

Human Factors for Networked and Virtual Organizations

Vincent E. Lasnik

Independent Knowledge Architect, USA

“There are simple answers to all complex problems—and they are uniformly wrong.”

INTRODUCTION

One of the central problems and corresponding challenges facing the multi-disciplinary field of networked and virtual organizations has been in the construction of theory-grounded, research-based *taxonomies* for prescribing what particular strategies and approaches should be employed when, how, and in what combination to be most effective and efficient for specific business domains, organizational structures, and enterprise-wide performance objectives.

An Imperative Requirement for Human-Centered Design

Our workplaces—and certainly our daily lives—have become increasingly cluttered by a vast array of ubiquitous “high technology” products from CD/DVD/M3P players, personal data assistants (PDAs), laptops, and recently mini-palm-top computers, cell phones, digital cameras, graphic video games, voice mail, e-mail, and Web-accessible portable devices, electronic car keys, answering machines, microwaves, alarm clocks, printers, fax machines, pagers, programmable robotic vacuum cleaners, and multiple-component home entertainment systems—to name only a few. Learning to use many of these devices, far from being transparently easy, requires a steep learning curve punctuated by psycho-emotional intimidation, trial and error, frustration, and a personal sense of belittlement in the face of the impersonal, ubiquitous, and insurmountable dominance of machines. An impactful January 2001 cover story in U.S. News & World Report—“Overwhelmed by Tech!”—called these proliferating devices “fiendish new instruments of mental torture” and said that “consumers may not expect all their new gadgets and gizmos to be fun, but they are demanding that at

least they don’t make them feel like idiots” (Lardner, LaGesse, Rae-Dupree, & Roane, 2001). This is particularly salient for members of networked and virtual organizations who rely so critically upon their tools, systems, and user interfaces to be creative and innovative knowledge workers.

It might be an elusive goal to seek a single standard or set of guidelines that perfectly integrates all of the different descriptive practice (i.e., case scenarios/situations) and prescriptive management techniques and strategies within an easy-to-implement solution paradigm for every creative, innovative, and knowledge-based requirement. Up to now, it has been a nearly intractable challenge to establish unequivocally-accepted technical standards across ANY industry, as current competing specifications for HD-DVD, HDTV, widescreen format aspect ratios, Web-streaming formats, SCORM compliance, technology transfer and transportability, product interoperability, and reusability continue to persist. While it can be argued that over time many competing technology systems find some pragmatic, functional accommodation to co-exist within the same universal marketplace (e.g., AC and DC, AM and FM, Apple and Microsoft), idiosyncratic conceptual paradigms like management theories and organizational models have ultimately “agreed to disagree” in addressing the same, similar, or related issues and problems from different perspectives in different enterprises and nations. And this is not only intelligent and mature but probably wise since the compelling task of creating comprehensive explanatory models of complex phenomena that are parsimonious and robust without being overly reductionist—and concise and cogent without being oversimplifications—continues to be formidable.

HUMAN FACTOR DESIGN PRINCIPLES: AN OVERVIEW

On November 3, 2005, the first World Usability Day was held by the Usability Professionals’ Association

to promote “user-centered design and every user’s responsibility to ask for things that work better.” Many permeating technologies within networked and virtual organizations share *the amberfication paradox* of textbooks, newspapers, Whitepage listings, and nightly television news programs: they are all out of date as soon as they are produced and become like artifacts hermetically sealed in amber and suspended in time from the day of their encasement. Their “one size fits all” designs are neither adaptive nor adaptable and promulgate a top-down technological imperialism penetrating every aspect of their use. The communication, collaboration, and interaction infrastructure of organizations thus remain sorely challenged with enduring problems of usability, learnability, accessibility, and adaptability. As the function and form of products undergoes increasingly rigorous scrutiny, one important design goal is emerging as a paramount priority: improving the usability of products, tools, and systems for all stakeholders across the enterprise. From the perspective of the new science of human factors in user experience design (UXD)—lowering the cognitive workload by simplifying the system interface will contribute to a less stressful, more confident task performance, and a more effective and efficient user experience.

