

**UNIVERSITY OF ECONOMICS IN PRAGUE**

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International Business and Management

## **PLANNED OBSOLESCENCE**

UNDERSTANDING THE REALITY OF  
DURABLE GOODS OBSOLESCENCE AND CONSUMERS  
DISPOSAL BEHAVIOUR

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## **DECLARATION OF AUTHORSHIP**

I hereby declare that I have written this thesis by my own. I have quoted all the resources used. Their list can be found in the enclosed bibliography review.

Prague, Czech Republic, August 29, 2011

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Jana Nejedlá

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# **ABSTRACT**

## **TITLE OF THE MASTER'S THESIS:**

**PLANNED OBSOLESCENCE: UNDERSTANDING THE REALITY OF DURABLE GOODS OBSOLESCENCE AND CONSUMERS DISPOSAL BEHAVIOUR**

## **ABSTRACT:**

Planned obsolescence is the term used to describe incentives of companies to make durable goods faster obsolete. The aim of the study is to make a big picture and real situation about planned obsolescence practising and consumer disposal behaviour. First part addresses the theoretical background and provides comprehensive overview through different aspects of the good's durability issue and planned obsolescence characteristics and influences. Second part in further reference to the information provided in theoretical part examines the situation of specific durable products – laptops. From survey's results on consumer attitudes towards durability of laptops and real case study on Apple Inc. and its reliance to planned obsolescence, recommendations to the more sustainable consumption of consumer electronics are presented.

## **KEY WORDS:**

planned obsolescence, product obsolescence, durable goods, durability, products lifespan, throwaway society, e-waste, laptops, Apple Inc.,

# TABLE OF CONTENTS

<b>THESIS OVERVIEW .....</b>	<b>7</b>
My incentive and motivation .....	7
Structure and goals of the work .....	8
Existing available literature .....	10
<b>THEORETICAL PART .....</b>	<b>11</b>
1. Company in the changing global environment .....	11
1.1. Speed of change and growing global uncertainty.....	11
1.2. Progressive maturity of markets and the ever more market complexity of demand ..	17
2. Planned obsolescence .....	19
2.1. What is planned obsolescence? .....	19
2.2. Durability decision conflict.....	23
2.3. Historical context.....	24
2.4. Types of planned obsolescence mechanisms .....	30
2.5. Microeconomics of planned obsolescence – durable goods theory .....	37
2.6. Drivers of planned obsolescence .....	46
2.7. Social and environmental consequences.....	49
3. Ethical responsibilities and responses.....	55
3.1. Sustainable product design.....	56
3.2. Corporate responsibility.....	59
3.3. Public policy initiatives.....	61
<b>PRACTICAL PART .....</b>	<b>62</b>
4. Survey on consumer attitudes towards laptops' durability.....	64
4.1. Survey methodology and hypothesis .....	64
4.2. Survey results interpretation.....	66
4.3. Conclusions on consumer attitudes .....	73
5. Real case study: Apple Inc. and planned obsolescence .....	75
5.1. Structure and methodology .....	75
5.2. Case study .....	77
5.3. Author's conclusions .....	85
6. Recommendations for longer laptops' lifetimes and sustainability .....	88
<b>CONCLUSION .....</b>	<b>91</b>
<b>BIBLIOGRAPHY .....</b>	<b>92</b>
<b>LIST OF EXHIBITS.....</b>	<b>99</b>
<b>APPENDIXES.....</b>	<b>100</b>

## THESIS OVERVIEW

### MY INCENTIVE AND MOTIVATION

Fifty years ago, planned obsolescence was a hot topic mainly in the western countries. It was widely discussed practice and ethical issue in marketing classes. However, planned obsolescence is topical again in the developed countries. An increasing emphasis on continuous product development promotes shorter durables replacement and disposal cycles with troublesome environmental consequences. Our society works on the basis of production and consumption, where people are consuming and throwing goods with ever greater frequency. In this linear system resources are limited and waste dumps enormous. Planned obsolescence and product lifetimes are again very actual topics because people more and more realize that this system is not anymore sustainable.

Planned obsolescence's objective is to stimulate replacement buying by customers. Relentless product change has become the centrepiece of new product development strategy in many durable goods industries. Products' obsolescence helps to increase demand for the company products and it is profitable for the economy. Nowadays we do not expect anything to last forever, everything has limited life and this limited life is still shortening. It is not only the company who wants us to buy their products; whole economy is based on consumption. For example shortly after the World War II when economy restart was needed, President Eisenhower's Council of Economic Advisors Chairman said that "The American economy's ultimate purpose is to produce more consumer goods" (Leonard, 2007). More recently, after the terrorist attack in September 2001, George W. Bush in his speech to shocked Americans advised them to "Go shopping" (Leonard, 2007).

When I heard about planned obsolescence for the first time in the class of new product development during my exchange semester at HEC Paris, I have found the issue very interesting and started with my own research. Many papers on innovations, marketing and design and their importance in our socio-economical reality were written. My motivation is, on the contrary, to bring critical view on some of practises hidden behind the contemporary economical practises. Even though the topic can be seen as quite anti-business based, I do not see it like that, I just think it is interesting to look on the controversial aspects of our economy development as well. I believe that if people are educated and see the problems, it is on the best way to make the right decision when they have chance.

### STRUCTURE AND GOALS OF THE WORK

The goal of the thesis is to examine issue of planned obsolescence in detail, provide with knowledge for better understanding of the durable goods lifetimes and consumer attitudes towards durability of products as well as their motivation for their replacement and disposal behaviour in the developed countries. Even though some people argue that planned obsolescence is a term from past and there is no evidence companies are practising planned obsolescence these days, by my thesis I would like demonstrate that planned obsolescence is real and actual topic. I explain why planned obsolescence is practised and why it works. However, due to the tough competition and progress on global markets, planned obsolescence does not have to be deliberately planned by a company purposely; I would like to show that for many categories of products it is quite a standard and necessity as a respond to competitors and expectations of consumers. Nevertheless, I assume that mainly market leaders can ‘afford’ to practise real planned obsolescence thanks to their strong consumer awareness and leadership of the development on the particular market.

The goal of the thesis should be reached by two main parts – theoretical and practical. In total, thesis consists from four main parts – thesis overview, theoretical part, practical part and conclusion.

**Theoretical part** consists of three main sections. Firstly, in the chapter *3. Company in the changing global environment* I briefly outline the environment companies are facing on global markets. The aim of this part is to show those trends, which are connected to issue of planned obsolescence and influence it or are influenced by its practising.

The second and the main section of the theory - *4. Planned Obsolescence* should show the big picture of planned obsolescence and issues of durable products. I start with the introduction of the term planned obsolescence and its scope. In the connection to the subject, durability dilemma, which producers of durables confront, and the history of planned obsolescence, which provides the roots and thus logic behind the issue for better understanding of its purpose and effects, are presented. Subsequently, different types of planned obsolescence are depicted. Furthermore, I describe the main microeconomic theories explaining why companies may incline to early (planned) product obsolescence. Then, an explanation of two main drivers of planned obsolescence – competitive pressure for innovation and consumer decision making process- follows. I close the chapter by social (throwaway society) and environmental (e-waste) impacts of planned obsolescence.



In the third section *5.Ethical responsibilities and responses*, I introduce initiatives which are already appearing or possible actions being suggested to decrease the negative effects of planned obsolescence.

The **practical part** consists again of three individual but connected sections. Together, they should give us broader picture on planned obsolescence issues of consumer electronics (laptops) and prove and enrich some of the statements which I have made in the theoretical part.

Firstly, my own *Survey on consumer attitudes towards laptops' durability and extent of disposal behaviour* is presented. The survey brings the demonstration of the real situation on the demand side – consumer's attitudes towards durability of products – as consequence and in the same time one of the two main drivers of planned obsolescence. For the purpose of the survey, 5 hypotheses were made based on the assumption in the theoretical part.

Secondly, in the section *7.Real case study: Apple Inc. and planned obsolescence* I combine secondary information sources and in-depth interviews to investigate the reality of laptops producers (supply side) in the connection to planned obsolescence with the concrete example of Apple Inc. Company. A case study providing a reader with the information related to the topic and giving him/her hypothesis on which opinion should be made. At the end, I provide my own statements on the hypothesis.

In the final section *8.Recommendations for laptops' longer lifetimes*, I conclude the issues of laptops' planned obsolescence observed in the survey and case study and I come up with my own recommendations what could be done to eliminate planned obsolescence practises by companies and change consumer behaviour and attitudes towards laptops lifetimes and disposal.

Final **conclusion** at the end of this paper provides with the main points and knowledge remarked within the practical and theoretical part and final thoughts.

### EXISTING AVAILABLE LITERATURE<sup>1</sup>

Literature on the topic of planned obsolescence was mainly popular in the USA, especially among 50s and 70s, when it was publicly open topic. The prominent paper from this period is *The Waste Makers* of the American journalist and social critique *Vince Packard* (1960). This early critical paper on American productivity, which is still quoted by many present authors, defined planned obsolescence practises and types. Relevant academic papers on the economic models of durable goods and planned obsolescence were written mainly since 70s. In this area should be named authors as *P. L. Swan* (1970, 1972), University of New South Wales, Sydney; *J. Bulow* (1986), University of Stanford; *A. Utaka* (2000, 2006), Kyoto University; and *M. Waldman* (1993, 1996, 2003), Samuel Curtis Johnson Graduate School of Management. The most important thoughts are examined in the chapter Microeconomics of planned obsolescence.

Planned obsolescence is due to environmental consequences popular topic again. From recent academic papers, there should be named *Creative Destruction and destructive creations: environmental ethics and planned obsolescence* of *J. Guiltinan* (2009), University of Notre Dame; which offers explanations why planned obsolescence is practised and why it works and examines responsibilities of product developers and their responses. *Consumption, planned obsolescence and waste* by *N. Maycroft* (2009), University of Lincoln; provides historical critiques of planned obsolescence and critically maps contemporary practises. Very popular is the book *Made to Break* by the American author *Giles Slade*, which provides thorough the obsolescence history of twentieth century. In each period of American history is examined the most significant type of obsolescence which had occurred. Spreading the issue to the wide public empowers a documentary *The Light Bulb Conspiracy: The untold story of planned obsolescence* wrote and directed by *C. Dannoritzer* (2010). It uses investigative research and rare archive footage to trace the planned obsolescence ‘story’ guiding a viewer from historical to present cases.

Finally, a significant author on the understanding of consumer disposal behaviour is the Professor of Sustainable Design and Consumption at Nottingham Trent University *T. Cooper*. Among other interesting papers, importantly his book *Longer lasting products: alternatives to the throwaway society* (2010) is a compelling guidance as to how we could move away from throwaway society towards and economy sustained by more durable goods.

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<sup>1</sup> This overview through literature on the content of the thesis topic I have made subjectively from the most important literature sources I had obtained during my research and work on the thesis.

## THEORETICAL PART

### 1. COMPANY IN THE CHANGING GLOBAL ENVIRONMENT

Globalisation of markets put the companies into increasingly difficult challenges in terms of competition. Before we accuse companies of planned obsolescence practises, we should understand the global market characteristics and continuous innovation pressure companies are facing these days. Interconnection of markets thanks to information technology brought growing fuzziness in competitive boundaries and a growing interdependence between companies (Giaretta, 2005). A complex environmental scenario emerges from series of trends themselves fuelled by the globalization process (Giaretta, 2005). Companies are under pressure by following fast changes.

#### 1.1. SPEED OF CHANGE AND GROWING GLOBAL UNCERTAINTY

Interconnections in global environment cause rapid changes and thus increasing uncertainty in global environment. Uncertainty is mainly time related; nobody can undoubtedly say how long it will take to develop new technology (Giaretta, 2005).

The effect of speed of change is the trend towards **continuous product innovation** (Giaretta, 2005). Continuous and systematic search for product innovation is required to meet the increasingly rapid running speeds imposed by the hyper-competitive context.

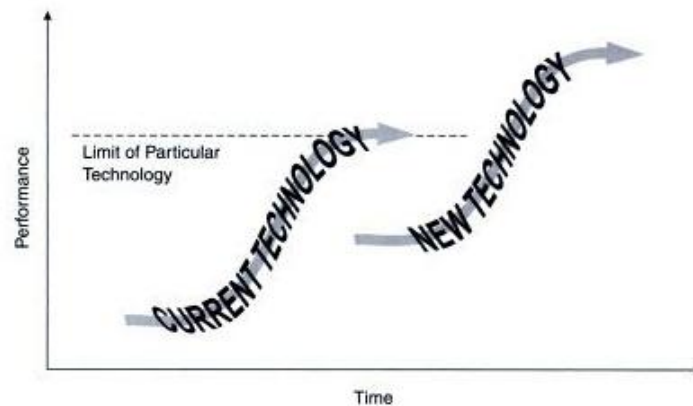
#### ACCELERATING TECHNOLOGICAL CHANGE

Forces of technological progress on one hand enable revitalisation of mature domains, on the other determine a widening in supply, both resulting in even more force competition (Giaretta, 2005).

Technological environment is the most dramatic force shaping companies destiny. Fast-changing, technology-intense markets are characterized by the successive introduction of next generation products. Most challenging and creating suspense is the fact that in technological progress and new product development, there are unlimited opportunities; scientists are working on a wide range of new technologies that will revolutionize products and production processes – biotechnology, miniature electronics, robotics etc. In addition, new technology inventions are offering new approaches to existing problems. Food cost, climate change, ongoing poverty, lack and inaccessibility of portable water and many more of those pressing problems new technology

can help to solve (see exhibit). Those technology solutions for global problems are represented by disruptive innovation for bottom -of-the-pyramid markets<sup>2</sup>.

**Exhibit 1 Technology Life Cycles**



Source: (Mohr, et al., 2010)

Technological change is fundamental for any market, it reshapes patterns of competition and a firm may best cope with these changes (Tang, et al., 1992). There can be infinity of examples how new technologies create new markets and opportunities. Commercial available technology can easily enhance competitive position. Better technology can reduce costs, improve quality and lead to innovation. These developments can benefit consumers as well as the organisations providing the products. Very often the challenge in each case is not only technical but commercial – to make affordable, practical versions of these products (Kotler, et al., 1991). Company has to keep with trends, innovate and think in advance but in the same time make those innovations understandable and affordable for customers.

Nevertheless, it is important to mention that all this will happen with very true innovation – breakthrough. Incremental innovations might accompany breakthrough but problem is that many companies are practising mainly or only incremental innovations. Those two types of innovation significantly differ.

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<sup>2</sup> Bottom-of-the-pyramid markets refer to the largest but poorest socioeconomic group: the 4 billion of the world who live on \$2 per day (Mohr, et al., 2010).

**Exhibit 2 Continuum of innovations**



Source: (Mohr, et al., 2010)

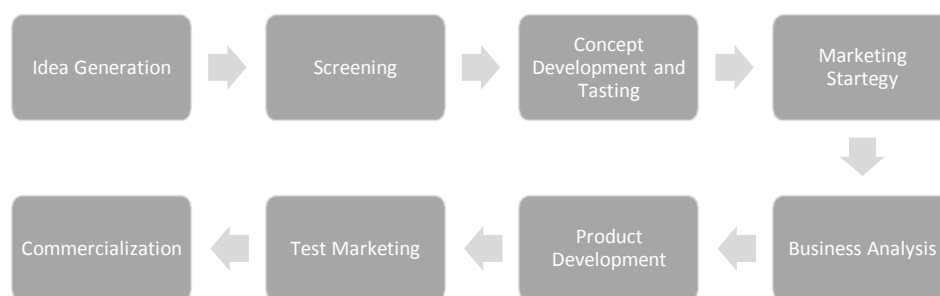
## ***SHORTENING OF PRODUCT LIFE CYCLES AND THE COMPRESSION OF NEWLY LAUNCHED PRODUCTS***

Product planning seems to be even more pressuring on the lowering duration of products. The increase in importance of developing new products makes most competitive those companies which are able to shorten launch times (Giaretta, 2005).

### ***Faster new-product development and replacement cycle***

Given the previously mentioned rapid changes in technology and competition, a company cannot rely solely on its existing products. Thus every company needs a new-product development program. Company can obtain new product through acquisition (buy a company, patent, a license etc.) or through new-product development in company's own R&D department. The new-product development to find a real new product consists of eight major steps (described in the figure below).

**Exhibit 3 Major stages in new product development**



Source: (Kotler, et al., 1991)

New product can be developed from scratch or revision of old products. As a result of high cost of developing and introducing new technologies and products, many companies are making minor product improvements instead of gambling on major innovations. Most companies are content to invest into copying competitor's product, making minor feature and style

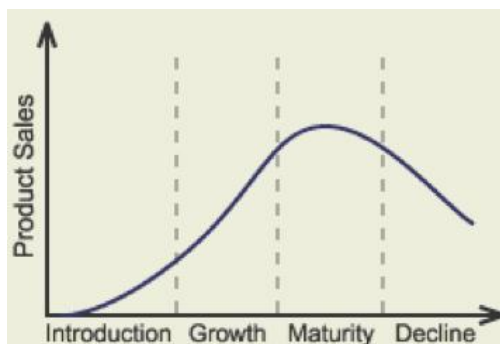
improvements, or offering simple extension of current brands (Kotler, et al., 1991). Those companies very often cannot afford or cannot raise the funds needed for new-product development as for instance IBM, General Motors or Ford do in billions of dollars each year. Moreover new-product development is very risky (as one study found that the new-product failure rate was 40 % for consumer products, 20 % for industrial products and 18 % for services) (Kotler, et al., 1991).

Under global competitive pressure, companies' goal is sustaining the continuity of its innovations; reducing time between one innovation and the next and launching new products at predetermined intervals. Many companies have adopted various approaches toward product development, example could be method of design for manufacturability and assembly (DFMA), which enables them to lower their development costs and shorten their development time. As Hewlett Packard, for example, has shortened the time for designing a new printer from 54 to 22 months (Giaretta, 2005). So Gillette operates its transition process by realising about 20 new products a year and does not put a prototype into production until new product is already on drawing board. Ability to change quickly and continuously develop new product, is a heart of companies' cultures like Intel, Wal-Mart or 3M (Giaretta, 2005).

### *Shortening product life cycle*

After product development, managing the product life is another important challenge for companies on the global market. In many consumer oriented industries, product life cycle have dropped below one year and continue to shrink. Consumer electronics producers like Sony are replacing products in less than year to take advantage of new functions and features as soon as they are developed.

**Exhibit 4 Model of Product Life Cycle**



Source: (Carroll, 2010)

In many industries generally applied model of product life cycle does not work anymore. Different models are developed for e.g. fashion, electronic products etc. Some industries are now

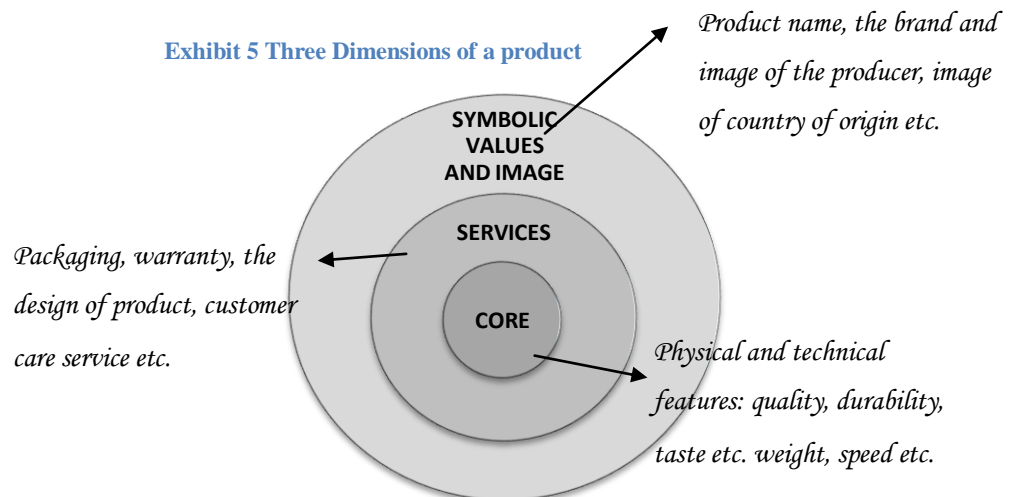
finding that product obsolescence now occurs during the growth stage. In the hi-tech industry firms face an environment characterized by ever-shortening product lifecycles with an inevitable rapid pace of change and potential obsolescence of products (Mohr, et al., 2010). The “decline” phase caused by ‘instant’ obsolescence can even occur during the introduction (Carroll, 2010). For example a new digital camera – there is only about three months to sell it before it is made obsolete. The reality of today’s market is that of ‘instant’ obsolescence, and if a company wants to master innovation, it needs to think about how its own product life cycle is changing.

### GROWING IMPORTANCE OF INTANGIBLE ASSETS

Accelerating technological change leaves consumers and companies under global uncertainty about face of new innovations. In some particular industries, companies cannot surely say what they or they competition will be selling next year. Thus, management of intangible assets is becoming the core values of the business, because of the higher ‘life time’ value.

### BRAND’S UNIVERSE

Significance and value of a brand can be compared or exceed the core of the product depending on the product type. In general, the more developed a market is, the core of the product is less worthy and characteristics connected to image gathering more relevance and interest. In classical marketing theory, 3 dimensions of product are considered, where the third one can make the biggest value.



Source: (Machková, et al., 2010)

This trend in developed countries, when shops’ shelves are overcrowded by “various” product types, brands and images of products help consumers make their purchase decision. Going for particular brand makes a product familiar and represents a certain quality and price level. This can help consumers to save their time of getting information about all products on the market

and following decision making which one to buy. Secondly, brand recognition reduces their risk connected to costs and protects them from threatening social embarrassment. Thirdly, brand hires usage satisfaction by raising emotional feelings (Machková, et al., 2010). It is valid that brand brings value to its owner only because it brings value for customers. Indeed, some brands may be more valuable than all other properties of owning companies.

The most valuable global brands for year 2011 according to BrandZ study are Apple, Google and third IBM (BrandZ Ranking Report, 2011). Report interestingly mentions that brand contributes significantly to earnings across all sectors, both consumer facing and business-to-business. The value of the BrandZ Top 100 Most Valuable Global Brands increased in 64% since 2006.



### 1.2. PROGRESSIVE MATURITY OF MARKETS AND THE EVER MORE MARKET COMPLEXITY OF DEMAND

The maturity of markets reached in industrialized countries makes it increasingly difficult to sell, also because of the complexity that demand has assumed. The consumer is more attentive, better informed and better placed to choose as well as being more demanding from companies. Consumers have higher requests, they are more demanding, informed and selective. The diffusion of information and experience by media are playing a critical role in consumer attitudes. Also the spread of awareness of environmental issues and sensitiveness to well-being of society and sustainability has been growing significantly (Giaretta, 2005).

#### CHANGING SOCIAL BEHAVIOURAL PATTERNS

In the process of modernization, western societies became more individualistic; we live in the age that is global and individualistic. Modern life as it can be observed daily is dominated mainly by culture over economy, aesthetics over instrumentalism, consumerism over production. An individual selects free what he or she feels fits better his or her current need or needs just to replace this with another one in more and more short time, which is usually more interesting, aesthetically more attractive and at the same time having short lifespan. This behaviour entered and has been destroying at ever higher speed also the family structure and marriage.

Ronald F. Inglehart has already in the seventies of last century in the theory of post-materialism postulated that the importance of material security steps in the second row. A young generation more of interest and interesting are postmodern values as quality of life and maximal self-realization represent (Inglehart, 2000).

Our society entered a reality in which our individual selection holds upper position over determination, our wishes over our needs and our personal inclination over external pressures. It all looks like that we have dealings with people who freed themselves from boring earning and dedicate their time to the more exciting spending, certainly with credit, and living with debt. At the same time a debt is becoming the issue for Governments in all parts of the world. The upper hand of economy influences all parts of our life. It did not ceased its power, did not transfer it to the individual. And at the same we are pressured to believe, that an age arrived in which non obliging life style, free person with its individual taste is the best.

In this context it is important to remember that many authors of utopia consider the quality of time in which the contradiction between an increasing economic power influencing not only the

human being and its activities, but also the nature and ecology and decreasing power of the individual to influence the process of implementation of the economic power.

Ulrich Beck (Beck, et al., 2002) describes the wider consequences of individualism as a forced individualism. It is an individualism which remains after the individual has been freed of and from all social networks and support. But such an individual became not free. The opposite is true: the individual is totally dependent on market mechanism and the hyper commercialism. This total dependence represents at the same time a very complex challenge: as an individual with shortage he or she should behave as an early classical capitalist and manage market risk with own means. It is without any doubt that an individual cannot win in this situation. The winner can only be those who are out of the competitor field.

