Chapter 1
Introduction

Abstract This book will examine the importance of Human Computer Interaction, Usability, and Sustainability, including sustainable design, in the Information Communication and Technology sector (ICT). ICT usage by businesses and individuals has become a significant instrument for searching, conducting research, communication, entertainment, commerce and information. The recycling of ICT usage is becoming a major dilemma for businesses and individuals, since it is not simply a matter of concern for environmental damage or a solution to an environmental problem. Designers, businesses, and individuals must collaborate in making a concerted effort to tackle the environmental concerns by developing new ICT technologies with sustainable design in their agenda to meet the needs of businesses and individuals both currently and in future. This book discusses sustainable design features as well as the New Participative Methodology for Sustainable Design.

1.1   Introduction

Computer technology, internet technology, and systems are essential tools in the twenty-first century since businesses and individuals have come to depend increasingly on these technologies compared with the traditional systems used to achieve the same ends. The current technology is more capable of managing and assisting businesses and individuals to complete their tasks far more efficiently. Not only is there a proliferation of stand-alone computers; networking on a global scale has increased enormously as a result of the Internet, World Wide Web, social networks, mobile systems, Intelligent Environments and others. The increase of ICT usage throughout the world has presented a new challenge to HCI researchers and practitioners to match businesses and individual needs and ensure that the new ICT technologies are more sustainable for both current and future needs. HCI is the study of the interaction between humans and complex technology in order to examine how the current input and output of technologies influence the interaction between users and interface. HCI draws on many disciplines but it is in "computer science and systems design that it must be accepted as a central concern, and HCI involves the design, implementation and evaluation of interactive systems in the context of the user's task and work" (Dix et al. 1993, p. 4).

Therefore, HCI researchers should consider within their discipline not only productivity and customer satisfaction, but also human factors that affect "acquisition, disposal, renewal, and re-use and design for sustainability" (Dillahunt et al. 2010, p. 1). In addition, they should assist to create and develop technologies which are more effective and efficient and should study the "social and communal aspects of technology use and effective and aesthetic aspects of design" (Sengers et al. 2006, p. 1683). To achieve this, they must consider the different perspectives of users and designers in order to understand their notions of design, attitudes, ethnography, user empathy, and seek to develop new technologies that address sustainability goals for the current and future generations (Busse et al. 2009; Sengers et al. 2009a).

Hence, HCI researchers, businesses, and individuals should add to their notions of design the concept of "green" technologies, since the current technologies are adversely affecting and causing major problems to the environment. In addition, sustainability principles should be applied to the system design to ensure that the new design is more sustainable, user friendly, safe, efficient, effective, and usable for businesses and individuals. This is done by studying and understanding potential users' desires and requirements. Furthermore, this book will examine the importance of HCI, Usability, and Sustainability in respect to design systems, thereby raising the awareness of HCI practitioners and academics regarding the development of new technologies, bearing in mind the future generations. In addition, a new sustainable design model will be developed to promote the notions of HCI, Usability, and Sustainability when developing new devices now and in future.

This book is organized as follows: Introduction, HCI, Usability, User Participation in the System Development Process, Physical, Cognitive Affective Engineering, Color, Prototyping and Navigation, Guidelines and Principles Design, Evaluation and Testing; Task Analysis, Models, and Methodologies and the New Participative Methodology for Marketing Websites (NPMMW), the New Participative Methodology for Sustainable Design (NPMSD) and Future ICT.

1.2   Human-Computer Interaction

Human-Computer Interaction was adopted in the mid-1980s as a means of describing this new field of study. HCI "is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them" (Preece et al. 1994, p. 7). However, this field is now "concerned with understanding, designing for, and evaluating a wider range of user experience aspects" (Sharp et al. 2011, p. 18). Therefore, the reason for studying HCI in the development process is to create interactive computer systems that are usable as well as practical (Head 1999).

The term 'HCI' relates to several stages in the development process, including the design, implementation and evaluation of interactive systems, in the "context of the user's task and work" (Dix et al. 2004, p. 4). According to Vora (1998), HCI

implementation requires a massive range of skills, including an understanding of the potential users, their tasks, and environments, software engineering capabilities, and graphical interface.

Designers often have a poor understanding of HCI issues; therefore, designers need to know how to think in terms of future users' needs, values and supportable tasks and how to translate that knowledge into an executable system. This can be accomplished by establishing a good interface design to let the user interact and deal with the user interfaces without any difficulties and to give the user more control of the site.

