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Legal and Human Factors Contributing to Resistance Against the Digitization Process in Government Institutions in Sri Lanka

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Abstract: Data and information are increasingly stored in electronic media, offering significant benefits, particularly in terms of efficiency. This includes faster and easier access to information, reduced storage space, minimal workforce requirements for management and handling, reduced paperwork and printing costs, and environmental protection through material conservation. Additionally, the risk of data loss is reduced, as digital records can be more easily maintained and duplicated compared to physical documents. Minimizing repetitive data entry can save time, reduce human error, and facilitate analysis of available data. Despite these advantages, few state-owned enterprises have fully transitioned to digital operations. Key barriers to this transition include financial constraints, lack of physical resources, inadequate legal frameworks, resistance to change among management and employees, and limited understanding of technological advancements and legal requirements. While financial and resource limitations can be addressed through government support, legal provisions for electronic transactions have been in place since 2006 and were updated in 2017. Therefore, the primary challenges remain resistance to change and limited awareness of technological and legal updates. Addressing these issues is crucial for enabling state-owned enterprises to fully digitize their functions and services in compliance with existing regulations.

Keywords: *Access to Information, Reduced Paperwork, Environmental Protection, Analysis of Available Data, Digital Operations*.

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I. INTRODUCTION

Despite Sri Lanka's high overall computer literacy, computer literacy within the public sector remains unsatisfactory. One key reason for this is that computers and related technologies only became prevalent in Sri Lanka at the beginning of the 21st century. Many senior officials currently in the public sector, who were promoted based on experience, began their careers in the early 1990s, when computers were not yet widely used in government institutions. As a result, their computer skills tend to be minimal unless they have undergone specific on-the-job training or pursued a personal interest in technology. This has been highlighted by numerous surveys and is recognized as a major obstacle to the digitization of many government sectors in the country.

Government officials may also lack adequate education not only in technology but also in the evolving legal and subject-specific knowledge necessary for adapting to technological advancements. While the country's legal framework has evolved to some extent, the flow of information to relevant authorities remains insufficient. This communication gap creates significant challenges when introducing advanced technologies. For instance, many public servants, whose duties have traditionally involved working with printed documents, forms, and books, are reluctant to embrace digital methods. A lack of technological knowledge and distrust of electronic information has resulted in an adherence to outdated practices and regulations. Most public officials are familiar only with the laws directly relevant to their roles, and there is little understanding of the Electronic Transactions Act No. 19 of 2006, which has been in effect since 2006 but remains underutilized in their duties. These factors collectively hinder the digitization of governmental operations.

II. LITERATURE REVIEW

- *The Electronic Transactions Act, Enacted Under Act No. 19 Of 2006, Provides the Legal Framework for the Use of Electronic Transactions in Sri Lanka. The Main Objectives of the Act Are:*

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- Removing legal barriers to electronic transactions both locally and internationally.
- Building and promoting confidence in electronic procedures.
- Directing government operations towards electronic systems to enhance the efficiency of governmental functions.
- Strengthening public trust in the authenticity and reliability of electronic documents, data, reports, and messages.

The Act outlines the legal basis for digitization, specifying procedures that need to be implemented. Section 3 legally recognizes electronic documents, data, reports, and data messages, while Section 4 states that electronic records and messages can serve as legally valid alternatives to written documents. Section 8 grants management the authority to handle matters related to the existence, storage, confidentiality, format, and signature requirements of electronic documents, as well as processes such as governance and fee structures related to electronic records.

A 2018 survey found that 63.2% of Sri Lankans are computer literate. In both the private and public sectors, computer literacy is particularly high among clerks and related workforce groups, with a rate of 89.9%. Professionals and associate professionals follow closely, with literacy rates of 87.4% and 83.8%, respectively. However, computer literacy is lowest among top executives and managers, at 70.2%.

In the government and semi-public sectors, 44% of employees lack adequate computer literacy, according to the latest survey. Data from the National Census Bureau indicates that Sri Lanka's public service employs approximately 1.1 million people, and 62% of them do not possess email addresses, illustrating the digital divide in the sector.

The digital transformation of government institutions is a critical process for enhancing efficiency, transparency, and service delivery. However, Sri Lanka has experienced significant challenges in implementing digital technologies across its public sector, with the Geological Survey and Mines Bureau (GSMB) serving as an example of the complex barriers to digitization.