As the connection of individualistic style of life to the excessive consumerism, many respected scientists and researchers invite to direct our attention to the model of supermarket. In a supermarket our society presents itself as a mosaic of ever changing groups of buyers meeting in the supermarket to realize their own individual life, needs and so called free choice. The construction of individual life seems to be as a Lego play or collection of elements taken out of the supermarket shell. Therefore we can claim that consumers tend to be more dependent on products and companies.

### GROWING ENVIRONMENTAL PRESSURE

Global environmental issues are very discussed and strongly stressed these days. Sustainability and sustainable development are deeply integrated into our daily vocabulary. Environmental aspects of production have started being relevant to some groups of consumers and there is pressure on companies to be “green”.

Society is aware that every day natural resources are being depleted, while rapidly grows the middle size with substantial purchasing power in large nations like China and India. Paradoxically, this is a threat for the developed world. This system of materials economy cannot continue under same circumstances if billions of people from developed countries will purchase and throw away the same amounts of goods as consumers e.g. in the US.

*“The USA has 4.6% of the world’s population but they are consuming 33% of the world’s resources and creating 30% of the world’s waste. If everybody consumed at U.S. rates, we would need 3 to 5 planets, or it would meet the needs of only approximately 1.2 billion people”* (Leonard, 2007).

## 2. PLANNED OBSOLESCENCE

### 2.1. WHAT IS PLANNED OBSOLESCENCE?

You can easily find enough expressions of what the term planned obsolescence actually mean. Although, there is a plenty of the definitions, it is very hard to find any, which would be unprejudiced, complex as the issue of planned obsolescence actually is. However the core and main idea of all definitions are very similar and straightforward. Let's use one of those you can find anywhere on the internet, if you use Google to search for planned obsolescence, as an example.

*"Planned obsolescence is the decision by a manufacturer to purposely design, manufacture and distribute a consumer product to become obsolete or non-functional specifically to force the customer to buy the next generation of the product"* (ComputerInfoWeb.com).

From the definition it is clear that planned obsolescence of product is a conscious stimulation of a consumer and demand by a producer. This represents the first word **planned**, which stands for the most important fact that products consumers buy do not obsolete by a chance, but it had been purposely planned or at least desired by a company before the product has actually become obsolete. The word decision in the definition integrates the fact that company could choose and decide whether it integrates planned obsolescence or not. As it is examined later in the thesis, it is not so simple, a company is not separated individual and it is influenced by consumers' demand, competition and other elements from its micro and macro environment. Blame only companies would be too short-sighted.

The second word of term – **obsolescence** - denotes the device of a company's strategy. The company practising planned obsolescence does not want a product last forever; it wants the product to become obsolete after some amount of time or a volume of use<sup>3</sup>. Nevertheless, there are more possibilities how to make a product for consumer obsolete. Then we speak about different types of planned obsolescence. Either the product can stop functioning or the technological performance is unsatisfactory compared to newly launched products or product is "in our minds" just not enough desirable anymore and we buy more desirable and modern one<sup>4</sup>.

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<sup>3</sup> Businessmen over the years have developed a variety of phrases to describe that critical point when their product will, or is likely to, collapse. They speak of "the point of required utility", of "time to failure", or "product death date". Engineers can the product death date be determined very precisely.

<sup>4</sup> Detailed description of the different types of planned obsolescence you can find in the chapter 4.4 Types of planned obsolescence mechanisms

Companies are blamed for using design, marketing communication tools (advertisements) and fast “upgrades” to make consumer’s present model looks old-fashioned, looks shabby even though still functioning well, make the new model more attractive in appearance, more convenient, more economical and thus shortening the product lifespan. This suppose to be the most expanded form of obsolescence – the obsolescence of desirability, nicely expressed by statement of “the one” American industry designers from the 50s;

*"Planned obsolescence is instilling the consumer the desire to own something, a little more, a little better, a little sooner than it is necessary" (Brook Stevens)<sup>5</sup>.*

Importantly, **design** is perceived as the most important and easiest tool the obsolescence of desirability. From the 50s in the USA when designers were propagators of planned obsolescence and by new designs were trying attract customers’ attention and change their perception of products. According to the basic marketing theory, design is a larger concept than style. Unlike style, design is more than skin deep; it goes to very hard of the product. Suitable design can attract attention, improve product performance, cut production cost, and give to product a strong competitive advantage (Kotler, et al., 1991).

*“Planned obsolescence drives the design of fashion, design aesthetic that lead to reduced satisfaction, it drives our economy by encouraging people to buy new things instead of trying to repair the old ones, when they break” (Byrne, 2011).*

What the stated definition did not mention and should be stressed is that planned obsolescence has its sense and is used for **durable goods**. According to Philip Kotler durable goods are consumer goods<sup>6</sup> that are used over an extended period of time and that normally survive many users, e.g. automobiles, refrigerators, furniture, electronics etc (Kotler, et al., 1991). Durable decision conflicts of companies and also consumers make a dilemma and very hard decision about the durability of products. Then, the strategy logically is to give to a customer what he/she expects, not the best, but what he is willing to give up for the satisfaction he is looking for. The

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<sup>5</sup> You can read more about Brook Stevens in the chapter 5.3 Historical context

<sup>6</sup> Consumer goods are those bought by final consumer for personal consumption. Marketers usually classify these goods based on consumer shopping habits. Consumer goods include convenience, shopping, specialty, and unsought goods. Convenience goods – buyers does not spend much money and time in spending on these products, does not perceive significant levels of risk in making a selection (e.g. umbrellas). Shopping goods - buyers are willing to spend a significant amount of time and money in searching for and evaluating these products. Increased levels of risk are also perceived by consumers for these high involvement products (e.g. automobiles). Specialty goods - those which have some particular identification or unique characteristics for which a significant group of buyers is willing to make a special effort (e.g. high priced men’s suits). Unsought goods – are goods that consumer does not know about or does not think of buying them (e.g. life insurance). (Murphy, et al., 1986)

manufacturer choice is determinate by a quality and durability level that matches target market needs and the quality levels of competing products on the given price level.

### PERCEPTION OF PLANNED OBSOLESCENCE

Most of the people have very similar perception about planned obsolescence. They had it linked with the shorter life of batteries, cartridges and computer hardware and software, where its awareness ended for them. Those are the most frequent examples of planned obsolescence today. Many of them reacted to this topic usually quite negatively.

Nowadays planned obsolescence is not seen as a problem only of companies but it is seen as deeply integrated into our individualist **consumer society**. It could be even considered as one of its pillars. Consumer used to dispose functional products and go for the newest versions. Even though marketers argue that consumers can decide and buy what they like and when they like. However, many consumers feel pushed by still new coming technologies and fashionable trends.

*“It is the flip side of capitalism as a progressive and modernising historical force with its stress on what is new, what is created, what is produced. A focus on obsolescence highlights that which is devalued, wasted, destroyed. Indeed, all must be made obsolete according to capital's logic, such that all needs should be satisfied via the consumption of commodities, new needs are created to be satisfied in the same way and all needs and their commoditised satisfactions should be continually renewed in order to secure continual and expanding consumption”* (Maycroft, 2009).

What people usually do not know is that planned obsolescence does not have to be put irretrievably in the box of negative terms. Planned obsolescence is by many people viewed positively in connection to **innovation, technological progress** and creativity. As it is mentioned by misters Fishman, Gandal and Oz, “Planned obsolescence as an engine of technological progress” showed that planned obsolescence may be a necessary condition for the achievement of technological progress and that a pattern of rapidly deteriorating products and fast innovation may be preferred to long-lasting products and slow innovation (Fishman, et al., 1993). On the other hand, the innovation must be real and not superficial, as it usually happens in the practise.

The issue of planned obsolescence is very complex and because of its integration through the history deeply in the business strategies and in our society, it is very hard to say how the world would look like without it. We have to keep in mind not just a company or a product itself but how planned obsolescence's implementing influence whole business and society. Critics claim

that so-called planned obsolescence is the working force of competitive and technological forces in a free society, forces that lead to ever-improving goods and services (Kotler, et al., 1991).

One of the global and social issues linked to planned obsolescence is economically and ecologically irresponsible manufacturing, mainly represented by the exaggerated usage of renewable resources and **electronic waste**. The production of e-waste by developed countries is enormous and causes serious ecological and health problems in developing countries, where it is often illegally exported. Although most of the people argue that such a huge production of waste is unsustainable, some people are coming with more positive arguments. Mainly economist and engineers, from which can be named our formal president Václav Klaus, argue that only technology progress can help us to solve our present problems and find out new solutions (Klaus, 2009); how to use resources more efficiently, new ways of recycling and upcycling etc. In other words, broad policy of planned obsolescence can be valuable in order to take the maximum advantage of our potential for productivity and technological progress, which can help us solve the problems planned obsolescence brought.

Despite the innovative aspect of planned obsolescence, it still represents for a society more negative influences than the positive ones. Thus, unsatisfied consumers, ecologists, designers and engineers look still for new ways how to fight against consequences of planned obsolescence differently than just trying to restrict it and slow down the development, looking for sustainable future.

## 2.2. DURABILITY DECISION CONFLICT

Durable goods producers face a specific challenge in maintaining a high rate of sales growth (Guiltinan, 2009). Durability is an important choice variable for durable goods producers to compete in the differentiated goods markets. When a company makes decision about product's durability, it has to take into consideration not only effects on the product's life cycle and development time and costs, but primarily the influence on the demand of the product. The conflict in company's decision making about durability of its products is the problem of the durability's two opposing effects on demand.

The positive effect of durability on demand is easy to recognize. Higher reliability boosts demand by benefiting the durable product owners in two ways - so called **competition effect**. Firstly, it implies a lower rate of problem occurrence and thus lower cost associated with a product's breakdowns. This cost is not restricted to be pecuniary repair cost, it can also include the time spent with the dealers and processing warranty claims and all the other hassles and inconveniences caused by the service interruption. Higher reliability also leads to a higher resale price (Wang, 2007 p. 3).

However, durability has another level of effect on product demand which works in the opposite direction as above, so called **holding time effect**. This effect stems from one significant aspect of e.g. the automobile market that people hold vehicles across multiple periods. The negative effect of higher durability is that it lengthens the holding time. As a consequence, consumers come back to the market to make repeat purchases less often, which discourages the overall demand and firm's profits (Wang, 2007 p. 4).

On that account, company has to balance durability taking into consideration competition and holding effect - the retrieve production costs and marginal costs of improving durability. Company can adopt different marketing strategies and positioning together with selling price to which should be the durability adjusted. Clearly, current trend of price tough competition and need for cost cutting negatively influencing products' durability and encourages or even impel companies to planned obsolescence practising<sup>7</sup>.

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<sup>7</sup> The problem of durability level and planned obsolescence involvement is much more complicated and there have been many microeconomic theories developed to analyse it. I examine this in more detail in the context with planned obsolescence in chapter 5.5 Microeconomics of planned obsolescence – durable goods theory



### 2.3. HISTORICAL CONTEXT

“Planned obsolescence in all its kinds and forms was born and grown up in the United States, from where it had been spread covered by the capitalism coat all over the world” (Dannoritzer, 2010). The dominant opinion on planned obsolescence differed through twentieth century, which helped me to recognise and divide the „history of the planned obsolescence” in the following main periods. Looking at the history helps us to understand why and how planned obsolescence used to be and is practised.

*“In many respects obsolescence is the economic and cultural foundation of capitalism in general and of its distinctive variety of market driven consumption in particular”* (Maycroft, 2009).

#### INTRODUCTION OF PLANNED OBSOLESCENCE AS A TOOL TO FUEL THE ECONOMY

A conception, roots and an idea of planned obsolescence can be seen already in the **Industrial Revolution**. As the late 19<sup>th</sup> century economy moved from man-powered to machine driven industry, new machines could produce much more products and cheaper. It was good for consumers. However consumers could not keep up with the machines. There was so much production. Supply overturned demand. Mass production made many products wide available, prices fell and people started shopping for fun rather than need (Dannoritzer, 2010). The economy was booming and consumer economy growing in the beginning of the 20<sup>th</sup>.

*“Planned obsolescence last the same time as production and consumer society”* (Dannoritzer, 2010).

Manufacturers were looking for solutions how to sell all the production and acquire permanent and growing body of consumers. The first answer for the manufacturers was branding and packaging as the power for creating repetitive demand. Business philosophy in its primary development was moving from production concept to product concept. Nevertheless branding after some time was not enough and in **1920s** manufactures started shortening products’ life to increase consumer demand.

**Automobile industry** was one of the first industries (following e.g. the light bulbs and followed by radios, watches etc.) where the idea of planned obsolescence was used. The reason was simple; nearly every American family that could afford a car already owned one. It was the time when fashion was introduced into manufacture of automobiles (Slade, 2006). The two biggest players and competitors on the US market – **General Motors** and **Ford** – chose different strategies. General Motors president Alfred Sloan had unreservedly adopted the principle of the yearly style change which they called as “artificial” obsolescence. On the other hand Henry Ford



tenaciously and ideologically opposed to obsolescence; as a concept and in practise. The triumph of obsolescence in the automobile industry has been told by a number of historians as part of the explanation how Henry Ford forfeited his dominant share of the market (Harmer, 2005).

*"The key to economic prosperity is the organised creation of dissatisfaction... If everyone were satisfied no one would want to buy the new thing"* (Charles Kettering, head of research in General Motors).

However, the origin of the expression “planned obsolescence” is generally linked with **the Great Depression in the 1930s**. It was the period of a deep economic recession following the Wall Street stock market crash in October, 1929. Banks failed, many companies went bankrupt and unemployment soared. Entering the Great Depression, millions of people were unemployed in the USA, approximately ¼ of workforce. In other countries, the unemployment rates range from 15 to 25 percent. People no longer queued for goods but for food and work.

In 1932, **Bernard London**, a Manhattan real estate broker, made a radical proposal how to kick the economy again. He came with the suggestion for a “cure” for the depression in his controversial paper **Ending the Depression Through Planned Obsolescence**. Very likely it was the first time when the term planned obsolescence was actually used.

London criticised the inadequate economic organisation, when too much was staked on caprices of consumers. He did not agreed with the chaotic and unstable way how economy was working. He wanted to plan and control; adjust people the new way of thinking. His proposal was built on compulsory planned obsolescence controlled by the Government. Majority of products would have a span of life with a certain expire date. Consumers would give these products to Government Agencies where they would be destroyed (London, 1932). The government would have stable earnings from taxes on the legally “dead” products. Afterwards state could lend money toward creating new building, machines and commodities. The new building owner would pay twice higher interest rate than was the real interest rate (London, 1932).

Bernard London was trying to achieve balance between capital and labour. Everyone would be consuming and everyone would have a job. Bernard London saw in his theory of planned obsolescence the benefits as it would bring order out of the chaos, for example organised and regularized the opportunities for employment. He believed that planned obsolescence could obviate the colossal social waste of making no use of the work power of millions, which was for the US estimated by Malcom C. Rorty, business executive and statistician, for more than 50 billion of dollars during the years 1929 - 1932 (London, 1932). Last big advantage London saw

in the Government finances, which would be more stable thanks to income from goods, which had been declared obsolete.

Despite of the fact that London's proposal was ignored and obsolescence as legal obligation was never put into practise. However, 1930s were mother of industrial design and thus planned obsolescence. Obsolescence planning was spelled out much more bluntly and specifically in terms of quality, example can be a speculative article entitled "Outmoded Durability" in Printers' Ink (January 9, 1936). The article's subtitle was: "If merchandise does not wear out faster, factories will be idle, people unemployed" (Packard, 1960). During the **1930s** and **1940s** the superstar designers were employed to make all kinds of new products irresistible to consumers (Dannoritzer, 2010). After the World War II, the most important need of the consumers had been met and marketing turned to consumer oriented.

### CELEBRATION BY INDUSTRIAL DESIGNERS AND CONSEQUENT ACCEPTATION BY CONSUMERS

Planned obsolescence's "years of fame" came in **1950s**, when it became massively accepted term. The symbol and person behind propagation of planned obsolescence to every day American life was an industry designer **Brook Stevens**. He believed that an industrial designer "should be a businessman, an engineer, and a stylist, in that order" (Adamson, 2005). Stevens designed all kinds of products from home appliances to cars always with product obsolescence his in mind, his designs had the speed and modernity. It is already more than 50 years since he travelled around the USA to promote planned obsolescence but the design industry has had to cope with it ever since, argues Jeremy Myerson, professor of design studies at the Royal College of Art (Myerson, 2004).

*"Our whole economy is based on planned obsolescence, and everybody who can read without moving his lips should know it by now. We make good products, we induce people to buy them, and then next year we deliberately introduce something that will make those products old fashioned, out of date, obsolete. It isn't organized waste. It's a sound contribution to the American economy"* (Brook Stevens) (Packard, 1960).

Stevens was unapologetic about the ability to instil in the buyer. He promoted that man and woman are increasingly interested in look of things. They give their attention to what is new and beautiful. Volkswagen contradicted him in one 1959 advertisement, which stated "We do not believe in planned obsolescence". In the functional durability of that ugly little motor from

Germany, there was a distinct shift of emphasis from the one-season-only Detroit dream machine (Myerson, 2004).

Steven Brooks was not only propagator of the planned obsolescence in the 50s. Elder designer W.D. Teague argued for “legitimate, honest obsolescence to advance the market rather than the questionable tactics that produced such lame ducks as the Ford Edsel” (Myerson, 2004). Even not only designers celebrated planned obsolescence, it was a culturally accepted phenomenon in the USA. Unlike the European approach, when they were still trying to make the best product, last forever; meaning you bought such suit or clothes that you married and buried in it (Dannoritzer, 2010). Approach in America was to make consumer unhappy with the products that he has enjoyed have it passed on to second hand market and obtain the newest product with the newest possible look. In fact, this approach, mass production and American consumption culture was rapidly creeping across the Atlantic Ocean.

*“Freedom and happiness through the unlimited consumption – the American way of life in 1950s became the foundation for consumer society as we know it today”* (Dannoritzer, 2010).

### DISPUTATIONS OF IMPACTS OF PLANNED OBSOLESCENCE WHICH IS INSEPARABLE FROM MODERN CAPITALIST SOCIETY

In the **1960s**, when businessman believed in the practise of “progress through planned obsolescence”, students protests involved a strong counter cultural stream that seek to develop alternatives to consumer goals. **Hippies** and other counter cultural groups disdained many of the splendours of consumerism. The goal was turning back to the nature and modest life (Stearns, 2001).

In the year 1972 **OPEC oil crises** occurred, launching the environmental movement. People started realising that resources are non-renewable and waste decomposition takes decades and even more. Through the 1980s public’s awareness of environmental issues began to grow. Since that environmental aspect is more and more important for the society. Until nowadays the two most criticised impacts of planned obsolescence are unnecessary high consumption of resources and huge production of electronic waste.

At the beginning of the twenty-first century, most consumers in the west have not known a world where planned obsolescence did not exist. On the contrary, economies within the Eastern Bloc were working without planned obsolescence. They were not ruled by free market but by centrally planned one. Therefore planned obsolescence was in this economic system inefficient, it did not make any sense; it would be a shortage of resources. In the East Germany, there was officially

declared that fridges and washing machines should have worked for 25 years (Dannoritzer, 2010). 20 years after fall of the Berlin wall consumerism is ramped in the east as in the west of Europe (Dannoritzer, 2010).

Recent trend, outsourcing manufacturing to companies in China and other low cost production centres has affected product price and life expectancy. The low price and quality of MADE IN CHINA had a distorting effect on the western marketplace that accelerated early retirement of products. The outsourcing manufacturing has raised planned obsolescence to a higher level.

### **REAL CASE FROM HISTORY: LIGHT BULB CONSPIRACY**

The story of light bulbs is undoubtedly a real case of planned obsolescence in our history. How ironical that light bulb has always been a symbol for ideas and innovation and at the same time represents probably the earliest and best example (Dannoritzer, 2010) of worldwide organised planned obsolescence.

Thomas Edison's first commercial bulb put on market in 1881 lasted 1500 hours. When advertised lifetime of bulbs was 2500 hours, main manufacturers suit meeting for secret plan. On December 24th, 1924 the so called Phoebus Cartel or International Energy Cartel was formed to control the manufacture and sale of light bulbs through the world (Sasaki, et al., 2008). Run by International GE, Osram, and Associated Electrical Industries of Britain, which were in turn owned 100%, 29% and 46%, respectively, by the General Electric Company in America (Pynchon, 1995).

Officially, Phoebus members systematically changed bulbs to allow them to produce more light per unit of electricity. This also cut the average lifespan of bulbs, forcing consumers to purchase more of them. The cartel did not advertise the change, but when called to account, managers pointed out that the new bulbs provided more light per unit of power and so benefited customers. Nevertheless, it was not clear, why consumers could not have chosen for themselves between the new, brighter bulbs and the old, longer-lasting ones (Sasaki, et al., 2008).

However, the purpose of the cartel cannot have been rebutted; in 1925, "1000 hour life committee" was established with the purpose to technically reduce the time an incandescent lamp could burn. In one of the Phoebus statements was written: "The average life of bulbs must not be guaranteed published or offered for another value than 1000 hours" (Dannoritzer, 2010). Under pressure of the Cartel engineers and research aimed to more fragile bulbs. All members of the Cartel had to write monthly average life reports of all types of light bulbs and there were fines for factories with longer lifespan. In two years lifespan of bulbs dropped steadily - in two

years from 2500 hours to less than 1500 hours. By 1940 cartel reached its goal; “1000 hours become the standard lifespan for bulbs” (Dannoritzer, 2010).

In next decades inventors came with many patterns for bulbs including one lasting 100 000 hours but none of them reached the general market. As a prove can serve the NARVA bulb example. In 1981, the long life bulb NARVA was launched in the East Berlin and it was proudly taken to international lightening fair looking for buyers from the west. The western buyers illogically for the eastern engineers rejected the bulb (Dannoritzer, 2010).

The rationale behind reducing a light bulb’s lifetime seems obvious: it forces customers to buy more light bulbs and, hence, increases demand. On closer inspection, it is unclear whether this commercial strategy raises profits, because, quite naturally, customers will not be willing to pay as much for a less durable product (Sasaki, et al., 2008). Indeed, Phoebus “stabilized” prices of light bulbs at a high level, roughly four times higher than in the U.S. (Time Magazine, 1945). Professors from University in Berlin Dan Sasaki and Roland Strausz provide another straightforward explanation why colluding firms may want to reduce durability: “reduced durability makes collusion easier to sustain”. Their argument is that reduced durability raises the frequency of interactions between the firms and thereby raises the speed at which cartel members can retaliate against deviators (Sasaki, et al., 2008 p. 3).

Nowadays, we cannot naturally meet another case like was the Phoebus cartel, in most of the countries cartels are as a form of business prohibited because their reducing effect on competition.

### 2.4. TYPES OF PLANNED OBSOLESCENCE MECHANISMS

Planned obsolescence can be perceived as the catch-all phase used to describe the assortment of techniques used to artificially limit the durability of manufactured goods in order to stimulate repetitive consumption. (Slade, 2006) These techniques how to achieve repetitive consumption through obsolescence have appeared in its many forms and combinations. In various literature sources ( (Cooper, 2004), (Downes, et al., 2011), (Guiltinan, 2009), (Maycroft, 2009) and (Packard, 1960) )the forms or phases of planned obsolescence are named or divided little bit differently, so for the purpose of this thesis, it has been applied sorting derived from and the various sources and my contribution. However, the major separation into three different types of obsolescence is derived from Packard (1962). He uses obsolescence of function, obsolescence of quality and obsolescence of desirability. For better association with the terms those three types of obsolescence are used under the terms obsolescence of functionality (Slade, 2006) (corresponds to the Packard's obsolescence of quality), obsolescence of technology (Slade, 2006) (corresponds to the Packard's obsolescence of function) and obsolescence of desirability remains the same.

#### OBSOLESCENCE OF FUNCTIONALITY

Nowadays, we generally do not expect durables last forever. Engineers make products to last for certain definite time of life. Problem arise when a company is too aggressive, underestimates consumers expectations and overshoot “socially accepted” products’ life duration. Then we talk about *limited functional life design* or “*death dating*” (Packard, 1960).

*When deliberately planned, certainly the most dubious of all types; a product wears out or breaks down at a given time, usually not very distance* (Packard, 1960).

The obsolescence of functionality mostly started appearing when producers recognized their ability to manipulate the failure rate of manufactured materials. As one of the best examples (next to light bulbs) for this kind serve ‘the nylon stocking story’. In 1940 American chemical company DuPont introduced to the world revolutionary synthetic fibre - nylon. Ladies celebrated the new lasting stockings but the joy was shortly terminated; these new stockings were very strong and had very long lifetime. Companies soon realised that they were selling stockings and would not sell too many (Dannoritzer, 2010). Chemists got new instructions to try to make the fibres weaker and come out with something which was more fragile so the stocking would not last as long (Dannoritzer, 2010).