The main purpose of using HCI in the design is to develop an efficient and effective user interface to suit the needs and requirements of the users. To achieve these features, HCI specialists need to involve the users in their design, integrating different kinds of knowledge and expertise, and making the design process iterative (Preece et al. 1994). It was noted that HCI design should be user-centered to integrate knowledge from different disciplines and be highly iterative, and include an effective usability evaluation. This type of process will allow for feedback regarding negative and positive aspects of prototypes. It is important that the way in which people interact with computers be intuitive and clear. However, the designing of appropriate HCI is not always straightforward, as the many poorly designed computer systems testify. One of the challenges of HCI design is to keep abreast of technological developments and to ensure that these are harnessed for maximum human benefit.

The goals of HCI are to produce usable, safe and functional systems. These goals can be summarized as safety, utility, effectiveness, efficiency and appeal. These goals focus on the services that the system provides and how quickly the tasks can be achieved, and ensuring that users like the system. By the same token, Haklay (2010, p. 5) indicated that HCI aims to create systems which provide functionality to meet the needs of businesses and individuals. In addition, in order to develop or improve their design, HCI specialists should understand how system design can support users in an effective and efficient manner, and how users intend to use computers systems. Finally, Bodker, Byrne and Boye (cited in (Maceli and Atwood 2011) describe the three waves of HCI: humans as factors, actors and crafters. Therefore, all information interfaces including websites should have a good interaction with users and vice-versa to effectively ensure efficiency and safety, and make them more enjoyable for users.

1.3   Usability

Usability refers to the "quality of the interaction in terms of parameters such as time taken to perform tasks, number of errors made and the time to become a competent user" (Benyon et al. 2005, p. 52). Alternatively, Usability "is a quality attribute that assesses how easy user interfaces are to use. The word 'usability' also refers to methods for improving ease-of-use during the design process" (Nielsen 2003).

Furthermore, Shackel (2009, p. 340) indicates that usability is the "capability in human functional terms to be used easily and effectively by the specified range of users, given specified training and user support, to fulfill the specified range of tasks, within the specified range of environmental scenarios".

The usability evaluation stage is an effective method by which a software development team can establish the positive and negative aspects of its prototype releases, and make the required changes before the system is delivered to the target users. Usability evaluation is about observing users to "see what can be improved, what new products can be developed" (McGovern 2003). It is "based on human psychology and user research" (Rhodes 2000). HCI specialists "observe and talk with participants as they try to accomplish true-to-life tasks on a site, and this allows them to form a detailed picture of the site as experienced by the user" (Carroll 2004).

From the user's perspective, usability is a very important aspect of the development process as it can mean the difference between "performing a task accurately and completely or not" and the user "enjoying the process or being frustrated"(Usability First 2002). Alternatively, if usability is not an integral part of user interface design, then users will become very frustrated working with it. In general, usability is an essential concept in HCI and is concerned with making systems easy to learn, easy to use, and with minimal error frequency and severity. In order to develop a successful system with good usability, HCI specialists need to understand and realize various factors, namely organizational, social and psychological factors that determine the extent to which people effectively operate and make use of computer technology. They need to develop tools and techniques to help designers ensure that computer systems are suitable for the activities for which people will use them, and achieve efficient, effective and safe interaction in terms of both individual Human Computer Interaction and group interaction. These factors should be considered very carefully at the design stage, as most of the users should not have to change radically to 'fit in' with the system; rather, the system should be designed to meet their requirements (Preece et al. 1994).

Furthermore, Sharp et al. (2011) indicate that usability goals should be considered by designers and HCI specialists to ensure that the user interface is easy to learn and remember, effective and efficient to use, and with fewer errors and good utility. These goals can be applied to the design of an interactive system in order to promote its usability. Therefore, these principles are intended to give more assistance and knowledge to system developers regarding the system design. Together with the above principles, an important additional key factor is Utility. Utility refers to the functionality so users can "do what they need or want to do" (Preece et al. 2002, p. 16). In other words, "does it do what users need?" (Nielsen 2003). Hence, usability and utility are equally important in the development process and need to be integrated.

Finally, it was noted that HCI and Usability are essential factors to consider when designing and developing a user interface, which is more efficient and effective and produces user satisfaction rather than frustration. In order for the interface to have these attributes, the potential users should participate in the design from the

outset. Folstad et al. (2010) and Issa et al. (2010) reiterate that user participation is essential in the system development process and users should be present during this process to share their opinions, especially from the initial planning stage through to the maintenance stages and procedures.

