

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ (1) خَلَقَ الْإِنْسَانَ
مِنْ عَلَقٍ (2) اقْرَأْ وَرَبُّكَ الْأَكْرَمُ (3) الَّذِي عَلَّمَ
بِالْقَلَمِ (4) عَلَّمَ الْإِنْسَانَ مَا لَمْ يَعْلَمْ (5)

صَدَقَ اللَّهُ الْعَظِيمُ

سورة العلق - الآيات 1 - 5

Dedication

This thesis is dedicated to:

My loving mother, the candle who lightens my life

*My father, who taught me how to fight and stand up during
the hard time.*

My Husband Khalifa

My daughter HANEEN and my son AHMED

*All my friends and for everyone who gave me his support and
advice.*

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Abstract

Balancing Assembly line in garment industry is an important step towards improving production rates and stabilizing outputs. The aim of this study is to balance U3 Shirt assembly line in Sur Military Clothing Factory. The objective of the study is to develop a simulation model which represents real production process scenarios of U3 Shirt that helps to decrease the finish time, increase the efficiency of the line and generating different alternative scenarios to utilize the assembly line. The methodology adopted includes firstly calculation of cycle time of U3 Shirt assembly line process by using time study, Secondly, to set up a model of the line by simulation the following tools and technologies had been used: MySQL Database Management System (DBMS), Java language, Hyper Text Markup Language (HTML), Cascades Style Sheets (CSS) and SMARTY J. The developed simulation model was found to be matching the real system. Several scenarios were created to enhance the system. Three possible scenarios were proposed. The best scenario gave a finish time decrement of 24113 sec (6.7 hours) and other two alternative scenarios gave 26603 sec (7.39 hours) and 26622 sec (7.395 hours) respectively. The efficiency of the line is increased to 19%, 10% and 10% respectively. The cost of the three alternative scenarios was increased by 9%, 15% and 3% from the real system cost respectively. The result concluded that the current system can be enhanced to be more effective with less finishing time and also it provided a way to create many alternatives for the decision maker for further improvement.

المستخلص

تعد موازنة خط التجميع في صناعة الملابس خطوة مهمة نحو تحسين معدلات الإنتاج واستقرار المخرجات . الهدف من الدراسة هو بناء نموذج محاكاة يمثل النظام الحقيقي لخط تجميع القميص الذي يمكن عن طريقه محاكاة عدة سيناريوهات ممكنة ومحتملة للمساعدة علي تقليل وقت الانتاج الكلي لعدد القطع المطلوبه وزيادة كفاءه خط التجميع. إشتملت المنهجية المعتمده أولا علي حساب وقت انجاز عمليات خط تجميع القميص باستخدام دراسة الزمن، ثانيا لبناء نموذج المحاكاه تم استخدام لغة الجافا وقواعد البيانات وأدوات برمجية أخرى. نموذج المحاكاه الذي تم تطويره تم مطابقه أداءه مع النظام الحقيقي ووجد أنه يعطي نتائج مرضية ومطابقة تقريبا. تم تجربه عدة سيناريوهات محتمله. وقد أعطي أفضل سيناريو إنخفاض في وقت الإنتهاء من عدد القطع المطلوبه قدره 24113 ثانيه (6.7 ساعه) بينما أعطت السيناريوهات البديله الأخرى 26603 ثانيه (7.39 ساعه) و26622 ثانيه (7.395 ساعه) علي التوالي . زادت كفاءه الخط الي 19% في السيناريو البديل الاول ، 10% في السيناريو البديل الثاني و 10% في السيناريو البديل الثالث . زادت تكلفة السيناريوهات الثلاثه البديله بنسبه 9% ، 15% و 3% علي التوالي. وخلصت النتيجة إلى أن النظام الحالي يمكن تعزيزه ليكون أكثر فاعلية مع أقل وقت إنتهاء ، كما أنه يوفر وسيلة لخلق العديد من البدائل لصانع القرار لمزيد من التحسين.