

Factors influencing the usage of e-procurement in the South African Navy



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Abstract This research examines the factors influencing the utilisation of e-procurement in the Department of Defence, with a specific focus on the South African Navy. Although e-procurement was introduced to streamline the purchasing and supply function, reduce costs, and simplify the process, procurement managers in government still face challenges such as corruption, noncompliance, overspending, and wasteful expenditure. To gather data, the study employed a qualitative research approach, conducting interviews with 17 procurement members from the SA Navy. The findings show that e-procurement system inefficiencies, unreliable power supply due to load shedding, issues with the Central Supplier Database, partial automation of e-procurement processes, capacity and system integration challenges, and a lack of technical knowledge about the system were the main factors affecting the use of e-procurement in the South African Navy. To address these challenges, the paper recommends investing in infrastructure, improving supplier verification processes, adopting standardised documents, enhancing human resource capacity, improving system integration, and strengthening legislation on supplier data protection.

Keywords: Procurement, e-procurement, South African Navy, digitalisation

1. Introduction

Introduced in the South African Public Sector Supply Chain Management (PSSCM) by the National Treasury (NT) in 2015, e-procurement was mainly developed to improve the government purchasing function in its entirety, which in turn was expected to promote better planning, accountability and oversight (Treasury 2015) and encourage transparency in the procurement process. In addition, it was expected to reduce administrative expenses and procurement staff while enhancing communication with more rapid information access. E-procurement ensures that the information and documents related to tenders are easily accessible. It allows the government to identify its regular suppliers and let the public know who they are (Anthony 2018).

However, despite the above, by 2023, the procurement processes in the South African public sector, in general, are still faced with the same problems they did when the process was not electronic. According to Rukuni et al (2022), the procurement divisions of SA are still mired in corruption, and the Department of Defence (DoD), which houses the SA Navy procurement, is no exception. For instance, according to the Auditor General's report 2019/2020 financial year, within the DOD structures, some of the goods and services with a transaction value below R500 000 were procured without obtaining the required price quotations, as required by treasury regulation 16A6.1. Similar noncompliance was also reported in the prior year. Tenders were awarded to suppliers who lacked the requisite South African Revenue Services tax clearance certificates. The preference point system was not applied in some of the procurements of goods and services above R30 000, as required by section 2(a) of the Preferential Procurement Policy Framework Act of South Africa. Moreover, bid documentation for procurement of commodities designated for local content and production did not stipulate the minimum threshold for local production and content, as required by the 2017 preferential procurement regulation 8(2) (Auditor General South Africa (AGSA) (2020).

In addition, according to the South African parliament's research unit report, the Department of Defence's procurement processes are also faced with database inefficiencies, making it challenging to filter relevant suppliers due to the aging Information and Communication Technology (ICT) legacy systems that have become increasingly more difficult and costlier to maintain and repair due to their obsolescence (Parliament Research Unit 2021; Department of Defence annual Performance Report 2022). However, the units with R100 000,00 struggle to procure on the delegation as price increases push quotations to above their delegation, especially rations and minor facility repairs (Parliament Research Unit 2021; Parliamentary Monitoring Group 2021).

While many research studies have focused on e-procurement challenges across the globe, including South Africa, few have looked at the factors hindering the usage of the e-procurement process in the South African Navy within the Department of Defense. Instead, prior scholars have conducted research on public procurement as a tool to drive innovation in South Africa,



the implementation of e-procurement, and public procurement trends and development (Ambe 2016; Bolton 2006; Bolton 2016). Moreover, those that studied e-procurement use have focused on other sectors and countries, such as the use of e-procurement in the South African Public Procurement Law (Anthony 2022), e-procurement use in the South African construction Industry (Ibem and Laryea 2015; Assessing the electronic procurement of SOE's (Rukuni et al 2022) and exploring E-procurement Adoption in the Context of a Developing Country: the case of Lesotho (Pitso et al 2022)

Emanating from the above studies, there is a knowledge gap on the factors that hinder the usage of e-procurement in government departments such as the Department of Defence. We employ the Technology Acceptance Model (TAM; Davis 1989), one of the most influential models of technology acceptance, to fill the knowledge gap. The TAM identifies perceived usability and ease of use as the two main factors influencing an individual's intention to use new technology. This study adopts a qualitative approach, using semistructured interviews to collect primary data and documentary reviews to obtain secondary data to understand the challenges. Data were analysed using a thematic approach where themes were developed from interview transcripts. The identified themes were then used to analyse findings and suggest recommendations that may assist in enhancing the utilisation of the digitalised procurement process in the SA Navy.

We believe that the study outcome will contribute to the body of knowledge in the discipline of public administration in identifying factors relating to governance using the digitalised procurement system. Additionally, this study unearths and analyses the challenges associated with using the e-procurement system mainly from the operator's point of view and provides a workable solution that may enhance the modernised procurement process in the SA Navy.