On the other hand, some people argue that despite the fact that lowering quality of especially electronic appliances is accused; nowadays physical obsolescence is not the most common paradigm of planned obsolescence. Economists argue that by slashing the lifetime of products by half, consumers do have to buy them twice as often but are willing to pay only half as much. In the end, the firm's monetary revenues remain the same (Strausz, 2008).

### *DESIGN FOR LIMITED REPAIR (GULTINAN, 2009)*

Greatly much familiar and verifiable obsolescence of functionality is a designated lifespan into specific parts of products. Problem is that companies often provide new components prohibitively expensive to discourage people from trying to replace parts. 50 years ago, people were used to have their televisions repaired and in existing repair shops. Today the price of reparation is catching up the price of a new product. Finally, the repair does not have to be even possible; a company will simply stop making spare parts to make sure consumers buy another product. Here we can put the very best example of batteries' durability. Your laptop or cell phone is working perfectly, just the battery capacity and potential went steeply down after the warranty was over. Moreover replacement of the battery will be very expensive, is not possible or the battery is not anymore available in shops. So you prefer to buy a new product.

The most famous case and evidence of those practises is the case of Apple iPods. Apple Computer Inc faced the nationwide lawsuit by US customers in December 2003, because of the first, second and third generation of iPods early battery failures. The iPods batteries had lower playtime than was advertised and usually broken down in between 12 to 18 months and moreover were at first irreplaceable and later the price for battery replacement was approximately one fifth of the iPod's price (Konrad, 2005). The law suit was two years after iPod was introduced when only in the US were about 2 million iPod users. As the advocate of plaintiffs Elizabeth Plizker said: "From the technical documents about battery was clear that the battery was designed by design to have short period of life." After the judicial decision, Apple set up replacement battery service and prolonged service warranties (Dannoritzer, 2010).

"Apple has to admit they messed up and made a battery that doesn't last very long and doesn't have the ability to be easily replaced. Failure to do so is evidence of their environmental very as cosmetics" said Gopal Dayaneni, director of sustainable technology program at Silicon Valley Toxics Coalition (Konrad, 2005).

### *NOTIFICATION OBSOLESCENCE (Wikipedia, n.d.)*

The newest and surely the less moral is the version of planned obsolescence which is not mentioned to be hidden but reversely presented to the customer as an innovation and an advantage. The product itself informs user when it is a time to buy a replacement. Think about new “innovation” of Mach 3 from Gillette, one of the brands of Procter & Gamble, a strip which changes colour to alert the user he needs a new blade. Users are notified that the blade will be blunt soon and they should use a new one, very probably more quickly than it is really necessary as some users have already pointed out in online discussions.

More extreme level of notification, unfortunately very actual, is combined with the deliberate of a product to prevent it from working, thus demanding the user to buy a replacement. Here is the place to mention the often criticized printers and inject cartridges. In their case we really can say that “they are designed to fail”. Manufactures built in the obsolescence by the proprietary smart chips which do not allow the printer to work after some defined amounts of pages printed (Dannoritzer, 2010). A printer stops printing and repair is not possible, all the shopkeepers advise to buy a new printer.



### OBSOLESCENCE OF TECHNOLOGY

The second type of planned obsolescence is so called *technological obsolescence* or *obsolescence due to technological innovations*. In this situation an existing product becomes outmoded when a new product is introduced which performs the function better. If there is pure technological innovation, functional obsolescence would be just natural obsolescence, and thus beneficial. In another case, if the new technological aspects are just superficial, made to persuade consumer he/she has to buy something with “higher performance” than he/she has now, then we can talk about examples of planned obsolescence.

To meet a superficial innovation is very easy these days. Strategy of most companies is very clear, every year new product, but no relevant innovation value added. Let's mention example of the digital compact cameras. Marketers persuaded people that more megapixels mean better quality of pictures and they should spent their money on a new camera with more megapixels, so a higher resolution. However, the higher resolution may paradoxically lead to a lower image quality. More megapixels on a small chip digital camera further multiply the impact of poor quality optics and the image pops up various image defects, such as noisy and grain. Megapixels affect picture size, not image quality. That is the reason why your new camera can make worse pictures than your old one.

### DESIGN FOR FUNCTIONAL ENHANCEMENT THROUGH ADDING OR UPGRADING PRODUCT FEATURES (GUILTINAN, 2009)

Technological development and very frequent “upgrades” of products' versions allow firms continuously expanding the number of uses or benefits of a product (e.g. adding camera feature to a cell phone). Producers tend to “overcrowd” their products with upgrading futures and even if some consumers would like to buy simple products, they are mostly forced to buy the “full of futures products”. Obsolescence is more effective when the incremental features of the new products are universally perceived as beneficial and desirable (Guiltinan, 2009). Moreover, producers will often remove the older products from the market when launching the more sophisticated alternative. As a result, consumption of the new version may become obligatory when it becomes necessary to replace a minor component, affect a certain repair and so on (Sasaki, et al., 2008).

### INCOMPATIBILITY OF TECHNOLOGY (MAYCROFT, 2009)

Technological development combined with technical incompatibility between systems, hardware and software all aid this dynamic towards obsolescence. The fact that many incompatible

components are often manufactured by the same company through subsidiary divisions adds to the suspicion that obsolescence is indeed planned or in-built (Maycroft, 2009). The very used example in this case is Microsoft and its operation systems. They force their users switch from the older version to new one just because the new one is incompatible with the older one, even though the older one is still more than satisfactory and comfortable for the users. You can buy software which is compatible with Windows XP and surprisingly the same software is not compatible with the Vista coming after. Hardware developers make their products very often backwards incompatible for the same reason.

### *OBSOLESCENCE BY LAW (LAPOIX, 2011)*

As the last form of planned obsolescence practised by companies we can consider lobby for new legal requirements and standards when customers have to buy a new product to stay within the law.

A great example of this forced consumption is the humble lift. The four main lift cabin manufacturers - ThyssenKrupp, KONE, Otis and Schindler - appealed to the French standards setting body AFNOR<sup>8</sup> after mortal accidents in Amiens and Strasbourg. They expressed their concerns to the minister, Gilles de Robien, who tabled a law that will lead to a huge replacement programme to ensure the country's lifts are safe to run between 2013 and 2018. This safety critical upgrade is set to cost between four and eight billion Euros (Lapoix, 2011).

Nevertheless, according to a report by Parisian councillor Ian Brossat published last year by Marianne2 (Dequay, 2010), the programme is very unlikely to be of much use to the general public. "It's not the lift cabins themselves that cause problems, but poor maintenance carried out by overworked technicians" (Lapoix, 2011). Especially the two accidents that led to the "de Robien law" were both triggered by insufficient maintenance.

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<sup>8</sup> Association française de Normalisation (AFNOR) is the French national organization for standardization and its International Organization for Standardization member body. More information on their official homepage: <http://afnor.org/>

### OBSOLESCENCE OF DESIRABILITY

The obsolescence of desirability is the most widely used and the most effective form of planned obsolescence. You can hear people talk about *psychological*, *perceived*, *stylistic progressive* or *dynamic obsolescence*, which all represents the same – mechanism of changing product style as a way to manipulate consumers into repetitive buying. Products are deemed to have worn out stylistically well in advance of any functional considerations. By changing the way stuff looks, consumers tend to throw away products which are perfectly healthy. This stylistic obsolescence copies the law of fashion. To wear the product out in the owner's mind, made it old fashioned, non-modern.

The material manipulation upon which stylistic obsolescence is built is significant. So, while it may be truthfully argued that no one is forced into stylistic replacements for appearance's sake alone, it is often the case that such cosmetic refinements mask these more material concerns of functional or technological planned obsolescence (Maycroft, 2009).

### DESIGN FOR FASHION (GULTINAN, 2009)

*"Fashion is a form of ugliness so intolerable that we have to alter it every six months."* (Oscar Wild).

Fashion and textiles were in the 30s in the USA the third largest and the most rapidly growing industry. Therefore the success of styling and designing of women fashion was copied to other industries. One of the first examples is cooperation between General Motors and dye-making giant Du Pont. Instead of waiting for technological innovation that would push consumers to trade in their older-model cars, General Motors turned to "sleek" styling as way of making new cars more desirable. The GM's success of the cosmetic changes in 1923 Chevrolet spread this tactic to many other industries, such as watches and radios. This "ideal type" of stylistic obsolescence has become the model for many other product areas which have adopted rapid turnover in physical form as part of the production-consumption cycle (Slade, 2006).

Designers in the 50s were very opened about their approach toward industrial design and psychological obsolescence. George Nelson bluntly summed up the challenge of producing the appearance of change when he stated, in Industrial Design:

*"Design is an attempt to make a contribution through change. When no contribution is made or can be made, the only process available for giving the illusion of change is styling. In a society so totally committed to change as our own, the illusion must be provided for the customers if the reality is not available"* (Packard, 1960).

Vance Packard (1960) wrote that those times it would have been a challenge for modern marketing to persuade the public that style was an important element in the desirability. As we could observe, marketing did great, more than great job (Packard, 1960).

*"Most design changes are made not for improving the product, either aesthetically or functionally, but for making it obsolete."* (Louis Cheskin, marketing innovator) (Hayes, 1978)

Design and marketing always seduced consumers to the newest model. Thus, it should be remembered that every stylistic re-launch of a product or product range requires additive volumes of materials, energy, manpower, research and development, prototypes, testing, packaging, advertising, promotion etc. This brings extra cost to the final product whilst working to reduce its stylistic durability. Consumers pay these extra costs in the higher price of the 'newer and cooler' higher priced product.

Last years, we can observe the proliferation of restyling and repackaging of many familiar objects in unfamiliar forms. A typical design for one product goes to another, where has never been before. When all the innovative ideas seem to be wasted, the retro style is always good choice. The very best example is revitalisation of MINI car by BMW Company. BMW used the style and typical design features of famous car from 60s. Under more modern face but still with the typical features of MINI, the introduction of new MINI in 2001 was wonderful success. Thanks to its connection with older famous model and very fresh new design it became one of the most selling car models with probably the highest margin.

### ***DESIGN AESTHETICS THAT LEAD TO REDUCED SATISFACTION (GULTINAN, 2009)***

Rachel Cooper (2005) shows how aesthetic characteristics can influence premature disposal. Some products, which have a polish and pristine appearance, can be with everyday use scratched and damaged. The flawless but delicate surface design of many contemporary products helps stimulate unnecessary disposal behaviour and replacement (Cooper, 2005). All the designers' methods she sees as unsustainable, you can find in Appendix 1 An Aesthetic typology for contemporary, unsustainable products.

## 2.5. MICROECONOMICS OF PLANNED OBSOLESCENCE – DURABLE GOODS THEORY

Durable goods pose number of questions for microeconomics analysis. One of the basic is the durability choice and connected issue of an excessive obsolescence. Planned obsolescence is defined as the production of goods with uneconomically short useful lives so that customers will have to make repeat purchases. According to basic economic theories, rational customer will pay only for the present value of the future services of a product. So, firm maximizing profit behaviour of a firm would apparently imply producing any given flow of services as cheaply as possible, with production involving efficient useful lives (Bulow, 1986). Many economists in their studies have been showing that this analysis is logical but incomplete and therefore incorrect; issue of durable goods is way more complicated.

As Wildman (2003) imparts economists have been trying answer the questions being raised around durability of products. Do firms have an incentive to reduce durability below efficient level so that goods break down quickly? To what extent have an incentive to introduce a new products that makes old units obsolete (Wildman, 2003)? How are current prices and marketing strategies affected by a producer's actions tomorrow that affect the future value of units the producer sell today (Wildman, 2003)? Their models and theories have been developing, enriching the previous ones, and becoming more complex. While Jeremy Bulow (1986) considered issues of planned obsolescence to be quite difficult and not up to the hilt understood topic, modern authors see the issue quite more clearly. However, new perspectives and views to issue of durability and planned obsolescence are still appearing.

Further in this capture, majority the most known and relevant theories (classical and avant-garde) are bring concisely, answering the previously most often asked questions.

### I. CLASSICAL DURABLE GOODS THEORIES

Durable goods' theories date back to at least Wicksell in 1923 (Strausz, 2008). Focusing on monopolists, earlier studies quite surprisingly conclude, that a typical monopolist does not have an incentive to distort a product's lifespan (Strausz, 2008). This counter-intuitive result was first indicated by Swan (1970), who demonstrates that, even though a monopolist distorts the quantity to price decision, he does not distort the product's lifetime. (Swan, 1970) Schmalensee in his paper from 1979 examines more closely the assumptions under which durability is independent of quantity and concludes that, even for a monopoly setting, a convincing theory of planned obsolescence requires further studies (Strausz, 2008). Subsequently, Bulow (1982, 1986) argues

that the time-inconsistency<sup>9</sup> problem of a durable monopolist identified in Coase (1972). Coase induces a monopolist to choose excessive obsolescence. Much of the subsequent works on planned obsolescence are based on this framework (Strausz, 2008).

### *DURABILITY CHOICE*

In **Jeremy Bulow's** paper - **An Economic Theory of Planned Obsolescence** from 1986, he examines the dilemma of a firm - how much durability to build into its product over time. His two-period model of a durable good monopolist<sup>10</sup> follows the tradition of using durability as proxy for obsolescence. This assumption is combined with perfect second-hand market hypothesis. It permits the model to regard goods produced in different times as homogenous, which greatly simplifies the analysis. Confrontation with reality is that planned obsolescence is here represented just by the durability perspective<sup>11</sup>.

Jeremy Bulow explains why a firm might opt to give its products a shorter than economically desirable useful life. Surprisingly, in his theory, sometimes firms may even pay more to produce a shorter lived asset (Bulow, 1986). Although Swan (1972) concludes that **Monopoly** will choose economically efficient durability of products, Bulow argues that increasing durability has the extra cost of increasing the units on the market in the second period, and those extra units reduce profits. There is thus an incentive to reduce durability below the efficient level, so monopolies will use at least a little planned obsolescence. In example about the monopolist facing second-period entry, he on numerical example (based on Cournot equilibrium) shows that if the first-period technologies were differentially efficient, the monopolist will choose a durability somewhere between 50% and the maximally efficient level (Bulow, 1986). Decreased durability implies a lower second-period price but a bigger market share for the incumbent.

Moreover with the shorter periods of production, the need to 'buy' commitment via planned obsolescence can increase. Interestingly, Bulow suppose that a reduction in monopoly power – cumulating planned obsolescence – can be welfare reducing. It will reduce consume discounted surplus relative to an unconstrained monopolist (Bulow, 1986).

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<sup>9</sup>Time inconsistency problem occurs because a firm has its interest in the next generation of goods; once a firm sells its durable goods output, no longer has an interest in the value of those products.

<sup>10</sup> The two-period model was originated by Jeremy Bulow in 1982 and since that time used by most of all economists for their theories of planned obsolescence.

<sup>11</sup> In reality and following models, planned obsolescence represents much more than a matter of durability; it is also about how often a firm will introduce a new product, and how compatible the new product will be with other version.

In the case of **Oligopoly**, a firm has to take into consideration one main aspect more – the effect of competitor's future strategies; one's durability on competitors' second-period output. With quantity competition a higher durability will usually cause competitors to cut output, and this increases one's profitability. Hence, there is an advantage to high durability that the oligopolist must trade off with the competing advantage of faster obsolescence (Bulow, 1986). Bulow's example on symmetric oligopoly solved for the Cournot-Nash equilibrium shows that as more firms enter the market, profit margin decrease, and firms cannot afford so far from efficient production techniques as monopoly can. So, if a firm wishes deter to entry into its markets, than it will prefer longer durabilities. On the other hand, if oligopolist can collude to set the durability of the industry's products, they will opt for some planned obsolescence<sup>12</sup> (Bulow, 1986).

To conclude, Bulow shows that monopolists desire uneconomically short useful lives for their goods. He links this result to the observation that a durable goods monopolist will prefer to rent, rather than sell its output. Oligopolists may choose either uneconomically short lives as well or long lives, depending on their technologies and market conditions (Bulow, 1986). Logically, compare to monopoly situation, there is an incentive increase durability to deter entry; when a market becomes more competitive, products' lifespan tend to increase (Bulow, 1986). This conclusion is in line with the reality; when Japanese vehicles with longer lifespan entered the American market in the 1960s and 1970s, American carmakers were forced to respond by building more durable products (Dickinson, et al., 2001).

### *NEW PRODUCT INTRODUCTION AND STYLE DECISION*

**Michael Waldman** in his study **A New Perspective of Planned Obsolescence** (1993) looks at the problem of time inconsistency in the case of new product introduction. He considers planned obsolescence from the standpoint of a firm that can change the nature what it sells. His analysis shows that if the monopolist sells his output, then both from the firm's private standpoint and from a social welfare standpoint, his incentive will be too high to switch from the first-period technology (A) to advanced technology (B) in the second period (Waldman, 1993). New technology (products) will make new old units obsolete quicker, i.e. the firm will have incentive to practise planned obsolescence.

Waldman see the reason in that the firm does not internalize how its choice affects the value of the units sold in the first period when chooses which type of output to sell in the second period. The monopolist face (as in the Bulow's case with durability decision) the time-inconsistency

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<sup>12</sup> To support reality of this assumption just remind you the real case about the Phoebus Cartel influence on light bulb's durabilities.



problem; producer's actual technology choice in the second period often differ from the choice the producer would make if he could commit to his B in the first period. He proves that monopoly switches to B even though it is socially efficient for him to remain with technology. This inefficiency can have according to Waldman (1993) two forms; either *weak planned obsolescence* or *strong planned obsolescence*. In the case of weak planned obsolescence social welfare is maximized, if everyone consumes A in the second period, but there is no commitment to the new group of consumers coming with B (if they consume A or B, while group of consumers from first period consumes only A). With strong planned obsolescence, social welfare is again maximized if everyone consumes A in the second period, but no commitment solution is characterized by both groups of consumers purchasing B and consuming B in the second period. (Waldman, 1993)

Let's see Waldman's theory in example – a text publisher who periodically introduce new edition of a textbook. The publisher must decide how often introduce new editions and how similar to make new edition to the old one. It is important that a more dramatic change in a new edition will make it more difficult for a student to continue to use an old copy (have a bigger negative effect on the value of old copies) (Waldman, 1993). The Waldman's conclusion is that the publisher will have the incentive to bring out new edition too soon. Moreover, incentive to write it such a way to kill off the market for old copies. Even if a style change of new edition has a positive effect on the value placed on new textbooks, the publisher's incentive to introduce style changes will still be too high (Waldman, 1993).

### ***THE R&D (RESEARCH AND DEVELOPMENT) DECISION***

Waldman enriched his theory in 1996 by publication **Planned obsolescence and the R&D decision**. Taking into consideration R&D, the time inconsistency problem a firm faces is that the R&D choice that maximizes current profitability does not maximize overall profitability. The result is that if output is sold rather than rented, than in its R&D decision the monopolist has an incentive to practise a type of planned obsolescence that lowers its own profitability (Wildman, 1996).

By investing in R&D, a durable-goods monopolist can improve the quality of its future output, and in this way reduce the future value of current and past units output (Wildman, 1996). Similarly, as in the product introduction case, the monopolist cannot commit to future values for R&D, than it frequently chooses an investment in R&D greater than the amount that maximizes its own profitability (Wildman, 1996). Waldman also found that the monopolist is unable to capture all the societal benefits from its R&D investments. As a consequence, in contrast to previous



findings, from social welfare point of view the time inconsistency problem that increases the firm's incentive to invest is, in fact and in contrast to other points of view (Bulow's findings), beneficial.

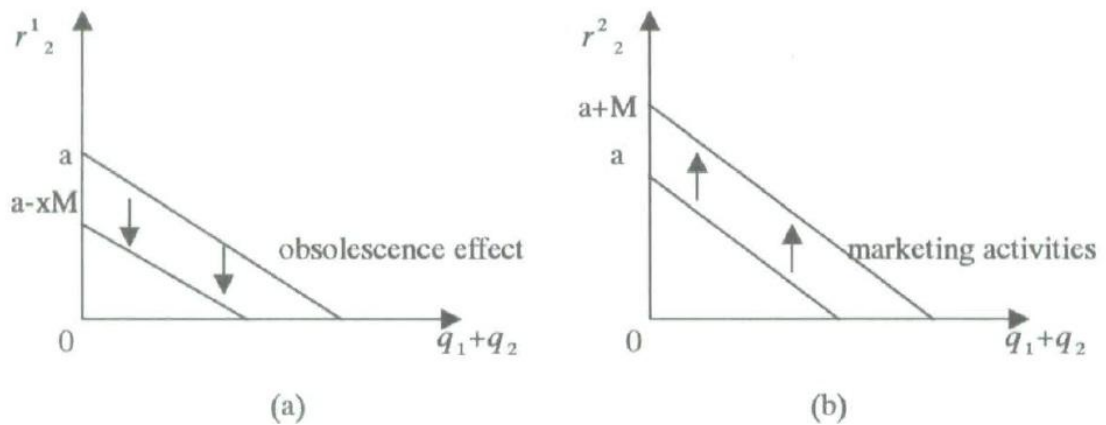
Special case would be if monopolist can choose from more than a single technology in the first period. In that case, Waldman suggests that the monopolist might be able to reduce the effects of this time inconsistency problem by choosing a technology that is excessively costly to improve. The monopolist can de facto commit to spending zero on R&D by choosing such technology, since with such a technology in place, any R&D investment would be wasted (Wildman, 1996).

### *EXTENT OF MARKETING STRATEGY AND SOCIAL WELFARE*

**Atsuo Utaka** from Kyoto University in Japan tied on Waldman work and investigated more deeply the impact of planned obsolescence (distortion of durability) and use of those supporting marketing strategies on social welfare. Utaka in the contrary to Waldman imagine that a monopolist sells product in the first period, while simultaneously he proceeds with development of a new model, so he does not consider the problem of time inconsistency anymore. In his paper from 2000 **Planned Obsolescence and Marketing Strategy**, he investigated the equilibrium level of marketing and the influence of the obsolescence effect.

His new assumption is that in the second period, the monopolist can stimulate consumer demand by marketing activities. Therefore demand for products of second period is higher about the level of marketing activities (M) (Utaka, 2000). On the other hand, demand for products from the first period is decreased by the degree of obsolescence effect which marketing has on first-period products (x) (Utaka, 2006).

**Exhibit 6 Demand functions in the second period of products from the (a) first period and (b) second period**



Source: (Utaka, 2000)

The level of marketing ( $M$ ) can be determined in the second period or in the first period in advance (Utaka, 2000). Utaka proved that in the former (latter) case ( $M^S$ ), the larger the obsolescence effect on marketing, the higher the equilibrium level of marketing. The equilibrium level of marketing becomes higher than the efficiency level, because the monopolist performs marketing efforts without considering the effect of marketing (Utaka, 2000).

When the monopolist determined the level of marketing in advance ( $M^f$ ) – commitment case, the equilibrium level of marketing becomes higher than efficient level only if obsolescence effect is not so large (Utaka, 2000). The monopolist plans marketing activities during the first period, which will lower the valuation of products he currently sells, because he cannot control the level of production in the second period. Therefore, if he engages in marketing targeted a new product line, the benefit obtained by stimulating demand for new demand outweigh the loss caused by obsolescence effect on old products (Utaka, 2000). Consequently, total profits exceed the non-marketing situation (Utaka, 2000).

However, Utaka developed his theory in the next article about **Planned Obsolescence and Social Welfare**. Here, he adds the prospective of consumer; how the introduction of a new model decreases the benefit derived by consumer from using older models that have lost their appeal. He considers this as a direct obsolescence effect of marketing. Now taking prospective of a firm and consumers he examines the level of marketing and social welfare.

He assumes that the monopolist chooses the degree of improvement and introduction of a higher quality model that lowers the utility of consumer who use a lower quality model. Again by looking for perfect Nash equilibrium, he shows that equilibrium level of marketing investment in both no commitment and commitment cases always become higher than the socially optimal level, which differs from Waldman results. The intuition behind the result is as follows. The

obsolescence effect has only a negative effect on social welfare, since it decreases the valuation of an older model (Utaka, 2006). From the monopolist's standpoint, however, the larger obsolescence effect also serves to increase price<sup>13</sup> of a new model. Therefore, even in commitment case, the equilibrium level becomes too high from the view point of social welfare (Utaka, 2006; Iizuka, 2007).

### *COMPETITIVE MARKET*

After examination of planned obsolescence, it would be interesting to explore a model of planned obsolescence in a competitive market. That is what **Park and Grout** did in their paper **Competitive planned obsolescence**. The essential problem of monopolist is that his actions provide competition for the company in the present market. Thanks to this monopolist has an incentive to reduce durability or make the good obsolete after a period of time (Grout, et al., 2005). However, they argued that planned obsolescence arises also in competitive markets. In Park's and Grout's analysis, they assume that competition between producers determined initial price and planned obsolescence simultaneously.