Furthermore, according to Issa et al. (2010), user participation in the system development process will prevent user frustration, thereby reducing training time, and ensuring that the system is designed to match users' requirements. Finally, Nies and Pelayo (2010) posit the same notion that it is necessary to involve users in the system development process so that the design meets their requirements.

1.4   Sustainability

Before discussing the term 'sustainable design', firstly we need to discuss the notion of 'sustainability', since these two concepts are related in terms of benefitting human and natural resources that will be needed in the future (Weybrecht 2010). Gro Harlem Brundtland from the World Commission on Environment and Development first coined the term 'sustainability' in 1983. Brundtland's report urged businesses and individuals to progress toward economic development in a way that could be sustained without destroying the natural resources or the environment for the next generation.

Erek et al. (2009, p. 2) define sustainability as "a survival assurance meaning that an economical, ecological or social system should be preserved for future generations and, thus, necessary resources should only be exploited to a degree where it is possible to restore them within a regeneration cycle". This suggests that businesses and individuals must protect the current infrastructure so that it can be re-used by the next generation. The notion of sustainability is highly significant in the twenty-first century since, increasingly, businesses and individuals are now required to think in terms of delivering "solutions rather than products, and seek to define their markets in terms of customer activities and outcomes rather than products and services" (Jeffers 2009, p. 263).

The integration of sustainability in businesses and in individuals' strategies will be highly advantageous in terms of cost reduction, resources preservation, conformity to legislation, improvement of reputation, maintaining happier customers and stakeholders, attracting capital investment and capitalizing on new opportunities (Nidumolu et al. 2009; Sharma et al. 2010; Smith and Sharicz 2011). Finally, Kendall and Kendall (2010) indicated that sustainability will assist businesses, stakeholders, individuals and society in general.

The integration and application of sustainability strategy in business should suit project needs and business proposals of a particular division or even the whole company. According to Weybrecht (2010), the adoption and application of sustainability in businesses will achieve the following advantages: cost reduction; preservation/saving of resources; compliance with legislation; enhanced reputation that differentiates businesses; securing quality employees; satisfy customer needs;

meeting of Stakeholder expectations; attracting of capital investment; and capitalizing on new opportunities. These advantages will make the business unique in the market locally and globally, since sustainability is already, a part of how business is done; the nature of the business is not as important as its ability to continue. Currently, the potential high cost of sustainability for both the business and society since multiple benefits will be achieved by integrating sustainability in the business strategy. However, sustainability will be very strong when it is embedded into the strategy and culture of a business with the full cooperation of the CEO.

To integrate the sustainability factor in the business strategy, the project manager should collect all the necessary information about what is happening in his/her company at all levels of the business hierarchy. Once the required information has been collected, it is necessary to secure everyone's cooperation so that all employees and management have the same positive attitude toward sustainability. The project manager must pick the correct moment to disseminate the notion of sustainability adoption throughout the organization. The advantages and disadvantages of integrating sustainability in a business strategy should be put to management whose role it is to inform staff of any changes that this requires. Furthermore, in terms of sound business practice, the different attitudes of staff together with their roles, backgrounds, and personalities should be taken into account.

Moreover, the project manager must make a strong case by outlining the benefits of a sustainability policy, and the disadvantages if the organization does not address this issue. This adoption of sustainability in the organization structure will be useful when hiring new staff.

Finally, sustainability as an integral part of an organization's strategy requires understanding, consideration, and tolerance at all levels of the organization as well from its stakeholders. The strategy should be easy, straightforward, dynamic, and easy to implement. Finally, patience must be exercised when changing the mindset and attitudes of staff and stakeholders in terms of introducing sustainability strategies.

According to Moscardo et al. (2013), sustainability requires a long-term orientation and commitment to changing the way businesses conduct their activities in order to balance the needs of the current personnel with those of future generations. Furthermore, there should be recognition that business is part of a complex system in which environmental, social, and economic activities are common. Part of the strategy awareness and training should be available to improve knowledge about sustainability. This learning should not be limited to staff; specific training should be available to stakeholders and the community to make them aware of all the issues concerning sustainability, since the needs of the business should and must match the needs of stakeholders, society, the economy and the environment. Implementing sustainability in business strategy will enhance natural capital and improve a company's reputation in the market nationally and internationally.

Finally, sustainability is a complex area that is continually changing and growing. This means each person in an organization should participate in this change from training, learning, considering the benefits and risks, green washing and changing the mindset.