2. Literature Review

E-procurement in South Africa was initiated to promote good governance in public procurement (Ambe 2009). This was followed by inconsistency in the application of procurement procedures, lack of accountability, and fragmented procurement processes. This was coupled with corruption, incompetence and negligence by public servants (Munzhedzi 2016). Ambe and Badenhorst-Weiss (2012) posit that:

“Approximately 20 per cent of the government's procurement budget alone “went down the drain each year. This was because officials stuck their fingers in the till, overpaid for products and services or failed to monitor how money was spent.”

The Auditor General also highlighted weaknesses in procurement processes that included an absence of the utilisation of information technology (Smart Procurement 2009), noting that public procurement was “deteriorating” and “disappointing”. Pursuant to obtaining challenges, Mathee (2006) argues that a uniform implementation approach to procurement became a necessity. This precipitated in the pursuit of procurement reforms that included the introduction of e-procurement.

Nawi et al (2016) outline that e-procurement is a simplified electronic tool that assists in supplying and providing sales online using the internet and email on business-to-business transactions. Some of the activities that are performed using e-procurement comprise advertising tenders, submission of tenders, third-party sourcing, and integration of procurement with financial and inventory management. Moon (2005) defines e-procurement as a “comprehensive process in which government uses IT systems to establish agreements for the acquisition of products or services (contracting) or to purchase products or services in exchange for payments”.

According to Piera et al (2014), e-procurement implies adopting the purchasing function using the Internet. It can also be seen as the modernised version of the traditional procurement process designed to make it easier and faster for procurers to manage the entire purchasing and supply function as well as to save costs (Kutlesa 2016). According to Rotich and Okello (2015:1382), the main reason for e-procurement is to enhance the fundamental principles of public procurement, namely, accountability, transparency, and cost-effectiveness. For Nawi et al (2016), e-procurement is a simplified electronic tool that assists in supplying and providing sales online using the internet and email on business-to-business transactions.

There are several benefits associated with the use of e-procurement. Matunga et al (2013) identify the following benefits: quick turnaround time on sourcing quotations and following up orders; lower administration costs; a smaller number of staff needed; and improved communication. The digitalised procurement process may also result in disastrous unintended consequences if not correctly implemented. According to Matunga et al (2013), significant challenges in utilising a computerised procurement process include company culture, resistance to change, lack of leadership, inadequate availability of IT infrastructure, and high costs associated with the system and security of information. Mose et al (2013) add those integration problems with the backend system, resulting in incompatibility as another challenge.

Notwithstanding the challenges of implementing e-procurement, Nawi et al (2016) emphasize that the barriers mentioned above must be appropriately managed, as the system is more than just for online purchasing. It also promotes good governance in public procurement. Rotchanakitumnuai (2013) defines good governance in the public service as founded on transparency, fairness, integrity, maximum benefit to the country, effectiveness, efficiency and accountability.

Although there is a consensus on the importance of good governance concerning e-procurement, Aigheyisi and Edore (2015) caution against the ineffective implementation of the reformed procurement system, as it has proven to result in a lack of transparency in the awarding of the state contract and lack of accountability on the part of the state in the use of public funds.

Even though the benefits of using e-procurement far exceed the disadvantages, it can also have negative consequences if poorly managed.

Over the years, digitalisation of the public procurement process has been adopted by several nations even though the implementation differs owing to the unique environment in which countries operate (Anthony 2018). In South Africa, e-procurement was adopted by the National Treasury (NT) in 2015 in the Public Sector Supply Chain Management (PSSCM) Review. The Review was developed to improve the government purchasing function, resulting in better planning, accountability, transparency, and oversight.

The PSSCM Review was produced against the backdrop of the founding principles of public procurement entrenched in the Constitution of the Republic of South Africa. In terms of Section 217 of the Constitution,

“When an organ of state in the national, provincial or local sphere of government, or any other institution identified in national legislation, contracts for goods or services, it must do so following a system which is fair, equitable, transparent, competitive and cost-effective”.

The review was also developed consistent with the Public Finance Management Act (PFMA), 1999 (Act 1 of 1999) for national and provincial government levels, Municipal Finance Management Act (MFMA) 2003 (Act 56 of 2003) for local government, together with the Preferential Procurement Policy Framework Act 2000, Treasury Regulations (TR) about procurement and Supply Chain Management guidelines as well as the Broad-Based Black Economic Empowerment (BBBEE) policy framework.

Moreover, the adoption of e-procurement in South Africa is in accordance with the National Development Plan (NDP) objectives, which comprise job creation, innovation and the adoption of technological mechanisms to grow the economy in the country (Madzimore et al 2020). NDP, also known as Vision 2030, is an overarching long-term plan that aims to eliminate poverty and decrease the level of inequality in South Africa.

Last, the Review also envisaged that proper implementation of e-procurement in the South African context would bear, among others, the following substantial gains:

- Improved quality of services delivered to citizens, particularly to the poor and vulnerable, who depend highly on the state for care.
- Efficient maintenance of economic infrastructure will lead to economic growth.
- Expansion of the market for procurement of goods, services and works will lower the purchase price.
- Drastically reduce the cost of doing business with the state by service providers.