The basic idea behind their model is that goods differ in basic quality but it is the private information of the owner. In the same time, there are products' attributes, which are observable, represent high value for consumer and change over time. Then, if new product comes onto market and its attributes are adequate superior to the previous ones, than the owners of the older versions will be more likely to trade both high quality and lower quality products for the new one (Grout, et al., 2005). Therefore their conclusion is that planned obsolescence in certain configurations is the dominant mod of delivery and in this sense it is not driven by exploitation of monopoly. (Grout, et al., 2005) Nevertheless, because they use a competitive equilibrium in their model, the obsolescence is not seen as producer's initiative. It is in the sense that producers are induced to supply such products by consumers forward-looking demand behaviour (Grout, et al., 2005).

## **II. NEW APPROACHES**

Since so far mentioned theories have strong assumptions, they gave us good theoretical foundation, but the understanding of real world markets for durable goods was not advanced so far. Recent paper's advanced the theory, so it is more applicable on real markets. Examples could be newest contributions of M. Wildman, I. Heder and A. Lizzer or for instance Strausz

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<sup>13</sup> In this model, a larger obsolescence effect promotes replacement demand, which enables the monopolist to charge higher price for the new model.

(2009) apply his model in competitive market, and see quality and durability as two different aspects of planned obsolescence, as mutual complements.

### *DURABLE GOODS THEORY FOR REAL WORD MARKETS*

**Michael Wildman** in his paper **Durable Goods Theory for Real Word Markets** (2003) follows the most important assumptions and conclusions of the classical durable goods theories and assesses them in comparison to real market situation. One of the general points of theories, that a subject with market power wants to lower quality of used products because they transfer into higher prices for new units (Wildman, 2003).

### *INCENTIVE FOR UNOBSERVABLE QUALITY*

**Roland Strausz** from University of Berlin came with a new theory of planned obsolescence in his paper **Planned Obsolescence as an Incentive Device for Unobservable Quality** from 2008. He argues that reduced durability may actually be in the interest of consumers, because planned obsolescence strengthens the producer's incentives to provide adequate quality in other dimensions. He builds his theory on the intuitive idea that the need for repurchases gives the consumer power over the producer. If the consumer is disappointed with the product, he does not purchase it again. This threat induces the producer to provide an appropriate quality (Strausz, 2008).

Strausz explains that quality of a durable depends not only on how long a good is working, but also on how well it works. As a supportive example of those hinges on the multi-dimensional character of quality he uses Apple's iPod. The iPod's irreplaceable battery is an example of planned obsolescence and therefore suggests that the iPod is an inefficient product. However, Strausz argues that durable products often have important quality attributes that are difficult to determine before purchase but are naturally learned during the good's lifetime as it is in the case of Apple products.

Thus, he argues that reduced durability provides stronger incentives for the provision of quality (on markets where durability is not too costly and consumers appreciate other quality aspects than durability alone) (Strausz, 2008). This leads to lower levels of durability than in a first best world where quality is observable (Strausz, 2008). From a first best perspective, it may interpret these lower levels of durability as a planned obsolescence of consumption goods. By this latter observation he explains that planned obsolescence is a bigger issue in the US, because US consumers put less weight on durability. Also explaining why Apple's iPod is more successful in the US than in Europe or Japan.

In the contrast to the classical suspicious theories, where planned obsolescence enables the monopolist to commit easier to high monopoly prices, Strausz suggests more cautious evaluation of planned obsolescence. His results show that planned obsolescence may be considered, indeed, as a positive factor, because it enables higher quality in other dimensions. Hence, depending on the underlying reason he would evaluate policies that target a good's degree of obsolescence, such as minimum warranty requirements, differently (Strausz, 2008).

### 2.6. DRIVERS OF PLANNED OBSOLESCENCE

#### COMPETITIVE PRESSURE FOR INNOVATION

Very competitive and predatory propensity in the technological environment forces companies to innovate. As it was mentioned in the previous chapter, durability problem occurs even in monopoly conditions. When competition occurs, it creates additional pressure for obsolescence. Since durability lowers sales volumes of replacement goods, firms are increasing the frequency of the revision (upgrade) cycle to mitigate competition from the used markets. Thus, in very competitive environment the managerial dilemma regarding ‘willingness to cannibalize’ arise; if a company will not cannibalize its own product’s sales, its competitors will (Guiltinan, 2009 p. 22).

However, the motivation for a firm to launch new products does not need to have an incentive to kill off used units. Under some specific conditions, firms may need to introduce products periodically, because, otherwise, the demand for their products may decline as technology and/or information content becomes outdated (Iizuka, 2007 p. 192).

Nevertheless, in both cases, companies are mostly trying to innovate as soon as possible and in many situations even concentrate only on minor improvements. As you can read in the first chapter, shortening of product lifecycles and compression of new launched products is generally observed trend on global markets. Increasing the rate of replacement through obsolescence enables companies to (Guiltinan, 2009 p. 21):

- Through faster repurchase stimulate demand and revenues
- Reduce competition older versions and secondary markets
- Increase value and price for the new product

We can say that the existence of a highly competitive environment, combined with the fundamental economic motives, have created a sort of path-dependence for product development strategies geared faster replacement of durable goods (Giaretta, 2005). Thus, we can argue that technological progress of new product development goes hand by hand with planned obsolescence (faster replacement) and vice versa.

### THE IMPACT OF CONSUMER DECISION MAKING PROCESS

Mainly three reasons why consumers repurchase durables were identified: failure, dissatisfaction and change in consumer needs (Cooper, 2004). According to the type of planned obsolescence applying, two decision making situations may occur. Firstly, in the case of **‘forced’ replacement**, consumers are forced by company to purchase by functional obsolescence or technological obsolescence. The motivation for the purchase is then poor performance of current product or its incompatibility with new version. In the second case of **‘unforced’ replacement**, when obsolescence of desirability is applied, innovations and enhancement of a product generates excitement among consumers and motivate them repurchase the durable. The success of obsolescence of desirability depends on consumer behaviour on market place. It is the consumer who decide about repair and maintenance policy, as well as when replace the functioning durable (Guiltinan, 2009).

Furthermore, consumers when buying durable product face two unique challenges (Grewal, et al., 2004):

- Durables typically cost substantially more than nondurable products – with higher durability consumer face higher financial risk.
- More durable product consumer purchase, longer time stays out of the market, not able keep with new upgrades. On the other hand, it saves him time of additional purchase decisions he would have to otherwise make.

As a prove to planned obsolescence theory, the research into the timing of repeat purchases of consumer durable goods by Grewal et al. (2004) shows, company can influence the nature of the purchase decision; unforced decision by pace of technological advances or forced one by durability and reliability. Moreover, the nature (reason) of the decision determined the way a consumer formulates the purchase decision. Consumer is more excited and motivated to purchase of a durable when the replacement is voluntary. Therefore for the companies is more effective to apply obsolescence of desirability (Grewal, et al., 2004).

The Grewa et al. (2004) study also indentified various stimulations for durable goods replacement. Mainly desire for social approval and social goals motivates replacement. For example when an automobile is important for a consumer’s social status, he or she is more motivated to own the latest and most prestigious models, because such products help them fit into desired social situation (Grewal, et al., 2004).

Nonetheless, other motivator is also frequent introduction of upgrades. The policy of continuous upgrading creates a heightened sense among consumers that their existing durable is outmoded. Therefore, more rapid launches motivate faster replacement regardless of the actual level of the quality enhancement (Guiltinan, 2009). Then it is difficult to speculate on the relative impact of fashion changes versus functional enhancements in replacement buying (Grewal, et al., 2004).

Related question challenges consumers face when purchasing durable products is; do costumers really want more durable products and how strong is durability motive in the decision about new product in replacement buying? Consumers tend to ignore durability in the benefit of quality (Cooper, 2004). In this sense warranty influences the decision; consumers are willing to pay more for longer warranties. Warranty and brands positioning influence consumer opinion about product's quality but there is very often no real proved connection between higher price and longer durability of premium products (Grewal, et al., 2004).



## 2.7. SOCIAL AND ENVIRONMENTAL CONSEQUENCES

Environmental and social effects are the main force going against planned obsolescence. Guiltinan (2009) identified mainly two aspects of planned obsolescence and new product development strategy which drive the environmental problems. Firstly, it is **higher motivation and more opportunities for consumers to replace their still functioning durables** (Guiltinan, 2009) – “throwaway society” encouragement. Higher motivation is driven by desirable benefits and fashion design style incorporated into products – higher obsolescence of desirability. More opportunities occur thanks to frequent introductions of replacement products. Secondly, **the recyclability and the content of chemical substances** of new products are influenced by choice of components and materials by designers and engineers (Guiltinan, 2009).

### THROWAWAY SOCIETY

Throwaway society is a used term for societies in developed countries where consumption of individuals is huge and growing followed by very significant disposal behaviour. In emerging countries we can observe more repairs and renovations, successfully working secondary markets. The essence is that consumers lack their knowledge about the environmental implications of their purchases, consumers believe in the responsibility of manufacturers (Cooper, 2005).

*“Municipal waste in industrialized countries has been increasing at around the same rate as economic growth, around 40% over the past 30 years”* (Cooper, 2005).

Society’s changing values push people to be more individual, successful and “buying” their social status.

*“We lay emphasis on our self-realization, career, perfect place to live, big car, free time activities. Though for all this we need money. We have more stuff but we have less time for the things that really make us happy: family, friends, and leisure time”* (Leonard, 2007).

Consumer culture is the major force to planned obsolescence. However it is driven by marketing; the symbolic dimension to consumption has long been recognized in marketing campaigns, which often associate products with desirable image or appeal to prospective purchaser’s aspiration or lifestyle preferences. Consumers are glutted by those types of advertisements e.g. more than 3,000 times a day in the U.S. (Leonard, 2007). Advertisement influence consumers’ decision making about unforced replacement and are the tool of obsolescence of desirability. Consumer is the one who makes the decision and depend on each consumer how let himself influence and contribute to planned obsolescence effectiveness. Unfortunately, consumers let them influence by marketing and strategy of firms and the push to remain their social position by

up-to-date products. Most consumer durables are marketed primarily on the basis of functional characteristics.

### *PRODUCTS LIFESPAN*

Product lifespan corresponds to the duration of time when a product is in use, so approximately from the time of purchase to the time of disposal. Public opinion inclines toward the belief that lifespan have declined. Research by academic researchers and practitioners has suggested that product lifespan are determined by a complex range of factors that include design, technological change, the cost of repair and availability of parts, household affluence, residual resale values, aesthetic and functional quality, fashion, advertising, and social pressure (Cooper, 2005).

Theory of products' durability and planned obsolescence observe companies incentives to the product lifespan. Planned obsolescence is the needed device of companies to their continuous shortening. Although some academics have argued that product lifespan have declined, there is still need for lifespan data on wider range of consumer durables. The research base in this area remains weak. Cooper (2005) quote from different sources that lifespan data have long been regarded inadequate. Moreover, empirically it is very difficult to rigorously examine product lifetimes.

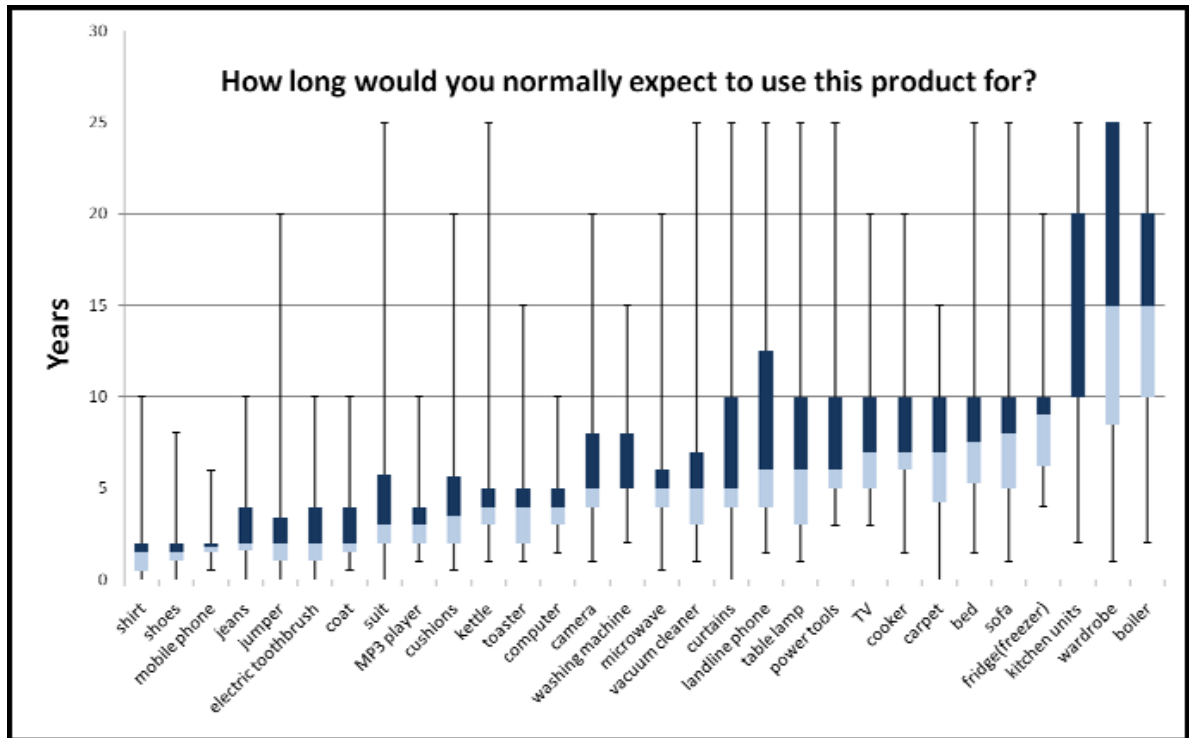
Nevertheless, couple of swallows can be found - a research into discarded household appliances in the United Kingdom, which Cooper and Mayers described (2000). Between the years 1993 – 1998, over 800 households provided quantitative data on consumer attitudes and behaviour relating to appliance lifespan. Information was extended in focus groups where variation in behaviour showed how users may influence appliance lifespan (Cooper, 2004). “The results of the research suggest that have an important role in reversing the trend toward increased appliance waste but currently face economic disincentive and lack adequate product information” (Cooper, 2004).

From the table in Appendix 2 showing age of discarded appliances and lifespan considered in the research “reasonable”, it can be easily seen that “reasonable” lifespan for all appliances are form one to four years higher than the real ones. Some households had very high expectations, about 10% of households thought that refrigerators and freezers, telephones and stereos should last more than 20 years. On the other hand, results proved that consumers are not ready for long lasting products.

In the summary report of Environmental Resources Management consultancy final report on Longer Product Lifetimes was described research made by Brook Lyndhurst into consumer

attitudes towards product lifetimes of a range of consumer products in the spring 2010. This work involved canvassing the opinions of consumers (115 participants from UK). The study examined purchasing and disposal decisions for recently bought products, expected lifetimes and consumer motivations for purchasing.

**Exhibit 7 Findings of Brook Lyndhurst focus group expectation of product lifetimes (1)**



(1) Error bars show the maximum and minimum values given by participants in the survey (rather than confidence intervals). The top of the dark blue bar indicates the third quartile and the bottom of the light blue bar, the first quartile. The interface between the two coloured bar, indicates median value, the typical consumer expectation.

Source: (Downes, et al., 2011)

The results of the research in 2010 were compared to those of Cooper and Mayer from 1998. Brook Lyndhurst is cautious about their findings but suggest there is a possibility that expected product lifetimes have actually shortened over the last decade (Downes, et al., 2011).

### ENVIRONMENTAL ASPECTS

Planned obsolescence increase emphasis on continuous product development and linear disposal cycles with ‘waste of natural capital’. “More products are produced, worse environmental consequences.”

#### *E-WASTE*

E-waste<sup>14</sup> is considered to be the most rapidly growing waste category and with the lowest collection rate. Rapid innovation and fashionable design and consumers’ attitudes importantly contribute to increasingly short lifespan of high-volume electronics. Many of appliances become obsolete despite the fact that they are still entirely functional. U.S. Environmental Protection Agency (EPA) estimates that 438 million electronic products were sold in 2009 within USA, which represents a doubling of sales from 1997 (EPA, 2011). A study by the United Nations University suggested that e-waste added up to 8.3 million tons in 2005 in the European Union (EU27) (Huisman, et al., 2008). Forecasts presume that e-waste rises will grow between 2.5 to 2.7 % annually in the EU(27), reaching about 12.3 million tons in 2020<sup>15</sup> (Oswald, et al., 2011).

Therefore, main issues connected to e-waste supported by its rapid growth rate are (1) depletion of “critical” raw materials, (2) complicated recycling, (3) its export to the developing or emerging countries and (4) damages to the environment and human health by toxic substances.

- (1) Electric and electronic appliances are considered “urban mines” as they accumulate relatively high concentration of precious metals and special technology metals. E-waste holds a number of the “critical” raw materials – materials, especially metals, that combining characteristics like predicted demand growth, limited technical, geological and economic availability, and constrained possibilities in recycling and substitution (Oswald, et al., 2011). In a report of European Commission from 2010, they classified 14 the most “critical” materials for EU (e.g. cobalt, magnesium, beryllium, platinum group metals etc.) (European Commission, 2010 p. 36). For the most technology metals, substitutive materials either do not exist or compromise the functionality of original material.
- (2) Composition of e-waste is very various and depends on the type of product. Many electronics contains more than 30 different substances (Oswald, et al., 2011). Besides that

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<sup>14</sup> The term e-waste is commonly used to discarded consumer electronics, so called electrical and electronic equipment (EEE). Any obsolete appliances with a plug or battery can be considered as e-waste (Oswald, et al., 2011): computers, monitors, mobile phones, televisions, dishwashers, microwaves, MP3 players etc.

<sup>15</sup> Estimations about e-waste volumes do not contain so called “hibernating” e-waste in drawers and basements.

e-waste has low collection and recycling rates. Collection of e-waste from users is difficult, especially with small appliances, which usually end in common waste or are stored by consumers. The study from United Nations University estimates that only about 30 % of total e-waste arising is being collected by member states of EU (Harmer, 2005).

- (3) One of the most sensitive worldwide issues is e-waste export from developed countries (USA and Europe) to developing countries and emerging economies (Africa and Asia). Although international movements of hazardous waste, including e-waste, are illegal and prohibited by international law, transnational movements to countries such as Ghana, Nigeria, India, China etc. do exist on large scale. According to Basel Convention (a treaty in force from 1992) export of reused equipment is not illegal. Waste is presented as second hand goods, even though more than 80% of waste is beyond repair and ends in dump sites of those countries (Dannoritzer, 2010). Estimations say that from 50% to 80% of e-waste disposed in the USA is shipped to the third world countries.

Most ethically issue is the procession of e-waste in those countries. Primitive manual techniques such as opening burning of wires to recover copper, cracking of monitors to remove chopper chokes, printed circuit boards are desoldered over coal fire grills and chemically leached to extract precious metal (Dannoritzer, 2010). Workers usually do not wear any protection. Children and youngsters from poor families are looking around the dump for scrap metal. Those primitive methods cause huge environmental and health problems for the inhabitants, animals and nature.

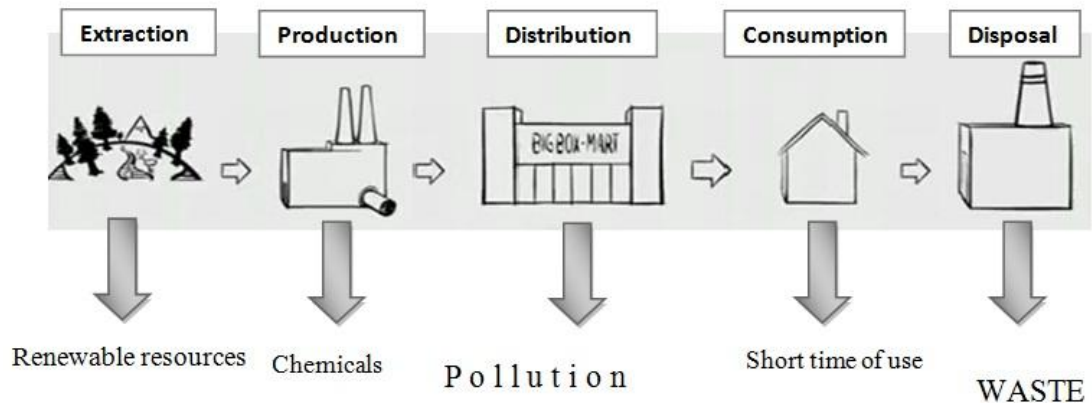
- (4) Moreover, men and women working in informal recycling business are constantly exposed to toxins. E-waste contains a number of toxic substances, including plastics and heavy metals such as lead, cadmium, and mercury, and expose to the serious health risks.

Given the environmental impact and economic value of e-waste, the EU implemented the *Directive on Waste Electrical and Electronic Equipment (WEEE Directive)* in 2003. The aim is to increase the amount of e-waste that is appropriately treated and to reduce the volume that goes to disposal by e.g. setting mandatory collecting targets for member countries (WEEE Directive, 2011). By shifting the cost of e-waste recycling to the producers, the EU hopes to promote eco-design and encourage manufacturers to improve the recyclability of e-waste (Oswald, et al., 2011).

### *LIFE-CYCLE ASSESSMENT*

Life-cycle thinking appeared to measure all environmental impacts of a product during his whole lifetime. Life-cycle assessment (LCA) distinguishes different phases in the life-cycle of a product and their separate and connected environmental impacts.

**Exhibit 8 Environmental issues during life-cycle of a product**



Source: (Leonard, 2007) & Author

Designers should take into consideration all the phases of product life to make him environmentally friendlier. LCA would help to the required shift from “extended producer responsibility” to “extended product responsibility”.

### 3. ETHICAL RESPONSIBILITIES AND RESPONSES

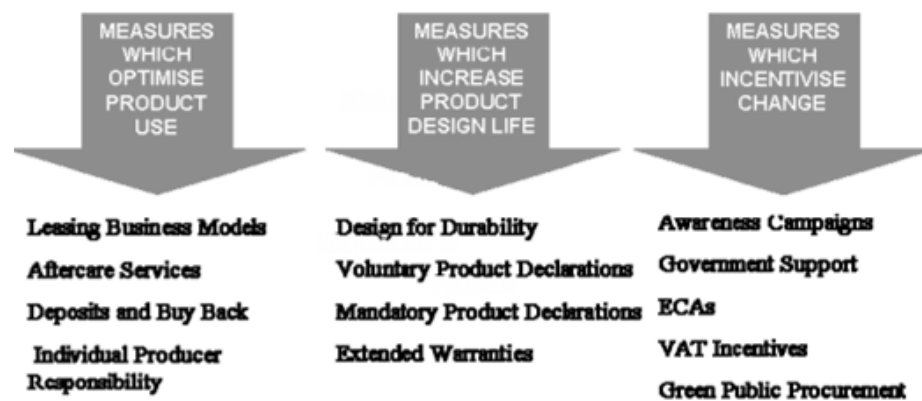
The responsibility for the negative consequences of the planned obsolescence is shared one. (Guiltinan, 2009) Firstly, technical professionals - **designers and engineers** are responsible for the product development. They influence durability of the product, determine materials, structure, components, make products impossible to repair. Most importantly, they are fostering premature obsolescence of desirability by design for fashion or design aesthetics that lead to reduced satisfaction.

Secondly, **managers and marketers** responsible for products' planning and replacement strategies, offering often "upgrades", in many cases incompatible. Managers among other decide about companies' strategy and plan launches of products, abetted by marketers who promote the incremental value of these "upgrades" (Guiltinan, 2009).

Thirdly, even though planned obsolescence is practised by companies and they bear the guilt, these days we cannot ignore that **consumers** very often act unethically and are significant drivers of planned obsolescence. We are who buys the products and demand them. Our self-serving replacement behaviour and unneeded stocks of products – consumers decide whether and when to replace functioning durables with new version. There is the dilemma if consumers really act under their free will or they are shaped by the marketing.

All different kinds of measures how to eliminate planned obsolescence and prolong lifetime of products summarize Defra Innovation Centre in its Longer product lifetimes summary report (2011). Some of the measures are introduced in detail within the following chapters on corporate responsibility and public initiatives. For overview of specific measures (sorted due to their principal objectives) see Exhibit 9. Measures and brief on their applicability and critical success can be found in the Appendix 3.

Exhibit 9 Principal objectives of specific measures for longer product lifetimes



Source: (Downes, et al., 2011)

### 3.1. SUSTAINABLE PRODUCT DESIGN

Sustainable product design is quite a new discipline. In response to the disposal waste crisis, a new philosophy promoting a non-toxic or recyclable destiny for all man-made products has triggered a new industrial revolution among designers and manufacturers. They see the revolution and solution in the concept of production in the sake of production; enabling a loop economical system.