The GSMB of Sri Lanka is used as an example to present a compelling case study to illustrate the legal and human factors hindering digitization in government institutions. This organization, responsible for the exploration, conservation, and management of Sri Lanka's mineral resources, faces several challenges in its digitization efforts:

The Geological Survey and Mines Bureau represents a valuable case study in government digitization challenges. By addressing technological, human, and organizational barriers, the GSMB can transform its operational capabilities, ultimately enhancing national geological research and mineral resource management.

The journey of digital transformation requires a holistic, patient, and strategic approach that balances technological innovation with human-centric organizational development.

➢ *Geological Survey and Mines Bureau (GSMB)*

The Geological Survey and Mines Bureau has a long history dating back to 1903 when renowned geologist Ananda Coomaraswamy and Professor W.W.R. Dunston began the Mineral Survey of Ceylon. Initially established to conduct mineral surveys, it became the Department of Mineralogy in 1922 and later, in 1962, the Department of Geological Survey. In 1993, following the passing of Act No. 33 of 1992, it was restructured as the Geological Survey and Mines Bureau, with an expanded role overseeing mining activities. The Act was further amended in 2009 (Act No. 66) to meet current demands.

Under Section 28 of the Act, licenses are mandatory for mining, transporting, storing, exploring, processing, or exporting minerals for commercial purposes, with some exceptions, such as gemstones and petroleum. The Act provides clear guidelines on how licenses should be obtained, with Sections 29 and 30 addressing the eligibility criteria for license holders, land ownership considerations, and procedural requirements. Section 35 outlines the key elements of a license, which is valid for a specified period and for a specific mineral within a defined area. The Bureau also determines the terms and conditions for each license in accordance with Section 35.

Section 23(4) clarifies that the provisions of Act No. 33 of 1993, amended by Act No. 66 of 2009, do not conflict with or impede the application of Act No. 19 of 2006, thus allowing for the use of electronic processes within the Bureau.

III DIGITIZATION EFFORTS AT THE GEOLOGICAL SURVEY AND MINES BUREAU

➢ *Legal Factors:*

- Outdated Legislation: The existing legal framework may not adequately address the complexities of digital operations, data security, and online service delivery. This can lead to legal uncertainties and hinder the implementation of necessary digital reforms.
- Bureaucratic Red Tape: Complex bureaucratic procedures and a lack of clear guidelines for digital transformation can slow down decision-making processes and delay the adoption of new technologies.

➢ *Human Factors:*

Resistance to Change: Employees may resist digitization due to fear of job displacement, lack of digital literacy, and concerns about the impact on their work routines.

Lack of Digital Skills: A significant portion of the workforce may lack the necessary digital skills to effectively utilize new technologies and adapt to a digital work environment.

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Cultural Barriers: Traditional work cultures that prioritize manual processes and paper-based systems can create resistance to digital transformation.

By examining the specific challenges faced by the GSMB, this research can shed light on the broader issues hindering digitization in Sri Lankan government institutions. It can also provide valuable insights into potential solutions, such as:

Legal Reforms: Updating outdated legislation to facilitate digital transformation and address data privacy and security concerns.

Streamlining Bureaucratic Procedures: Simplifying administrative processes and reducing red tape to expedite decision-making.

Digital Literacy Training: Providing targeted training programs to enhance the digital skills of employees.

Change Management Strategies: Implementing effective change management strategies to address employee resistance and facilitate a smooth transition to digital operations. By addressing these legal and human factors, the GSMB and other government institutions in Sri Lanka can accelerate their digitization efforts and improve service delivery to the public.

- *To Streamline its Operations, the GSMB has Initiated Several Digitization Efforts:*

- Digitizing essential forms, including applications received by the Bureau, and electronically entering relevant information.
- Scanning key documents such as land deeds and affidavits provided by license applicants and storing them electronically.
- Integrating recommendations from government agencies directly into the GSMB's system.
- Linking all relevant documents and recommendations to specific file numbers for easy access.
- Equipping field officers with tablet computers to transmit inspection data electronically, which is automatically linked to the relevant file in real time.
- Once all requirements are met, the system generates a printed license in compliance with Section 35, which is provided to the applicant.
- The printed copy of the license can be retained by the license holder and must be presented to law enforcement officers upon request. A simple application will be made available to authorities to verify the validity of these documents.

IV ANALYSIS OF AVAILABLE DATA

The Mines and Minerals Act is the primary statutory instrument within which the GSMB operates. This Act provides overall requirements for exploration, extraction, transportation, and trading of mineral resources and is complemented by regulations that ensure adherence and compliance with environmental and safety standards. The Act aims to foster responsible mining, regulate the use of mineral resources, and curb illegal mining activity.