In this context, this paper examines factors affecting the utilisation of the e-procurement system in the SA Navy, intending to contribute towards enhancing the modernisation of procurement processes in the SA Navy.

3. Theoretical framework

This study used the Technology Acceptance Model (TAM). The TAM model is a theoretical framework that researchers use to analyse factors that impact the usage of technology and explain the underlying factors that motivate users to accept and adopt new information technology systems. Initially, conceived by Fred Davis in 1989, the TAM model assists researchers in understanding and predicting how users buy and use new technology.

TAM argues that an individual's intention to use a particular technology is based on perceived usefulness and perceived ease of use. In perceived usefulness, the potential user of a form of technology gauges the degree to which a user believes that it will improve their performance/productivity. Perceived ease of use refers to how easily users perceive the technology to learn and use. Below in Figure 1 is an illustration of the TAM.

The above illustration shows that two factors determine the acceptance of the utilisation of technology by its potential users (i.e., attitude toward using technology): (1) perceived usefulness and (2) perceived ease of use. The key feature of this model is its emphasis on the perceptions of the potential user. That is, while the creator of a given technology product may believe the product is useful and user-friendly, it will not be accepted by its potential users unless the users share those beliefs.

TAM has been used in a number of fields beyond technology, including healthcare and education. It is gaining currency in public administration. Shore et al (2018) state that the TAM is used to determine the technology acceptance of e-government because it is a generic model that can be applied to any context using ICT. Furthermore, the authors note that the TAM model has received extensive support through validation, applications and replications for its power to predict the use of information systems. EL Kheshin and Saleeb (2020:3) share similar sentiments by arguing that TAM.

“Is considered to be a well-established, well-tested, powerful, robust and parsimonious model for predicting user acceptance of technology and the fact that various research and empirical studies used TAM in the context of e-government mainly to model users' behaviour and intention to use certain e-government systems or applications”.

In addition, the model permits the addition of external constructs or variables (through perceived ease of use and perceived usefulness constructs), for example, trust in the Internet. This provides for testing their effects on adopting the technology in e-government services such as e-procurement.

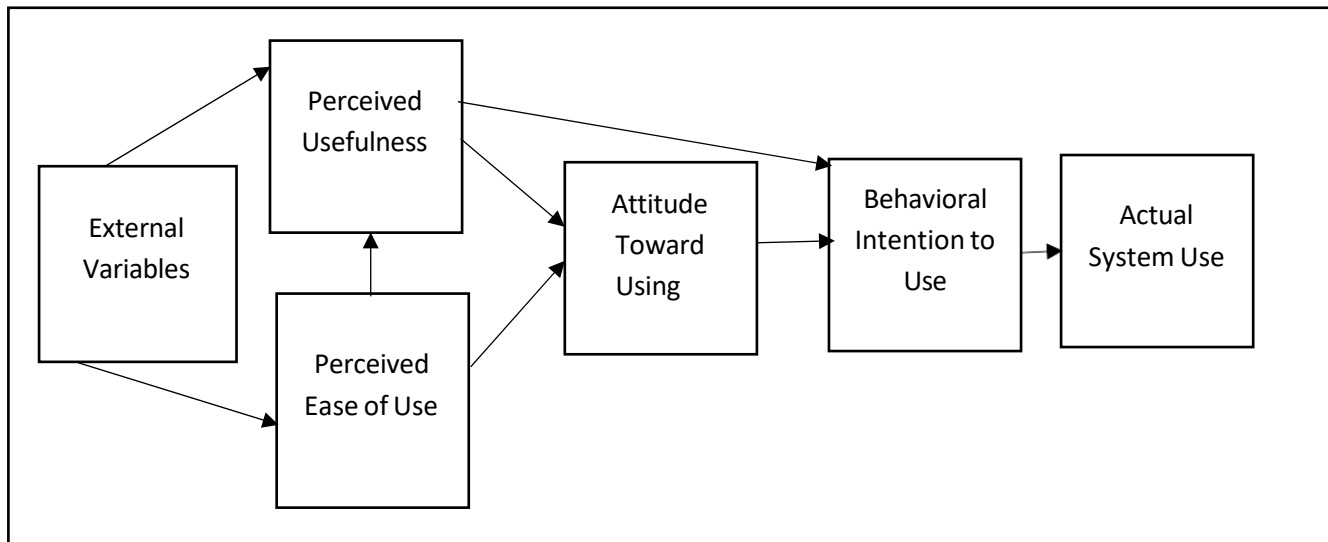


Figure 1 Illustration of the TAM. Source: Adopted from Davids (1989).