Product still must be consistent with the firm's strategic priorities on positioning and growth objectives (Guiltinan, 2009). Therefore new design concepts, where growth of sales and consumption is welcomed and environmental consequences minimal.

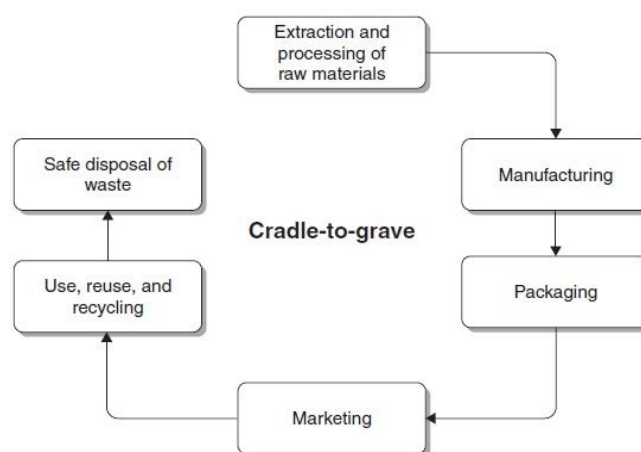
#### CRADLE TO CRADLE CONCEPT

Cradle to Cradle Design (C2C) is a conceptual framework for the restructuring of the fundamental relationship between human industry and the encompassing environment. This concept, with foundations in rigorous science and quality design, moves beyond concerns for sustainability to a new positive paradigm where growth is good (Girardet, 2007).

*“Eliminate the concept of waste – not reduce, minimize or reduce waste – but eliminate the very concept by design”* (McDonough, et al.).

Firstly, we have to get to know the term ***Cradle to Grave***. Our current manufacturing process produces goods at the lowest possible cost.

Exhibit 10 Cradle to Grave life cycle



Source: (Dr Salah M. El-Haggar, 2007)

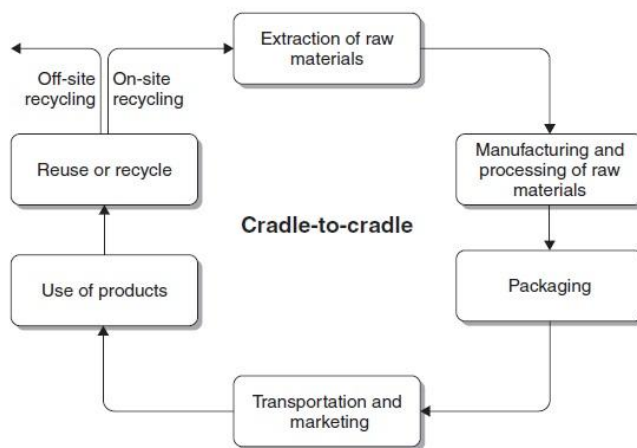
Products and packaging are later discarded into local waste management systems, often times this means landfills. We harvest and use material resources (cradle) which are later rendered useless (grave). This has a negative impact on the environment in terms of pollution, waste



volume and resource depletion. To address this concern we recycle materials such as metal, paper and plastics. However, recycling does not capture all waste. Thus the energy and materials put into production are creating incremental damage to the environment (Aebi, 2010).

The basic concept of *Cradle to Cradle* design is that technological production can learn from nature. In nature, there is no waste. When a plant dies, it decomposes, feeding the soil, which benefits the surrounding environment (Aebi, 2010). Using nature's example, manufacturers can develop products that ensure little to nothing is wasted and introduce a loop to product life. Theoretically and in a broader sense, the C2C model could be applied to social systems, communities, architecture, and economics (Aebi, 2010).

Exhibit 11 Cradle to Cradle life cycle



Source: (Dr Salah M. El-Haggag, 2007)

According to the C2C concept, products are designed to be made of materials that can be safely manufactured, used, recovered, and reused while still maintaining their high value throughout their life cycle. This way valuable used material can be continuously cycled in closed loops and transformed for reuse as other products. By applying the principle of Cradle to Cradle design and transforming industrial systems to a closed system of material flow, not only will this design save the environment from waste generation and negative impacts, but industries can even benefit from the continuous availability of products made of high value material even after the useful stage of the product's life (Dr Salah M. El-Haggag, 2007). Either by *on-site recycling*, where recycled materials go again to the same production, or *off-site recycling*, where materials are collected by another party and after recycling sold to other industries.

The Cradle to Cradle concept divides the world into two material cycles - the biological and the technical. Biological items can be broken down safely and returned to nature - eco-friendly cleaning materials or 100 percent cotton shirts, for instance. Technical items - for example office

chairs - would be broken down into their component parts and then reused in other chairs (Waldoks, 2010).

C2C was first formulated by American architect **William McDonough** and German chemist **Prof. Dr Michael Braungart** in the mid 90s. In 1987, they wrote an article in The Atlantic magazine titled "The Next Industrial Revolution." In it they laid out what they saw as the problem with *eco-efficiency* and proposed moving to *eco-efficacy* instead. *Eco-efficiency*, they argued, means remaining within the existing polluting industrial cycles but producing fewer tons of pollution. *Eco-efficacy* means designing items that don't harm the environment from start to finish (Waldoks, 2010).

In 1987, Braungart and McDonough founded *the Environmental Protection Encouragement Agency (EPEA)*. EPEA is an international research and consultancy institute working with organisations and companies across a range of industries of which core competence is integrating science with industrial innovations to recreate materials, products and supply chain partnerships so they have positive impacts. However, for professional consultancy to firms wishing adopt Cradle to Cradle design and official Cradle to Cradle product certification, it should be contacted their company *McDonough Braungart Design Chemistry (MBDC)* operating since 1995.

With Cradle to Cradle certification, not only are products components reviewed, but each components base ingredient face strict guidelines as well. Products receiving basic, silver, gold or platinum certification must have been successfully designed to "eliminate the concept of waste." Five criteria regarding a products safety, recyclability, renewable energy use, water stewardship, and the company's social responsibility efforts must be met in varying degrees for each level (Kimble-Evans, 2011). Actually about 123 companies reached Cradle to Cradle certification. As an example the probably most known company - Procter & Gamble – which has certificated 4 of their hair care products.

Cradle to Cradle approach to design could be sustainable way of the future, where consumption could be kept, but resources will be protected and waste will not be the problem anymore. Then, in this sense, planned obsolescence could be practised without enormous e-waste ballast.

### 3.2. CORPORATE RESPONSIBILITY

Stakeholder model of corporate social responsibility (CSR) an increasing companies act to responsibly. Although it is in some way beneficial to the stakeholders and society, CSR is made strategically by the company's management itself. CSR is than frequently another of company's PR strategies; doing what stakeholders expect them to do, not what would be the most prosperous. Nevertheless, some of the CSR activities are helping to the problem of fast replacement as e.g. possibility for consumers to get paid for delivering of their old products for recycling. On the other hand, some of the companies sold their consumers a false or better sense of sustainability, e.g. Apple, Amazon.com, Kraft and FedEx (Justmeans, 2010).

Below I introduce couple of measures which could companies acquire to become responsible in the matter of product lifetimes and planned obsolescence.

#### DESIGN FOR DURABILITY

One of the measures for longer product lifespan is that manufacturers would improve product design to increase product durability. The product's materials, product use profile, characteristics of the product would be reviewed with a view to designing in features to maximise the product's life (e.g. capacity to be readily upgradeable or repairable, 'timeless design', modularity etc.) (Downes, et al., 2011).

Problem of this measure is that products designed for longevity tend to be relatively expensive and often account for a small share of the market. If product lifespan should increase, customers have to change their priorities and companies have to apply new marketing strategies. A deeper exploration of consumer values and attitudes is needed to understand how people could reduce their desire to acquire new product and instead increase their attachment to that they own (Cooper, 2005). However, increasing pressure may in the future require development of new marketing platforms in order to promote products on the platform of durability in ways that will attract consumers and add to brand strength (Cooper, 2010).

#### AFTER CARE SERVICES

Companies could offer enhanced aftercare and maintenance services that include the aftercare service in the product price (Downes, et al., 2011). After care services could be assigned to prolonged warranties or loyalty programmes. It would require more complex business models and long term relationship with customers. Customers would have to understand their future life cost savings and be ready to pay for them in the time of purchase.

### LEASING BUSINESS MODELS

Another idea for the way out of the throwaway society is of manufacturers leasing their products rather than selling, choose to sell services distinct from products (Fishbein, et al., 2000). Longer lasting products used by more consumers. It could work if the product would be attractive for consumers next to the freshly new designed disposal products. There must be also desire for more complex business models repeated hire (repair). In my opinion, it could be convenient for example for the people who travel or move often to different parts of the world (e.g. expats).

By the extension of the leasing business model, new system of product as a service, is seen as another possibility for the future. Products will not be sold to the consumers but provided them as a service.

### 3.3. PUBLIC POLICY INITIATIVES

Direct voluntarily reductions in the new product upgrades would be akin to a request for unilateral competitive disarmament. If all the companies will not participate, total volumes of durables may not change. So, it would take industry agreements (despite anti-trust issues) to ensure that producers deliver to the market durables which are equally environmentally benign. There would appear ‘durable problems’ and industry would economically sacrifice for the price of sustainability. So we have a ‘social dilemma’ (Guiltinan, 2009).

In this case, public policy authorities and government plays important role. As Joseph Guiltinan (2008) mentions, many of the strides being made in sustainable design were initially motivated by public policy directives. Public policy initiatives can be upstream targeting on companies or be downstream targeting on consumers. Downstream policies may be efficient only if consumers send sufficient signal back upstream in the demand change (Calcott, et al., 2000). Legislation can to some extent lower consumer replacement and disposal behaviour e.g. by disposal fees.

Nevertheless, current environmental policy prefers upstream solutions over downstream solutions (Calcott, et al., 2000). Take-back laws are implemented in the belief that such laws provide incentives to firm to implements design changes that will reduce the environmental burden created by future new products while shifting the cost form local government. For instance, the EU is stipulating minimum reuse and recovery rates for end-of-life automotives vehicles, and already mentioned EU Directive on Waste Electrical and Electronic Equipment makes manufactures and importers responsible for the treatment and disposal of products discarded by consumers in those categories (Guiltinan, 2009).

Additional upstream measures which could EU Directive establish for longer products’ lifetimes are product durability standards, grants supporting industry players to work in partnership to find ways to increase product lifetime or VAT incentives on products. As example of additional downstream measure could be consumer awareness campaigns. However, according to Defra’s Longer lifetime products report (2011) the most probable to be effective new public initiative is the legally defined extended warranty. It would not be relied on consumer demand to shift the market, thus product would be manufactured to new standards regardless consumer demand. For more details on different measures see Appendix 3.

### PRACTICAL PART

*Survey on consumer attitudes towards laptops' lifespan followed by real case study on reality of Apple Inc. relation to planned obsolescence and concluded by author's recommendations on more sustainable future of laptops' use*

The theoretical part of the thesis aimed to get broad picture of planned obsolescence issue and causes of disposal consumer behaviour in general for any durable. All conclusions and facts were based on various scientific, research and academic papers, internet discussions and blogs. The practical part should prove and enrich some of the theoretical statements which I have made in theoretical part by my survey on consumers attitudes and contribution to the laptops' lifespan. In second section, I try to investigate the reality of laptops producers in the connection to planned obsolescence with the concrete example of Apple Inc. Company. In the final phase, I come up with my own recommendations what could be done to eliminate planned obsolescence practises by companies and change consumer behaviour and attitudes towards laptops lifetimes and disposal.

I have decided to dedicate the practical contribution to just one group of products for more concrete outputs. I have chosen the personal computers – laptops<sup>16</sup>, because I find them very suitable for the purpose of my contribution<sup>17</sup>. Principally, laptops come under the most technologically sophisticated consumer electronics with continuous development. They are widely spread among many generations of users and for many of them necessary for their daily life. Laptops' market is very saturated and competitive with the strong domination of strong global companies. The competing brands have very strong awareness and general associations are assigned to each of them.

For the real case, I have especially chosen the Apple Inc. for many concrete reasons. Firstly, Apple has very unique position on the market leaded by powerfully strong brand, which according to BrandZ study Apple is the most valuable global brand for year 2011. Secondly, Apple is an exception among laptops' producers, except hardware they provide their consumers by original sophisticated own software system. It enables Apple very efficiently coordinate development in hardware and software at once. Thirdly, during past ten years Apple is under intensive attention of media and suspicion of planned obsolescence practising.

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<sup>16</sup> Under the term notebooks, in American English laptops, are included notebooks as well as netbooks and MacBooks.

<sup>17</sup> In the connection to planned obsolescence very frequently mobile phones are attacked. I have decided not to target my survey on mobile phones because consumer mobile phone replacement decision is very much influenced by mobile operators and their favourable offers e.g. with the contract prolonging.

Although the practical part of the thesis consists of three separate chapters, they should together give us broader picture. The survey demonstrates the reality of erudition and approach, reactions to the planned obsolescence practising in consumer electronics on the demand side. Due to my decision question the young generation – students, we could assume that their approach will be more or less similar for the whole Czech society in the nearest future without any significant intervention.

On the other hand, the real case study demonstrates power of brand and marketing and its influence on consumers. It should show how Apple by giving their consumers something very innovative, superbly designed, effective, easy to use with the best services tight them and love the short replacement and disposal. Moreover, due to Apple position on the global market and in the branch, we could assume that other companies will incline to copy Apple's successful strategies and concept of marketing.

My own recommendations how to fight for sustainability and against planned obsolescence in the example of laptops should be suggestions on relevant reactions and antagonistic interventions to the observed trends on demand side and mainly supply side.

## 4. SURVEY ON CONSUMER ATTITUDES TOWARDS LAPTOPS' DURABILITY AND EXTENT OF DISPOSAL BEHAVIOUR

Aim of the survey was to support unsatisfactory data on product lifespan, obtain consumers' perception of products (laptops) durability and its role in purchase decision making – to understand consumers' attitudes towards laptops replacement and disposal. My motivation was mainly because of the fact not many information is available on this issue. The research potential on consumer attitudes towards products lifespan and their replacement behaviour is still significant. Moreover, when any research is done, usually it is done in the UK or in the US; I personally have not found any research in the area on attitudes of consumers in the connection to durability of products nor from the Czech Republic, neither from Central or Eastern Europe.

### 4.1. SURVEY METHODOLOGY AND HYPOTHESIS

Survey was executed by quantitative method of online questionnaires. As the target group I decided to concentrate only on Czech university students from 20 to 26 years old. One hundred students from five Czech universities, so in total 500 students, were directly approached via email, social networks or on recommendation. I have been getting and collecting the contacts for approximately one month. Time frame of research was from end of June until mid of July 2011. After three weeks of ongoing online survey I have collected 171 responded questionnaires; the response rate was 34.2 percent.

### THE SURVEY SAMPLE

Exhibit 12 Detailed information about the survey sample

Survey on consumer attitudes towards laptops durability		Number of respondents
Charles University		35
Czech Technical University in Prague		32
Jan Evangelista Purkyně University		24
Masaryk University		27
University of Economics in Prague		53
Total		n=171
Male share		52%
Female share		48%



The university students may in my opinion serve as very interesting representative sample for this survey. Undoubtedly my choice of respondents has influenced the results of the survey contrary to those of sample copying the demographic factors of population in the Czech Republic. I suppose that because of the students' above-average education profile, they are more informational driven and rational in the purchase decision. Moreover I assume that thanks to their relatively young age, majority of them is more welcoming and adaptive to the technological upgrades than average population sample, so they tend to replace their still functioning laptop earlier. Plus that they are well oriented in the market situation than for example they parents. In the contrary, I suppose that they are more influenced by the marketing of companies. Thus, their attitude towards durability of laptops could tell us more about the future 'ordinary' attitudes.

The questionnaire was developed through a pilot survey of five students. For better understanding the questionnaire was rendered in the Czech language. The English version of the questionnaire you can find in Appendix 4. Some of the questions held attribute to tick more than one from the given answers. This was for the case when a respondent had owned more than one laptop. For ensuring the data validity results were recalculated to 100 percent base (total measure used is number of occurrences, not respondents).

### HYPOTHESIS

In the light of knowledge of laptops characteristics and pieces of knowledge from surveys' results mentioned in theoretical part five elementary hypotheses were made for the purpose of the survey:

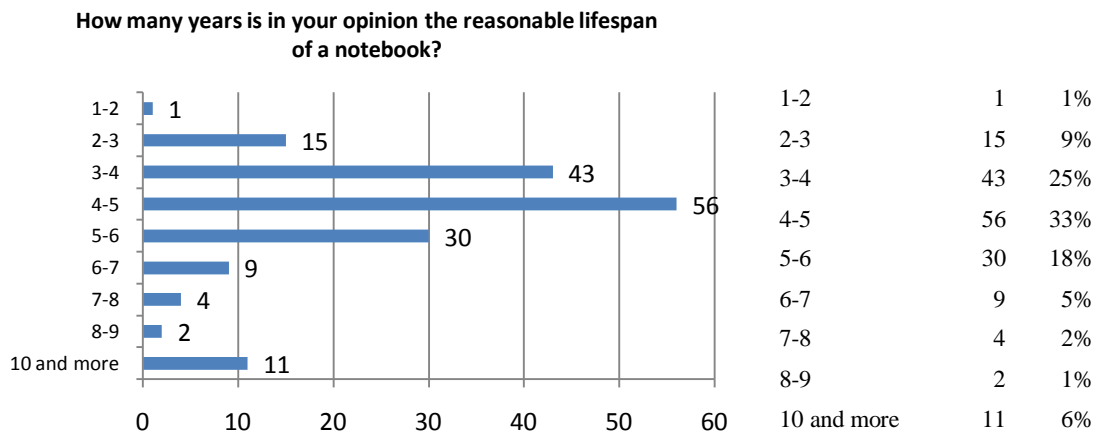
- (1) Consumers do not require more durable laptops; majority of them consider their contemporary durability satisfactory.*
- (2) Significant number of consumers tends to replace their laptops while they are still functional.*
- (3) The most important motivator for laptops' replacement is their technological obsolescence.*
- (4) Consumers consider as the main disadvantage of a long lasting laptop its high price.*
- (5) For a customer it is the most difficult to obtain information on a laptop's reliability (e.g. quality) and durability from a seller or a manufacturer.*

## 4.2. SURVEY RESULTS INTERPRETATION

During the research from the 171 sample of respondents 124 of them owned one laptop, 37 respondents owned two laptops simultaneously and 5 owned more than two laptops or none. Therefore, we can say that 171 students own at least 198 laptops - there is over 16% overlap of laptops over number of users. In last ten years most of the students owned from 1 to 3 laptops, only 10% of students owned 4 and more. This result is little bit lower than we would expect, which is influenced by the fact that students buy usually first laptop when they go to a university, so we could say that actually this result is not for last ten years but for form 1 to 6 years (depending how long the they have already been studying at the university).

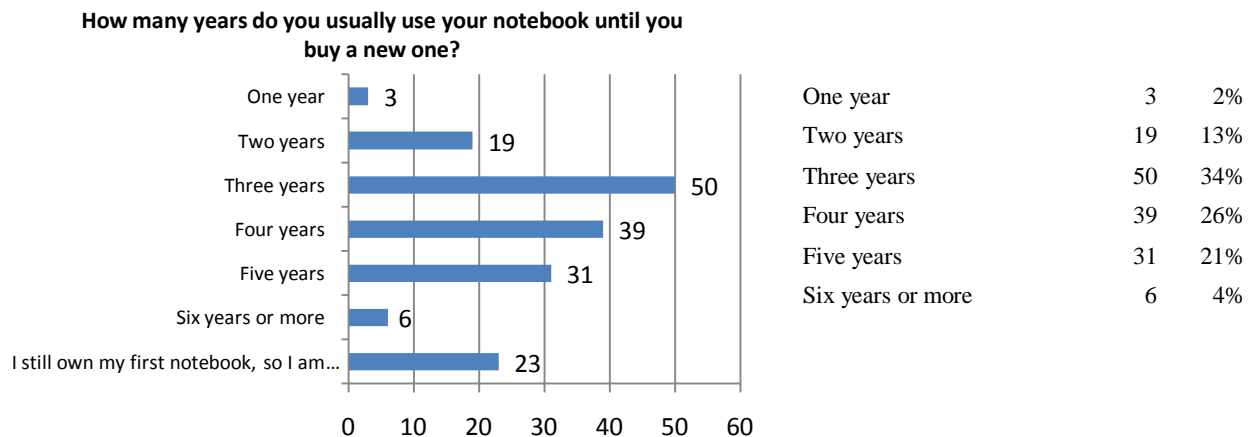
As you can notice in the Exhibit 13 below, one third of respondents see a laptop's reasonable lifespan from 4 to 5 years. Great majority, about 76% of respondents, regard the optimum lifespan among 3 to 6 years.

**Exhibit 13** Survey responds to the Question 10



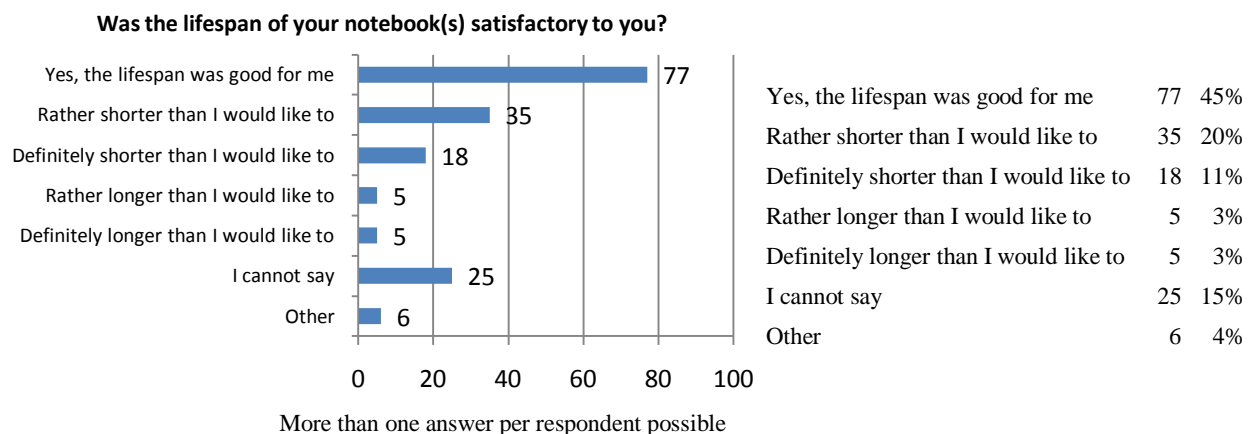
In comparison to the reasonable lifespan, real holding times slightly differs. Demonstrating in Exhibit 14, most of the students (34%) who own at least their second laptop (n=148) used their laptops before for 3 years, little bit less of them (26%) for 4 years and 21% of them for 5 years. In the contrary to the optimum durability, the real time of laptops' holdings differs in shorter and longer periods (extremes). For one or two years a laptop is owned by a student in the 15% of cases (n=148), but only one student from the sample thinks that lifespan from 1 to 2 years is reasonable. Only 6 students (4%) had been using their laptop for 6 and more years but whole 14 % see the optimal durability over 6 years.

Exhibit 14 Survey responds to the Question 3



In the Exhibit 15 we can see students' responds on their satisfaction about experienced laptops' durability. Close to half (46%) of the respondents their experience with durability of laptops was good – the durability was suitable for them. Ten respondents even experienced longer durability than was their expectation. Based on answers of this question *the first hypothesis can be confirmed; majority of consumers (about 51%) is satisfied with the durability*. However, 33% of respondents find the durability shorter than satisfactory. There can be two main factors influencing their experience - inadequate expectations (in comparison to the other consumers and market standards) or insufficient durability of product.

Exhibit 15 Survey responds to the Question 7

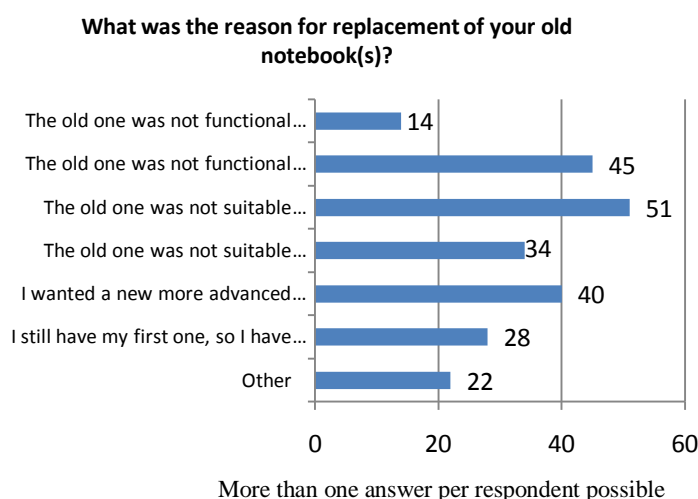


The dissatisfaction of about third of the respondents can be reversely seen in the difference between average actual user time of laptops and the required reasonable laptop's lifespan. The reasonable lifespan required by student's sample is approximately 4 years and 10 months, but average usage time of a laptop is approximately only 3 years and 7 months. If we assume that the time of usage is determined just by the durability of laptops (e.g. a consumer would replace a

laptop when it stops being fully functional), then the laptops lifespan would be given only by their durability, and therefore consumers would find the durability of laptops unsatisfactory and would be willing to have it on average about 1 year and 3 months longer.