1.5   Sustainable Design

According to Nathan et al. (2008), the terms "sustainable" and "green" are used ubiquitously within businesses and by individuals locally and globally. Currently, these notions play a major role in businesses and individual strategies; therefore any design should ensure that whatever is created and developed should first meet the current users' and businesses' requirements and, of course, those of the next generation.

Stelzer (2006, p. 4) defines sustainable design as the "fundamentally a subset of good design. The description of good design will eventually include criteria for the creation of a healthy environment and energy efficiency." Silberman and Tomlinson, (2010, p. 3470) discuss and argue the relationship between sustainable design and HCI, confirming that previously HCI researchers were concerned with "What do users do? When? How often? Why? How do they feel about it? What do know about what they are doing? How do they know?"

Nowadays, however, HCI researchers should understand the relationship between users and technologies, and how this can assist designers to simplify more sustainable user practices. Moreover, DiSalvo et al. (2010) confirm that HCI researchers and top management should be encouraged to collaborate in the design and development of applications, interfaces, equipment and services with more sustainable effects; in addition, this design should comply with the principles of economic, social and ecological sustainability. Smith and Sharicz (2011) posit that HCI and Information Technology researchers and professionals must take into consideration the environmental impact of the design of current and future technologies, so that practitioners are aware of the environmental impact of the technologies they use. Most importantly, sustainable design should meet users' needs. Sustainable design needs awareness and innovation among designers and users. Awareness can produce opportunities to be unique and exceptional in design, and this can lead to creativity and innovations in research. Awareness of the need for change can contribute to the improvement of the environment, to social equity and to growth and profit in the expanding global community. This awareness will lead the designers to action orientation, learning, and excitement, and to a new level of caring based upon new knowledge and commitment. To achieve the above, participation in sustainable design is essential, and designers must take into account the opinions and perspectives of potential users to assist with the design, since designers cannot act by themselves.

Currently, the world is under pressure from human actions that threaten sustainability. At the global level, the quantity of e-waste generation in 2014 was around 41.8 million tones, and 4 billion people were covered by national e-waste legislation. This number will be increased to 49.8 by 2018, meaning an increase growth rate of 4–5 % if developers still maintain the status quo when designing, without integrating sustainability in their practice agenda (Baldé et al. 2015). Figure 1.1 shows the total e-waste per category in 2014. Small devices such as USB-sticks, phones, and electronic toothbrushes have the highest rate compared to 1.0 MT for the lamps.

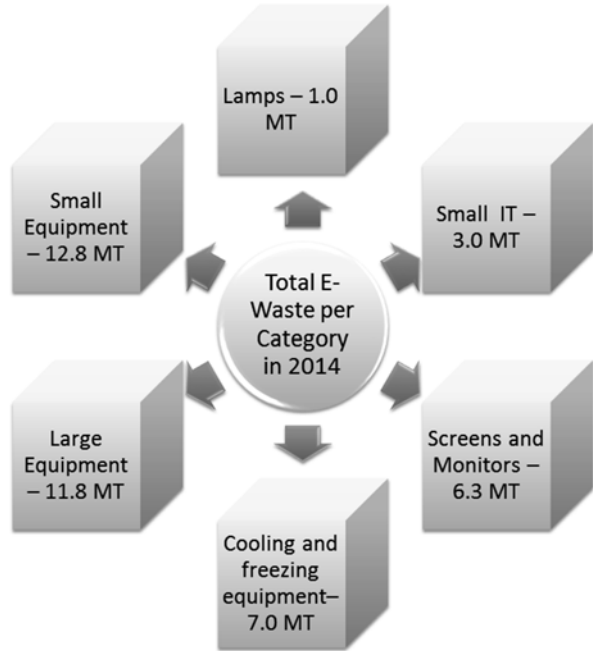Fig. 1.1 E-waste per category in 2014 (Adopted by Baldé et al. (2015). Prepared by the authors)

Lamps – 1.0 MT

Small Equipment – 12.8 MT

Small IT – 3.0 MT

Total E-Waste per Category in 2014

Large Equipment – 11.8 MT

Screens and Monitors – 6.3 MT

Cooling and freezing equipment– 7.0 MT

Fig. 1.2 E-waste generation per continent in 2014 (Adopted by Baldé et al. (2015). Prepared by the authors)

