

Sudan University of Science & Technology

College Of Graduate Studies

**Aggregate Inventory Management. Applied
Study**

. دراسة تطبيقية

A Thesis Submitted in partial Fulfillment of the Requirement for
the Degree of Master of Science in Mechanical Engineering

By

Omer Ibrahim Obaid Ahmed

Under Supervision of

Dr: Fuad Babiker Abd Elgadir Mulla

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الآية

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الى امي وابي



الى اخواني واخواتي



التقدير والعرفان الى اخي وصديقي المهندس حسن سيد



احمد واسرته لوقوفهم معي طيلة فترة دراسته والبحث

الى جميع اساتذتي الاجلاء و كل من علمني حرفه



الى جميع الاصدقاء و الزملاء



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Omer Ibrahim Obaid Ahmed
Mechanical Engineer

ABSTRACT

Central medical supplies cooperation – Sudan have some problems in their inventory management system, these problems are summarize in:

- . High quantity of familiarization inventory.
- . Higher inventory cost.
- . Inaccurate aggregate inventory data which are exchange between different departments.
- . Out stock for some stored items.

The research solved these problems through gathering the necessary information for the ordering quantity for any item and order point and how much the reserve stock.

The group of seven items data are use for study purposes, a database system was made using Microsoft Office Access language for this items group, modifying the existing method which is use for calculating the inventory lot size – order point – safety stock to develop the current system and apply the aggregate inventory management concepts.

After modifying the system the total order quantity of the seven items is reduce from 198645 items with the total cost \$466854 to the 146156 items with the total cost \$364522, with the reduction of 22% in inventory investment without increase in expense and these lead to reduce the familiarization rate and total inventory cost.

Modifying the current method used for determining the reserve stock, lead to reduce the reserve stock from 231753 to 11238 which is lead to reduce the inventory holding cost and minimize the familiarization from aggregate inventory.

Re-order point in the current system is determining by double of reserve stock without putting the demand during lead time in account (high – low). This

method is modifying in proposed system by including the demand during lead time and adding the reserve stock to it to determining the re-order point, and comparing the results there is reduction in this quantity form 463505 to 232103 for group of items.

نظام ادارة المخزون المستخدم بواسطة هيئه الامدادات الطبيه – السودان به عده مشاكل. هذه

. ارتفاع في كميات المخزون التالف

. ارتفاع تكلفه التخزين

. عدم الدقه في بيانات المخزون الاجمالي المتداوله بين الاقسام

. المخزون لبعض الاصناف المخزنه

قامت الدراسه حل هذه المشاكل بتجميع المعلومات عن الكميات المطلوبه من كل عنصر ومتي يتم الطلب و ما هي كميته المخزون الاحتياطي.

تم اخذ بيانات مجموعته مكونه من سبعة عناصر بغرض الدراسه ثم عمل نموذج قاعده بيانات بواسطه لغه Microsoft Office Access لهذه المجموعه من العناصر كما تم تعديل الطريقه المستخدمه في حساب الكميات المطلوبه ونقطه اعاده الطلب والمخزون الاحتياطي.

بعد اجراء التعديلات علي النظام ومقارنه النتائج تم خفض الكميات المطلوبه من عنصر وتكلفه \$ 4 وذلك يؤدي

الي خفض نسبه التالف من المخزون وتقليل اجمالي التكاليف.

تعديل الطريقه المستخدمه في تحديد كميته المخزون الاحتياطي مما يؤدي الي انخفاض في كميته المخزون الاحتياطي من الي مما يؤدي الي خفض تكلفه الاحتفاظ بالمخزون وتقليل كميته التالف.

نقطه اعاده الطلبيه في النظام الحالي هي عبارته عن ضعف المخزون الاحتياطي دون النظر الي مستوي الخدمه والطلب علي الصنف المحدد خلال فتره التأخير (-). تم تعديل

هذه الطريقه وتضمن الطلب خلال زمن التأخير و اضافته المخزون الاحتياطي الي كميته المستخدمه خلال فتره التأخير لتحديد نقطه اعاده الطلب وبمقارنه النتائج كان هنالك خفض في هذه الكميات من

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List of abbreviation

CMS	Central Medical Supplies
MRP	Material Requirements Planning
ERP	Enterprise Resource Planning
EOQ	Economic Order Quantity
LIMIT	Lot-size Inventory Management Interpolation Techniques
MAD	Mean Absolute Deviation
DBMS	Database Management System
DDL	Data Definition Language
SQL	Structured Query Language