However, in reality, there are many incentives for replacement of their laptops earlier than they stop functioning – technological progress, thus laptops’ technological obsolescence, or the obsolescence of desirability. According to students’ responses about reasons of laptops replacement (see the Exhibit 16), replacement of a present laptop by a new one because of problems with functionality (laptop was not functional anymore, repair was not possible or was too costly or functionality had decreased significantly) happened approximately in 54% of cases (n=206).

**Exhibit 16** Survey responds to the Question 4



The old one was not functional anymore and repair was impossible	14	7%
The old one was not functional anymore and it was not worth to repair it (the repair was too expensive or took too much time etc.)	45	22%
The old one was not suitable anymore because of reduced functionality compared to the original state	51	25%
The old one was not suitable anymore because of deficient parameters compared to the new one	34	17%
I wanted a new more advanced laptop with better equipment, which the old one did not have	40	19%
Other	22	11%

Only in 14 cases from total 206 laptops the replaced ones were beyond repair. In 45 cases laptops were in need of repair which was not worthy. Most frequently – in 25% of cases, students replaced their laptops which were still functional but their performance had diminished during their usage. Thus, we see that at least 29% of laptops are replaced because of their non-

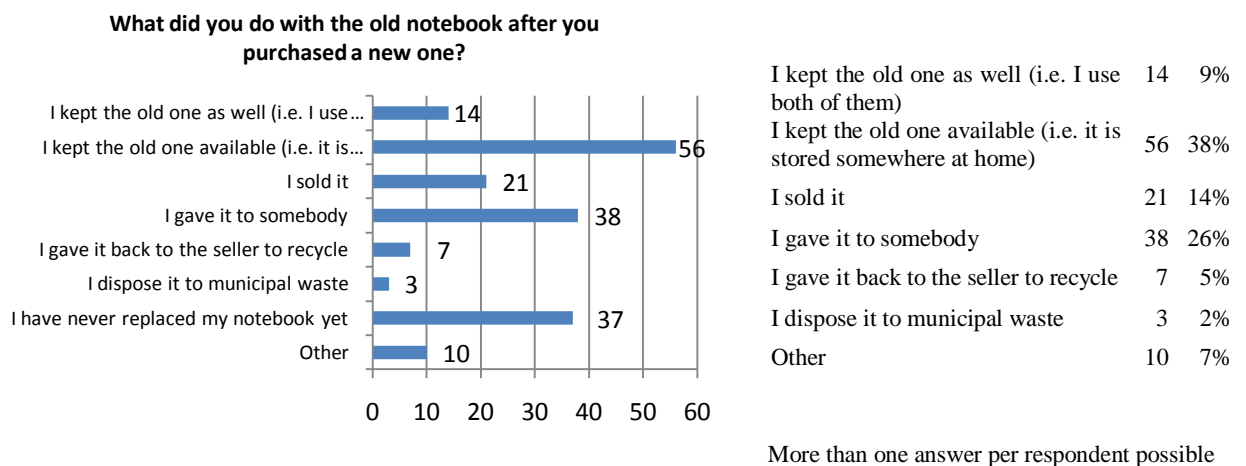
functionality<sup>18</sup>. In 25% cases, laptops were functional but functionality was reduced, so it is disputable whether and when the replacement was competent and when premature.

On the other hand, in 36% of cases can be the replacement apprehended as premature and motivated by new upgraded models (e.g. better parameters or/and equipment) on the market. *So in correspondence with the second hypothesis, at least 36% - could be up to 61% - of laptops are replaced while they are still functional, therefore the hypothesis can be confirmed.* There would be (as probably in most of the outputs of the research) interesting see the development of the result during the time. Then we could validate the hypothesis more surely.

Coming to the third hypothesis, I come back again to the fact that at least 36% of laptops respondents replaced because of contemporary ones worse performance or out datedness in comparison to new ones on the market. Thus for the reason of their technological obsolescence. Although, it was the reason for more than third of laptops, so very important motivator in replacement, without other more detailed research, so far I cannot confirm that it was more important motivator over functionality problems. *Hence, the third hypothesis cannot be surely confirmed.*

Taking into consideration the Question 5 (see Exhibit 17) and answers of those who disposed their laptop at least once (n=149), we can observe that about 7% of laptops were given back to the seller for recycling or in 3 cases to the municipal waste.

**Exhibit 17 Survey responds to the Question 5**



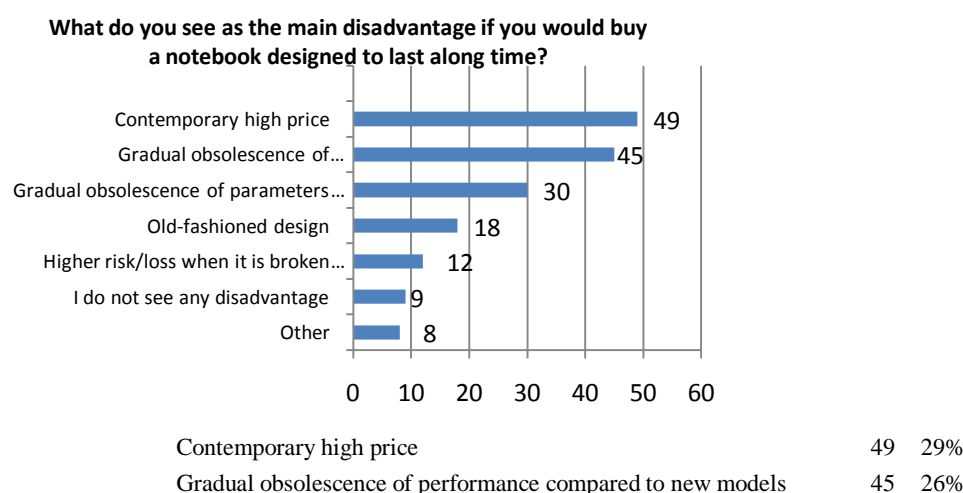
<sup>18</sup> In the 11% of cases, when respondents market possibility other, two notebooks were stolen, some notebooks were faulty and consumers obtained full or partial monetary refund (within warranty) or respondents described in detail situation which was offered in possibilities.

In another 7% of the cases of respondents by marking possibility 'other', laptops were mostly on accepted reclamation given back to seller or used for components top other laptops and PCs of a user. So according to those responds, we could assume that only 14% of laptops were surely beyond repair. In other cases we could assume that a laptop, which was sold or given to someone or is stored by a respondent at home or even still used, is most probable functional. If this assumption was true, up to 86% of laptops could be theoretically still functional when they are replaced. If we assume that just laptops, which respondents sold, donated or are using as the spare one, were functional (and those once stored at home not), whole 49% of laptops would be replaced while functional.

Forty percent of laptops was by students sold or gave to a second user. Thus we can say that secondary market is quite developed in the Czech Republic or that those laptops went to the older relatives who are not demanding and do not keep with the up-to-date technology and trends. It means that lifespan of laptops is on average much longer than average students' usage time - 3 years and 7 months. Furthermore about 47% of laptops are kept by users as spare ones in households.

Respondents were also marking the main disadvantage they see in a purchase of a long lasting laptop. Disadvantage in high price is the main problem of all products designed to last long. Putting high price on the first place (Exhibit 18), consumers approved that price level of long lasting laptops is significant factor discouraging consumer from purchase. Consumers do not see in it so much value, which is one of the main for companies when deciding about durability of their products. *Therefore the fourth hypothesis was verified.* With longer lifetime of long lasting laptop and its high investment is assigned logically also to higher risk of a purchase, which see as the main disadvantage only 5% of respondents.

**Exhibit 18 Survey responds to the Question 11**

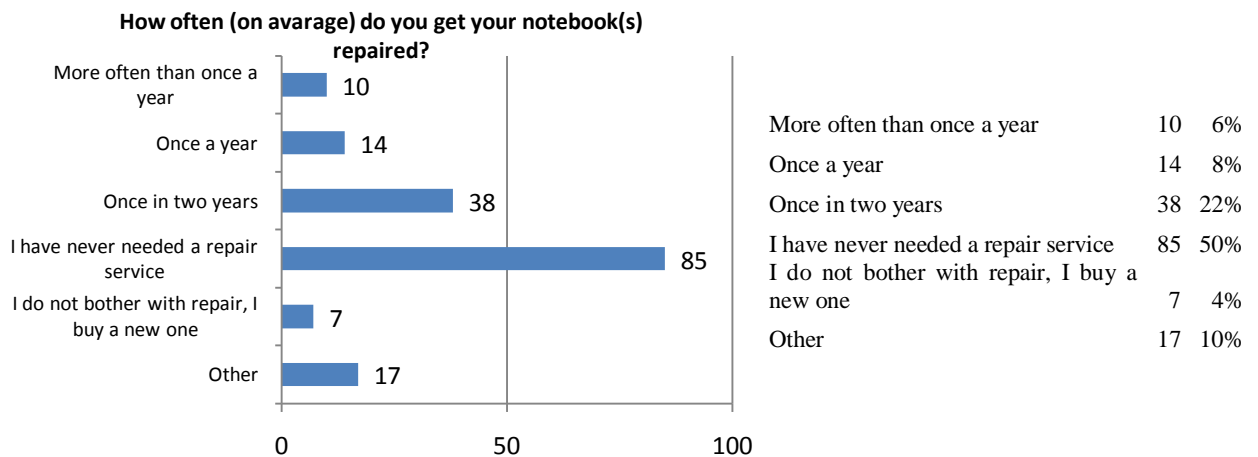


Gradual obsolescence of parameters compared to new models	30	18%
Old-fashioned design	18	11%
Higher risk/loss when it is broken down by accident	12	7%
I do not see any disadvantage	9	5%
Other	8	5%

In high percentage of answers on gradual obsolescence of performance and parameters, again the influence of technological progress and obsolescence is observed and motivation of upgrades for disposal. 44% of respondents are afraid of the gradual obsolescence in technology and progress in parameters. As other disadvantage respondents brought forward limited lifespan of batteries and hard disks. Obsolescence of desirability through design sees as the main disadvantage 7% of respondents, which could be considered quite high for up-to-date electronics.

If we look at the results of the Question 6 (Exhibit 19), 36% of consumers have their laptops repaired at least once in two years. On the other hand 50% of respondents never had to repair their laptops. Therefore we could make another wider assumption in the connection to the technological obsolescence. If you had never need to leave repair your laptop, there is lower probability it suddenly would not be functional. Thus, this possibility marked owners of their first laptop and consumers who tend to replace their still functional laptops seeing higher value in new upgraded models.

**Exhibit 19 Survey responds to the Question**

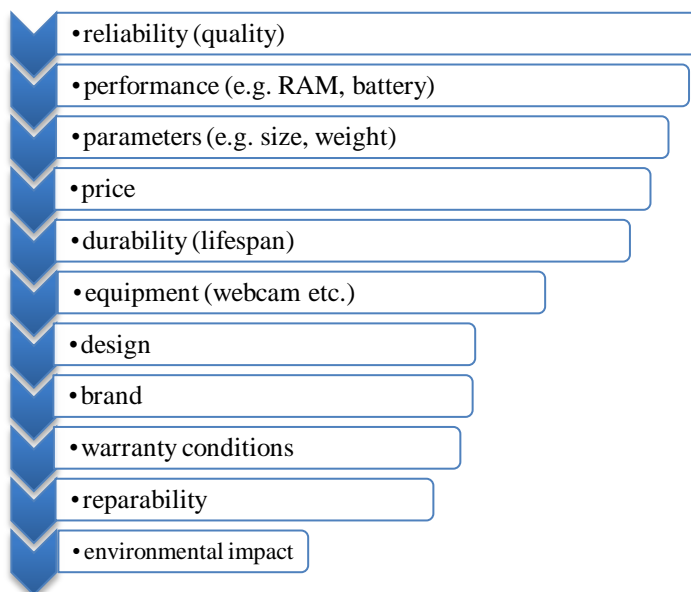


In reliance to the repair frequency, respondents indicated as the most important factor in the purchase decision about new laptop (Exhibit 20) its reliability (quality). In the same time, reliability was indicated as one of the worst accessible information. The following very important criteria in purchase decision were marked performance, parameters and price. Those are in the contrary the easiest to obtain. Companies market their products mainly on those three criteria and in the upgrades models improvement of performance and parameters are always

stressed. According to respondents, environmental impact is the least important criterion for a laptop purchase. On the other hand durability stays in the more important half of criterions.

Coming to the last fifth hypothesis; although respondents consider reliability and durability as very important criterions, those information about laptops are for them the most difficult to obtain. *Thus the fifth hypothesis was confirmed.* Sellers and producers are not willing to reveal the information about the designed lifespan. Consumers also see very difficult to obtain information on the recyclability of a laptop.

**Exhibit 20** Survey responds to the Question 8 - How important are the following criteria for you when you are making purchase decision about your new laptop?



The questionnaire also asked about brands and respondents negative experiences. Most problems respondents undergo with short lifespan of batteries, over warming and hard disks failures. Most often problems were connected to the laptops of brands Acer and Hewlett Packard (HP). In the connection to the next part on real case study, Apple users were represented by 10% of respondents. Even though the sample of 17 Apple customers is very small for any relevant conclusions to be made, Apple users have in the Czech Republic still the probably most heterogeneous profile form users of any brand. Therefore, I would like to reveal the most important corresponding facts anyway.

Apple users quoted the average holding time of their MacBooks for 3.2 years (without any significant deviation) in comparison to the 3.8 years quoted by all respondents even though Apple MacBook are generally regarded more durable. Thus we could assume that Apple users have higher incentive exchange their MacBooks earlier even though their higher durability. 80% of them never needed have their MacBook repaired. As reasonable lifespan they consider 3.3



years, which very nearly correspond to the holding time. It is in comparison to the general view, about 1 year and six months less, quite significantly about 25% lower desired lifespan. It was also proved by their answers that experienced lifespan of MacBooks were for 15 of them satisfactory. Furthermore, there were mainly very positive references on MacBooks; only one negative appeared mentioning their incompatibility with external devices. As wrote one of the respondents; "MacBooks are the best, the most stylish, the most convenient. Once you buy MacBook, you are part of 'the club' forever. I would never buy any other kind of laptop anymore."

### 4.3. CONCLUSIONS ON CONSUMER ATTITUDES

Young generation of consumers in the Czech Republic have similar approach towards durability of personal computers as in the western countries. Whereas if we observed older generations grown up in the communist times, the results would be probably more inclined to the longer durability and lower replacement rate. Very typically most of the Czech students pass their older laptops to their parents, grandparents or other relatives. Therefore the average lifespan -for how long is a laptop actually used - is very difficult to define. However, if we observe behaviour of young generation, as the results of university students sample show, the reasonable lifespan is by majority (mode value) seen for 4 to 5 years, as well as median value median values is 4 years. The results are very similar to the research which was made by Brook Lyndhurst<sup>19</sup> in the UK last year, where median value for reasonable lifespan of personal computers was 4 years.

The results of this survey also shows that usage time is by majority (mode value) seen for 3 years, median value is 4 years. 81% of students replaced their past laptop(s) in between 3 to 5 years. Thus average usage time is just slightly under average reasonable lifespan. "As there are no published data on life spans to shape consumer expectations, people are likely to judge a reasonable life span by their past experience and that of family and friends, together with factors such as anticipated intensity of use and technological advance" (Cooper, 2010). The unsatisfactory data on laptops lifespan were approved by the fifth hypothesis when students responded that the quality and durability of laptops are the information most difficult to obtain from sellers or producers. Furthermore, students confirmed also my first hypothesis that for majority of them is present durability of their laptops satisfactory.

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<sup>19</sup> Some more information about the research you can read in the chapter 5.7 Social and environmental consequences – Products lifespan

Although one third of respondents is dissatisfied with the durability, it is not a prove that there is a ready market for longer lasting appliances. Effective demand depends on willingness and an ability to pay the market price. In connection to that, 29% of students see exactly the price as the most negative aspect of a long lasting laptop; the fourth hypothesis was by the survey also confirmed. Nevertheless, the most important reason why not to buy a long lasting product is its obsolescence of technology – about 44% of respondents see as the biggest disadvantage of long durable laptop gradual obsolescence of performance or parameters. “The need of consumers feel to be ‘up to date’ provides a potentially powerful barrier to prolonged use of longer lasting products” (Cooper, 2004). Problem is that nowadays products, laptops as one of the best examples, are mainly marketed on their performance. So even if respondents see as the most important criterion for a laptop purchase its quality, its performance and parameters are tightly ensuing. However, from the survey results, without any assumptions, it is not surely possible proclaim obsolescence of technology as the main driver for replacement; the third hypothesis was not confirmed. Although students tend to replace their still functional laptops (the second hypothesis was validated), the lowering quality (the cost cutting) or even the functional obsolescence still plays significant role. In 22% of cases of replacement, laptops could be repaired but the repair was not worth it due to high cost or time inconvenience. It proves another trend of disposal over repair, when almost every fourth laptop was by students replaced instead of repaired.

Overall, it could be interesting to distinguish in very details motivations for replacement by functional and technological obsolescence even obsolescence of desirability, which according to students’ responds plays a role as well (e.g. old-fashioned design of long lifetime laptops). Most probably, as can be derived from the survey results, functional obsolescence prevail for low-end models, as students were mostly complaining about functional problems of lower positioned brands offering cheaper but less quality models (e.g. Acer, Asus). On the other hand, obsolescence of technology and desirability predominate for premium or higher positioned models (e.g. Apple, Lenovo). As the sample of Apple users responded; even though the quality is the most important criterion for them, in more than 80% of experiences with MacBooks repair was never needed and MacBooks are regarded more durable, the replacement rate stated by Apple users was higher than for whole sample of students. This issue will be more revealed on the example of Apple Inc. Company in the following real case study.

## 5. REAL CASE STUDY: APPLE INC. AND PLANNED OBSOLESCENCE

My incentive is to create a real case study on issue of planned obsolescence. In the connection to the survey, if there were any concrete data or differences among Apple products' facts, I primarily concentrated on issue of MacBooks.

### 5.1. STRUCTURE AND METHODOLOGY

Apple Inc. Company is blamed from practising planned obsolescence. Aim of the real case study is to give the most sober overview by providing relevant information from various sources, so a reader is able to make his/her own statement on Apple's relation to planned obsolescence. For the purpose of the thesis, I make my own conclusion and evaluation of given hypothesis. Thus, the real case study for the purpose of the thesis consists from three parts, which are following:

#### (1) Case study foreword

⇒ basic facts about company, problem introduction and hypothesis

#### (2) Case Study – Body of information

⇒ related information collected from interviews and secondary sources

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#### (3) Author's conclusions

⇒ based on assignment information and knowledge obtained in theoretical part

### CASE STUDY FOREWORD

The aim is to acquaint a reader with the case study by giving him the problem overview. Firstly, give the reader basic facts about Apple Inc., idea how important player on the market it is. Secondly, introduce to the reader the planned obsolescence suspicion which Apple is facing these days. Thirdly, by hypothesis creation, give to the reader statements he or she should agree with or rebut them after reading information given in the body of the case study. The foreword was created from secondary available information sources, but hypothesis were developed by the author.

### BODY OF INFORMATION

Body of information should provide reader with relevant information available to take standpoint on the problem and hypothesis. My attempt was to provide readers with objective information and various opinions of miscellaneous people.

The real case study's information body is based on secondary as well as primary information. Secondary data were gathered up from information and available sources of Apple Inc. Company

and other to the case relevant sources (articles, statistics, surveys, blogs etc.). Aim of the secondary information was to support, approve, enrich or bring other side perspective to the primary information. Primary information was obtained from in-depth interviews with Apple's loyal customers and proactive informed people from business.

## *IN-DEPTH INTERVIEWS*

Aim of the in-depth interviews was to get personal views of interviewees on Apple's business strategy, marketing practises and environmental responsibility. Only analysis of Apple's activities is in my opinion unsatisfactory. Important is the inside into interpretation and awareness of information and activities by its consumers and society.

In total, 10 subjects were approached, because of the personal way approaching them, 7 subjects were willing to participate in an interview but at the end only 6 in-depth interviews were realized. Three interviewees were 'general' (neither business educated nor business oriented) Apple's loyal consumers owning whole 'family' of Apple products more than two years Fourth one was an employee of Apple marketing department in the USA. Fifth interviewee was marketing specialist from international marketing agency. The last one was technically educated IT specialist.

**Exhibit 21 Detailed information about the interviewees<sup>20</sup>**

Specialization/ Knowledge of Apple	Nationality	Age	Gender
Contemporary employee of Apple Inc.	American	29	Male
Marketing specialist	Czech	35	Male
IT specialist	Czech	27	Male
Apple client I	French	26	Female
Apple client II	Czech	30	Female
Apple client III	Norwegian	27	Male

The goal of interviews was to get maximum objectivity information by concentration on interviewee knowledge and opinion without any interviewer influence. In-depth interviews were made spontaneously and context driven rather than based on in advance prepared structured questionnaire. Nevertheless, I had prepared couple of questions in advance for each of the respondents. Questions were varying according to the respondent's background but mostly were related to their opinion on case's hypothesis. According to interviewee convenience and time

<sup>20</sup> Some of the interviewee wanted to stay undisclosed. Respecting and meeting their requirements, I have decided not to include neither names neither contact details of any of the interviewee.

schedule interviews were held in person or via Skype. Interviews were lasting from 45 to 60 minutes on average and realized in the period between June 26 and July 30, 2011.

### **BODY OF INFORMATION CREATION**

Firstly, notes from interviews were checked for their credibility and validity and consolidated; some information and facts or their incompatibilities were as needed approved supplemented from secondary sources. Information from secondary sources is always in the case study quoted. Secondly, all of the valid information and facts were restructured into groups of arguments related to the same issue or hypothesis. Absent information from secondary sources were filled in. Thirdly, summary of information and facts was made from the relevant information to the case study.

### **AUTHOR'S CONCLUSIONS**

Conclusion of the case study encompasses my view on the given hypothesis in the case study. My motivation is to use the knowledge from theoretical part together with the facts from the case study and make a resolution on Apple's contribution to planned obsolescence.

## **5.2. CASE STUDY**

### **COMPANY INTRODUCTION – THE 'BIG APPLE'**

Apple Inc. has become a phenomenon. For reasons as various as its philosophy of comprehensive aesthetic design to its distinctive advertising campaigns, Apple has established a unique reputation in the consumer electronics industry. This includes a customer base that is devoted to the company and its brand, particularly in the United States. Fortune magazine named Apple the most admired company in the United States in 2008, and in the world in 2008, 2009, and 2010 (Wikipedia, n.d.) Its revenues growth significantly; net sales during 2010 increased \$22.3 billion or 52% compared to 2009<sup>21</sup> (Datamonitor, 2011). The freshest news is coming with new extent how "big" Apple is. Apple Inc. Company is now more liquid than the United States government. The US Treasury department on July 28, 2011 confirmed that Washington now has a total operating balance of only US\$73.768 billion. Meanwhile, Apple has US\$75.876 billion – and that number isn't going anywhere but up as the company continues to break records. Apple's market capitalization at the end of July 2011 was at US\$363.25 billion, making it the second largest company on the planet, after Exxon Mobil (Hartley, 2011).

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<sup>21</sup> Detailed Apple Inc. Revenue Analysis you can find in Appendix 5.

The company's best-known hardware products include the Macintosh line of computers – iMacs and MacBooks, the iPod, the iPhone and the iPad. Apple software includes the Mac OS X operating system; the iTunes media browser; the iLife suite of multimedia and creativity software; the iWork suite of productivity software; Aperture, a professional photography package; Final Cut Studio, a suite of professional audio and film-industry software products; Logic Studio, a suite of music production tools; the Safari web browser; and iOS, a mobile operating system. As of August 2010, the company operates over 300 retail stores in ten countries, and an online store where hardware and software products are sold (Wikipedia, n.d.).

