DESIGNING USABILITY INTO MEDICAL PRODUCTS



Michael E. Wiklund Stephen B. Wilcox

> FOREWORD BY Matthew B. Weinger

Designing Usability Into Medical Products

Basem El-Haik, Khalid S. Mekki

Designing Usability Into Medical Products:

Designing Usability into Medical Products Michael E. Wiklund, Stephen B. Wilcox, 2005-02-11 Advocating a user centered approach to medical technology design Designing Usability into Medical Products covers the essential processes and specific techniques necessary to produce safe effective usable and appealing medical systems and products Written by experts on user centered research design and evaluation the book provides a range of alternative approaches to the subject Wiklund and Wilcox explore how to make medical devices safe and effective by involving users in the design process They discuss specific design and evaluation methods and tools present case studies of user friendly medical technologies and corporate human factors programs and supply related resources for medical design professionals. The book conveys an in depth understanding of the user centered design process covers design methods for FDA compliance and offers guidance on performing a variety of hands on user research user interface design and user interface evaluation. The authors make a compelling case for treating the user's needs and preferences as a top design priority rather than an afterthought They demonstrate that high quality customer interactions with systems and products leads to effective medical diagnosis and treatment increases the physical and mental well being of patients and caregivers and leads to commercial success in a Handbook of Human Factors in Medical Device Design Matthew Bret Weinger, Michael E. crowded marketplace Wiklund, Daryle Jean Gardner-Bonneau, 2010-12-13 Developed to promote the design of safe effective and usable medical devices Handbook of Human Factors in Medical Device Design provides a single convenient source of authoritative information to support evidence based design and evaluation of medical device user interfaces using rigorous human factors engineering principles It offers guidance Humanizing Healthcare - Human Factors for Medical Device Design Russell J. Branaghan, Joseph S. O'Brian, Emily A. Hildebrand, L. Bryant Foster, 2021-02-21 This book introduces human factors engineering HFE principles guidelines and design methods for medical device design It starts with an overview of physical perceptual and cognitive abilities and limitations and their implications for design This analysis produces a set of human factors principles that can be applied across many design challenges which are then applied to guidelines for designing input controls visual displays auditory displays alerts alarms warnings and human computer interaction Specific challenges and solutions for various medical device domains such as robotic surgery laparoscopic surgery artificial organs wearables continuous glucose monitors and insulin pumps and reprocessing are discussed Human factors research and design methods are provided and integrated into a human factors design lifecycle and a discussion of regulatory requirements and procedures is provided including guidance on what human factors activities should be conducted when and how they should be documented This hands on professional reference is an essential introduction and resource for students and practitioners in HFE biomedical engineering industrial design graphic design user experience design quality engineering product management and regulatory affairs Teaches readers to design medical devices that are safer more effective and less error

prone Explains the role and responsibilities of regulatory agencies in medical device design Introduces analysis and research methods such as UFMEA task analysis heuristic evaluation and usability testing ICoRD'15 - Research into Design Across Boundaries Volume 1 Amaresh Chakrabarti,2014-12-23 This book showcases cutting edge research papers from the 5th International Conference on Research into Design the largest in India in this area written by eminent researchers from across the world on design process technologies methods and tools and their impact on innovation for supporting design across boundaries The special features of the book are the variety of insights into the product and system innovation process and the host of methods and tools from all major areas of design research for the enhancement of the innovation process The main benefit of the book for researchers in various areas of design and innovation are access to the latest quality research in this area with the largest collection of research from India For practitioners and educators it is exposure to an empirically validated suite of theories models methods and tools that can be taught and practiced for design led innovation

Advances in Human Aspects of Healthcare Vincent G. Duffy, 2012-07-17 Now more than ever the design of systems and devices for effective and safe healthcare delivery has taken center stage And the importance of human factors and ergonomics in achieving this goal can t be ignored Underlining the utility of research in achieving effective design Advances in Human Aspects of Healthcare discusses how human factors an Design of Biomedical Devices and Systems, 4th edition Paul H. King, Richard C. Fries, Arthur T. Johnson, 2018-10-03 This fourth edition is a substantial revision of a highly regarded text intended for senior design capstone courses within departments of biomedical engineering bioengineering biological engineering and medical engineering worldwide Each chapter has been thoroughly updated and revised to reflect the latest developments New material has been added on entrepreneurship bioengineering design clinical trials and CRISPR Based upon feedback from prior users and reviews additional and new examples and applications such as 3D printing have been added to the text Additional clinical applications were added to enhance the overall relevance of the material presented Relevant FDA regulations and how they impact the designer's work have been updated Features Provides updated material as needed to each chapter Incorporates new examples and applications within each chapter Discusses new material related to entrepreneurship clinical trials and CRISPR Relates critical new information pertaining to FDA regulations Presents new material on discovery of projects worth pursuing and design for health care for low resource environments Presents multiple case examples of entrepreneurship in this field Addresses multiple safety and ethical concerns for the design of medical World Congress on Medical Physics and Biomedical Engineering September 7 - 12, 2009 Munich, devices and processes Germany Olaf Dössel, Wolfgang C. Schlegel, 2010-01-06 Present Your Research to the World The World Congress 2009 on Medical Physics and Biomedical Engineering the triennial scientific meeting of the IUPESM is the world's leading forum for presenting the results of current scientific work in health related physics and technologies to an international audience With more than 2 800 presentations it will be the biggest conference in the fields of Medical Physics and Biomedical Engineering

