ABHISHEK KUSHWAHA

Medical Product Designer | Medical Device Usability Engineer | Human Factors Engineering | Industrial Design | Medical Device R&D
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Professional Summary

Medical Product Designer with 6+ years of experience developing tangible products and 3+ years of experience in innovative medical devices, wearable healthcare technologies, and human-centered solutions within regulated product development environments. Experienced in integrating Human Factors Engineering, usability engineering, and industrial design throughout the product lifecycle—from user research and concept generation to prototyping, validation, and design refinement. Proficient in applying IEC 62366-1, IEC 60601, ISO 14971, ISO 13485, and EU MDR/IVDR principles to support safe, compliant, and intuitive medical products. Skilled at translating clinical workflows, user insights, and engineering requirements into manufacturable solutions while collaborating with multidisciplinary R&D, engineering, regulatory, and product teams. Passionate about advancing healthcare innovation through user-centered design and contributing to the development of safe, intuitive, and regulatory-compliant medical technologies within global MedTech organizations.

Core Competencies

- Medical Product Design | Medical Device Design | Human Factors Engineering | Medical Device R&D
- Usability Engineering | Design Controls | Design Verification | Regulatory Documentation
- IEC 62366-1 | IEC 60601 | ISO 14971 | ISO 13485 | EU MDR | EU IVDR | Formative & Summative Usability Testing
- User Research | Contextual Inquiry | Clinical Workflow Analysis | Human Factors Validation | Design Validation
- Risk Management | Use Error Analysis | Interaction Design | Wearable Devices | Product Development
- Product Validation | Rapid Prototyping | Cross-Functional Collaboration | DFM & DFA

Technical Skills

- **Medical Device Standards & Compliance:** IEC 62366-1 | IEC 60601 | ISO 14971 | ISO 13485 | EU MDR | EU IVDR | Human Factors Engineering | Design Validation | Risk Analysis
- **Industrial Design:** Product Design | Interaction Design | Ergonomics | Wearable Devices | CMF Development | Electromechanical Systems | Medical Diagnostics | IoT Devices | Rapid Prototyping | Design Thinking
- **Software:** Fusion 360 | SolidWorks | Rhinoceros | KeyShot | Figma | Adobe Creative Suite | Vizcom | Krita | Microsoft Office

Professional Experience

Senior Industrial Designer - R&D & New Product Development (Medtech) Feb 2026 – Present
AIC Mahindra e-Hub Foundation | Hyderabad, India

- Design and develop AI-enabled wearable medical devices for physiological monitoring, integrating industrial design, usability engineering, and Human Factors Engineering throughout concept development, prototyping, and validation.
- Apply IEC 62366-1, ISO 14971, and ISO 13485 methodologies to support design controls, risk management, usability evaluations, and product verification activities.
- Conduct feasibility studies, usability assessments, and design reviews to improve product safety, usability, and clinical effectiveness.
- Collaborate with multidisciplinary engineering, clinical, and product teams to translate user needs into manufacturable medical device solutions while supporting regulatory documentation.

July 2025 – Jan 2026

Industrial Designer - R&D & New Product Development
T-Works (India's Largest Prototyping Facility) | Hyderabad, India

Flagship Project – TB-Dx Portable Tuberculosis Diagnostic System

- Led usability engineering activities across the complete development lifecycle of a Class C In-Vitro Diagnostic (IVD) device, conducting ethnographic research, formative usability evaluations, and use-error analysis that improved diagnosis speed by 66.5% while reducing use-related errors by 32%.
- Planned and executed formative usability studies, iterative validation activities, and risk mitigation aligned with IEC 62366-1 and ISO 14971, supporting compliance with EU IVDR.
- Maintained complete usability engineering documentation, ensuring traceability between research findings, identified risks, design controls, and validation outcomes.
- Coordinated with engineering teams throughout product development to strengthen usability, regulatory readiness, and pilot stage validation.

Selected Medical Device Projects

- Improved the ergonomics of a Class IIa Auricular Vagus Nerve Stimulation Device, reducing device weight by 40% while extending therapy duration by 40 minutes through iterative product refinement.
- Designed interaction architecture for an AI-powered wearable communication device that reduced text-to-speech latency by 80%, improving accessibility and overall user experience.
- Applied DFM/DFA principles across multiple electromechanical healthcare products to improve manufacturability, assembly efficiency, and production readiness.

Industrial Designer - R&D & New Product Development Jan 2024 – June 2025
Klioro | Pune, India

- Established the organization's industrial design and product development function, creating structured workflows that supported wearable product (accessory) innovation and accelerated new product development.
- Converted user research, engineering requirements, and stakeholder feedback into actionable design specifications supporting new product development.
- Designed wearable mechanisms using DFM/DFA methodologies, reducing component count by 30–45% and manufacturing costs by 13% and advanced five products from concept through production, with three designs showcased at IIJS.

Industrial Designer - Design Intern May 2023 – June 2023
Alagangle Design Studio | Nagpur, India

- Contributed to the redesign of an industrial tower light for Navitas Lighting, balancing functionality, manufacturability, and product aesthetics.
- Engineered integrated multifunctional components that reduced part count, simplified assembly, and lowered manufacturing costs by 26%.
- Collaborated with senior designers and engineering teams to translate functional requirements into production-ready design solutions.
- Optimized product architecture to improve usability, maintenance, and long-term manufacturing efficiency while successfully supporting the first production batch of 2000 units.

Academic R&D Project - Wearable Assistive Communication System for Cerebellar Ataxia Aug 2023 – Mar 2024
IDC School of Design, IIT Bombay

- Conducted formative usability research with neurologists and cerebellar Ataxia patients to identify communication challenges, user behaviors, and clinical workflows.
- Applied Human Factors Engineering principles, task analysis, contextual inquiry, affinity mapping, and user journey development to define product requirements and improve clinical usability.
- Designed a wearable assistive communication device integrated with an IoT mobile application (COMU) enabling SOS alerts and real-time caregiver communication.
- Developed iterative prototypes and validated interaction flows using IEC 62366-1 usability engineering principles, improving accessibility while supporting patient safety and clinical usability.
- Collaborated with clinicians and end users throughout multiple design iterations to ensure the solution aligned with real-world healthcare needs and regulatory expectations.

Education

- **Master of Design (M.Des.), Industrial Design**
  IDC School of Design, **IIT Bombay** | Mumbai, India

- **Bachelor of Engineering (B.E.), Mechanical Engineering**
  A.C.E.T., Nagpur University | Nagpur, India

Certifications & Languages

- **Certifications & Publications**
  Human Factors and Usability Engineering in Medical Devices.
  NPTEL - Product Design and Innovation.
  JETIR Publication - "Design and Modification of a DX Window AC into a Water Chiller".

- **Languages**
  English, French (A1 - in progress), Hindi (Native)
