

الآيه:

قال الله تعالى في محكم تنزيله:

بسم الله الرحمن الرحيم

(الذي جعل لكم الأرض مهدياً وسلك لكم فيها سبلاً وأنزل من السماء ماءً

فأخرجنا به أزواجاً من نباتٍ شتى)

صدق الله العظيم،،،

(سورة طه الآيه (53))

Dedication....

To my dear family:

Mother, Father, MY WIFE, MY SON, MY Brothers and Sisters

To all knowledge seekers and providers,

To all my teachers and instructors,

To my dear friends, colleagues and classmates

With my love and respect....

ABDELBASET...

Abstract:

This research presents a transportation network analysis and design by using the capabilities of a Geographic Information System (GIS). Advancing the GIS basic technologies, we are using the network analyst in Arc GIS to find out the best network schema, which fulfills the requirements of the Khartoum Metro Network and the services area.

The need of a Metro system in a city is generally considered necessary when population of the city exceeds one million. Khartoum State crossed this milestone in the early 1990's (2.44) Millions and has now around 8 millions. In this study we deal with a map and all the processes using Arc GIS V10.2 & QGIS V2.14.1 software to get the final results and a geo-database for the study area (Khartoum state), which contains road network, the suggested Metro network schema with its stations and paths as well as producing a number of thematic maps like the metro services area, accessibility, closest facility and shortest path for Metro Stations.

The study recommends that by using a geo-database in Khartoum State will support decision-making processes reducing the risks of taking the wrong decisions based on incomplete information.

This research contains an Overview, Theoretical Framework, Research Community, and the Methodologies implemented. These are followed by System Requirements, System Analysis and Design which produce the final results with some discussions and recommendations.

المستخلص:

هذا البحث يتناول تصميم وتحليل شبكه مترو باستخدام نظم المعلومات الجغرافية وذلك من خلال تطبيقها في تحليل وتصميم افضل مسارات لشبكة مترو لولاية الخرطوم، وذلك باستخدام محلل الشبكات Network Analyst.

إن الحاجة لنظام مترو في أي مدينة ضروريا عندما يتجاوز عدد سكانها المليون نسمة، ولاية الخرطوم تجاوزت هذا الرقم منذ أوائل التسعينيات (2.44 مليون نسمة) ، والآن حوالي 8 ملايين نسمة. إستخدمت الدراسة برنامجي Arc GIS V10.2 & QGIS V2.14.1. وقد قامت الدراسة بتصميم قاعدة بيانات جغرافية لمنطقة الدراسة (ولاية الخرطوم) تشتمل على شبكة الطرق وشبكة المترو المقترح ومحطات ومسارات المترو وكذلك خرائط المنطقة المخدومة وإمكانية الوصول، خرائط أقرب خدمه وكذلك خرائط أقصر مسار لمحطات المترو.

أوصت الدراسة بضرورة استخدام قواعد بيانات جغرافية لولاية الخرطوم مما يدعم متخذي القرار في اتخاذ القرار الصائب ويقلل الأخطار الناجمه من اتخاذ قرار خاطئ مبني على معلومات غير مكتملة.

يتكون هذا البحث من مقدمة والإطار النظري ثم تفصيل لمجتمع الدراسة والتعريف بمنطقة الدراسة والمنهجيات ثم يليه تحديد متطلبات النظام والتحليل والتصميم ثم المناقشة وتحليل النتائج وأخيرا التوصيات.

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Acronyms

Acronym	Meaning
GIS	Geographical Information System
DSS	Decision Support Systems
GIS-T	GIS In Transportation
ITS	Intelligent Transportation Systems
AHP	Analytic Hierarchy Process
AHPNDGIS	AHP Network Design Using GIS
VATS	Victorian Activity and Travel Survey
WGS 84	World Geodetic System 1984
UTM	Universal Transverse Mercator
QGIS	Quantum GIS
TSP	Travelling Salesman Problem
SPP	Shortest Path Problem

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