Several license types are given by the GSMB, each with its own regulation on a particular component of mineral resource management:

- Exploration License (EL)
- Mining License (ML)
- Industrial Mining License (IML-A, IML-B, IML-C, IML-D):
- Artisanal Mining License (AL):
- Trading License (TDL) -
- Transport License (TPL) -
- Special Authorizations (SPL)- The licensing system functioned by the Sri Lanka Geological Survey and Mines Bureau supports the principles of proper extraction and use of mineral resources. GSMB, through strict regulation and environmental safeguards, provides balance in the economic development-sustainability equation. It is imperative that every vein of the regulatory regime and compliance system be exercised to optimize the fine and responsible management of the mineral wealth of Sri Lanka for the present and generations to come.

The Industrial Mining License (IML) is issued to companies that apply mechanized techniques in mineral extraction. IML-A is allocated to big operations that have a developed infrastructure, IML-B applies to operations of medium size, and IML-C and IML/D is allocated to small-scale mechanized mining operations. All categorizations ensure that the mining activities are environmentally safe and protected, and responsible extraction of resources is practiced.

When issuing permits (excluding transport licenses), the regulatory body collects numerous documents and recommendations. Under the current process, these documents are submitted as hard copies and filed. These include the application form, payment receipts, route maps to the mining site, land ownership documents (certified copies), site plans, environmental recommendations, archaeological approvals, and urban development recommendations, among others. Each file contains at least 20 to 30 documents. When additional reports or information are requested, the number of documents can exceed 100. During permit renewal, this volume increases further as additional documents are filed.

An observation during inspections revealed that some documents, such as certified copies of land ownership, were repeatedly submitted with each renewal. While this process aims to ensure legal security and simplify verification for officers, it leads to redundant paperwork.

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Table 1 IML Issuing Summary

Year	Industrial License (IML)				Total
	IML/A	IML/B	IML/C	IML/D	
2017	351	808	132		1291
2018	687	749	145		1581
2019	341	749	145	62	1297
2020	103	262	1747	481	2593
2021	117	170	2430	601	3318
2022	106	123	1878	366	2473
2023	76	62	1385	456	1979
2024	64	69	1343	649	2125
Total	1845	2992	9205	2615	16657