Africa – 1.9 MT

Oceania – 0.6 MT

Americas – 11.7 MT

E-Waste Generation per Continent

Europe – 11.6 MT

Asia – 16.0 MT
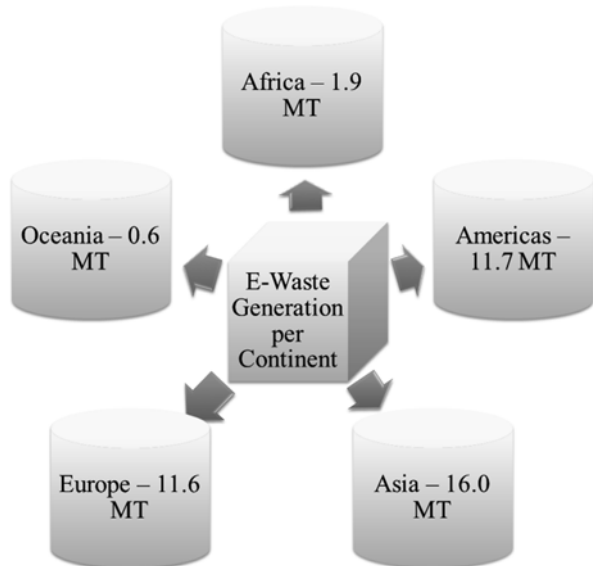
Furthermore, Fig. 1.2 shows the e-waste generated per continent; Asia generated 16 MT in 2014, while Oceania generated only 0.6 MT in 2014.

As shown by the results presented in Figs 1.1 and 1.2, the world is experiencing a great many transformations as a result of human unsustainable actions; therefore,

a plan of action should be implemented to change the way we live. Therefore designers, users, and organizations, should focus their minds and commitment on designing objects and devices that comply with the principles of social, economic and ecological sustainability.

Finally, sustainable design will be the way to make our world better. However, in order to achieve this, we need to have the right motivation, awareness, knowledge, commitment, trust, and loyalty. People need to act quickly to think about good and sustainable design by adopting sustainability in their business strategy in order to conserve raw materials for the next generation.

1.6   Methodology

For this book, an online survey is employed to examine users' attitudes toward sustainability and sustainable user interface design in Australia. An online survey will assist the authors to identify the new factors, which are required for the new sustainable design model. The online survey has been created based on the findings of the literature; and is divided to three sections; background; sustainable design, and advantages and disadvantages of sustainability. Employing an online survey in this study allows the users to identify the new factors for the new sustainable model and identify the new theoretical significance of this book. The online survey can offer greater anonymity, is less expensive, and is more accessible (O'Brien and Toms 2010; Kocher 2015; Issa 2013). However, technical failure, computer viruses, internet crimes, hacking, and privacy are considered the disadvantages of online surveys, and these factors can reduce the response rate (Fan and Yan 2010).

1.7   The Initial Sustainable Step in the New Participative Methodology for Sustainable Design

Sustainability is now generally accepted by most organizations as an important part of corporate citizenship. The concept of sustainability is based on the notion that our actions should not cause irreparable harm to our social and environmental infrastructure. It calls for our responsibility and action to improve or change our current way of living to avert social, environmental, and ecological crises. The term 'sustainable development' was first referred to in 1987 in the Brundtland Report on 'Our Common Future', where it states that 'sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. Incorporating sustainable strategy with emerging technologies is becoming the norm in contemporary businesses (Newton 2003).

To perform this effectively, and deriving from Dyllick and Hockerts (2002) and McDonough and Braungart (2002) models of corporate sustainability, Young and Tilley (2006) proposed an integrated model of corporate sustainability which links

together six criteria that a sustainable business will need to satisfy. The six criteria are (1) eco-efficiency, (2) socio-efficiency, (3) eco-effectiveness, (4) socio-effectiveness, (5) sufficiency and (6) ecological equity. However, further theoretical development is still under way in order to create an effective, integrated approach to applying the six criteria. Erek et al. (2009, p. 2) stated, "Sustainability has been extensively discussed within corporate management under the synonyms of corporate social responsibility (CSR), greening the business eco-efficiency or eco-advantage." To ensure that organizations develop and adhere to a sustainable development strategy, management should consider aspects of value creation that would benefit its employees, users and stakeholders by encouraging all participants to be environmentally and socially responsible corporate citizens.

