

الآية

الْكِتَابُ الْأَلَمُّ (1) يُبَافِيهِ هُ (مَلَأَنِي لِيَلْمَ يُتَّقُونَ مِنْ نُو) (2) بِالْغَيْبِ وَ يُقِيمُونَ
الصَّلَاةَ وَ مِمَّا رَزَقْنَاهُمْ يُنْفِقُونَ (3)

صدق الله العظيم (سورة البقرة)

Dedication

The prophet Mohammed “peace & blessing be upon him” said: “Who does not thank people does not thank Allah”.

I dedicate this Thesis to the people who kept lighting my way and without them I would never reached what I am today; my beloved parents who kept encouraging me to make my dreams see the light one day, Through their and my sisters’ emotional support, intellectual stimulation and many hours of identity-forming conversation, I am inspired to pursue an unconventional dream in which I truly believe. So, thank you, to Mom, Dad, Esraa and Asmaa for being the most supportive family one could hope for.

I would like to sincerely thank my friends who strengthen me with their warm wishes and prayers. Especially, I need to express my gratitude and deep appreciation to my best friend Nusiba Elwasila her friendship, hospitality and wisdom have supported, enlightened and entertained me over the many years of our friendship. She consistently helped me keep perspective on what is important in life and shown me how to deal with reality.

Abstract

A well designed and properly implemented Medical equipment management system can help not only managing the financial resources but also improves the quality of life. The thesis evaluated the existing medical equipment management practices and processes and came up with a new design to solve the existing problems. In order to properly assign the main requirements of the system design, preliminary study was implemented in the Governmental institutions those responsible for medical equipment management and the major public hospitals of Khartoum locality to assess the main challenges of the medical equipment management process. In-depth interviews were conducted with the biomedical engineers from those Governmental institutions. In addition; Biomedical engineering staff from the hospitals under study were interviewed and asked to fill a questionnaire on existing medical equipment management procedures to determine their effectiveness as they managed the life cycle of the medical equipment. This data indicates there is an improper performance in the selection of equipment (65.3% of hospitals), acquisition (70.2% of hospitals), training and skill development (46.9% of hospitals), operation (63.0% of hospitals), Maintenance and Repair (43.2% of hospital) and decommissioning (78.6% of hospitals reported that they have a problem in decontaminating devices before use and after removal) of medical equipment. The results offered the opportunity to design a system to reduce the existing problems and show improvement by increasing efficiency and making the most effective utilization of available resources. An input output model is used to construct the detail design of the Medical equipment management system. It is designed to help the biomedical equipment department in hospitals to manage all the stages of medical equipment life time effectively. As well as linking those governmental institutions with the hospitals so they can access the database of each hospital to monitor the quality of the implementation of effective management. It is a web based application that is accessible almost from everywhere via the Internet. All users of the system with a correct user name and password are able to login to it. The challenges encountered in this thesis included limited number of samples, difficulty to collect questionnaires and testing the system in the real world.

المستخلص

نظام إدارة نظم الأجهزة الطبية المصمم و المنفذ بشكل جيد يساعد ليس فقط في إدارة الموارد المالية و لكن ايضا يساعد على تحسين جودة الحياة. هذه الأطروحة قيمت ممارسات و عمليات إدارة الأجهزة الطبية الحالية و ابتكرت تصميمًا جديدًا لحل المشاكل القائمة. من أجل تحديد المتطلبات الرئيسية لتصميم النظام بشكل صحيح تم تنفيذ دراسة أولية في المؤسسات الحكومية المسؤولة عن إدارة الأجهزة الطبية إضافة إلى المستشفيات العامة الرئيسية في محلية الخرطوم لتقييم التحديات الرئيسية لهذه العملية. أجريت مقابلات مع المهندسين الطبيين في تلك المؤسسات الحكومية وكذلك تمت مقابلة موظفي قسم الهندسة الطبية في تلك المستشفيات و طلب منهم ملء استبيان في إدارة الأجهزة الطبية لتحديد فعاليتهم في إدارة الأجهزة الطبية طوال عمرها الافتراضي. البيانات التي تم جمعها اظهرت ان اللداء غير جيد في كل من: مرحلة إختيار الجهاز (65.3% من المستشفيات), الشراء (70.2% من المستشفيات), التدريب و تطوير المهارات (46.9% من المستشفيات), التشغيل (63.0% من المستشفيات), الصيانة و الإصلاح (43.2% من المستشفيات), و إزالة الجهاز من الخدمة (78.6% من المستشفيات). النتائج أتاحت الفرصة لتصميم نظام للحد من المشكلات الموجودة و إظهار التحسين بزيادة الكفاءة و الاستفادة الأكثر فعالية من الموارد المتاحة. استخدم نموذج المدخلات و المخرجات لإنشاء التصميم المفصل للنظام. تم تصميم هذا النظام ليعاود قسم الهندسة الطبية في المستشفيات على إدارة كل مراحل فترة حياة الجهاز الطبي بفعالية. بالإضافة الي ربط تلك بالمؤسسات الحكومية المسؤولة عن ادارة الاجهزة الطبية بالمستشفيات عن طريق اعطاءهم صلاحية الدخول الي قاعدة بيانات كل مستشفى ليتيح لهم امكانية مراقبة مدى جودة تطبيق الادارة الفعالة. هذا النظام عبارة عن تطبيق منشأ على الويب يمكن الوصول الي تقريبا من كل مكان عبر الأنترنت. جميع مستخدمي النظام عن طريق أسم مستخدم و كلمة مرور صحيحين يمكنهم تسجيل الدخول إليه. التحديات التي تمت مواجهتها في هذه الرسالة تضمنت عدد العينات المحدود و صعوبة جمع الاستبيانات و اختبار النظام على أرض الواقع.

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