4. Materials and Methods

This article adopted a qualitative research strategy, as it focuses on gathering data from people's thoughts and experiences in operating a procurement system using a digitalised process. Qualitative research is an approach that affords a new opportunity to examine and untangle in-depth the lived experiences of those taking part in the study (Alase 2017). A case study of the South African Navy procurement centre within the DoD is used. The strength of this case study strategy was the ability to achieve high conceptual validity and the capacity to tackle causal complexity. Creswell (2016) explained that a case study involves gathering deep knowledge about a specific (a single case) scheme, such as what is seen and done inside the system, as well as an extensive analysis of information gathered during the research period and identification of general ideas about the method through interviews, recordings, audio-visual records, and papers.

Purposive sampling was used. Robinson (2014) stated that the purposive sampling technique is when the researcher places more objective techniques to ensure that the overall study has equitable representation in all the groups. In this context, interviewees were selected from the Naval Base Simon's Procurement Unit (NBS PU). The NBS PU is divided into subsections to promote the segregation of duties. The division of the sections is as follows:

- Preorder Administration Section.
- Contract/Order Administration Section.
- Payment Section.

The 55 NBS PU employees represent the population of the study. Seventeen people were interviewed, 6 in the Preorder Administration Section, 6 in the contract/Order Administration Section and 5 in the Payment Section. The seventeen were deemed sufficient to gain a deeper practical understanding of the utilisation of the e-procurement system by the unit.

For this study, data were collected using the semistructured interview technique. Semistructured interviews are preferred in social sciences research because they have proven to be multipurpose and can be applied to individuals and groups (Kallio et al 2016). Questions were designed so that a comprehensive understanding of aspects encountered by participants daily during the execution of their tasks using the e-procurement system would be obtained.

The thematic analysis technique was used for data analysis in this study. According to Burnard et al (2008), thematic content analysis in qualitative research is a systematic approach involving the analysis of transcripts to identify themes using the collected information and correlate similarities of themes from the script. From the identified themes, codes were created using the participant paragraphs to summarise what was being described without losing key words. Coded data were then sorted, organised, and managed using the NVivo software package.

5. Findings

This section establishes and interprets the factors affecting the utilisation of a digitalised procurement system in the SA Navy. Using the NVivo software, the factors hindering utilising a digitalised procurement system in the SA Navy were itemised and coded according to themes to help map the findings. Each identified coded piece or subtheme was then placed into four barrier categories that typified the challenges in utilising a digitalised procurement system in the SA Navy. These categories included e-procurement system inefficiencies, unreliable power supply due to load shedding, central supplier database inefficiencies, partial automation of the e-procurement processes, capacity challenges, systems integration challenges and lack of technical know-how of how the system functions, as discussed below.

5.1. e-procurement system inefficiencies

The Department of Defence adopted and implemented a computerised procurement process in 2004. System enhancements have been undertaken over the years, including enabling system interface with the Central Supplier Database, which became effective on 01 April 2016 as directed by the National Treasury. As expected, the system relies heavily on the availability of appropriate infrastructure, such as reliable internet connections, ICT equipment, and local area networks (LANs). However, upon inquiry, the majority of the participants noted that what hindered them from using e-procurement were system-related issues. As an example, almost all the participants cited that the system “hangs” and is “extremely slow”, “on and off”, or “down most of the time”. These unpleasant experiences are prevalent when it is cloudy and many people are logged on or after load shedding. One interviewee said:

“In some instances, we invite the seven suppliers, and we get no response by the closing date, only to find that they have responded, but the emails are hanging somewhere. So, the internet connection should be advanced and sophisticated, and should the infrastructure be beefed up, then e-procurement should be okay”.

Even when there is no load shedding, the system's unreliability is suspected of being caused by the not-so-resilient server and old computer equipment.

5.2. Unreliable power supply due to load shedding

In addition to the above, the unavailability of a stable electricity supply is the biggest threat to the functioning of e-procurement. Load shedding in fact has the potential to undermine the whole process of reform of the public procurement system. Although a provision is made in the policy document to run the manual process when the system is inaccessible, the general views of the participants were that the manual recording of the process wasted time as recapturing is required once the system is up and running. One participant argued that “we see this as equivalent to doing the same job twice while we should be attending to other urgent files, and so, I would rather wait for the system to be back on again”.

The situation is further exacerbated by the severely limited internet availability used to email requests for quotations (RFQs). For example, as mentioned by one participant, “In the Tender Section, we are seven operators and take turns to send out emails to suppliers using the one station. This restricts the number of RFQs sent out on a day when the system is fully operational”.

All the above aligns with Krammer's (2016) argument that the “technological obstacles posed by the unavailability of the relevant technologies, infrastructure deficiencies, limited access to broadband and an unreliable power supply due to load shedding, might hinder the effective implementation of an e-procurement system”. Indeed, when e-procurement is unavailable, be it due to load shedding or the system being off or hanging, the staff at NBS PU cannot do their job.

5.3. Central supplier database inefficiencies

The Central Supplier Database (CSD) is utilised in two ways by the Unit interacting with suppliers who wish or do business with the State. First, CSD is linked to the e-procurement system, programmatically uploads registered suppliers from the central database managed by Treasury, and updates occur every twenty-four (24) hours. Second, a standalone internet facility is available for those registered to make general supplier-related inquiries such as tax status, BEE level indicator, and banking details as files move to different sections until the transaction is formally closed after the payment is finalised.