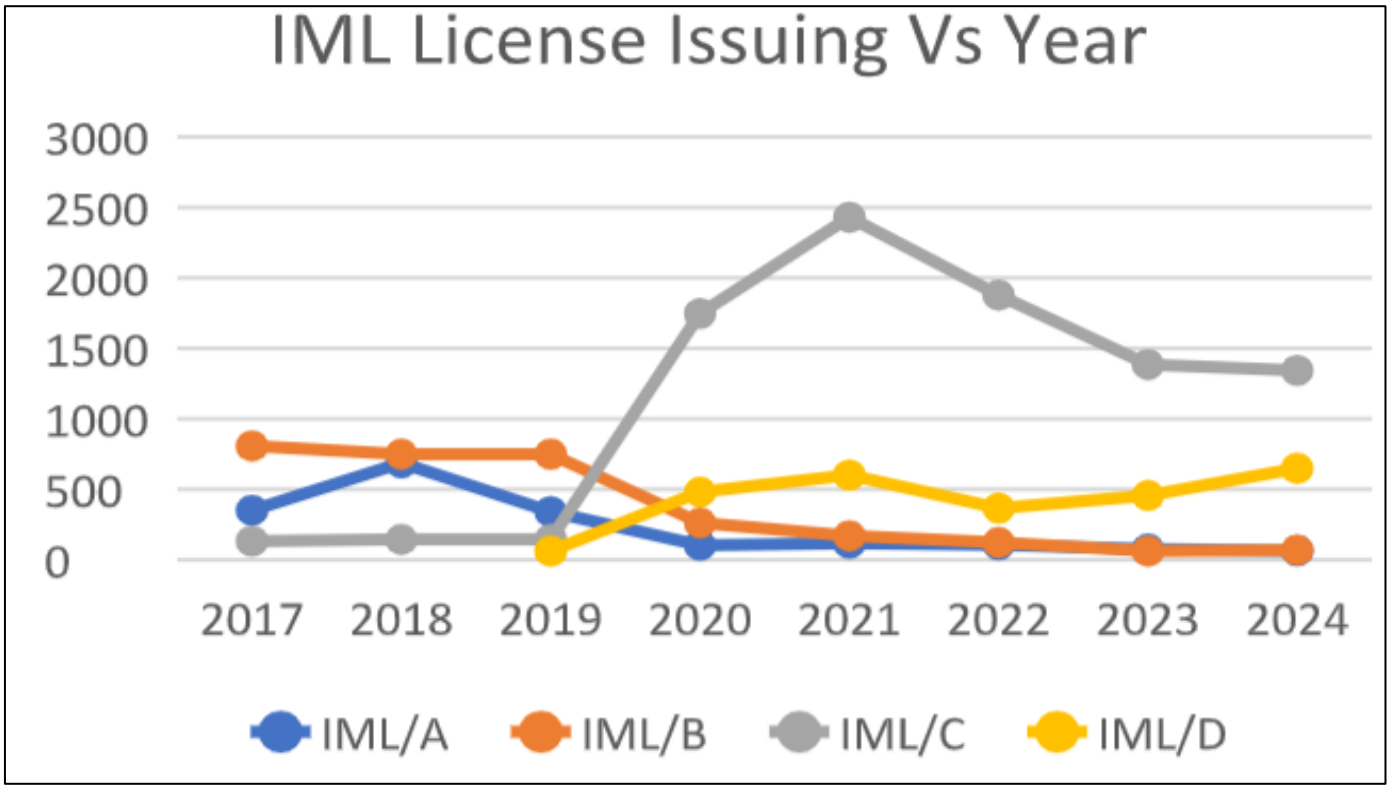

Fig 1 IML License Issuing Vs Year

The Artisanal Mining License (AL) is issued for non-mechanized small-scale manual mining purposes. The Artisanal Mining License (AML) is meant for single persons or small groups of people who carry out mining by hand. AML holders are supposed to work in particular zones, practice land sustainability, and rehabilitate land that has been mined. This system of licensing works to protect the remote local areas which have traditional mining techniques, and doing so in an environmentally responsible manner.

Table 2 AL Issuing Summery

Year	Artisanal License (AL)		Total
	AL/B	AL/A	
2017	2119	1437	3556
2018	2442	1791	4233
2019	2522	1443	3965
2020	2132	2504	4636
2021	2100	1592	3692
2022	1453	867	2320
2023	1349	871	2220
2024	1334	839	2173
Total	15451	11344	26795

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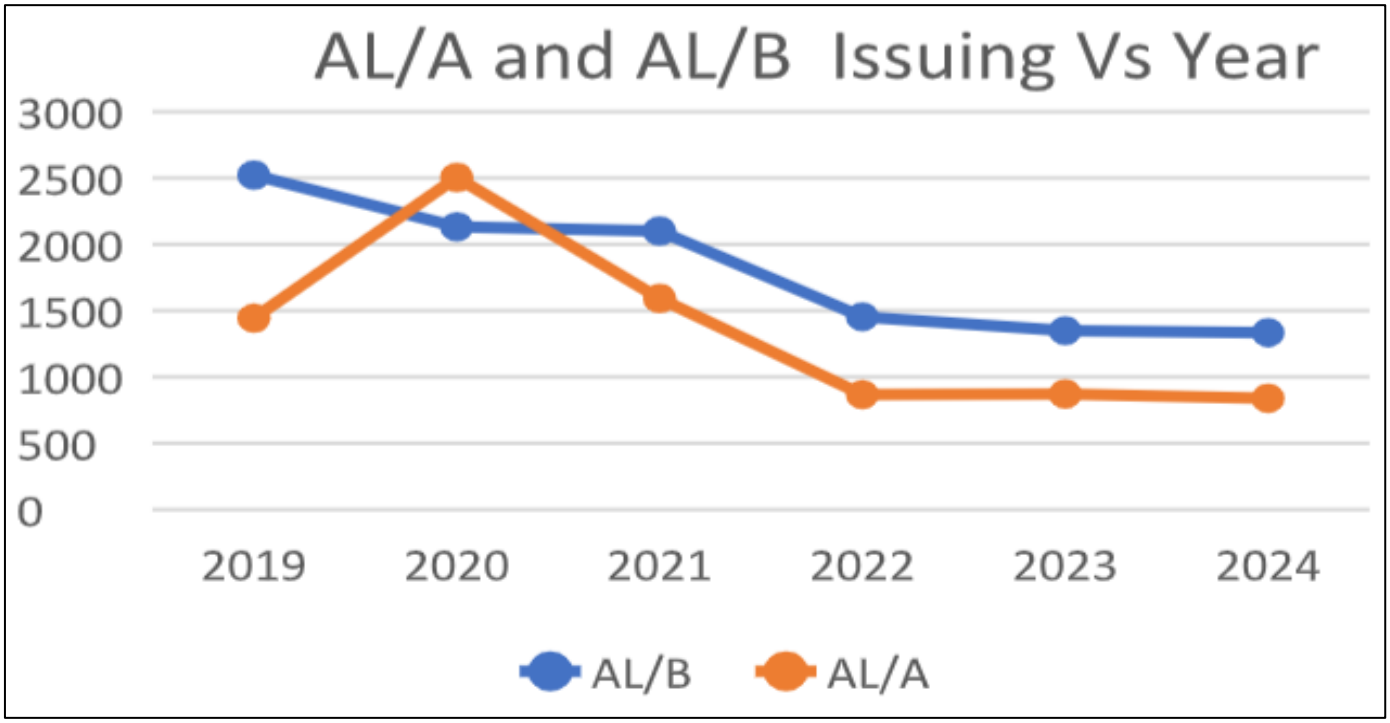