Enhancing Information and Communication Design Efficiency

In user-centered design, the conceptual model of the user becomes the superordinate principle guiding the design process and outcomes (Kuniavsky, 2003). Usage-centered design is different: it focuses primarily on the empirical (i.e., observable and measurable) goal-based, task-driven behavior of users and the structuring activities, procedures, processes, and corresponding information architecture required to optimize the effectiveness of the user to efficiently accomplish those functional goals. By integrating the human factors engineering “systems approaches”, it may be possible to optimize the beneficent design quality of products and services from the perspective of the user’s experience (Constantine, 2001; Constantine & Lockwood, 1999; Wickens et al., 2004).

While examining ways to improve the signage, self-directed wayfinding, and user-centered design of interactive public information environments like museums, science centers, and shopping malls, C. G. Screven (1999) synthesized a number of highly

pliant and insightful principles that could be effectively repurposed for the home-based infosphere we are discussing. Screven’s core UXD metric is *design efficiency*—described as “the average time it takes viewers to find and process message-related information” (p. 147). Efficient designs (a) conserve the time and both mental (i.e., working memory) and physical effort needed by users to find, access/retrieve, quickly understand, and respond to messages and content, in effect focusing their attention and augmenting their real-time decision-making capacity; (b) reduce fatigue and “maturation effects” by providing affordances with low cognitive loads to quickly engage and involve the user in self-directed behavior that enhances their interactivity with the exhibit’s information (i.e., less noise, more signal); and (c) generally improve all aspects of the information designs themselves by systematically employing larger, easy-to-read fonts, less dense and less difficult textual content (e.g., using familiar, jargon-free vocabulary), good contrast and consistent layouts (i.e., with good “chunking”, white space, use of colors and clear mnemonic cues, and reduced visual clutter), and precise, unambiguous headings and labels. An optimal high design efficiency is thus characterized by (a) a high ratio of needed and salient information to unneeded, superfluous information stimuli to ease working memory load and reduce affective stressors, and (b) facilitates users’ abilities to process and absorb new information (Preece, Rogers, & Sharp, 2002; Ware, 2004).

Screven is an advocate for thoughtfully designing human-centered information spaces that reward and reinforce the fun and enjoyment of goal-directed experiences while intelligently reducing the aversive stimuli associated with the disconnects of failure, confusion, frustration, avoidance, task-time and effort, media overload, product complexity, and the depersonalizing emotions engendered by being continuously fettered by seemingly ineluctable, *inefficient* information design solutions. The enactive, intentional, unifying higher-order problem-solving endeavor is *design* itself—and numerous universal principles, exemplars, and epitomes of design have emerged (Lidwell, Holden, & Butler, 2003). “Designing is, therefore, more than ordering and arranging, more than constructing. It is composing. It is using the codes and pattern languages of a domain to create wholes with not only parts and relationships but also ordering-underlying principles” (Rowland, 2004, p. 40). Critical in this human-centered design

8 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/human-factors-networked-virtual-organizations/17674

Related Content

Sixth Sense Technology: Advances in HCI as We Approach 2020

Zeenat AlKassim and Nader Mohamed (2017). *International Journal of Virtual and Augmented Reality* (pp. 18-41).

www.irma-international.org/article/sixth-sense-technology/188479

Onsite Proactive Construction Defect Management Using Mixed Reality Integrated With 5D Building Information Modeling

Pratheesh Kumar M. R., Reji S., Abeneth S. and Pradeep K. (2020). *International Journal of Virtual and Augmented Reality* (pp. 19-34).

www.irma-international.org/article/onsite-proactive-construction-defect-management-using-mixed-reality-integrated-with-5d-building-information-modeling/262622

Logistic Models for Symbiosis, Predator-Prey, and Competition

Ricardo Lopez-Ruiz and Danièle Fournier-Prunaret (2008). *Encyclopedia of Networked and Virtual Organizations* (pp. 838-847).

www.irma-international.org/chapter/logistic-models-symbiosis-predator-prey/17697

Liquid Communication in Mobile Devices: Affordances and Risks

Ana Serrano Tellería (2016). *Analyzing Digital Discourse and Human Behavior in Modern Virtual Environments* (pp. 196-219).

www.irma-international.org/chapter/liquid-communication-in-mobile-devices/145920

Exploring Virtual Reality for the Assessment and Rehabilitation of Executive Functions

Elisa Pedrolì, Silvia Serino, Federica Pallavicini, Pietro Cipresso and Giuseppe Riva (2018). *International Journal of Virtual and Augmented Reality* (pp. 32-47).

www.irma-international.org/article/exploring-virtual-reality-for-the-assessment-and-rehabilitation-of-executive-functions/203066