model 3 for Sustainable ICT Consumption



Betzler et al., 2018

Limits of existing consumer behavior models

- Individuals often act impulsively out of routine, habits or social convention (Jackson, 2005). ... Harder to model
- Consumers can make low-involvement decisions based on simple cues such as colour, price or brand (Hamlin, 2010)
- Buying products based on values requires considerable mental effort (Biel and Dahlstran, 2005)

Recent strategies towards changing consumption behaviors: Nudging (Thaler & Sunstein, 2009)

- People tend to act based on habits, emotions or biases and not necessarily rationally
- Nudging uses these tendencies to influence peoples behavior in subtle ways

Types of Nudges (Lehner, Mont, & Heiskanenm, 2016)

- Simplification and framing of information
- Changes to the physical environment
- Changes to the default option
- Use of social norms

Nudging: Simplification and Framing of Information

Positive labeling of products or behaviors

Feedback programmes on personal CO2 footprints i.e. through apps (Fuji & Tangluchi, 2006)



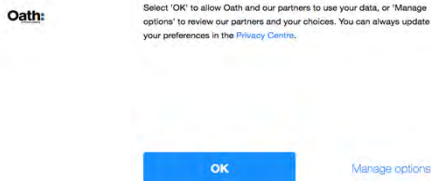
Nudging: Changes to the physical Environment

- Bicycle lanes in Cities
- Reduced plate size in all you can eat environments reduces calorie intake (Freedman and Brochado, 2010)



Nudging: Changes to the default policy

- participation in organ donation is significantly higher in countries where consent is presumed (Johnson and Goldstein, 2003)



Nudges: Use of Social Norms

Placing the text „the majority of guests reuse their towels“ in bathrooms led to greater towel reuse rates (Goldstein et al., 2008)

Neighbours' recycling rates influence each other (John et al, 2013)



iPhone 5
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Strategies towards sustainable smartphone consumption

- Purchase of refurbished phones
- Longer usage of old phones
- Repairing instead of replacing
- Purchase of environmentally friendly(ier) phones (e.g. fairphone)
- Recycling of old phones

Case Study Teamwork