In line with the integration of a sustainability strategy into technology, various studies from Human Computer Interaction, Usability and Sustainability were examined and investigated to study the ICT impacts on environment (Ramani 2010; Bevan 2001; Bodker 2006; Dillahunt et al. 2010; DiSalvo et al. 2010; Mann 2009; Nathan et al. 2008; Sengers et al. 2006, 2009b; Silberman and Tomlinson 2010; Wilson and Borras 1998; Dix et al. 1993; Gerlach and Kuo 1991; Te'eni et al. 2007). It was noted that the recycling of ICT usage is becoming a major dilemma for businesses and individuals, since it is not simply a matter of concern for environmental damage or a solution to an environmental problem.

Designers, businesses, and individuals must collaborate in making a concerted effort to tackle the environmental concerns by developing new ICT technologies with sustainable design in their agenda to meet the needs of businesses and individuals both currently and in future. Therefore, this book will discuss and present a New Participative Methodology for Sustainable Design for smart new technology and portable devices. From a review of the current literature (Gauthier 2015; Kemp 2015; Pan et al. 2015; Shaw et al. 2015; Stapledon et al. 2015; Wang et al. 2015a, b; Stelzer 2006; Nidumolu et al. 2009; Issa 2014; Issa and Isaias 2014; Comm and Mathaisel 2015; Wals 2014) the initial factors for the sustainable step have identified from design, safety, manufacture and energy, recycle efficiency and social (see Fig. 1.3).

These critical factors will assist to develop the first draft of the New Participative Methodology for Sustainable Design The authors will add the new characteristics and critical factors, which belong to the new sustainable model under the design stage under the new Participative Methodology for Marketing Websites' (NPMMW) – (See Fig. 1.4). NPMMW methodology includes all the necessary stages and steps, which are required to develop an efficient and effective device.

Figure 1.5 illustrates the first draft of the new Sustainable Model, which will be part of the design stage under the NPMMW methodology. This model will use all the stages and steps, which belong to the NPMMW model to ensure that the new devices meet users' requirements and needs.

According to Stelzer (2006), Sustainability is primarily a subset of design. Design is an exercise in meeting the challenges inherent in any situation that requires improvement or mediation. Ultimately, any design solution will need to create products and environments for a living earth with limited resources. The criteria for
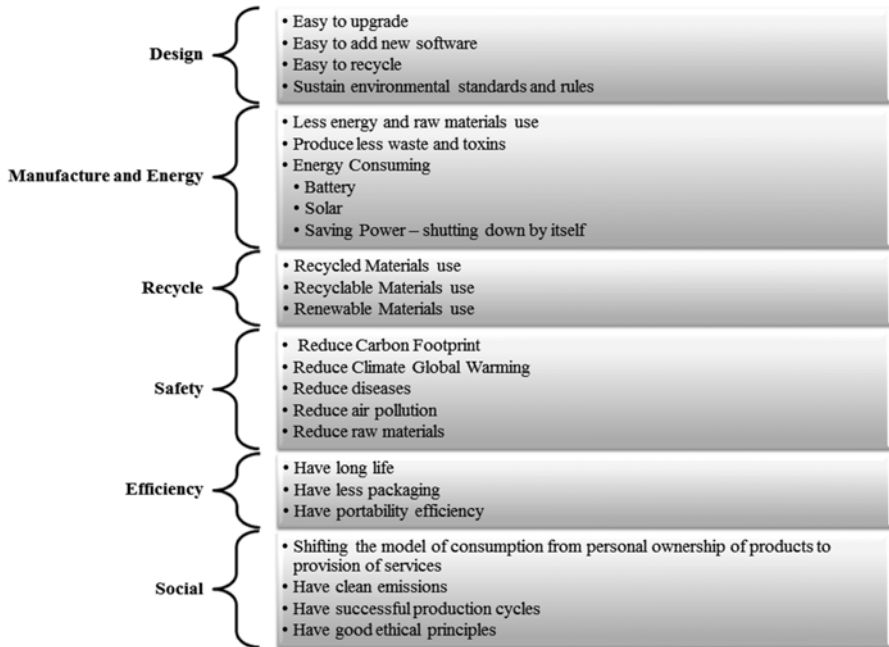
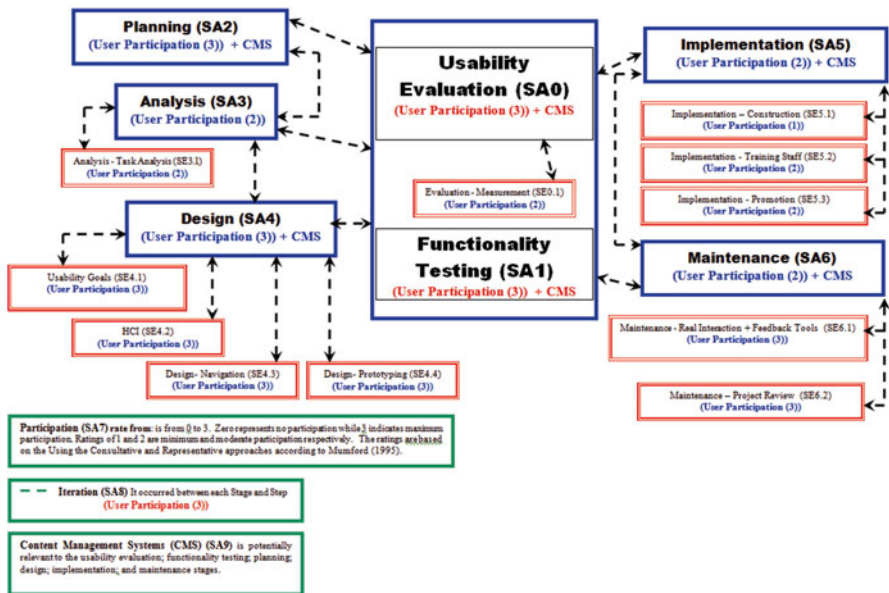**Fig. 1.3** Initial factors for the sustainable step (Prepared by Tomayess Issa)

