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Introduction

Today, it is hard to find a corner in our lives that is not affected by technology. We are surrounded by it at home, commuting, at work, and in our leisure time. Given its dominant position, it should come as no surprise that technology has a strong impact on our well-being. In recent years, there have been some major studies into different aspects of technology and its influence on our well-being. However, until now, no book has attempted a wide-ranging appraisal of how the technology that is such a part of our everyday lives impacts our well-being. This is precisely the aim of this book.

The term "technology" has its origins in the Greek concept *technologia*, which includes the ideas *techne* – "craft" – and *logia* – "saying." Many people have attempted to give this concept a definition. For example, Stein (1966) defined it as the sum of the ways in which a social group provides itself with the material objects of its civilization. Rousseau (1978) suggested that technology is the process used to transform raw materials into end products. Kipnis (1991) defined it as the use of systematic procedures to produce intended effects. However, a definitive meaning of the term "technology" is elusive: the term may be used to refer to material objects of use to humanity, such as hardware, machines, or utensils, but it can also encompass broader components, including methods of organization or techniques. The term can either be applied generically or to specific areas. Generally speaking, technology is the relationship that society has with its tools and crafts.

Well-being is also a term that defies a single definition. It has been used interchangeably with such concepts as happiness, health, welfare, comfort, security, and safety. In addition, there are associated terms, for example psychological well-being, subjective well-being, and so on. Argyle (1992) suggested that when people are asked to define happiness, they answer in one of two ways: Some describe happiness in terms of a positive emotion, like joy, while others will describe it in terms of contentment and satisfaction with life. Helliwell and Putnam (2004) distinguish between happiness and life satisfaction. They argue that: "Generally

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speaking, self-ratings of 'happiness' turn out to reflect relatively short-term, situation-dependent (affective) expressions of mood, whereas self-ratings of 'life satisfaction' appear to measure longer-term, more stable (cognitive) evaluations" (2004: 1435). Conversely, Ben-Shahar (2007) believes both the emotional component and the life-satisfaction component should be within the definition; thus, he defines happiness as the "overall experience of pleasure and meaning." In other words, a happy person enjoys positive emotions while perceiving his or her life to be purposeful. This definition does not pertain to a single moment, but rather to a generalized aggregate of one's experiences: A person can endure pain at times and still be happy overall.

Among other terms used to describe well-being is "quality of life." Janse *et al.* (2004) suggested that quality of life is a multidimensional construct; included within it are physical, emotional, mental, social, and behavioral components. Schwarz and Strack (1999) argued that subjective well-being can be defined as the individual's current evaluation of his or her happiness. Such an evaluation is often expressed in affective terms: When asked about subjective well-being, participants will often reply, "I feel good" (Schwarz and Strack, 1999). Pollard and Lee (2003) believe that well-being is such a complex construct that, despite all their attempts, researchers have never managed to find accurate ways to delineate it. The variation among the definitions employed, even within an individual discipline, is so great that producing a comprehensive overview of definitions in use within the literature is a formidable task. Nevertheless, it seems clear that what most definitions have in common is a concern for the psychological health of human beings.

In general, people want to feel that their happiness is justified; they actually appear to prefer the real feeling of enjoyment after they have worked hard to achieve it. This is a departure from the more hedonistic belief that enjoyment per se is the ultimate goal of individuals (Tatarkiewicz, 1976). In addition, it was found that people are ready to sacrifice short-lived happiness if it conflicts with the pursuance of other goals they value (Kim-Prieto, 2001).

Why is it important to study well-being? The benefits of well-being at the individual level are very significant. They are summed up by Diener and Seligman (2004) as (1) society: Democratic governance may be enhanced through the well-being of the populace; (2) income: Happy people earn higher incomes than unhappy individuals; (3) work: Happy and satisfied workers are more likely to perform higher citizenship organizational behavior (that is, individual effort that benefits the organization, unrecognized by the formal reward system). Satisfaction level in work units is correlated with high productivity and profitability; (4) physical

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health: Longevity is correlated with high levels of well-being. Individuals with low levels of well-being have compromised immune systems and are more likely to have certain diseases as compared with individuals with high levels of well-being; (5) mental disorders: Happy individuals score lower in mental disorders, as opposed to unhappy individuals; (6) social relationships: Positive well-being is associated with a higher likelihood of getting married and staying happily married, and with having large numbers of friends and strong social support.

