

آية

بسم الله الرحمن الرحيم

قال تعالى:

(وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُمْ مِنَ الْعِلْمِ إِلَّا قَلِيلًا) .

صدق الله العظيم.

سورة الأسراء ، آية (85) .

DEDICATION

To

My beloved parents, a precious thought to me.

**To my brother and sisters, whose cheerful patience
and constant encouragement made this project
possible.**

**To my friends and all students who are interested in
the field of software quality.**

**I dedicate this work to them all for the support,
encouragement, love and prayers that they have
always had for us.**

**My Allah blesses them all and grants them happiness
all through.**

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المستخلص

منذ زمن بعيد أصبحت البرمجيات تلعب دوراً مهماً في حياتنا. و نجد أن البرمجيات هي عبارة عن منتجات صعبة في التطوير والاختبار ولذلك فإن البرمجيات ذات الجودة المتدنية تواجه مشاكل قد تتسبب في خسائر كبيرة. ولهذه السبب نجد أن اهتمام الباحثون بدأ يتزايد في عملية تحسين جودة البرمجيات بطرق مختلفة أهمها التحسين في عملية إنتاج البرمجيات.

هذه الأطروحة تناولت تحسين مراحل إنتاج البرمجيات كطريقة لزيادة جودة البرمجيات, وفيها تم مناقشة أنواع واهداف وطرق ادارة تحسين مراحل إنتاج البرمجيات. ذكرت هذه الأطروحة بعض من معايير تحسين عملية إنتاج البرمجيات بصورة واضحة. أثناء هذه الأطروحة تم زيارة عدد من مؤسسات البرمجة السودانية لأجراء مقابلات مع بعض محترفي البرمجيات فيها, وملاحظة كيف تحسن هذه المؤسسات عملياتها لإنتاج البرمجيات, والتعرف علي المشاكل التي تواجه هذه المؤسسات أثناء تنفيذ معايير تحسين عمليات إنتاج البرمجيات. تم استخدام نتائج المقابلات و ملاحظة هذه الشركات في تصميم استبيان وتم توزيعه علي عدد من المؤسسات السودانية لتجمع بيانات من وجهات نظر مختلفة ويتم تحليلها. ووجد أن هذه المؤسسات عبارة عن مؤسسات صغيرة ويعتقد أكثرها أن تطبيق معايير تحسين عملية إنتاج البرمجيات يزيد في جودة البرمجيات. ووجد أن أكثر المشاكل التي تواجه هذه المؤسسات هي قلة الخبرة لدي الأشخاص الذين يتبعوا تنفيذ هذه المعايير, و ضعف الدعم من الإدارة, وعدم تعاون الزبائن مع هذه المعايير وحجم المشاريع والأشخاص المنفذين لهذه المشاريع لا يتناسب مع هذه المعايير, و في الأخير التكلفة العالية لتنفيذ هذه المعيير.

هذه الأطروحة أوصت ببعض المواضيع للبحث في المستقبل, تتضمن هذه المواضيع دراسة عملية لحل المشاكل التي تواجه مؤسسات البرمجة السودانية عند محاولة تنفيذ

معايير تحسين عملية إنتاج البرمجيات. تقديم معيار جديد خاص بالشركات السودانية يأخذ في الاعتبار الصفات الخاصة بالشركات السودانية والزبون السوداني، هو موضوع آخر قابل للبحث.

ABSTRACT

Software plays an essential and critical role in our society. Software applications are complex products that are difficult to develop and test. Very often, software exhibits unexpected and undesired behaviors that may even cause severe problems and damages. For these reasons, researchers and practitioners have been paying increasing attention to understanding and improving the quality of the software being developed.

This thesis studies the Software Process Improvement (SPI) as a way of increasing software product quality. Also SPI types, goals and management are discussed. Some of Software Process Improvement Standards are presented in particular. During this thesis some Sudanese software organizations were visited, to interview software professionals and observe how these organizations can improve their software process and to identify problems that can face these organizations during implementation of Software Process Improvement Standards. The results from interviews and observations were used to design questionnaire to collect data from different views and analysis this data. It was found that Sudanese software organizations are small, most of them believe that implementations SPI standards increase software quality. The problems that can face the small organizations are Lack of skilled people who can follow standards, Lack of Top Management Support, Lack of Customer Collaboration, Project Size/Complexity, Project Team Size, and Cost.

This thesis also presents some issues for future work that's including the empirical studies to solve the problems facing the Sudanese software organizations during the implementation of SPI standards. Introducing standards standard for Sudanese software organizations is an interesting topic for further study.

LIST OF ABBREVIATIONS

ACM	Association for Computing Machinery.
SIGSOFT	Special Interest Group on Software.
SPI	Software Process Improvement.
CMM	Capability Maturity Model.
CMMI	Capability Maturity Model for Integration.
ISO	International Organization for Standardization.
SPICE	Software Process Improvement and Capability dEtermination.
SEI	Software Engineering Institute.
PSP	Personal Software Process.
TSP	Team Software Process.
DSCS	DataStream Content Solutions.
KPA	Key Process Area.
SME	Small and Medium Enterprise.
SPC	Software Process Capability.
SPP	Software Process Performance.
SPA	Software Process Assessment.
SCE	Software Capability Evaluation.
SEPG	Software Engineering Process Group
CEO	Chief Executor Office.
IT	Information Technology.
UK	United Kingdom.

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