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A Survey of Environmental Threats to Farmers in Selected Area of Chhattisgarh Gram Panchayats Using a Mobile-GIS User Interface

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GIS has expanded significantly in the past few decades. Spatial thinking and GIS technologies are helping researchers from several fields create models for space. GIS includes computational geographical areas, collecting data, and mapping. In computational intelligence, a "cognitive agent" is an organization with perception, learning, inference, goals, and knowledgebase molded within intellectual. Socially intellectual the representative systems aim to provide both frameworks for creating complicated brain systems that involve social creatures and tools for collaboration, cooperation, and relationship that utilize cognitive the agents habits. Online GIS systems are "more mobile, powerful, flexible and better able to share and communicate geographic information.

Keywords: GIS, Network, Mobile, Internet, Digital Device.

1. Introduction

Through the internet GIS services disseminate interactive maps and other geographical data from GISs through the World Wide Web. Data is distributed across Internet-connected systems. Online GIS provides “universal accessibility to remotely distributed data and analysis functions”. This allows customers to utilise GIS products via their computers requiring installing a complicated GIS platform.[1] Infrequent customers may simply locate nearby shops for purchases. Mapping display dominates Online GIS nowadays. The map services show and distribute generated images. Online maps are either fixed or moving. Fixed maps display static data like maps made of paper. Hypertext links to other geographic-related publications may be added to stationary online maps. Geographic Information Systems (GIS) lets you query and analyse geographic systems like transportation connections. The GIS-based solution combines spatial transportation data from several sources and supports decision-making. GIS-integrated traffic modelling has several benefits. Statistical skills, archives performance, geographical system integrating, and geographical evaluation are the main

benefits.[2] Collaborative cognition organisms self-adapt to cognitive advancements and directly influence choices via communicating behaviors. The structure's "Isolated Cognition Models" maintain unique agendas and do not share information with the virtual civilization. For creating interactions in socially cognizant organisms in real, digital, and online environments for making choices and goal-setting. Spatial mental procedures are understudied [3]. To take advantage of the inherent difficulty inherent in social cognition, realistic pattern recognition, artificial intelligence, and information storing are combined within social creatures in order to generate activated behaviors with cognitive power that prepares agents with a new variety of conduct, but it also about operational distinct behave socially to collaborative accomplishment of individualistically and simultaneously established targets. Utilizing memorizing and learning sections from brain structures, thinking about chatting, interrelated, and partnering socially with shared and common knowledge, the society of cognitive agents can work unified and cooperatively to achieve goal in an extremely unsure the surroundings the network[4]. Innovative mappings link to datasets. Real-time querying of databases creates live maps. The visitor chooses the map's layout, size, material, etc. Internet mapping involves showing mapping server-generated maps in a web browser. Viewers see server-stored location information. The GIS-based solution combines spatial transportation data from multiple sources and supports decision-making. GIS-integrated mobility modeling has several benefits. Statistical skills, archives productivity, geographical information integrating, and geographic evaluation are the main benefits [5].

2. Literature review

Higher education institutions, operating under the umbrella of UBA, collaborate with individuals residing in rural regions to identify the issues they face in terms of development, and afterwards develop solutions aimed at promoting sustainable progress at an accelerated pace. The integration of Web-GIS facilitates the combination of geographical and non-spatial data, such as household data. This integration enhances the accessibility of information for rural communities and enables administrators to effectively plan development operations and monitor government programmes in rural areas. The objective of this study is to develop an interactive geospatial database that facilitates the retrieval of household information, including spatial data, for Ramulapalli village in Kannurugram panchayat. This village has been selected as part of the UBA programme. Ensuring the Preservation of the Specifications' Integrity.

At the local level, the absence of decision-making tools and precise data pertaining to the subject matter sometimes results in programme interventions lacking targeted focus. The objective of this study is to construct a database and application for village Business Intelligence (BI) that leverages the Geographic Information System (GIS) to support decision-making processes among village officials and other government authorities in the implementation of community welfare development programmes. The employed methodologies encompass literature reviews on village legislation, surveys, and interviews. The outcome of this study is the development of a comprehensive dashboard comprising a database and many apps.

The study utilised the LU/LC Vector Layer of 2012 (NRSC Cycle-1) and the LU/LC Map of 2012-13 to derive land use/land cover statistics for their respective time periods. These datasets

were employed to examine the alterations in the extent of certain land use/land cover categories over a ten-year period.

This article presents a comprehensive analysis of the possibilities and constraints associated with the utilisation of mobile phones for the provision of rural services in the context of agricultural and rural development in developing nations. The study highlights a significant increase in research activity in recent years, with a notable rise in the number of primary research projects that have employed robust procedures for data collecting and analysis. It is encouraging to observe the involvement of institutions and researchers from developing countries in this progress.