Lyubomirsky, King, and Diener (2005) found that happy people are more sociable, generous, creative, active, tolerant, healthy, altruistic, economically productive, and long-lived. It seems that the promotion of well-being is not just an important end itself, but also leads to positive outcomes for society.

Since well-being is so important to our society and since technology seems to pervade almost all areas of our lives, the study of the different effects of technology on our well-being would seem fundamental. In this book we have concentrated on major subject areas, including communication, Internet, medicine, transportation, gender, human factors, work environment, information society, and the work–home balance.

In the first chapter, George Rodman and Katherine G. Fry examine communication technologies and well-being. They suggest that communication technology creates a Yin and Yang in the sense that new devices can have positive or detrimental effects on psychological well-being. They conclude that, in terms of psychological impact, there appears to be a golden mean pertaining to the use of technology after which, the psychological benefits having been maximized at this midpoint, a downward spiral of decline begins.

The authors examine the relationship between communication technology and psychological well-being from a twofold perspective. They look at the framework of history and particularly how changing communication technologies have fostered changes in the concept of well-being through four communication epochs: primary orality, writing, typography, and electronic communication. Next, they look at the framework of social-science media research and analysis, especially in terms of such perspectives as cultivation theory, media addiction, parasocial relationships, environmental mastery, uses and gratifications, and desensitization. They argue that it is important to study the concept of well-being and the dominant forms of communication within various eras, and suggest that further research into this question, from both historical and social-scientific perspectives, would be valuable.

In the second chapter, Yair Amichai-Hamburger and Azy Barak discuss the impact of the Internet on our well-being. They describe the unique

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components of the Internet environment, such as greater anonymity, the diminution of the importance of physical appearance, greater control over the time, place, and pace of interactions, and the ease of finding similar others and their psychological impact on users. They focus on the influence of the Internet on our different life spheres. On the personal level, they assess the role of the Internet as a vehicle for revealing the "real me" and the "true self" – that is, as a means of reframing individual and subjective identities. The authors go on to examine the effects of the Internet environment on different areas of life. On the interpersonal level, they include discussions of the patient–physician relationship, online psychotherapy and counseling, and online support groups. On the group level, they focus on stigmatized groups, support groups versus treatment groups, online contact between rival groups, religious groups, and solving the conflict between belonging to a group and individuality. They conclude with some suggestions for further research to promote human well-being.

In Chapter 3, Steven L. Goldman examines the topic of information, innovation, and society. Assessing the impact on human well-being of recent innovations in digital information technologies requires clarifying the historical role played by information in Western societies, the meaning of the term "information," and the generic process by which technologies affect social change. In fact, there are at least three distinct usages of "information" extant today: as content, as a content-independent mathematical pattern, and as an elementary feature of physical reality. Contrary to the popular notion of an information revolution currently transforming societies around the world, only the second, and least familiar, of these usages merits being called "revolutionary." The media-reinforced popular notion obscures the evolutionary character of the role of information as content in society and the identification of information as a causally efficacious feature of the world. The claim that technological innovations unilaterally drive social change obscures the dialectical character of the technology–society relationship and the criteria for judging which social changes constitute improvements.

Over the last two decades, there has been a global explosion of technology, particularly computer-based and other media-based technologies. The utilization of information and communication technologies has become so pervasive that people can no longer conceive of what work and life would be like without them. In the workplace, the vast and rapid introduction of these technologies has brought many changes and widely influenced the organization of work, the psychosocial work environment, and work practices.

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In the fourth chapter, Michael P. O'Driscoll, Caroline Biron, and Cary L. Cooper examine the topic of technological change and psychological well-being. The authors discuss some of the major psychosocial impacts which this utilization of information and communication technology (ICT) has wrought on the psychological well-being of workers. One positive impact of ICT is increased flexibility by reducing the need for traditional offices. This can have positive benefits for individuals endeavoring to balance work and family responsibilities, and for organizations in terms of adapting more effectively to constant changes in the global economy. However, many studies have shown that the increased utilization of ICT can have both a positive and a detrimental impact on workers' well-being. Research has illustrated that technological changes are closely related to job demands, job control, and social relationships in the workplace, which in turn are critical factors for employees' stress and well-being.