Regarding sourcing suppliers, it has been established that the system provides seven suppliers at any given time on a rotational basis that are to be contacted per requirement. The number can be less when the requirement is published within a region where there are few registered suppliers or such a commodity or when executing an “Open Quote” process. The open quote process is activated only after many failed attempts to source service providers on CSD or in case of urgent requirements. A credible supplier is needed to deliver on short notice, for example, burial services for the Muslim faith base military personnel.

According to the participants, many registered service providers on the CSD now vary for different services and goods needed. With the new CSD, although preferred as it promotes transparency and fairness when compared to the previous process that was used where seven suppliers were manually selected, suppliers are not vetted to verify if they are able to provide the registered goods. According to one participant,

“this is attributed to an array of delays, some of which are receiving nil responses by the closing date because the selected suppliers cannot provide the required goods or services. Sometimes, when they are contacted to confirm if they have received the RFQ, they need help to make sense of what is needed, or the available contact number on the company profile is unanswered”.

Other interviewees, such as interviewee two, shared the aforementioned sentiment and reiterated that,

“Suppliers do not respond and the files are returned to us for readvertisement. Sometimes the quote is excessive or not according to specification. Others do not want to work with the government because they have not been paid”.

In addition, Interviewees 3 and 4 also voiced their frustrations with the system, especially when sourcing suppliers using CSD.

Some stated that the nonresponsive supplier contributes to the high rate of procurement files adjudicated with only one quotation received compared to the minimum of three as prescribed in Treasury Instruction 02 of 2021/22. Processing procurement files with one quote has resulted in adverse audit findings. Another stated that while the approval process has since been corrected, the problem of having to adjudicate one quotation continues unabated, as the procurement officers are faced with a tough decision of whether to readvertise and run the risk of not getting any response at all or process the one quote received, which in return restricts the application of the value for money principle.

Interviewee 10 stated,

"It is frustrating that we cannot remove companies from the database; we can only check if they are registered and their tax status. We do, however, have a register of suppliers who are not quoting. Sometimes we do not pick up suppliers on the database when they enquire about why they are not contacted for business, and we send those queries to Pretoria. At times, when a potential service provider is contacted to quote, they are unsure if the request is legit. So, I always advise them to drop their bidding documents in the unit".

A further concern raised pertains to payment delays. This is attributed to system interface problems that usually occur at the end and beginning of the month between South African Revenue Services (SARS) and CSD, resulting in a lag in the information update. According to respondent 8,

"Between the 1st and the 7th of each month, payments are delayed because most of the suppliers are indicated as non-compliant with tax, and by law, we are prohibited from paying suppliers whose tax matters are not in order".

This temporal tax issue is suspected to be caused by the processing of the "pay as you earn" reconciliation period, which is payable by no later than the 7th of the following month. The challenge of the unreliability of suppliers on CSD is also found in a study by Mphehle and Mudogwa (2020). They state that suppliers register for commodities they cannot supply and without the necessary speciality required to render such services.

5.4. Partial automation of the e-procurement processes

Insofar as the purchasing function within the unit is concerned, several issues were raised. What has become clear from the data collected is that the Section is currently running both manual and automated processes. As already argued in the preceding section, system unavailability is among the contributing factors that force operators to use the paper-based process.

This is exacerbated by several other systems that are not integrated in the process. Interviewee 12 contends that

"at this stage, files are moved around manually to the next section, and file movement is recorded manually on the registers". Another respondent strongly objected to the view that the process is fully automated and argues that it is a combination of the digitalised and manual since *"we moving around sections carrying big files full of papers"*.

The printed papers are always in the file in the procurement process until the payment is concluded. The file is then safely kept for audits. As expected in any automated process, generic information is usually custom-made for the system. E-procurement is no different. For example, the mandatory SBD forms, which should contain specific information as directed by the Treasury and the specification documents, are built and fixed on the system in a particular manner that the users cannot change. Understandably, this is important to ensure compliance and save time, as the user does not have to retype the generic information applicable to all purchases each time an RFQ is generated but only populates the nonstandardised fields, thereby reducing the likelihood of human errors. Despite this, the respondents argued that the information needs to be professionally arranged and the font must be relooked. Interviewee 16 indicated that *"we do sometimes call the suppliers just to confirm if they have received RFQ documents; some of them complain that the font is too small and unreadable"*. In addition, interviewee 7 linked this to suppliers quoting incorrectly on specifications or quantities because they could not see what was needed. The interviewee further states that this leads to suppliers being unfairly disqualified during the adjudication process or resulting in delays as requirements are sent back for advertisement. The process is restarted, as there is, in most instances, one supplier being adjudicated due to CSD challenges in sourcing suppliers.

5.5. Systems Integration challenges

In addition to the above, upon inquiry into the various systems, respondents expressed their disgruntlement over the systems expected to be used in e-procurement. One interviewee stated that e-procurement requires one to perform multiple tasks relating to provisioning, sourcing suppliers, obtaining financial authority, placing a purchase order, printing receipt vouchers, and payment, but all these tasks in the department require one to use four different systems.