The objective of this study is to examine the planning and development of a mapping, dereferenced, and analytical tool, as well as its usefulness in the agricultural sector. The use of Business Intelligence entails the application of computer-based methodologies for the purpose of identifying, presenting, and examining business-related data. This includes but is not limited to revenue generated from product or segment sales, as well as various expenses and incomes.

The objective of this study is to identify the roads within a network that require upgrading and maintenance, based on their pavement conditions. Additionally, the purpose is to design a system for prioritising these roads using village facility indices. The research site is situated within the geographical boundaries of Warangal District, which is located in the state of Telangana, India. The research region underwent spatial analysis to determine the maximum coverage distance of the facility, with the aim of designing the village facility index. This analysis was conducted using ArcGIS software. A rural road database utilising Geographic Information System (GIS) technology has been established to assist authorities in the road sector in expanding infrastructural facilities to meet present and future needs.

In the present study, it was determined The primary driver of Punjab's economy is its agricultural sector; yet, the rural regions of Punjab continue to face a deficit in terms of technical advancements and associated advantages. The province of Punjab continues to face a deficiency in terms of technical advantages. The cadastre border of villages in Punjab is of considerable antiquity and is in need of modernization. This article presents a study that focuses on the integration of the Global Positioning System (GPS) and Geographical Information System (GIS) as a means to facilitate the development of rural regions in the region of Punjab.

3. Proposed methodology

This proposal aims to enhance the livelihood of farmers through the utilisation of cognitive analysis on both geographical and non-spatial data. The technique employed in this study has been divided into four distinct steps, including data collection, processing, analysis, and reporting. During the process of data gathering, primary data was obtained by establishing control sites and performing field surveys. Secondary data collecting involved the utilisation of satellite photos, Google maps, traditional maps (missives), and census data. Following the data collection procedure, the maps were transformed into vector format utilising software. Subsequently, the acquired data underwent additional processing within open source

Geographic Information System (GIS) software, such as Map Guide Maestro Open Source Software or other suitable open source alternatives.

1) Data Collection: - In order to create an appropriate web-based Geographic Information System (GIS), it was imperative to ascertain the specific requirements of both the rural community and the district government. A comprehensive exercise was undertaken to facilitate the gathering of data and insights using various methods like as conversations, surveys, and workshops. The participants included both the inhabitants and the Panchayat members of the village.

2) Digitizing the data:- The conventional representation of the village known as Mussavi underwent a process of digitization with AutoCAD or similar software. This involved the depiction of various geographical elements such as buildings, poles, roads, and water bodies on the digitised version of Mussavi. Control locations were chosen and a survey of the hamlet was done using GPS and field survey methods.

3) User Management:-

• The suggested Rural GIS system discussed in this study is a secure mobile-based platform that has been constructed using an open-source content management system (CMS) and the PHP programming language.

The Quantum GIS programme is utilised for the generation of various situations in the shape file format. Different login IDs have been issued at various hierarchical levels.

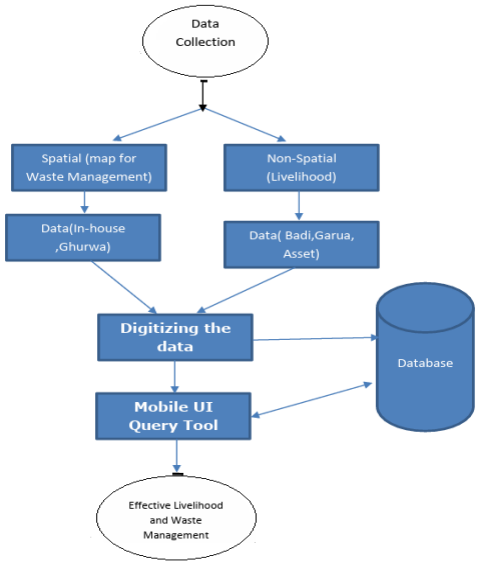


Fig. Proposed Layout for Mobile GIS

4) Database Management and reports:- The database of the proposed system encompasses a variety of data sources, including topographic data, satellite photos, and survey information, among others. The database has been developed with Post GIS within the framework of a three-tier architecture. During the database design process, careful consideration has been taken to enhance its integration with the Chhattisgarh state land record management system

database. The management of this database is now implemented at the village level, with the potential for expansion to encompass district and state-level centralised databases. The user has the ability to search for non-spatial data by utilising various queries inside the web-based system. The resulting output is then tailored to the user's preferences and presented in the form of reports within a web interface that has been developed using JSP/PHP programming languages..