When technologies are introduced in the work environment, adequate thought has to be given to creating mechanisms that ensure that workers participate in the decision-making process related to the introduction and utilization of ICT, and that perceptions of control and mastery over the technologies are enhanced. The design, development, and implementation of ICT require a thorough understanding of how people think, feel, and respond when dealing with systems that are challenging to cope with and which create significant changes in the work environment.

In the fifth chapter, Tal Oron-Gilad and Peter A. Hancock assess the development from ergonomics to hedonomics – trends in human factors and technology. Their chapter examines the transition in focus within the human factors engineering domain (Human Factors Engineering is the discipline of applying what is known about human capabilities and limitations to the design of products, processes, systems, and work environments) from the prevention of pain (ergonomics) to the promotion of pleasure and using technology to facilitate well-being (hedonomics). This transition is coupled with technological advancements and their penetration into a wide range of user groups. Implications for workers' well-being are discussed. Difficulties in implementing hedonic principles are outlined, along with examples of emerging areas of research.

Ellen Ernst Kossek, Brenda A. Lautsch, and Susan C. Eaton consider the conditions necessary for teleworking to enhance employees' well-being. In Chapter 6, they look at professionals' use of telecommuting as a lens through which to examine the ways in which access and the psychological experience of using telework relate to types of job flexibility control, boundary management, and work and family effectiveness. The

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results of survey and interview data from a sample of 316 professionals, some of whom teleworked and some of whom did not, show that mere access to teleworking will not necessarily lead to positive work and family outcomes, and sometimes may have null or even negative effects. The authors consider that these issues need to be more widely discussed in the work and family and human resource management literatures. It is important to note that for the professionals they studied, job flexibility control has a much stronger favorable relationship to turnover intentions than it has to work–family balance. It may be that telework access is insufficient to lower work–family conflict for professional jobs. Job control and boundary management are important moderators of well-being.

In the seventh chapter, Raymond W. Novaco and Oscar I. Gonzalez tackle the topic of commuting and well-being. Commuting stress, whether associated with driving on congested roads or with strains in public transport, has great relevance for the health and social sciences, urban planning, engineering, economics, and business management. The authors provide an overview of the research on commuting stress and the latter's impact on physical health and psychological adjustment. Within this framework, they assess historical developments in automobile commuting and technologically driven alternatives to cope with commuting stress related to personal health, work performance, and family relationships.

The chapter continues with a discussion on the subsidiary subject of driver stress within the context of its association with violations of the law and accidents. Comparative studies across commute modes and information-age innovations are also discussed. The authors cite evidence in support of telecommuting having become a coping strategy as the convergence of technological, economic, social, and psychological factors have made work less place-dependent. They review the major variables that moderate commuting stress, such as personal control, commute predictability, and gender, as well as environmental factors affecting commuting stress and coping. The authors conclude that despite the adversities of commuting, some of its elements can serve as enhancements to well-being, such as privacy, protected time, and the symbolic value of personal vehicles and freedom. They conclude with a discussion of adaptation as an overarching concept.

In the chapter that follows, Jeffrey W. Jutai, Sherry Coulson, and Elizabeth Russell-Minda deal with technology and medicine. Medical technology in the broadest sense refers to the diagnostic or therapeutic application of science and technology to improve the management of health conditions, and describes a vast array of devices and techniques. It is generally assumed that virtually every form of medical technology

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has a positive impact on quality of life and well-being, but it is important to analyze this assumption. This chapter examines how the relationship between technology and health is conceptualized and, therefore, how effectively it might be researched. It then reviews the research evidence for the impact on quality of life and well-being of technologies to assist mobility and vision for individuals with disabilities. It concludes with recommendations on how assistive technologies might be better researched and developed to enhance well-being.

In the penultimate chapter, Rae Lesser Blumberg examines the issue of gender and technology from a feminist, anthropological perspective. She argues that, throughout human history, there has been a greater contribution by women to subsistence technology and ensuing societal wealth and well-being than is commonly recognized. From baby-carrying slings and gathering baskets among our foraging ancestors to the development of cultivation, to the little-heralded near-gender-parity in the life sciences that are driving much of today's technological progress, women's roles have been more important than renowned. Recent gender and technology/science studies have focused more on the computer end of information technology, where the proportion of undergraduate women has been dropping. This reinforces the inaccurate view that women play a secondary role in technology and leads to the possible detriment to their well-being. The author aims to tell a fuller story, including women's roles in the emerging "techno-economic base of knowledge and life."

