UNIVERSITI TEKNOLOGI MARA

DESIGN AND DEVELOPMENT OF AN INVENTORY MANAGEMENT SYSTEM FOR RB SPECTRA USING USER CENTERED DESIGN

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ABSTRACT

Inventory management is a critical component of operational efficiency yet many small and medium-sized enterprises (SMEs) continue to rely on manual methods such as Microsoft Excel for tracking stock and asset. RB Spectra which is an engineering and service company based in Terengganu, Malaysia faces this exact challenge where its current manual inventory process has resulted in inaccurate stock record, delayed update, untracked item movement, poor inter-branch communication and a lack of accountability. This project aims to design and develop an Inventory Management System (IMS) for RB Spectra guided by the User-Centred Design (UCD) methodology which ensuring that the system genuinely reflects the need, task and working environment of its actual user rather than being built around technical assumption alone. The project follows three objectives which is to identify the current business process and problems within RB Spectra's inventory management,to design and develop an inventory management system using UCD, and to evaluate the functionality and usability of the inventory management system for RB Spectra. An Adapted Waterfall Model integrated with UCD principles and Nielsen's 10 Usability Heuristics was adopted to guide the system's development across three user role which is Staff, Manager and Admin. The developed system was evaluated through structured functional test cases, a usability questionnaire measuring Effectiveness, Efficiency and Satisfaction and an independent expert evaluation conducted by three academic professional. The results show that the system function correctly across all tested scenarios which achieved an acceptable System Usability Scale (SUS) score of
72.44 and recorded an overall expert compliance rate of 98.48%. These finding confirm that the developed RB Spectra IMS successfully replaces the company's manual process with a functional, user-centred and accountable digital solution while also contributing to the broader understanding of how UCD can be applied within SME inventory management context.