These systems are the Operational Support Information System (OSIS) for provisioning, e-procurement to source suppliers, and mandatory requirements such as local content threshold, BEE 80/20 calculations, tax status, etc. Next, the financial management system (FMS) is used to capture financial authority requests, followed by another check on a standalone CSD computer to ascertain compliance, and then the order administration system (OAS) is used to print government orders. Then, the OSIS is used again to generate received vouchers, and finally, payment is made on the FMS. However, some of these systems are integrated, while others operate in complete silos, although they are part of the process. For example, the FMS and the OAS somehow interlink, and e-procurement and CSD have some interface level. Meanwhile, one participant reported

that e-procurement and the FMS or the OAS and e-procurement are standalone systems. This implies that someone needs to capture the requirement, make printouts as proof for the following function, and physically move the file from one section (provisioning) to the next (tender section) to be captured manually in other systems. This process is repeated back and forth, generating large paper volumes right up until the payment section in Finance. To support this argument, respondent 9 argued that *“even though some systems are integrated, sometimes there are interface errors leading to further delays while waiting for logged calls to be attended to in PTA”*. Another interviewee, number 11, stated that a *“Know the Ropes”* tracking system was implemented to bridge the integration gap. *“Know the Ropes can provide some idea of where a certain file is in the process”*, argued the interviewee. This tracking system could also be used to determine who was the last person to work on a file and if there are any problems with a specific file. However, the downside of Know the Ropes is that it also runs separately from the other four systems. At all the critical stages of information capturing, there is an added separate task to also key in the necessary record on the tracking system. At the time of conducting interviews, the tracking system was not used, at least by most participants, as they see it as an extra task that can be forgone in an already lengthy process.

In the views of Krammer (2016), *“the successful implementation of a fully integrated electronic public procurement system and linking it with other systems may take many years. This means that it may take several years before the full benefits of such a system will be realised. Indeed, the department suffers this fate, and if no action is taken, achieving the benefits of adopting computerised systems may not be realised.”*

5.6. Lack of technical know-how of how the system functions

Interviewee 8 reported that *“limited personnel, which is centralised at Chief Logistics in PTA, is assisting with e-procurement system operational challenges”*. At the same time, another interviewee, number 13, posited that the

“Limited personnel are centralised in PTA to support FMS-related activities, such as updating bank details and providing remittance advice to help suppliers with proper payment allocation as the department makes bulk payments”.

This argument was supported by interviewee 7, who stated that *“personnel capacity at SITA is an issue because they take some time in resolving logged calls which hamper the processing of payments”*. A similar finding was cited by Anthony (2017), who noted that limited technical expertise in terms of *“know-how”* might be experienced in some institutions. In addition to the above, the respondents also indicated that due to the limited capacity at the national level, the centralisation of technical support functions is cited as a cause for significant delays in getting RFQ out to service possible providers and processing payments. The turnaround time from the PTA offices is reportedly lengthy. Since there are fewer people for support, *“sometimes assistance is not immediately available even when they are reachable over the phone, and the whole process gets halted,”* alluded to interviewee 6. The participants, however, understand the level of pressure these offices operate under, as they provide support services not only to the unit but also to the entire department.

Of most concern among this group was that they cannot be formally registered as system users, and some have resorted to sharing passwords with those legally authorised to work on the different systems. Another related finding is that fewer personnel can operate the e-procurement system. Respondent 10 argued, *“often determines that if that specific person who deals with a particular problem is not available or maybe on leave, the task will remain until the person is back”*. Similarly, even those who understand the system well within the unit are fairly few. Interviewee 15, for example, was not registered to work on the system since they are not course qualified, conceded that:

“I know that I am not supposed to work on the system because I do not have log-in details, so I borrow passwords from my colleagues. Sometimes I have to work late after hours because they are busy working during working hours. The system is easy to work with, but I depend on others to show me how to work on it because I have not been on the course to receive formal training, and they have not shown me everything. Management is aware of my situation, currently waiting my turn”.

While it can be argued that the work is getting done even if it is not at the required level, sharing log-in details is prohibited in the department on any system. Such an act carries a considerable risk that requires urgent attention, as these employees could soon find themselves in trouble while their intentions may purely be to assist in processing the workload.

6. Discussion

Through the TAM (Davis 1989), this study analysed factors that impact the usage of e-procurement in the Department of Defence with a specific focus on the South African Navy (SA Navy). Based on the study findings, it can be concluded that usage of e-procurement in the South African Navy is hampered by challenges ranging from procurement system inefficiencies, unreliable power supply due to load shedding, central supplier database inefficiencies, partial automation of the e-procurement processes, capacity challenges, systems integration challenges and lack of technical know-how of how the system functions. The same findings concur with the literature from various scholars, such as (Pitso et al 2018, Adebayo and Evans 2015, Akaba et al 2020 and Rukuni et al 2020), whose studies all assert that the lack of resources, lack of proper knowledge of how the system works, poor systems, misalignment of the e-procurement systems, and infrastructure in the form of internet, broadband and system developers who are supporting have a significant impact on e-procurement usage.