Fig. 1.4 The New Participative Methodology for Marketing Websites' (NPMMW) (Prepared by Tomayess Issa)
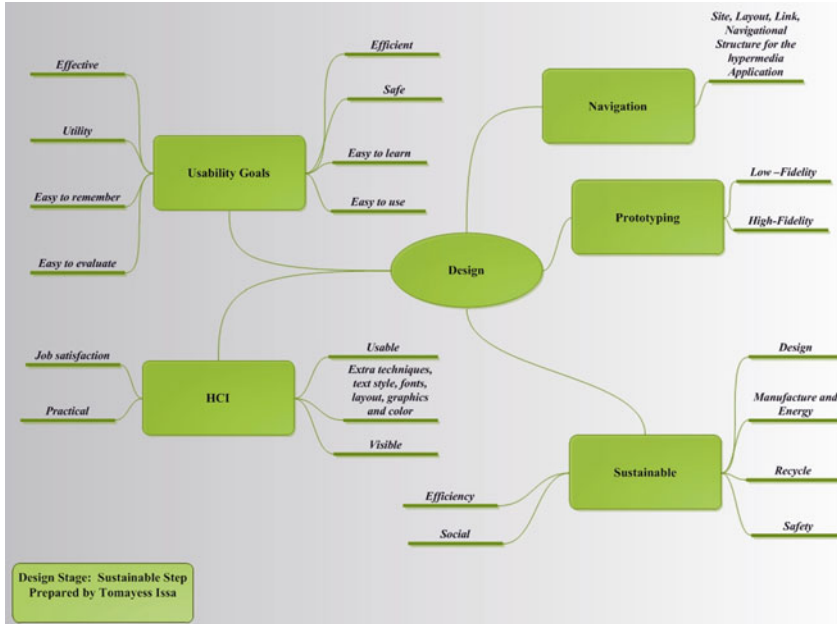
Fig. 1.5 Sustainable step in the new participative methodology for sustainable design (Prepared by Tomayess Issa)

successful design will be the creation of a healthy present and a prosperous future; and thus, by extension, the attainment of sustainability is a question of good design.

1.8 Outline of the Book

The new book comprises nine chapters, each of which will present the concepts and approaches, which are required to provide the necessary information for the readers. The chapters' topics have been carefully selected by the authors to ensure that readers will learn and put into practice the skills which are required to develop an efficient, effective, user friendly and sustainable design. From Fig. 1.6, it is noted that readers will learn the definition and the importance of HCI and usability in respect to user satisfaction, efficiency, effectiveness and user friendliness of the system (Lee and Koubek 2010; Nicolson et al. 2011).

In Chap. 1, the authors discuss in detail the notions of Human Computer Interaction and usability, and identify the relationship between sustainability and HCI, since this topic is becoming essential in the system development process. Although designers should integrate sustainability in their design and framework, innovative designs should not only include functions that satisfy the consumers, but should also be sustainable (Ramani 2010). Therefore, designers, users and top

Fig. 1.6 Outline of the book – table of contents

management must, together, work smarter and harder and more creatively if "we are going to help save our planet from ourselves" (Ramani 2010, p. 1).