### PROBLEM DEFINITION

There is no wonder that Apple is under continuous attention of media. Although Apple's marketing present Apple as very visionary, green and environmentally responsible company, make advertisements on greenest MacBook ever, offer recycle services for Apple even other brands electronics, sell refurbish products etc., you can find many articles and reports pour cold water on Apple's greenness. The company has received widespread criticism for its contractors' labour, environmental, and business practices. More importantly for the thesis, Apple is accused of planned obsolescence practising and compared to General Motors in the 30s. Apple is criticised for its frequent upgrades of products. There is no exception that Apple upgrades its product twice a year. Thus, even if you purchase your Apple product in first month when it has been launched, after only 5 months it becomes obsolete. Big indignation raises Apple's decision on non-replaceable components of its products – batteries and newly hardware in MacBooks, thus making them difficult to fix or upgrade. Most actually, Apple has started using new tamper-proof - proprietary five-point security screws in iPhone 4.

### HYPOTHESIS

- (1) Apple purposely makes customers products faster obsolete and motivates its consumers for faster replacement by their often (at least yearly) upgrades.*
- (2) Apple's policy with non-replaceable product components leads to better control of Apple over its products and motivates its customers in the replacement and disposal over repair.*
- (3) Apple is environmentally responsible company. Refurbished products are great chance how to decrease amounts of e-waste.*
- (4) iCloud will help Apple to ensure that its consumers will buy again Apple products.*

### APPLE – THE INNOVATIVE AND EXCEPTIONAL BUSINESS STRATEGY AND PRODUCTS

Apple Inc. is visionary company which enriched our world by many innovations. The first home computer with a graphical user interface GUI or graphical user interface based on Xerox technology was the Apple Lisa. Apple came up also with computer mouse which had been incorporated into GUI. Nevertheless, beginning of Apple's enormous success is assigned to year 2001 when first official Apple Retail Store was opened and most importantly - Apple introduced the iPod, which became the best selling portable media player in history. Together with iTunes from 2003, Apple became market leader in online music services. "The iPod is in the US synonym for MP3 and MP4." Apple's originality remains in ability using innovations and design thinking to make products very attractive for masses. Tablet was not an Apple's invention and had already been on the market for 10 years but when the multimedia tablet the iPad was introduced in 2010, Apple sold 1 million of them in 28 days (Buskirk, 2010) and tablets in general immediately became popular.

However, Steve Chazin, former Apple marketing executive argues that Apple did not invent anything really new like PC or telephone; the Mac, iPod, iTunes and iPhone are all successful because they were late to market and improved on existing designs and functionality. "Apple does one thing very well: making complex things easy and elegant well accepted by consumers" (Chazin, 2007). "So the key strategy of Apple is not to be first on the market but do it better and deliver it to consumers."

As its products, the company is unique as well. Apple doesn't do anything according to anyone else's timetable. In contrary to its competitors, Apple is not afraid launch product couple of months later, even if it means significant losses on sales. Apple follows the beat of its own drum. "If Silicon Valley's entrepreneurial spirit, employee ownership, and casual style changed corporate America, Apple took an entire one giant step further. Apple's culture is like a genetic mutation of the corporate America genome" (Tobak, Steve, 2010).

Apple made "step back in history" - everything important has under its own control: industrial design, operating system, hardware design, even the sales channel. Many consider Apple to be the most vertically integrated company in the world (Chen, 2011). Furthermore, Apple is very protective towards its information. "Apple holds secrets." It is very secret who manufacture for Apple, factories manufacturing for Apple does not disclose this, cannot approve their cooperation with Apple. The company is like "black box" where you do not know what is happening. Apple nothing reveals earlier than necessary; it is not Apple's style showing prototypes for next year, products are show to public maybe two weeks before launching in the



US. There is enormous buzz around new Apple launches supported by its secretiveness. E.g. as now blogs are full of speculation about iPhone 5 coming in September; some of the rumours even say that Steve Jobs proclaimed that Apple will never launch iPhone 5. Nevertheless, Apple manages control over messages on the internet; “few companies truly get communications and PR the way Apple does.”

Specific is also Apple’s ability align product development with product strategy and business strategy. The timing of new launches is amazingly coordinated; they are not overlapping, every big expected launch is in the different period of a year. Apple manages to do that by focusing on far fewer products than conventional consumer electronics companies; Apple has just one category of its products. In the laptops category Apple offers “only” 3 product lines MacBooks, new generation of MacBooks – MacBooks Air and MacBooks Pro. “Apple does not want to make more categories of cheaper lower quality MacBooks or more expensive ones; the actual MacBooks are according to Apple the best proportion of price and relevant quality.” In the phone category, Apple offers even “only” two products – iPhone 3GS and iPhone 4. New product launch in each category of products is minimally once in a year. E.g. MacBook Air 3,1 and 3,2 were launched in late 2010 had already been discontinued and replaced by its updated model newest MacBook Air 4,1 and 4,2 launched recently on July 2011.

Apple is quite unique in its strict price policy. New model is approximately for the same price as the previous one. The iPad 2 was launched in March 2011 at the same price as the original iPad and with the refresh of both the MacBook Pro and iMac 2011 with improved technology, Apple managed to maintain the same starting prices. (Turner, 2011) This is good for consumers, you can be sure that you can sell your MacBook after three years for reasonable price (could be about 30% of original price in the Czech Republic).

Apple has also great sales and stocking planning management. When new model should be launched, the old model which goes out of sales is sold out. “You can recognise new product launch time when your delivery of the older model takes longer time.” If old models are sold out actually when its upgrade goes on market, no sales no discounts are made. Plus own retail channel enables Apple keeping the prices of its products through their time on the market. “Apple does not decrease the price of a product after one year or two years of its presence on the market as it is common practise of its competitors.” Therefore, even though premium prices of Apple products, consumers see “MacBook as good investment because you can be sure you sell it after three years.”



Consumers love Apple products for its unique master design and easiness of use. The design and style is the core of Apple products. “The Mac was not just easier to use than the PC - it also had style. Style is Apple’s brand” (Chazin, 2007). “Creative people and design lovers gravitate to Mac because it frees their brain from having to use a computer. Designers, authors, artists and young consumers are all fans of good design and respond to those thoughtful touches” (Chazin, 2007). Apple purchase should be an experience. Apple’s retail stores are showcasing touch-worthy experience. Apple’s marketing is astonishing; surprising and delighting its customers. E.g. the experience of opening Apple’s product; the Apple product is decoratively packed in the designed Apple box which is covered by another casual box, so the Apple box stays undamaged and the experience from opening product is sensational, though not very eco-friendly. Apple is not selling only products, it is inviting you experience Apple lifestyle. Easy mottos which people can remember works. Moreover “1000 Songs in Your Pocket” and commercials for iPod does not sell the iPod but invites you to the iPod community (Chazin, 2007). “Nowadays teenagers need Apple products to be cool.”

Originality in Apple products is in the details. Very appreciate is the MagSafe – a connector which is held in place magnetically so that if it is tugged on by someone stumbling over the cable it will pull out of the cord safely, without damaging the connector or pulling the computer off of a table. On the other hand, Apple’s originality does not make the products’ sockets compatible with ordinary cables or facilities, users are forced to buy from Apple special adapters.

Nevertheless, Apple products are not just about its hardware. “Hardware itself is nothing so special except its design - HTC, Samsung have the same as iPhone, together with software is the biggest advantage of Apple, it is very well coordinated.” Specially implemented software and operational system OS X “is what makes a Mac a Mac”. It is user friendly and graphically very attractive. “The software is very easy to use but there is no possibility to adjust it.” Therefore IT specialists usually do not use Macs and they say; “It is targeted for ordinary users”, which is true and corresponds to Apple’s target group.

To the details in design and to which target group Apple addresses correspond also Apple’s new modifications in hardware. Apple for better comfort of its customers and more developed design continues with the trend of non-removable batteries. “When the battery is non-removable, it saves a lot of space.” After iPod and iPhone, now Apple’s MacBook Air and latest 17-inch MacBook Pro have non-removable batteries as well. Battery cannot be removed by users but only by authorized services by Apple. During one year warranty the service is for free, after

warranty is charged for \$179 (in the US). One year warranty service for all products is Apple standard worldwide. Within EU it is two because of the regulation. For additional amount of money you can purchase “Apple care” –up to three years warranty. Nevertheless, people argue that Apple batteries are higher quality than of its competitors; “MacBook, MacBook Pro or MacBook Air is designed to deliver up to 1000 full charge and discharge cycles before it reaches 80 percent of its original capacity” (Apple Inc., 2011). “It is quite hard to believe it if batteries manufacturers are only three in the world.”

Apple decided to continue in this trend even after the company had faced lawsuits in the past over the iPhone and iPod’s non-removable batteries. According to Apple a permanent battery means that the company can minimize and monitor the amount of waste that goes into a landfill and remove the battery in environmentally friendly manner. The very new impossibility to remove MacBooks hard drive goes with it. “The vast majority of people buying Apple products will have no desire taking apart their machine to upgrade or change a drive, so it is not a big deal if products are not designed in any way to be serviceable.”

Moreover to prevent users from opening their devices, Apple is switching to a new “tamper-proof” screw. “The policy is inconsistent. Apple doesn’t use tamper-proof screws across all its devices, only the consumer-focused gadgets are sealed shut (iPhone, iPod, iPad and MacBook Airt). Most of Apple’s pro- products (MacBook, MacBook Pro, iMac and Mac Pro) are user upgradeable or serviceable” (Kahney, 2011). Apple does not want customers trying a self repair of the product, which is not any exception among manufacturers. However, experience of Apple consumers is that in the case of a problem, product is very often replaced by new one than repaired. Due to the design there is tight adjustment of components, though repair is very complicated and do not have to be reliable. “Plus with the total mechanisation of production, qualified repair might be often more costly than production of a new product.”

Apple consumers are welcoming this solution of break downs. They trust Apple and its environmental policy. Apple offers gift cards for working or nonworking disposed ‘iproducts’. Gift cards can be used for purchase in Apple retail or online store and their monetary value equals to the established value of the disposed product. From the disposed products which are qualified to reuse “new” refurbished products are made. Refurbished MacBook cost about 150 dollars less (than for the original one) with guarantee of the same quality and one year warranty. “Future vision is that when you come to the store, you will get in exchange for your old laptop the new one.”

Overall Apple is by its customers perceived as socially responsible and eco-friendly company. On its official webpage<sup>22</sup> Apple describes in detail how energetically demanding and environmentally harmful are different phases in products life. “If what is there written is all true, Apple is not only innovative leader but eco leader as well.” Apple has been criticized many times for some environmental issues as usage of toxins in production etc, but it seems that in all aspects Apple tries to improve its ecological footprint, especially in those area where was criticized. E.g. new MacBooks’ covers are not from plastics anymore, but from aluminium, which can be recycled indefinitely, as reprocessing does not damage its structure. Aluminium is the most cost-effective material to recycle (Waste online, 2005).

However new justified attack are appearing as in the Chinese CSR Report which attacks Apple’s supply chain; “Apple can say it is completely ‘green’ because it is a brand with no factory, but if it doesn’t manage its supply chain, these are just empty words. Far from being the best on planet, it is bottom among 29 IT brands. Apple should be a leader. If it can move on this, it can change the whole industry.” wrote Ma Jun of the Chinese Institute for Public and Environmental Affairs (Institute of Public and Environmental Affairs, 2011). Apple’s statement on official webpage that “Apple is committed to ensuring that working conditions in our supply chain are safe, workers are treated with respect and dignity, and manufacturing processes are environmentally responsible” (Apple Inc., 2011), was disproved in all points by the report of the Chinese institute. “The toxins in the production and poor working conditions are the problem of whole IT industry, not just Apple” (Institute of Public and Environmental Affairs, 2011).

Nevertheless, consumers’ attention is fixed on the introduction of this fall. With new operating system iOS 5, consumers can subscribe to the iCloud, which was unveiled on June 6, 2011 WWDC (Apple Worldwide Developers Conference). iCloud with the 5 gigabytes free storage enables Apple users to view and edit their documents online as it offers Google or Dropbox and share them from their iMac, MacBook, iPod or iPad. Moreover, iCloud automatically shares all files and information across all Apple devices; if you download app, music or take a photo, iCloud pushes a copy to all devices. When you buy something new, it is immediately on all your advices. iCloud brings as big compelling convenience to Apple customers as many Apple devices they have. “This is a milestone in computing. The fact that you no longer have to think in terms of files and folders is a big deal.” said Mike McCue, a veteran Silicon Valley executive who now heads Flipboard, a popular news app for iPhone and iPads (Helft, 2011).

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<sup>22</sup> <http://www.apple.com/environment/>

*“There's an old Wayne Gretzky quote that I love. I skate to where the puck is going to be, not where it has been. And we've always tried to do that at Apple. Since the very very beginning. And we always will.” (Steve Jobs) (Cramton, 2011)*

### 5.3. AUTHOR'S CONCLUSIONS

Information which I obtained during the interviews proved that Apple, as it was predetermined in the survey conclusion, demonstrates that more durable products than average standard can have the same or even lower lifespan than less durable products thanks to upgrades and functioning of obsolescence by technology and desirability. Apple makes their MacBooks satisfactory durable but the newer versions are more tempting for the consumers, so they tend to switch to the newest versions far earlier than it is necessary. The effect of upgrades is the most effective for iPhones, which are in many countries, as for example China, a symbol of high status. "When in September new iPhone 5 is launched, you have to buy the new iPhone to remain the status, iPhone 4 becomes in a second obsolete and undesirable." Nevertheless, in the connection to the first hypothesis, I have to admit that Apple does not upgrade faster than its competitors; all computer producers are launching new products each year, phone producers cannot survive without new models coming in horizons of months or weeks<sup>23</sup>. It is the Apple's great strategy of few transparent product lines and brand marketing which just impact consumers more efficiently. Apple does not launch new product but new version of the familiar one. Thus, *I agree with the first hypothesis but must be stressed that Apple does not upgrade or innovate its products faster than its competitors, rather more efficiently in the sense of perceived obsolescence by consumers*. Moreover, it is very hard to determine how much upgrades timing and 'innovativeness' is determined by market and technological development or how much it is determined by Apple's effort coming with the 'reasons' why you should replace the older version by the new one.

In the connection to the buzz around the non-replaceable components of Apple products, Apple pushes forward the trend of replacement over repair, which has been already identified in the survey. Despite the fact that controlled, centralized and ecologically respectful battery replacement by Apple should be less environmentally harmful, plus it enables Apple to efficiently and more safely build in components, thus also push forward the design possibilities. On the other hand, from the point of planned obsolescence, it could, in some cases, motivate consumers rather to replace their products than pay and wait couple of days for a new battery. It

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<sup>23</sup> "While upgrades has an effect of making older units obsolete, introducing a new product is the most important in differentiating its own from others and continuing to sell certain amounts of products. "Therefore, for companies in IT industry, facing continuous technological development and keen competition, excessive "planned obsolescence" cannot be avoided. It can be said, that kind of 'prisoner's dilemma'<sup>23</sup> occurs." (Atsuo Utaka)

makes consumers more dependent on the company. If anything happens with the product or components, which until now many consumers were able to solve by themselves, now their only chance is turn to the authorized Apple service. The most sensitive then could be the question of the future. If Apple will make some components less durable and their replacement will charge more expensively or the company will stress even more to the strategy of limited repair (rather replacement of whole product), it would move consumer disposal behaviour and values further away. Consumers might become more unconcerned and indifferent, do not even consider possibility of repair. Therefore, *I can absolutely agree with second hypothesis in the sense that Apple by this step takes over part of consumers' field of possibilities and make them more reliable.* The question of higher motivation to replacement tendency is partly true and differs for various Apple products. The cases where Apple was suited for short batteries' life and its impossibility of replacement in iPods, it was a modern example of planned obsolescence by functionality. No, it seems that Apple has learnt from those cases and is more guarded and responsible. The change of batteries policy in MacBooks, I do not see as a problem of planned obsolescence as far as the batteries will have satisfactory life and price for their replacement will be still reasonable compared to the price of a new MacBook. "If Apple has learnt from its past mistakes or only plays the game smarter, it will be revealed in the future."

Although Apple customers are very confident about Apple's initiatives and eco-friendliness, my notion on the environmental policy of Apple is mixed as well. Same as the necessity of upgrades, nowadays there is the pressure on companies to be socially and environmentally responsible. Problem of the responsibility is that it does not generate money but the other way round. In the environment, where money and actual performance are on the first place, it is hard to believe companies invest in the sustainability future more than is a must, especially in the IT industry. In the connection to planned obsolescence and product disposal, I think that consumers should not blindly trust companies and leave on them whole responsibility of their decisions, because who really knows what happens with the product when it is handed over to the company for recycling. Concretely with Apple, there were many times revealed information that Apple is not green as it is perceived by consumers and presented by the company (e.g. the Chinese report contradiction in the case).

In addition to the third hypothesis, refurbished products are certainly good reaction on huge amounts of e-waste and offers another utilise of faulty products. However, during the in-depth interviews, Apple consumers tended to interpret the new possibility to buy refurbished products as a solution to the disposal of products: "Apple sends returned products to China, where they

make from them the new ones, so I do not see in the higher disposal a problem<sup>24</sup>.” Refurbished product is positive initiative but problem is how consumers can interpret them, one of the interviewee thought that all possible disposed products are refurbished (confusion of the term refurbished and recycled). *Overall I agree with the second part of the hypothesis but I cannot fully confirm its first statement.* Firstly, the Apple’s environmental responsibility is in my opinion lower than its reputation. Secondly, responsibility is sufficient to the IT industry standards but there are many points for improvements.

Coming to the fourth hypothesis, iCloud will offer to Apple consumers great experience of products synchronization, it is brave new world of cloud computing. In the same time, it will have the lock-in effect on them. iCloud automatically synchronizes all Apple products and applications. If a consumer own MacBook and iPad, it will be very effective to buy the iPhone as well to have it synchronized all – laptop, tablet and phone. Then when a consumer will be deciding about purchase of a new laptop, there is very high chance he/she would go for MacBook again. The big motivator will be the data shared on Apple store and iCloud service. The switching cost will be for consumer too high. So even if only hypothetically Apple was acting with consumers more unethically, it would take consumers very long time to switch to other brand. Therefore, *I fully agree with the fourth hypothesis.*

Apple is very often not purchased by consumers for their technology advancement but because of their friendliness of use and the brand value connected and its perceived importance for their social status, especially in the countries as China where it is important to show status. Apple introduced fashion and status within the consumer electronics industry. In the contrary to the other premium brands selling the same bags or perfumes for years, Apple is thanks to technology upgrades able to exchange the desirable product every year and make the old ones immediately obsolete. What have to be given to Apple as a plus is that marketing and strategy on consumers is not push but pull by giving them what they want.

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<sup>24</sup> The essence is that consumers lack their knowledge about the environmental implications of their purchases, consumers believe in the responsibility of manufacturers (Cooper, 2005).



## 6. RECOMMENDATIONS FOR LONGER LAPTOPS' LIFETIMES AND SUSTAINABILITY

After observing situation on the consumer side (the survey on consumer attitudes towards laptops' durability) and investigation on the company side (the real case on Apple Inc.), I would like to use the knowledge obtained and make conclusion of the situation as well as suggestions for longer laptops lifetimes and sustainability.

Laptops are good example of products, where all three kinds of planned obsolescence are practised by companies. Firstly, producers tend to practise planned obsolescence of functionality. Even though the competition is very tough and all the kinds of cost cutting are practised within the consumer electronics, still some gradual functional problems, which are for users significant enough to replace the laptop, are occurring in many models repetitively. Also question of durability and prices of replaceable batteries is still doubtful. Furthermore, the trend of design for limited repair is recognisable. Most of laptops and especially Apple MacBooks have complete and inviolable design; there is little or nothing to be added or contributed by the user. "Even the repair of a simple scratch or break is not invited, and it would be difficult to achieve a satisfactory result. Thus, the user cannot truly 'own' the object if he or she cannot engage with it, understand it (except on a very superficial level), or maintain or care for it " (Cooper, 2005).

Secondly, obsolescence of technology companies reach through innovation and fast upgrades of laptops' models by slight improvements on their performance and/or by adding still new product futures (e.g. fingerprint reader). Thirdly, planned obsolescence of desirability is targeted on consumers as well. Design aesthetics that lead to reduced satisfaction, for example polished or fragile surfaces which are susceptible to wear out in short period of usage.

Trend of faster replacement is motivated also by the demand side. Consumers like to buy new electronics and want to have up-to-date products. Moreover, for user it is very often more comfortable to buy a new laptop rather than upgrading the existing one (cost of repairs relative to cost of new products). Value from having up-to-date products determines how long consumers want to hold their laptops. In general, consumers are not ready for long lasting laptops; they do not see such a value obtained as it is charged for longer lifetime products, as well as they are afraid of theirs gradual obsolescence.

Therefore, extending of products lifetimes needs to be realistically modest, at least in the short term. Most importantly, there is a strong need to improve perceived value of long lifetime products. In the survey, students specified that quality is the most important criterion for a laptop



purchase. Thus, quality of longer lasting laptops could be stressed adequately. In the same time, suggested measures for longer lifetimes of laptops have to enable companies ensure adequate ROI on design and manufacture of new models.

Laptops in the future should be more standardized, universal, and less governable by fashion. They should be designed for assembly and reuse, plus their spare parts should be available, easily accessible and with reduced complexity. Modular design approach might be used; products would be compound from couple of exchangeable compatible parts (e.g. monitor, mother board, keyboard), which each of them can be easily exchanged for new one. Marketing should turn from performance driven to durability and quality driven. During the period when consumers stay out of the market, the relationship with the company would be secured by strong after care service based on in house repair service and consultations with shorter repair duration, transformation or exchange of components service.

The real catch is how to shape consumers to buy more durable laptops and producers to produce them. Firstly, we should start with the education of consumers. Awareness campaigns by regulatory bodies could start e.g. by changing the term consumer electronics which itself evokes quicker consumerism. Green (durable) product procurement should be more communicated towards consumers and it should support the awareness campaigns. Prepare consumers paying higher prices for more quality products with better services. Consumer demand should be changed through emphasis on durability and environmental impacts.

Secondly, there is need for changes on supply side. Very low quality products should be removed from markets by taking three main legislative measures.

- Compulsory extended warranties on laptops and also batteries (3 and 2 years).
- Compulsory certifications on simulated laptops usage (e.g. number of lid close/opens with the guaranteed unchanged mechanism quality, keyboard tests etc.).
- Compulsory shortened repair period (from 30 to 15 days).
- Compulsory presentation of spare part prices during the purchase.

All these legislative changes would have double lever effect. It would lead to increased producers' costs which would afterwards be compensated via increased laptops' prices. This increase in prices would have the secondary influence on customers. The more expensive the more customers would care about their products and start preferring repair over replacement.

However, longer laptops' lifetimes and life spans are mainly ways how to eliminate the problems of increasing consumption and planned obsolescence. Nevertheless, the way towards sustainable

future (from the environmental aspect) might go in different direction in the long term. As we know, the problem is linearity of the system from production to consumption. Therefore the cycled system from production to production (e.g. cradle to cradle) could be the new future scenario. If all materials from laptops were efficiently reused, thus, there was no waste, and reused materials went directly to the production, thus, no additional resources were needed, sustainable consumption would be possible at any laptop lifetime and for any replacement period. Materials would be just flowing from producer to consumer and from consumer back to producer. We would move from recycled and refurbished products to 'cycled' products. As we can observe, these days pressure and progress in recycling is very evident; companies are by public forced to be environmentally responsible and it will be more and more in their interest to make the recycling process as efficient and economical as possible. Furthermore, new technologies and innovative ideas are appearing every day and open new possibilities. Therefore, planned obsolescence and consumption could in the shorter term have even positive influence on growing pressure on recycling and innovations, which would most probably lead to the sustainable future of 'cycled' products.

Nonetheless, cycled system of flowing materials would avoid the environmental problem but not the social one. In my opinion - "Population, which is replacing products frequently, will lose their income sooner or later. People will need to buy more and more products, considering them to be necessary for their survival. All the money they make will be handed over until there is no more. Dependency on companies increases."

### CONCLUSION

The main thoughts of my thesis applied on particular problem solution please read in the previous chapter 9. *Recommendations for longer laptops lifetimes and sustainability*. In following conclusion I introduce the general final thoughts on the planned obsolescence topic.

Planned obsolescence is not only companies issue; it is inseparable from our present economic system of market driven capitalism. Ever since supply overtook demand, companies are determined to stimulate demand by repeated purchases and consumers are motivated for replacement of products and for premature disposal. Companies are facing tough competition and pressure for continuous product innovation on global markets which leads to compression of newly launched products and their lifecycle and replacement cycle. Using new technologies, products enhancements, design and marketing, companies stimulate consumers' perceptions about durability of products. As the survey on consumer attitudes showed, consumers do not demand long lasting products and their expectations are shaped by companies and derived from their experiences. Companies mainly play around those consumer expectations, but some companies, mainly market or innovative leaders of the particular market are able to move consumers' expectations and market standards further.