As an example, Rukini et al (2020) showed that there was a moderate to significant solid positive relationship among subconstructs that represent the implementation of e-procurement, notably compatibility, resource constraints, organisational cultural issues, infrastructural issues and environmental issues. In this research, in one way or another, the respondents raised each of these factors as a challenge hindering the use of e-procurement in the SA Navy.

The findings reveal that challenges are also faithful to the two users' attitudes towards an application stated in TAM theory: perceived ease of use and usefulness. According to the respondents, the e-procurement system in the SA Navy is not easy to use, nor do they regard it as useful for them. This is precisely due to the nonfriendly user interface marred by partial automation of the e-procurement processes exacerbated by other systems that are not integrated. This is seen in the respondent's views that strongly objected to the view that the process is fully automated and argued that it is a combination of the digitalised and manual since "we moving around sections charring big files full of papers". The printed papers are always in the file in the procurement process until the payment is concluded. The file is then safely kept for audits. The other concern raised is regarding payment delays. This is arguably attributed to the system interface problems that usually occur at the end and beginning of the month between South African Revenue Services (SARS) and CSD, resulting in a lag in the information update. Devaraj et al (2002), Palmer (2002), and Shim et al (2001) assert that good layout design, effective search engine, transparent navigation structure, and user-friendly interface all contribute to the use of online applications, so providing a straightforward and user-friendly interface is essential.

7. Conclusions

Based on the preceding discussion, it is evident that e-procurement poses two major challenges for the South African Navy. The first set of challenges pertains to ease of use, specifically, the respondents' perception that the system is not user-friendly and easy to operate. The second set of challenges relates to perceived usefulness, which refers to how much users believe the system will enhance their job performance. For instance, the study identifies integration issues, partial automation, technical know-how, and capacity constraints as some of the perceived usefulness challenges. Meanwhile, the ease-of-use challenges include system inefficiencies, power outages caused by load shedding, and central supplier database problems. To address these challenges, the paper recommends investing in infrastructure, improving supplier verification processes, adopting standardised documents, enhancing human resource capacity, improving system integration, and strengthening legislation on supplier data protection. Ultimately, while computerised systems are the way forward in public procurement, it is crucial to identify and rectify challenges that undermine the full benefits of digital procurement systems.

Ethical considerations

Not applicable

Conflict of Interest

All authors declare that they have no conflicts of interest.

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References

- Adebayo VO, Evans RD (2015) Adoption of e-Procurement Systems in Developing Countries: A Nigerian Public Sector Perspective. Proceedings of the IEEE International Conference on Knowledge-Based Engineering and Innovation. Tehran, Iran: IEEE.
- Adjei-Bamfo P, Domfer KA, Bawole JN, Ahenkana A, Maloreh-Nyameke T, Adjei-Bamfo S (2020) An e-government framework for assessing readiness for public sector e-procurement in a lower-middle income country. *Information Technology for Development* 26:742-761.
- Aigheyisi OS, Edore OJ (2015) Public procurement, governance and economic growth: some policy recommendations for Africa's growth and development. *African Journals Online* 10. Available in: <https://www.ajol.info/index.php/ijdmr/article/view/120966>. Accessed on: February 2 2023.
- Akaba TI, Norta A, Udokwu C, Draheim D (2020) A Framework for the Adoption of Blockchain-Based e-Procurement Systems in the Public Sector A Case Study of Nigeria. Switzerland: Springer Nature.
- Alase A (2017) The interpretative phenomenological analysis (IPA): a guide to a good qualitative research approach. *International Journal of Education & Literacy Studies* 5:9-19.
- Ambe I, Badendorst-Weiss J (2012) Procurement challenges in the South African public sector. *Journal of Transport and Supply Chain Management* 6:242-261.
- Ambe IM (2009) An Exploration of Supply Chain Management Practices in the Central District Municipality. *Educational Research and Review* 4:427-435.
- Ambe IM (2016) Public procurement trends and public procurement trends and developments in South Africa. *Research Journal of Business and Management* 3:277-290. Available in: [Internet:http://uir.unisa.ac.za/bitstream/handle/10500/22017/Ambe%20article1%202016.pdf?sequence=1/](http://uir.unisa.ac.za/bitstream/handle/10500/22017/Ambe%20article1%202016.pdf?sequence=1/). Accessed on: April 8 2020.
- Anthony A (2018) The use of e-procurement in South African public law: challenges and prospects. *Law Democracy and Development* 22:39-47.
- Auditor General South Africa (2020) Integrated Annual Report: Twenty-Twenty Online.