in 2009 Medical physics biomedical engineering and bioengineering have been driving forces of innovation and progress in medicine and healthcare over the past two decades As new key technologies arise with significant potential to open new options in diagnostics and therapeutics it is a multidisciplinary task to evaluate their benefit for medicine and healthcare with respect to the quality of performance and therapeutic output Covering key aspects such as information and communication technologies micro and nanosystems optics and biotechnology the congress will serve as an inter and multidisciplinary platform that brings together people from basic research R D industry and medical application to discuss these issues As a major event for science medicine and technology the congress provides a comprehensive overview and in depth first hand information on new developments advanced technologies and current and future applications With this Final Program we would like to give you an overview of the dimension of the congress and invite you to join us in Munich Olaf D ssel Congress President Wolfgang C Medical Device Use Error Michael Wiklund, Andrea Dwyer, Erin Davis, 2016-01-06 Medical Device Use Error Root Cause Analysis offers practical guidance on how to methodically discover and explain the root cause of a use error a mistake that occurs when someone uses a medical device Covering medical devices used in the home and those used in clinical environments the book presents informative case studies about the use errors **ID** .2003 Medical Device and Equipment Design Michael E. Wiklund, 1995-02-15 The key to profitability and success in both the medical device and the equipment markets often relates to how easy your products are to use User acceptance and preference frequently is dependent upon ergonomic design Medical Device and Equipment Design helps you enhance your product design maximize user acceptance and minimize potential problems in the marketplace It provides practical guidance on how to plan and incorporate ergonomic design principles into medical devices and equipment so users intuitively feel comfortable with the product Design engineers usability and reliability engineers software programmers documentation specialists product managers quality engineers and market product managers will find this text invaluable in getting usability built into products **Proceedings of the ... ASME Design Engineering Technical Conferences** ,2006 from the very beginning

Automated Systems Based on Human Skill and Knowledge 2003 Johan Stahre, Lilian Mårtensson, 2004 Focusing the impact of automation on the human this symposium aims to arrange a solution oriented meeting between international scientists application specialists and industrial experts The topics include Human centred and participatory design Adaptive and dynamic automation levels of automation automation in working life and others Medical Device Design for Six Sigma Basem El-Haik, Khalid S. Mekki, 2008-04-25 The first comprehensive guide to the integration of Design for Six Sigma principles in the medical devices development cycle Medical Device Design for Six Sigma A Road Map for Safety and Effectiveness presents the complete body of knowledge for Design for Six Sigma DFSS as outlined by American Society for Quality and details how to integrate appropriate design methodologies up front in the design process DFSS helps companies shorten lead times cut development and manufacturing costs lower total life cycle cost and improve the quality of the medical

devices Comprehensive and complete with real world examples this guide Integrates concept and design methods such as Pugh Controlled Convergence approach QFD methodology parameter optimization techniques like Design of Experiment DOE Taguchi Robust Design method Failure Mode and Effects Analysis FMEA Design for X Multi Level Hierarchical Design methodology and Response Surface methodology Covers contemporary and emerging design methods including Axiomatic Design Principles Theory of Inventive Problem Solving TRIZ and Tolerance Design Provides a detailed step by step implementation process for each DFSS tool included Covers the structural organizational and technical deployment of DFSS within the medical device industry Includes a DFSS case study describing the development of a new device Presents a global prospective of medical device regulations Providing both a road map and a toolbox this is a hands on reference for medical device product development practitioners product service development engineers and architects DFSS and Six Sigma trainees and trainers middle management engineering team leaders quality engineers and quality consultants and graduate students in biomedical engineering **Design of Computing Systems: Social and ergonomic considerations** Michael James Smith, Gavriel Salvendy, Richard J. Koubek, 1997*** **Interactions**, 2001 A magazine for designers of interactive products

Human Factors in Computing Systems ,1998 *UX Best Practices: How to Achieve More Impact with User* Experience Helmut Degen, Xiao Wei Yuan, 2011-12-06 Evolve to a user centered product development philosophy Deliver superior products and escalate your market share by employing real world user experience success strategies from global corporations Featuring in depth case studies from Yahoo Siemens SAP Haier Intuit Tencent and more UX Best Practices How to Achieve More Impact with User Experience offers proven methods for instituting user centered design in industrial environments Discover how to integrate user experience activities into product development processes for investment and consumer goods in different regions reduce product complexity increase product quality and boost the bottom line This comprehensive guide covers a variety of user experience techniques such as analyzing user needs and expectations creating design concepts prototyping using agile development conducting usability testing developing user interface guidelines defining user interface patterns and specifying metrics Communicate objectives and user requirements in design briefs Establish end to end UX centered development policies Foster collaboration between managers designers and engineers Integrate user experience metrics into business target frameworks and the product development process Employ agile development and design thinking methods Collect measure and analyze usability data Employ a User Experience Evaluation System to identify problems Convey and assess design ideas quickly using prototypes Achieve consistency across products Field Methods Casebook for Software Design Dennis Wixon, Judith Ramey, 1996-10-05 The with UI patterns and libraries first field methods book devoted exclusively to the areas of interface design and human computer interaction this collection offers design practitioners a unique opportunity to study a wide range of techniques developed by their peers to investigate user work in context and to provide a basis for grounded product design **HWWE 2005** Debkumar Chakrabarti, Abhijit

Das,2006 Papers chiefly in the Indian context presented at the conference held at Indian Institute of Technology Guwahati during Dec 10 12 2005 organized by the Dept of Design in collaboration with the International Ergonomics Association and Indian Society of Ergonomics Using Human Factors Engineering to Improve Patient Safety John W. Gosbee,Laura Lin Gosbee,2005 Human factors engineering HFE is concerned with understanding human characteristics and how humans interact with the world around them and applying that knowledge to the design of systems that are safe efficient and comfortable This book describes how to use HFE tools and principles to curb preventable errors and minimize patient harm

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