Fig 2 AL/A and AL/B Issuing Vs Year

The Trade license (TDL) is a prerequisite for all corporate bodies dealing with the purchase, sale, and exportation of minerals. It ensures that all transactions in mineral trade are conducted in a legal manner.

Table 3- TDL Issuing Summery

Year	Trade License (TDL)		Total
	TDL/A	TDL/B	
2021	1	1293	1294
2022	9	3245	3254
2023	28	3526	3554
2024	45	4023	4068
Total	83	12087	12170

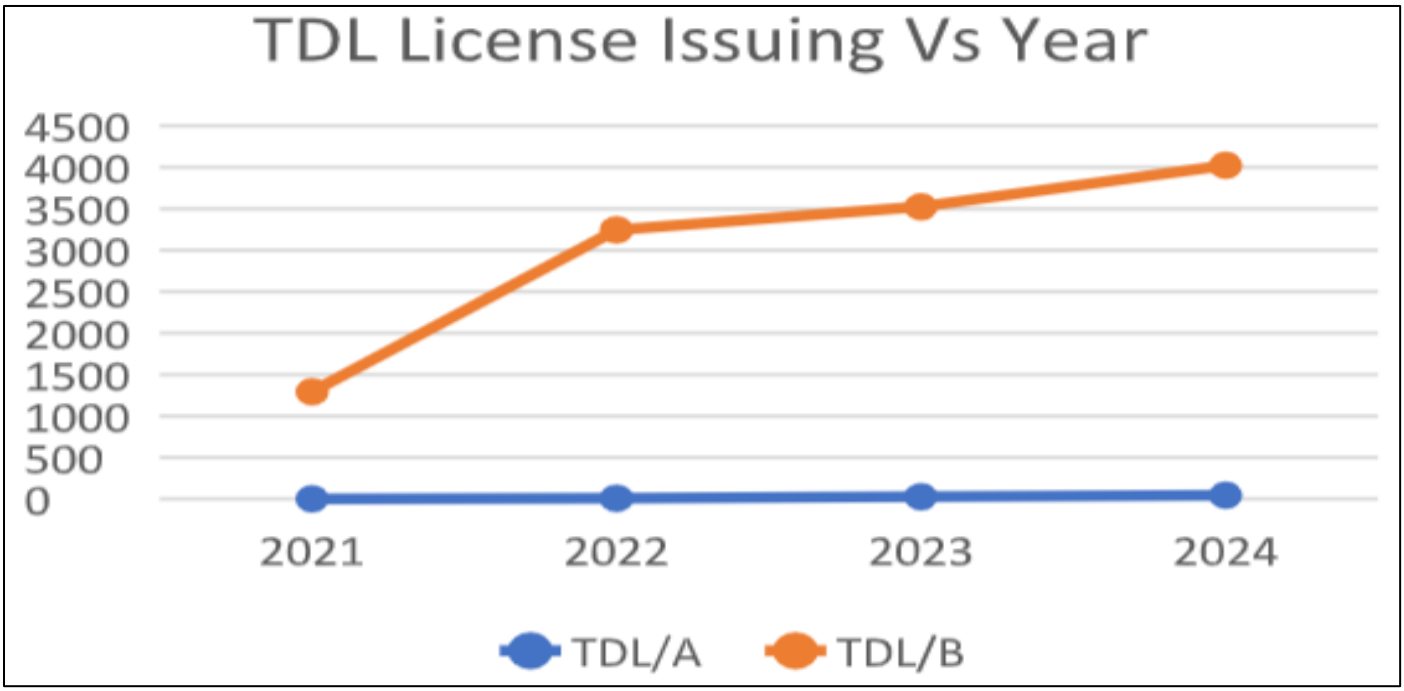

Fig 3 TDL License Issuing Vs Year

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All TDL, AL, and IML licenses issued have been considered in this analysis. However, owing to data retrieval problems and the absence of comprehensive records, 2017, 2018, and 2019 data could not be accessed. Although TDL licenses were issued in these years, however, data for the year 2020 are also available but in a partial manner and for few months only.