Although planned obsolescence has positive effects towards economic and technological development, the negative influence on consumer values and behaviour and most importantly the environmental consequences of product waste are the stimulants for endeavour of particular people to find planned obsolescence practising unsustainable. Mostly the initiatives for sustainability go for the possibility of reducing planned obsolescence, higher responsibility of companies and education of consumers towards longer products lifetimes. However, in my opinion, this cannot be really successful, since it goes against the inherited values of capitalism. However, as for today more and more knowledgeable professionals start to think that contemporary economic crisis is starting to determine the end of this economic era. I have definitely no ascription to describe the upcoming new economic system. My only assumptions lead me to think that this new system will be based more on real values and its main attributes will be sustainability and conscious consumption. This will most probably terminate planned obsolescence as we know it today.

I personally incline to opinions that in the longer run, new technologies or/and new economic system will help to solve our contemporary concerns. Even if planned obsolescence has a positive influence on companies' innovations they have to start taking into account that even innovativeness bares some spillovers. This must be done by public pressure on the companies.

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## LIST OF EXHIBITS

### COMPANY IN THE CHANGING GLOBAL ENVIRONMENT

Exhibit 1 Technology Life Cycles .....	12
Exhibit 2 Continuum of innovations .....	13
Exhibit 3 Major stages in new product development .....	13
Exhibit 4 Model of Product Life Cycle .....	14
Exhibit 5 Three Dimensions of a product.....	15

### PLANNED OBSOLESCENCE

Exhibit 6 Demand functions in the second period of products from the (a) first period and (b) second period .....	42
Exhibit 7 Findings of Brook Lyndhurst focus group expectation of product lifetimes (1) .....	51
Exhibit 8 Environmental issues during life-cycle of a product .....	54

### ETHICAL RESPONSIBILITIES AND RESPONSES

Exhibit 9 Principal objectives of specific measures for longer product lifetimes .....	55
Exhibit 10 Cradle to Grave life cycle .....	56
Exhibit 11 Cradle to Cradle life cycle .....	57

### SURVEY ON CONSUMER ATTITUDES

Exhibit 12 Detailed information about the survey sample .....	64
Exhibit 13 Survey responds to the Question 10.....	66
Exhibit 14 Survey responds to the Question 3.....	67
Exhibit 15 Survey responds to the Question 7.....	67
Exhibit 16 Survey responds to the Question 4.....	68
Exhibit 17 Survey responds to the Question 5.....	69
Exhibit 18 Survey responds to the Question 11 .....	70
Exhibit 19 Survey responds to the Question 6.....	71
Exhibit 20 Survey responds to the Question 8 - How important are the following criteria for you when you are making purchase decision about your new laptop?.....	72

### REAL CASE STUDY: APPLE INC. AND PLANNED OBSOLESCENCE

Exhibit 21 Detailed information about the interviewees .....	76
--	----

### APPENDIXES

Appendix 1 An Aesthetic typology for contemporary, unsustainable products .....	101
Appendix 2 Age of discarded appliances and life spans considered reasonable .....	102
Appendix 3 Possible measures to achieve longer product lifetimes .....	103
Appendix 4 Survey Questionnaire .....	106
Appendix 5 Apple Inc. revenue analysis fiscal year 2010 versus 2009 .....	112

## APPENDIX 1 AN AESTHETIC TYPOLOGY FOR CONTEMPORARY, UNSUSTAINABLE PRODUCTS

Aesthetic Identifier	Description	Relationship to Unsustainable Practices
Culturally neutral or bland	This is a function of mass production for global distribution. Cultural or regional preferences and distinctions are generally omitted from the design because the same product has to be acceptable to different users all over the world.	In their design and production, products that exhibit such aesthetic neutrality often fail to respond to the particularities of place that are so important to the notion of sustainable development.
Pristine, polished, and fragile	This depends on capital- and energy-intensive production processes, as well as a “one-time use” of finite resources, to achieve faultless forms and surfaces.	With everyday use, the perfect appearance quickly becomes scratched and damaged—which can engender user dissatisfaction and premature product disposal and replacement. In addition, delivery to the market of such products requires a heavy reliance on packaging. Thus, the flawless but delicate surface design of many contemporary products helps stimulate unnecessary consumerism and contributes to waste production.
Concealing and disguising	The exterior of the object is perceived as an envelope or casing. It is usually a molded or press-formed shell that has little bearing on the function or form of the inner workings of the product.	This is a barrier to product comprehension. It not only hampers product repair, but can also contribute to a lack of resonance with, and attachment to, our material possessions, because we do not understand them and we cannot engage with them, except in a very superficial way.
Curved, rounded, and smooth	The exterior forms of many contemporary products, often made of plastics, are distinguished by forms that can be readily injection-molded. Consequently, hard edges are eliminated, corners are rounded, and forms become smoothed and easy to mould.	This molded aesthetic is indicative of energy- and resource-intensive mass-production processes that are environmentally damaging and frequently socially problematic. Production is often done in low-wage economies with poor worker conditions and lax environmental policies. Hence, this aesthetic characteristic can be indicative of environmentally and socially unsustainable practices.
Fashionable or showy	Many so-called consumer durables are designed in ways that both pander to and spur on short-lived trends through unnecessary updates and changes in form and color.	When such “permanent” products—which are problematic in terms of their disposal—are designed in ways that quickly become outdated, it is indicative of irresponsible practices and lack of respect for the environment and the use of finite resources. Such designs foster premature aesthetic obsolescence, waste, and consumption.
Complete and inviolable	This aesthetic quality is a function of the overall presentation of the object in terms of its sophisticated forms, finishes, and materials.	Most products demand passive acceptance by the user; there is little or nothing to be added or contributed by the user. Even the repair of a simple scratch or break is not invited, and it would be difficult to achieve a satisfactory result. Thus, the user cannot truly “own” the object if he or she cannot engage with it, understand it (except on a very superficial level), or maintain or care for it. Again, this can foster a lack of valuing of the object and lead to its premature disposal. This feature is related to the “professionalization” of design and the fact that the physical descriptions of our material goods have effectively been taken out of the hands of ordinary people and local or regional communities.

Source: (Cooper, 2005)

**APPENDIX 2 AGE OF DISCARDED APPLIANCES AND LIFE SPANS CONSIDERED REASONABLE**

Product category	Life span considered "reasonable" (mean)	Age of appliances discarded in disrepair (mean)	Age of all discarded appliances (mean)
Electric cookers	13	12	12
Refrigerators and freezers	12	11	11
Televisions	11	10	10
Washing machines, dishwashers, and tumble dryers	10	9	9
Hi-fi and stereo	11	8	9
Vacuum cleaners and carpet cleaners	9	7	8
Video equipment	10	7	7
Home and garden tools	10	7	7
Microwave ovens	9	6	7
Computers and peripherals	9	7	6
Telephones, faxes, and answer machines	10	5	6
Radio and personal radio, stereo, and CD	8	5	6
Small work or personal care appliances	6	4	4
Mobile phones and pagers	6	4	4
Toys	6	4	4

Source: (Cooper, 2004)

Apologies for the lower picture quality but the original source was available only in this quality.



## APPENDIX 3 POSSIBLE MEASURES TO ACHIEVE LONGER PRODUCT LIFETIMES

1. Design for durability	<p>Less suited to:</p> <ul style="list-style-type: none"> <li>up-to-date products items where durability is not a key factor in the purchasing decision.</li> <li>products experiencing rapid innovation, ie new functionality, materials, fashion</li> <li>infrequently used consumer products, where the product is likely to last for a long time without the need for better design, due to its infrequent use pattern</li> </ul>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>retailer support for sales of more durable products</li> <li>consumer demand for longer life products</li> <li>manufacturer desire to develop financially competitive longer lived designs</li> <li>longer-term increase in commodity prices/resource scarcity could encourage manufacturers to rethink sales-based business models</li> </ul>	<p>Likelihood of success - low:</p> <ul style="list-style-type: none"> <li>durability as a factor in purchasing is generally low in consumer psyche, relative to costs.</li> <li>More durable products generally likely to cost more to produce and retail at higher prices in order to maintain margin</li> <li>retailers satisfy consumer demand</li> </ul>
2. Leasing business models	<p>Less suited to:</p> <ul style="list-style-type: none"> <li>low value products as leasing costs are less financially/ commercially attractive to customers.</li> <li>frequently used consumer products, where occasional access to the product would be insufficient</li> </ul>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>retailer interest in alternatives business model to unit sales</li> <li>customer willingness to lease products rather than to own them</li> <li>desire/practicability for more complex business models repeated hire/repair</li> </ul>	<p>Likelihood of success - medium:</p> <ul style="list-style-type: none"> <li>requires fundamental change to PSS business model, possible in commerce and public sector</li> <li>low likelihood in domestic market because consumers like to own items</li> </ul>
3. Aftercare services	<p>Unsuitable for:</p> <ul style="list-style-type: none"> <li>products which cannot be nurtured to increase their lifetime.</li> </ul> <p>Less suited to:</p> <ul style="list-style-type: none"> <li>low value products, as servicing costs may be disproportionately high compared to cost of purchasing the product.</li> <li>up-to-date products items where the desire to update is strong.</li> <li>infrequently used products that are less likely to require aftercare &amp; maintenance services</li> </ul>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>retailer interest in extension to current business models and entering into long term relationship with customer</li> <li>customer recognition of life cycle cost savings and preparedness to pay upfront for services</li> <li>desire/practicability for more complex business models repair/servicing</li> </ul>	<p>Likelihood of success - low:</p> <ul style="list-style-type: none"> <li>likelihood of success may be higher for expensive workhorse and 'on show' investment products, but limited for other products where purchase cost is low relative to repair services (labour costs)</li> <li>appears to be limited interest in 'care/repair' amongst many consumers</li> </ul>

## PLANNED OBSOLESCENCE

Measure	Applicability to Products	Critical success factors	Likelihood of Success
4. Deposits / product buy-back	<p>Less suited to</p> <ul style="list-style-type: none"> <li>workhorse products which are more likely to be used by consumers until the end of life.</li> <li>low value products where the price differential between new and second hand product could be insufficient to attract customers of second hand products</li> <li>products with no second hand market /low resale value</li> </ul>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>retailer interest in providing deposit scheme</li> <li>setting cost of deposit, low enough for customer preparedness to pay up front, but high enough for them to want to return product</li> <li>financial and non-financial incentives to enter</li> <li>existence of wide consumer base with different expectations/tastes/purchasing power in order to enable multiple redeployment of product</li> </ul>	<p>Likelihood of success - medium:</p> <ul style="list-style-type: none"> <li>with the exception of rapid turnover high tech electronics, and out-of-favour investment products, products are likely to have low inherent value at discard</li> <li>some consumers are adverse to reused products</li> </ul>
5. Consumer awareness campaigns	<p>Unsuitable for:</p> <ul style="list-style-type: none"> <li>commercial or public sector customers</li> </ul> <p>Less suited to</p> <ul style="list-style-type: none"> <li>workhorse products which are more likely to be used by consumers until the end of life.</li> <li>functional or valued investment products which are not likely to be discarded prematurely</li> </ul>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>overcoming manufacturer/retailer/ institutional resistance to such a campaign in what is likely to be perceived by many as anti economic growth</li> <li>effectiveness of design of campaign in hard to target groups and clear message – nudge theory, influencing amenable and leading social groups</li> </ul>	<p>Likelihood of success - medium:</p> <ul style="list-style-type: none"> <li>essential to change consumer psyche if any voluntary measures are likely to be effective</li> </ul>
6. Government support	<p>Less suited to:</p> <ul style="list-style-type: none"> <li>up-to-date products where durability is not a key factor in the purchasing decision.</li> <li>imported electrical products with design and manufacturing bases outside UK</li> </ul>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>requires partnership and joint working in industry</li> <li>requires customer demand and retailer interest for this measure to work</li> <li>specific measure demands consumers to consider whole life cost of products rather than impulse buy or buy only on cost. Consumer attitudes research showed limited interest at present</li> </ul>	<p>Likelihood of success - low:</p> <ul style="list-style-type: none"> <li>limited funding likely to be available, so only select products would be covered.</li> <li>limited number of products for which UK will have sufficient influence</li> </ul>
7. ECAs	<p>Unsuitable for:</p> <ul style="list-style-type: none"> <li>products purchased by consumers/ householders.</li> </ul> <p>Less suited to:</p> <ul style="list-style-type: none"> <li>low value purchases, although a high number of low value products would be suitable, where the value taxable benefits are insufficient to drive demand for the allowance.</li> </ul>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>promotion of measure and take up by procurers</li> <li>manufacturer interest in/ability to develop standards for more durable products</li> </ul>	<p>Likelihood of success - low:</p> <ul style="list-style-type: none"> <li>promotion of measure and take up by procurers</li> <li>commerce focused</li> <li>labour costs, rather than product costs are main driver – limited impact on balance sheet of most companies</li> </ul>
8. VAT incentive	<p>Unsuitable for:</p> <ul style="list-style-type: none"> <li>VAT registered commerce and public sector organisations</li> </ul> <p>Less suited to:</p>	<p>Key factors are:</p> <ul style="list-style-type: none"> <li>government willingness/ability to implement variable VAT on products.</li> <li>difficulties/costs associated with</li> </ul>	<p>Likelihood of success - low:</p> <ul style="list-style-type: none"> <li>limited impact on low value products.</li> </ul>



## PLANNED OBSOLESCENCE

Measure	Applicability to Products	Critical success factors	Likelihood of Success
	<ul style="list-style-type: none"> <li>low value products where the price differential between VAT-reduced longer life products and VAT- standard life products is insufficient to drive demand.</li> </ul>	developing/revising product specific standards	
9. Voluntary Product durability standards	Less suited to: <ul style="list-style-type: none"> <li>up-to-date products where durability is not a key factor in the purchasing decision.</li> <li>products where variables make it difficult to agree standards, eg uses per day, high innovation, routine care extends life.</li> </ul>	Key factors are: <ul style="list-style-type: none"> <li>difficulties/costs associated with developing/revising product specific standards.</li> <li>lack of incentive for industry to engage.</li> </ul>	Likelihood of success - low: <ul style="list-style-type: none"> <li>durability factor are generally low in the consumer psyche, relative to costs.</li> <li>more durable products generally likely to cost more to produce and retail at higher prices in order to maintain margin</li> <li>retailers satisfy consumer demand</li> </ul>
10. Mandatory Durability Declaration	Less suited to: <ul style="list-style-type: none"> <li>up-to-date products where durability is not a key factor in the purchasing decision.</li> <li>products where variables make it difficult to agree standards, eg uses per day, high innovation, routine care extends life.</li> </ul>	Key factors are: <ul style="list-style-type: none"> <li>difficulties/costs associated with developing/revising product specific standards.</li> </ul>	Likelihood of success - medium: <ul style="list-style-type: none"> <li>durability factor generally low in consumer psyche, relative to costs.</li> <li>more durable products generally likely to cost more to produce and retail at higher prices in order to maintain margin</li> <li>retailers satisfy consumer demand</li> </ul>
11. Green Public Procurement	Unsuitable for: <ul style="list-style-type: none"> <li>commercial and domestic purchased products</li> <li>up-to-date products where durability is not a key factor in the purchasing decision.</li> <li>low value/low volume products, as there is an insufficient incentive to develop standard</li> </ul>	Key factors are: <ul style="list-style-type: none"> <li>restricted to government procurers.</li> <li>difficulties/costs associated with developing/revising product specific standards.</li> </ul>	Likelihood of success - low: <ul style="list-style-type: none"> <li>more durable products generally likely to cost more to produce, causing difficulties for public sector procurers.</li> <li>may fail unless in conjunction with mandatory government standard due to lack of significant incentive for industry to develop standards.</li> </ul>
12. IPR	Unsuitable for: <ul style="list-style-type: none"> <li>products which cannot be refurbished.</li> </ul> Less suited to: <ul style="list-style-type: none"> <li>up-to-date products , especially where resale value is low/no effective second hand market.</li> </ul>	Key factors are: <ul style="list-style-type: none"> <li>restricted to products with high value and high potential for refurbishment, otherwise will not be a mechanism for extending product life.</li> <li>difficulties in enforcement, ensuring reuse/refurbishment potential is achieved.</li> </ul>	Likelihood of success - medium: <ul style="list-style-type: none"> <li>measure may not increase refurbishment/extended life if waste management costs significantly cheaper.</li> <li>could result in refurbishment of products without subsequent market for products.</li> </ul>
13. Extended Warranties	Less suited to: <ul style="list-style-type: none"> <li>up-to-date and rapidly innovating products, since an outright ban could stifle innovation/lead to illegal import.</li> </ul>	Key factors are: <ul style="list-style-type: none"> <li>raises the 'bar' for all products</li> <li>independent of consumer choice /demand</li> <li>significant opposition from industry.</li> <li>uncompetitive for UK industry – so EU wide implementation encouraged.</li> </ul>	Likelihood of success - high: <ul style="list-style-type: none"> <li>legally defined, not standards based</li> </ul>

Source: (Downes, et al., 2011)

## APPENDIX 4 SURVEY QUESTIONNAIRE

### Customer Attitudes towards Laptops' Lifespan

This questionnaire was developed as information source for the survey in the practical part of diploma thesis on the topic of “planned obsolescence” at the University of Economics in Prague. In the questions below, under the term laptop author includes laptops, netbooks and MacBooks together. Please include in your responds only those laptops, which you use personally either for your private or business activities. From laptops for business activities please include only those of which purchase you decide according to your needs, not your employer.

#### Question 1

How many laptops do you currently own and use?

- ☐ None
- ☐ One
- ☐ Two simultaneously
- ☐ More than two simultaneously

#### Question 2

How many laptops have you owned during last ten years?

- ☐ One
- ☐ Two
- ☐ Three
- ☐ Four
- ☐ Five
- ☐ Six or more

#### Question 3

How many years do you usually use your laptop before you buy a new one?

- ☐ One year
- ☐ Two years
- ☐ Three years
- ☐ Four years
- ☐ Five years
- ☐ Six years or more
- ☐ I still own my first laptop, so I am not sure

#### Question 4

What was the reason for replacement of your old laptop(s)? (If you have owned more laptops and the reasons differ, you can mark more than one possibility.)

- ☐ The old one was not functional anymore and repair was impossible

- ☐ The old one was not functional anymore and it was not worth to repair it (the repair was too expensive or took too much time etc.)
- ☐ The old one was not suitable anymore because of reduced functionality compared to the original state
- ☐ The old one was not suitable anymore because of deficient parameters compared to the new one
- ☐ I wanted a new more advanced laptop with better equipment, which the old one did not have
- ☐ I still have my first one, so I have never replaced any
- ☐ Other

### Question 5

What did you do with the old laptop after you purchased a new one? (If you have replaced more than one laptop, you can mark more options.)

- ☐ I kept the old one as well (i.e. I use both of them)
- ☐ I kept the old one available (i.e. it is stored somewhere at home)
- ☐ I sold it
- ☐ I gave it to somebody
- ☐ I gave it back to the seller to recycle
- ☐ I disposed it to municipal waste
- ☐ I have never replaced my laptop yet
- ☐ Other

### Question 6

How often (on average) do you get your laptop(s) repaired?

- ☒ More often than once a year
- ☒ Once a year
- ☒ Once in two years
- ☒ I have never needed a repair service
- ☒ I do not bother with repair, I buy a new one
- ☒ Other

### Question 7

Was the durability of your laptop(s) satisfactory to you? (If you had different experiences, you can mark more possibilities in one time.)

- ☐ Yes, the lifespan was good for me
- ☐ Rather shorter than I would like to
- ☐ Definitely shorter than I would like to
- ☐ Rather longer than I would like to
- ☐ Definitely longer than I would like to
- ☐ I cannot say
- ☐ Other

### Question 8

How important are the following criteria for you when you are making purchase decision about your new laptop?

	not important	less important	important	very important	I do not take into account
Parameters (e.g. size, weight)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reliability (quality)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Durability (lifespan)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performance (e.g. RAM, capacity of battery)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warranty conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment (e.g. DVD burner, webcam, fingerprint reader etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental impact, recyclability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reparability (possibility to exchange battery etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Question 9

How difficult it is to obtain following information about a laptop from seller (producer)?

	very easy	easy	difficult	very difficult	It is not possible to obtain this information
Parameters (e.g. size, weight)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reliability (quality)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Durability (lifespan)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performance (e.g. RAM, capacity of battery)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warranty conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment (e.g. DVD burner, webcam, fingerprint reader etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental impact, recyclability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reparability (possibility to exchange battery etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Question 10

How many years is in your opinion a reasonable lifespan of a laptop?

- ☐ 1-2
- ☐ 2-3
- ☐ 3-4
- ☐ 4-5
- ☐ 5-6
- ☐ 6-7
- ☐ 7-8
- ☐ 8-9
- ☐ 10 and more

### Question 11

What do you see as the main disadvantage if you would buy a laptop designed to last a long time?

- ☐ Contemporary high price
- ☐ Overall gradual obsolescence
- ☐ Gradual obsolescence of performance compared to new models
- ☐ Gradual obsolescence of parameters compared to new models
- ☐ Old-fashioned design
- ☐ Higher risk/loss when it is broken down by accident
- ☐ I do not see any disadvantage
- ☐ Other

### Question 12

What is the brand of your present laptop?

- ☐ Acer
- ☐ Asus
- ☐ Apple
- ☐ Dell
- ☐ Fujitsu Siemens
- ☐ HP
- ☐ IBM
- ☐ Lenovo
- ☐ MSI
- ☐ Samsung
- ☐ Sony Vaio
- ☐ Toshiba
- ☐ Others

### Question 13

Did you have any bad experience with laptop of particular brand? Which brand was that?  
(If you do not mind, please write the brand down.)

- ☐ .....

### Question 14

What was the bad experience concretely? (If you do not mind, please write it down.)

- ☐ .....

### Question 15

How old are you?

- ☐ .....

### Question 16

What is your gender?

- ☐ Male
- ☐ Female

### APPENDIX 5 APPLE INC. REVENUE ANALYSIS FISCAL YEAR 2010 VERSUS 2009

Net sales during 2010 increased \$22.3 billion or 52% compared to 2009. Several factors contributed positively to these increases, including the following:

Net sales of iPhone and related products and services were \$25.2 billion in 2010 representing an increase of \$12.1 billion or 93% compared to 2009. Net sales of iPhone and related products and services accounted for 39% of the Company's total net sales for the year. iPhone unit sales totalled 40 million in 2010, which represents an increase of 19.3 million or 93% compared to 2009. iPhone year-over-year growth was attributable primarily to continued growth from existing carriers, expanded distribution with new international carriers and resellers, and strong demand for iPhone 4, which was released in the U.S. in June 2010 and in many other countries over the remainder of 2010. As of September 25, 2010, the Company distributed iPhone in 89 countries through 166 carriers.

Net sales of iPad and related products and services were \$5.0 billion and unit sales of iPad were 7.5 million during 2010. iPad was released in the U.S. in April 2010 and in various other countries over the remainder of 2010. As of September 25, 2010, the Company distributed iPad in 26 countries. The Company distributes iPad through its direct channels, certain cellular network carriers' distribution channels and certain third-party resellers. Net sales of iPad and related products and services accounted for 8% of the Company's total net sales for 2010, reflecting the strong demand for iPad during the five months following its release.

Mac net sales increased by \$3.6 billion or 26% in 2010 compared to 2009, and Mac unit sales increased by 3.3 million or 31% in 2010 compared to 2009. Net sales per Mac unit sold decreased by 4% in 2010 compared to 2009 due primarily to lower average selling prices of Mac portable systems. Net sales of the Company's Macs accounted for 27% of the Company's total net sales in 2010 compared to 32% in 2009. During 2010, net sales and unit sales of the Company's Mac portable systems increased by 18% and 25%, respectively, primarily attributable to strong demand for MacBook Pro, which was updated in April 2010. Net sales and unit sales of the company's Mac desktop systems increased by 43% and 45%, respectively, as a result of higher sales of iMac, which was updated in July 2010.

Net sales of other music related products and services increased \$912 million or 23% during 2010 compared to 2009. This increase was due primarily to growth of the iTunes Store which generated total net sales of \$4.1 billion for 2010. The results of the iTunes Store reflect growth of the iTunes



App Store, continued growth in the installed base of iPhone, iPad, and iPod customers, and the expansion of third-party audio and video content available for sale and rent via the iTunes Store. The Company continues to expand its iTunes content and applications offerings around the world. Net sales of other music related products and services accounted for 8% of the Company's total net sales for 2010.

Net sales of iPods increased \$183 million or 2% during 2010, while iPod unit sales declined by 7% during 2010 compared to 2009. Net sales per iPod unit sold increased by 10% to \$164 in 2010 compared to 2009, due to a shift in product mix toward iPod touch. iPod touch had strong growth in each of the Company's reportable operating segments. Net sales of iPods accounted for 13% of the Company's total net sales for the year compared to 19% in 2009.

Source: (Datamonitor, 2011)