4. Research importance

While observing and studying the planet's the outside, it was evident that several forces—industrialization, population growth, demands for food, and agricultural use—are causing this transformation. decline and ecosystem. This rapid development sometimes changes our way of life, but we all pay a dangerous price. Human processes put us in danger. Dehydration is not only worldwide but also municipal and local, therefore area and global effect evaluation are continually possible.

The current state of affairs in the subject matter region is troubling. If equitable growth is not prioritised, the generations to come is going to encounter shortages of food and water, unhealthy environments, unsafe conditions, inadequate agricultural efficiency, rising temperatures, and a lack of precipitation. This topic uses satellite imagery and geographic information systems to observe and conserve encroachment in Janjgir-Champa, Chhattisgarh. This study will assist surveyors, government agencies, planners, administrators, entrepreneurial investigators, and inventors identify decertified areas.

5. Research limits

- The current inquiry was hampered by the limits of inadequate funds, time, and other assets that are often encountered by a single investigator. Because of time constraints, we were unable to investigate all of the facets of the study we were interested in. On the other hand, a great deal of caution and reflection has been used in the selection of the contributing factors so that each of the goals may be accomplished. Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity that you use in an equation.

- The village-wise digitised vector images that had been properly indexed and given by Survey of India, Dehradun that was employed towards the purposes of the research.

- In the Janjgir– Champa region, there are an overall of a total of 898 villages, pursuant to the census numbers from 2011, yet the digitised picture supplied by Survey of India shows that there are only 758 towns inside the county border.

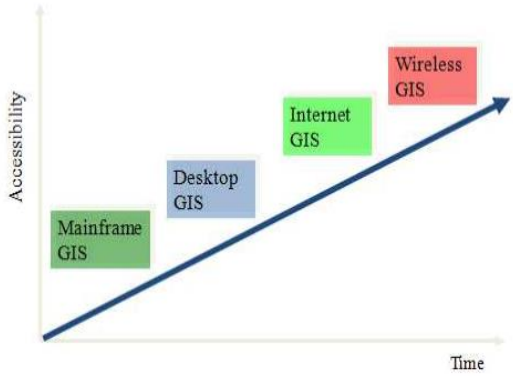
As a result of the actual research, it was discovered that different Gramm Township sections are responsible for encompassing two to three settlements. This is since the populace of each village is fewer than 1500 people, which is one of the reasons why the census information from 2011 and data supplied by Survey of India were not aligned.

6. From Internet GIS to Mobile GIS

The manner in which people communicate and engage in all spheres of existence is undergoing continuous transformation as a result of advances in technological innovation. Because of advances in miniaturisation of semiconductors and improvements in the rate of transfer for Bluetooth communications, the usage of handheld gadgets has spread to practically every aspect of human existence.

Smartphones were first created for the purpose of making voice calls. Because of the Since the initial short message service, or text messaging, was sent in the year 1992, cellphones have been used as an item that is designed for carrying and receiving knowledge. These days, cellphones are multifunctional private media machines that can do a broad variety of things. Cell phones and other types of handheld electronics all have the capability to play video content and interact with high-speed networks. Approximately forty percent of all mobile data applications used in energy are connected to GIS. On the opposite together, these apps are used in the field, wherever customers are most often engaged in interaction with the world around them. It is necessary for GIS to become mobile in order to accommodate this kind of live engagement.

According to the process for rendering GIS mobile is intrinsically difficult due to the sophistication and heavy on resources arrangement of GISs. Additionally, user interfaces need to be rethought and updated so that they better meet the demands placed on them by wireless settings. Uses of internet-based geographic information systems (GIS) in mobile contexts have seen explosive growth over the past few years, thanks to the proliferation of cell phone web technologies. Portable GIS appears to be nearer to the work reality of numerous users than classic GIS does and will draw in additional user associations. The proliferation of cell phone connection, mobility location technology, mobile terminals, and the decentralized administration of geographical data are driving the swift growth of cellular GIS. In addition, the needs of the industry and advancements in technology are what are driving the integration of satellite imagery with handheld devices. This has resulted in the development of a fascinating new area of bioinformatics known as portable GIS.