Table 4 IML, AL, TDL Issuing with year

Year	License			Total
	IML	AL	TDL	
2017	1291	3556	0	4847
2018	1581	4233	0	5814
2019	1297	3965	0	5262
2020	2593	4636	0	7229
2021	3318	3692	1294	8304
2022	2473	2320	3254	8047
2023	1979	2220	3554	7753
2024	2125	2173	4068	8366
Total	16657	26795	12170	55622

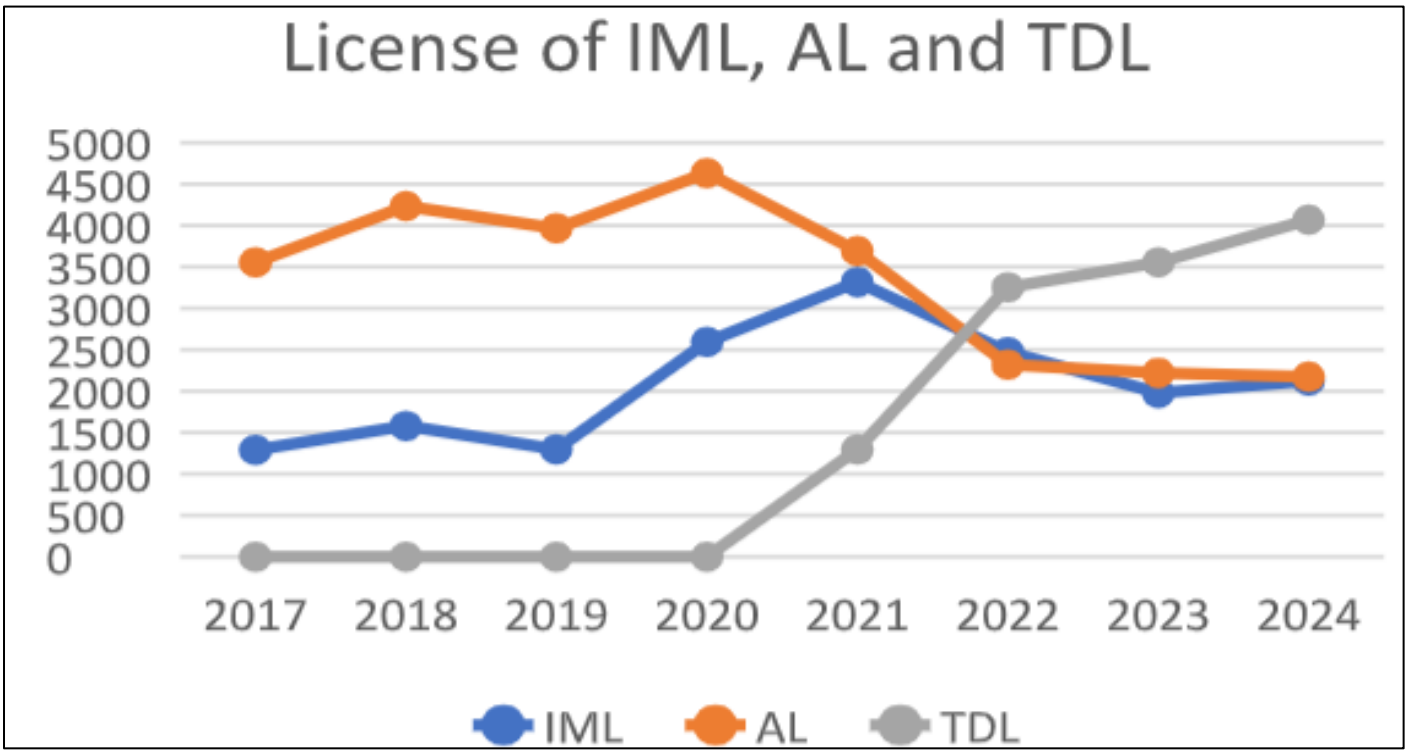

Fig 4 License of IML, AL and TDL

➢ *Transport Licenses (TPL)*

The transport license (TPL) oversees the movement of minerals from the mines to the points of processing or trading in a wise manner so as to prevent the illegal transportation of minerals. Transport licensing faces challenges, particularly with domestic transportation. For instance, thousands of daily activities occur across licensed excavation and storage sites, but the GSMB has limited human resources to monitor all these operations. To address this issue, a solution is proposed whereby permits are issued according to Section 35. Additionally, a registration certificate, valid for three months, may be issued by the GSMB, allowing law enforcement officers to verify the legal origin of transported minerals.