Several scholars (Dillahunt et al. 2010; Huh and Ackerman 2009; Sharma et al. 2010; Thatchenkery et al. 2010), propose that an agreement should be developed between designers, users and top management encouraging them to work collaboratively on a sustainable interface, application and equipment to meet the current and future generation in order to minimize damage done to our planet.

Chapter 2 encourages readers to learn the principles and guidelines for Human Computer Interaction and Usability in the system development process. Chapter 3 focuses on user participation in the system development process by obtaining opinions about and attitudes to the design in order to prevent potential user frustration.

Chapter 4 examines the differences between physical, cognitive and affective engineering, since these topics will assist readers to understand that design is not limited to layout, navigation and colour, but that other aspects should also be taken into consideration in the design process. These topics will engender discussion about the interaction and relationship between human and machine, ergonomics, and development concerns such as memory, attention span of users, and reduction of complexity between the goals of cognitive engineering, speed and accuracy and finally, effectiveness, i.e. making the interface more attractive, beautiful, entertaining, enjoyable, engaging and fun (Te'eni et al. 2007).

Chapter 5 discusses the importance of colour, navigation and prototyping in the system development process (Bonnardel et al. 2011; Cyr et al. 2010), as designers and users should be satisfied with the final sketches before coding and implementation

occur. Furthermore, the authors will discuss the significance of evaluating and testing during the system development process. In respect to the evaluation, the authors will address the following issues: Why and what and when to evaluate in the system development process; they will also discuss the difference between formative and summative evaluation. Additionally, the testing concept will be discussed in this section to distinguish between evaluation and testing and their place in the system development process (Issa et al. 2010; Petre et al. 2006). To assess and evaluate an interface (including the website), readers should understand the concept behind design principles and guidelines which will be introduced in this unit. A knowledge of design principles is essential since readers will learn how to evaluate interfaces (including the websites) in a professional way from different perspectives: promotion of trust, diversity of users, affordability and performance, matching information representations needed with that presented, designing for errors, and providing, enjoyable, and satisfying interaction. On the other hand, the design guidelines will assist readers to evaluate and assess the interface (including the website) in terms of control and feedback, direct manipulation, metaphor, consistency and aesthetic appeal (Preece et al. 1994, 2002; Te'eni et al. 2007). Finally, readers will learn three aspects of task analysis: Task, Action and Goals (Shneiderman and Plaisant 2010; Galitz 2007). These concepts are very important in the design process since they assist both designers and users to identify the tasks, which are required in order to achieve specific goals.

To ensure that interfaces are developed successfully without causing frustration to users, Chap. 6 introduce a series of methodologies to demonstrate the stages and steps, which are required to develop a system in a sequential manner, by defining the activities, method and techniques, and tools which are required to develop these interfaces.

Chapter 7 discusses the New Participative Methodology for Sustainable Design and identify the new factors, which are required to develop a sustainable design now and in future.

Furthermore, the authors will continue to introduce other topics to the new unit program, i.e. social and global issues and social networking including Web 2.0 and 3.0 in Chap. 8. The former topic will include the following social aspects of information systems and how HCI can ameliorate these aspects: anxiety, alienation, potency and impotency of the individual, complexity and speed, organizational and societal dependence, valuing human diversity, privacy, accessibility, accountability and property, and the social and global impacts of the Internet (Te'eni et al. 2007; Thakurta 2010). While the latter topic will be concerned with how social, networking (Web 2) is becoming a critical strategy in teaching, especially since these tools can assist in teaching and learning, not just in social life. Furthermore, Web 3.0 will be introduced to readers since this new technology is more creative and dynamic compared with Web 2.0 (Kearns and Frey 2010; Rego et al. 2010).

Finally, this book concentrates on establishing and consolidating the relationship between HCI, Usability and Sustainable design, and sharing the latest information in respect to the previous topics, since the majority of HCI authors are keen to develop frameworks, tools, techniques, and models to meet the sustainable design requirements.

1.9 Conclusion

This chapter discussed and examined the concepts, which are required for sustainable design. To identify the new sustainable model, an initial model is discussed and an online survey is distributed in Australia to examine users' attitudes to sustainability and sustainable user interface design. The online survey results will be discussed in Chap. 8; and later we identify the new factors, which are required for new sustainable model. Finally, this chapter presented an overview of this book.

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