In the last chapter, Yair Amichai-Hamburger adopts a wide-ranging perspective on the issue of technology and well-being. The chapter begins by assessing the major roles played by technology in our lives. Is technology a means to an end or does it serve a function in and of itself? Does technology carry within it the answers to many of the current and future challenges facing society or is it a tool that has to be directed in order to achieve our real goals? This chapter initially explores some of the more worrying aspects of our highly technological society and then goes on to discuss ways in which present technological achievements and those of the future may be harnessed to promote the well-being of the societies in which they operate.

This book aims to create a more comprehensive understanding of the impact of technology on well-being, to place this issue firmly on the agenda, and to provide tools to improve the positive impact of technology on well-being. We believe that with the creation of the "global village" and the technological explosion, the issue of how technology impacts our well-being has become crucial throughout the world. We hope that this book will play a part in raising awareness of this critical universal concern.

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1 Communication technology and psychological well-being: Yin, Yang, and the golden mean of media effects

George Rodman and Katherine G. Fry

The Yin and Yang of ancient Chinese philosophy is the symbol of two primal opposing but complementary forces found in all things in the universe. The Yin and Yang of communication technology could be described as follows: like most technological advances, communication devices improve people's lives immeasurably. Once they use them, people cannot imagine living without them. On the other hand, critics contend that these same electronic communication media – beginning with movies, television, and radio, and today including the Internet, video games, cell phones, PDAs (personal data assistants), and other mobile devices – are turning those of us who spend an inordinate amount of time with them into isolated, narcissistic, anxious, and ultimately unhappy beings. Whether we are technically addicted, or just spend too much of our time communing with digital visual, audio, and text devices, we are thought to be socially fragmented, less able than others who are not as drawn to these technologies to connect in face-to-face interactions. We experience, perhaps, a diminished sense of psychological well-being in comparison to them.

It seems safe to say that each new communication technology could be either a detriment or a benefit to psychological well-being. The Yang of detriments and the Yin of benefits exist as a whole. We could add Aristotle's conception of the golden mean to this equation: There is a midpoint between extremes in which the psychological benefits of communication media are maximized. Below this point, one does not experience the benefits. Above this point, one experiences the detriments.

To cite one example, the Yin and Yang of media effects are seen in media's impact on self-acceptance, the quality of having a positive attitude toward oneself and one's life. Communication media such as home movies and home videos have been used to record our lives as a series of golden moments and celebrations, presumably having a positive effect. However, children and teens compare themselves to idealized

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media images, which has been blamed for eating disorders (David and Johnson, 1998).

Another example: The Yin and Yang of media technology can be seen in the way portable music players such as the iPod are used. Their huge popularity testifies to the great pleasure they provide, but they also isolate listeners by allowing them to tune out the world around them. Parents today notice that their children no longer squabble about what station the car radio should be tuned to. Each family member is tethered to his or her individual earplugs, and the eerie silence has reminded more than one dad of an invasion of pod-people. The absence of squabbling is comforting, but one cannot help feel that opportunities for bonding are being lost with each mile.

In this chapter we will take a look at the Yin, the Yang, and the golden mean of communication technology both from a historical and a social-science point of view.

Approaches to communication technology and psychological well-being

Psychological well-being is a theoretical concept that refers to an individual state of psychological equilibrium. Also known as mental health, subjective well-being, or self-reported happiness, psychological well-being has been the subject of scientific study for more than a century (Brim, 1994). Until recently, most studies of well-being defined mental health as not being sick, as an absence of anxiety, depression, or other forms of psychological problems. The modern conception of psychological well-being emphasizes positive characteristics of growth and development. Ryff (1995) points out that this concept involves six commonly accepted components: self-acceptance, purpose in life, environmental mastery, personal growth, positive relations with others, and autonomy. Amichai-Hamburger (2005) explains the state of well-being by reference to pioneers Jung and Rogers. Drawing on Jung's theory (1939), psychological well-being is understood as the successful creation of a balance between the opposing forces of introversion and extroversion in one's personality. Carl Rogers (1980) theorized that there are various forms of self – the true self, the ideal self, and the self-concept. Balance, he argued, is achieved when there exists the smallest gap between these three states. One could argue, then, that a state of psychological well-being is the state wherein there exists such an internal balance. It seems these descriptions of well-being define a state of equilibrium. Such equilibrium is determined as a measure of social connectedness. Therefore, social connections are an important component for the balanced individual who has achieved psychological well-being.

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