7. The Implications of Researchers

Telephones have fundamentally altered the ways in which people communicate and get knowledge all around the globe. Because of its portability, increased life of batteries, the expansion of wireless infrastructure, and the decreasing expense of phones, cell phones is now physically within reach of multitudes of individuals across the globe. The phrase "Mobile GIS" refers to a system that is comprised of a combination of hardware and software and is designed to allow users to use spatially information and resources using handheld gadgets connected to either wired or wireless networks. The term "wireless GIS" refers to a subclass of mobile GIS technology that centres on the mobile GIS services' capacity to communicate with one another across wireless networks. Mobile cartographic is the term used for defining the process of displaying cartographic data on a mobile device. Providing the correct data in the most efficient and user-friendly manner possible while paying consideration the limitations of the tool is the primary responsibility. In principle Mobile phones are now systems that feel the conditions while they move. They also acquire and create knowledge that can be readily controlled and subjugated, resulting in solutions that become more clever and alert. Cellular GIS has seen significant use in recent years, which has coincided with advances in both its hardware and software. These advancements have led to improvements in both the mapping accuracy and capabilities of mobile GIS. Cell GIS opens up an entirely fresh set of options for developers of creative and helpful apps. Such apps may give consumers on smartphones updates depending on their current position, amid other types of material. Some of smartphone geo-apps include GPS navigation devices for vehicles and pedestrians, as well as digital tourist's guides. These programmes often make use of augmented reality maps as displays.

	Features	Software
Desktop GIS	• Software installed on desktop • Agency's GIS professionals develop and use maps • Maps not accessible to general public users • Superior spatial analytic capabilities • Steep learning curve for developers and users	Proprietary software: ArcGIS; Bentley Map; GeoMedia; IDRISI Taiga; Manifold; MapInfo; Maptitude Open source software: GRASS; MapWindow; Open Source Software Image Map; Quantum GIS
Internet GIS	• Software installed on public agency's servers • Agency's GIS professionals develop maps • Maps accessible to general public users via Internet • Maps cannot be edited by public • Limited spatial analytic capabilities • Flat learning curve for users	Proprietary software: ArcIMS; ArcGIS Server; Manifold IMS; Maptitude for the Web Open source software: CartoWeb; GeoServer; MapGuide; MapServer

Key Differences between Desktop GIS and Internet GIS

Standard computer GIS and Internet-based GIS now bring greater variety to the geographical features and their depiction than what is possible with a fixed physical map. The person using it is able to examine the representation of a region while roaming about in the actual land them, which is an additional feature that Handheld GIS is able to achieve. Applications of Internet GIS in mobile phones have the opportunity to grow rapidly as a result of the growth of infrastructure that enables internet access. Mobile GIS appear to be closer to the work reality of a lot of people than standard GIS does and may draw in additional user groups. Also GIS for cell phones now has the ability to exploit the public's attention in actual time thanks to the advent of electronic devices that are equipped with GIS and global positioning system (GPS) features as well as networks like the social network and blog platforms like Twitter.

Stand Alone GIS 1970s-1980s	**Early Network GIS Mid-1980s-1990s**	**Complex Network GIS Late 1990s -**	**Mobile GIS 2000s -**
Large, project applications, GIS software and data resides on fixed computers; full GIS functionality; proprietary data formats; closed, stand alone systems; applications concentrate on the automation of existing tasks; static inventory applications (e.g. natural resource inventories, early urban management systems, tax assessment); computer cartography	Data can be accessed on a server via LAN or WAN; allows centralised storage and remote access to data; software must be installed on fixed computers; full GIS functionality; proprietary data formats; closed, stand alone systems; more advanced analysis and modelling applications (e.g. modelling flood risk, power network outages, transportation networks)	Distributed GIS; software and data reside on one or more remote servers; clients can access GIS tools, services and data through web browsers; existing internet applications are customised GIS applications with limited functionality (simple analysis and mapping); utilises open standards (e.g. OpenWMS); many desktop or professional GIS also allow access to remote data via the web	Infrastructure features similar to Complex Network GIS; data and GIS software tend to reside on the server; some software can be installed on the mobile device (e.g. ArcPad); utilises wireless networks; a limited but specialised set of tools for fieldworkers and consumers; highly customised applications; utilises mobile devices; standards based; real-time data management applications (e.g. utilities maintenance, disaster management); Location Based Services

8. Applications of Mobile GIS

- Storage.
- Management..
- processing.
- Aanalysis.
- displaying spatial information.

GIS offers comprehensive capabilities of visualisation and assistance with choices in response to the demands placed on it by applicable disciplines such as urban development and management, managing transportation, and the surveillance of the environment. However, smartphone GIS is changing the application pattern of GIS so that users may free from their workstations by using portable computers. Earlier usages of GIS in various domains were restricted and basic. So the distance between GIS applications and users is reduced, and by focusing on the aforementioned list of processes, mobile GIS is able to deliver much more

capabilities than statically GIS. This is the case even after the restrictions of data amount and unreliable connectivity are taken into consideration.

9. Conclusions

Handheld GIS design advancement is discussed. Panning, enlargement, and spinning mobile phones affect geographical data maps. Nevertheless, inadequate cell phone data and sluggish internet connections hinder these processes. To overcome the bottleneck of downloading all the map information on the need for mobile gadgets. The first section of this thesis presents a thick client architecture that uses beforehand to download map data depending on user motions.

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