Table 5 TPL Issuing Summery

TPL Issuing	
Year	No of License
2021	744103
2022	540585
2023	378285
2024	463998

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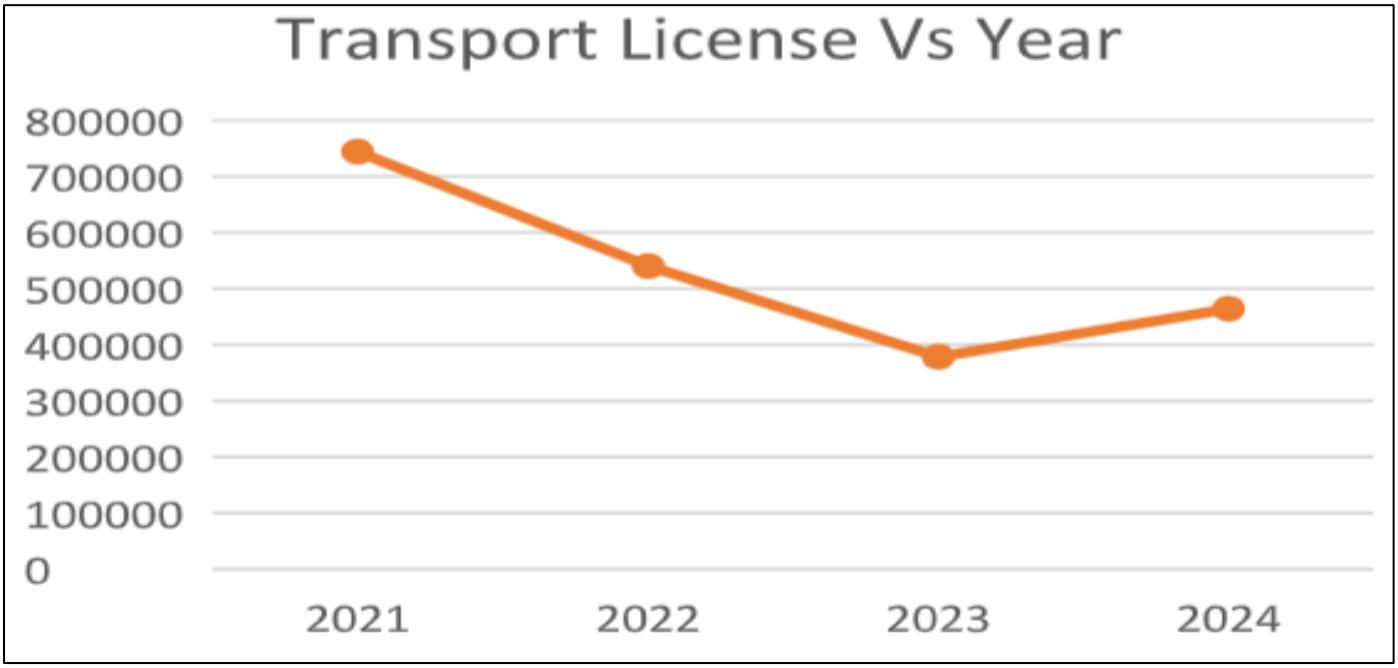

Fig 5 Transport License Vs Year

Fig 6 No of Mining, Trade License Vs Year

Following 2021, the pandemic and the economic crisis hindered the issuance of licenses in Sri Lanka, resulting in a severe shortage of diesel and ammonium nitrate across the key industries of transportation and mining. The country also faced a major supply deficit in critical resources.

Due to the poor economic condition in the country, the issuance of transport licenses greatly declined in 2022 and 2023. However, the fuel crisis brought forth an even greater economic and infrastructural recession in the country. While there are early signs of marginal recovery in economic conditions in 2024, the country still faces numerous challenges which are reflected through the limited issuance of transport and other associated licenses.

The office accepts documents in a filed manner which is inefficient. Because of that, all applications require a fresh set of documents to be submitted even when the vehicle registration is provided, which is needed for the transport permit. In total, the office requires the application, a copy of mining permit, and the copy of vehicle registration to be able to properly issue a transport permit. On other occasions, other documents might be needed as well. The filing system is troubling because while documents do get filed, previously stored documents are hard to obtain. Because of that, time and resources get wasted since documents need to be resubmitted due to them being hard to retrieve.

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The bureau is in dire need of an efficient data management system. This would allow for easy retrieval of data instead of struggling with documents and having to manually sift through them. The current transport license issuing system only allows data to be processed using a basic MS Access program or manually entered. Using either option leads to inefficient use of resources. This is especially troubling for the bureau as the program or programmatic filing system is needed for accurate records post-2020. Permits issued before 2020 are even harder to retrieve because of the lack of an efficient data put in place for permits.

The information retrieval process consists of extracting important information from existing records and entering the data into an Excel file. This method of data entry and filing has resulted in a high number of human mistakes and inefficiencies.

It has been identified that an average 530,000 transport documents are issued annually. Considering each document has at least three pages, the total number of pages processed every year is a minimum of 1.6 million. This is the same as 3200 packs of paper A4.

In a year with minimal permits, 6,115 permits were issued, equating to over 122,300 documents filed. When considering envelopes, postage materials, and miscellaneous records, this figure increases by at least 50%.

- *Benefits of Digitizing the Permit Process*

If these documents were digitized instead of managed as hard copies, the process of obtaining permits could be simplified, accelerated, and made more reliable. Here are the primary advantages of digitization:

- Time Savings
- Enhanced Operational Efficiency
- Customer Convenience
- Cost Reduction
- Increased Transparency
- Environmental Benefits
- Improved Data Security and Management**:** By digitizing the permit application process, organizations can deliver faster, more reliable, and environmentally friendly services, benefiting both operational efficiency and customer satisfaction.

V ANALYSIS OF LICENSING TRENDS AND TECHNOLOGICAL GAPS AT THE GEOLOGICAL SURVEY AND MINES BUREAU (GSMB)

Although the total number of permits issued by the Geological Survey and Mines Bureau (GSMB) in 2022 decreased compared to the previous five years (2017–2024), the number of permits issued in 2021 showed a slight increase over the figures of the previous two years. Despite the fact that electronic services are still not completely operated, the GSMB still keeps up to its reputation by annually granting a quite large number of mining permits as before on a classical basis. An inspection into the GSMB's activities unveiled that the bureau misses a centralized, fully-fledged e-system. The solutions we manage to give, each designed for the specific types of problems, pave the way to complications related to information storage and retrieving those with such problems.

VI CONCLUSION

The reluctance to adopt modern technology into Sri Lanka's Geological Survey and Mines Bureau (GSMB) is a mixture of outdated laws and people policies. These hardships greatly affect the ease with which people can adopt a digital approach. Additionally, there are concerns about data security, meeting compliance requirements and the absence of clear digital governance policies which makes the institution gatekeep the adoption of modern systems.

From the human side, there is a number of factors such as employee resistance to non-traditional workflows, fear of losing one's job and low levels of digital literacy which hinder the digitization of work processes. The reality is that a good number of government workers have long been using systems that are traditional and paper-based. They opt not to change due to fears that are associated with system reliability, heavy loads of learning new systems, and instability in a world of automation.

The above data and statistics highlight a critical issue: a significant portion of public sector employees, particularly those in top management, lack sufficient computer literacy. Although Sri Lanka has had a legal framework for electronic transactions in place since 2006, a lack of awareness and training within the public service has hindered the effective provision of state services.

The number of permits issued by the GSMB in recent years reflects the continued demand for its services, but the Bureau has yet to implement comprehensive technological solutions. Currently, there is no computer system in place that connects all offices or manages licenses across the country. Given the availability of resources in the country's IT sector, the persistence of these issues suggests resistance to digital transformation. This resistance likely stems from management, employees, or legal challenges. Although the necessary legal framework is already in place, resistance may arise due to ignorance or a lack of understanding, which could be resolved through periodic awareness campaigns. Additionally, the reluctance of technology users, including management and employees, can be addressed through proper training and awareness programs.

By overcoming these barriers, the GSMB and other public sector entities can fully realize the benefits of digitization, improving service delivery and operational efficiency More policies, reskilling initiatives, and better change management approaches for the public sector adopted by GSMB will serve to cultivate acceptance of technology. There is also a need to improve collaboration between the government and the private sector, adopt digital systems bit by bit, and implement robust cybersecurity systems to facilitate smoother transitions.

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The digitization process of government services in Sri Lanka, like the case of GSMB, is faced with critical legal and human resistance. Obsolete legislation, data security, bureaucratic reluctances, lack of digital literacy, employment insecurity, and organizational resistances are the key challenges. These obstacles can be overcome with legal reforms, enhanced cybersecurity, capacity building, change management, and accessibility and provide a less bumpy ride to digitalization. These hindrances can push GSMB and other government entities to foster effectiveness, transparency, and service delivery in the coming years.

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