- Balkaran S (2017) The fourth industrial revolution - its impact on the South African Sector. Available in: <https://www.academia.edu/download/43371223/3>. Accessed on: June 3 2021.
- Bengtsson M (2016) How to plan and perform a qualitative study using content analysis. *Nursing Plus Open* 2:8-14.
- Bienhaus F, Haddud A (2018) Procurement 4.0: factors influencing the digitisation of procurement and supply chains. *Business Process Management* 24:965-984.
- Bolton P (2006) Government procurement as a policy tool in South Africa. *Journal of Public Procurement* 6:193-217.
- Bolton P (2016) Public Procurement as a Tool to Drive Innovation in South Africa. *Potchefstroom Electronic Law Journal* 19:1-35. DOI: 10.17159/1727-3781/2016/v19i0a1286
- Burnard P et al (2008) Analysing and Representing Qualitative Data. *British Dental Journal* 204:429-432. DOI: 10.1038/sj.bdj.2008.292
- Burnard P, Gill P, Steward K, Chadwick B (2008) Analysing and presenting quantitative data. *British Dental Journal* 204:429-432.
- Creswell J (2016) *Research in Education: Design, Conduct and Evaluation of Quantitative and Qualitative Research* (Translated by Kouvarakou, N.). Ion (Year of Publication of the Original 2005), Athens.
- Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. *Management Information Systems Quarterly* 13:319-340. doi:10.2307/249008
- Department of Defense (DOD) 2021/222. Annual performance Report FY2021/22. Available in: [https://nationalgovernment.co.za/department_annual/408/2022-department-of-defence-\(dod\)-annual-report.pdf](https://nationalgovernment.co.za/department_annual/408/2022-department-of-defence-(dod)-annual-report.pdf). Accessed on: September 25 2022.
- Elkhashin S, Saleeb N (2020) Assessing the Adoption of E-government Using Tam Model: Case of Egypt. *International Journal of Managing Information Technology* 12:1-14. Available in <https://www.agsa.co.za/Portals/0/Reports/PFMA/201920/PFMA%202019-20%20Report%20-%20signed.pdf>. Accessed on: September 25 2022.
- Ibem E, Laryea S (2015) E-Procurement use in the South African construction Industry. *Journal of Information Technology in Construction (ITcon)* 20:364-384.
- Kallio H, Pietila AM, Johnson M, Kangasniemi M (2016) Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing* 72:2954-2965.
- Krammer G (2016) Electronic public procurement as a tool of reform in South African public procurement. *African Public Procurement Law Journal* 3:1-41.
- Kutlesa I (2016) The development of an e-procurement system in Bosnia and Herzegovina. *Centre for Social Research* 2016:1-7.
- Madzimore J, Mafin C, Dhurup M (2020) E-procurement, supplier integration and supply chain performance in small and medium enterprises in South Africa. *South African Journal of Business Management* 51:1-12.
- Matthee CA (2006) *The Potential of Internal Audit to Enhance Supply Chain Management Outcomes*. Master's Dissertation. Stellenbosch, South Africa: University of Stellenbosch.
- Matunga DA, Nyanamba SO, Okibo DW (2013) The effect of E-Procurement practices on effective procurement in Public Hospitals: a case of KISII Level 5 Hospital. *American International Journal of Contemporary Research* 3:103-111.
- Moon MJ (2005) E-procurement management in state government: diffusion of e-procurement practices and its determinants. *Journal of Public Procurement*, 5:54-72.
- Mose JM, Mjihia JM, Magutu PO (2013) The critical success factors and challenges in e-procurement adoption among large scale manufacturing firms in Nairobi, Kenya. *European Scientific Journal* 9:375-401.
- Mphehle Z, Mudogwa RM (2020) Utilisation of digital central supplier database in enabling electronic procurement in the Limpopo provincial departments. *Africa's Public Service Delivery and Performance Review* 8:1-10.
- Munzhezvi PH (2016) South African public sector procurement and corruption: Inseparable twins?. *Journal of Transport and Supply Chain Management* 10. DOI: 10.4102/jtscm.v10i1.197
- National Treasury (2015) *National Treasury Instruction No 1 of 2015/2016*, Pretoria: National Treasury.
- Nawi MNM, Saniah R, Narul Azita S, Zulhumandi F (2016) The benefits and challenges of e-procurement implementation: A case study of Malaysian company. *International Journal of Economics and Financial Issues* 6:392-332.
- Opoku A, Ahmed V, Akotia J (2016) Choosing an appropriate research methodology and method. In: Ahmed V, Opoku A, Aziz Z (Eds.) *Research Methodology in the Built Environment: a selection of case studies*, pp 3-10. London: Routledge.
- Parliament Research Unit (2021) *Procurement challenges in the South African national defence force: key oversight focus areas*. Available in: https://static.pmg.org.za/210602PCDMV_Procurement_challenges_in_the_SANDF_May_2021.pdf. Accessed on: June 2 2023.
- Piera C, Roberto C, Giuseppe C, Teresa M (2014) E-procurement and E-supply Chain: Features and Development of E-collaboration. *IERI Procedia* 6:8-14.
- Pitso N, Kabanda S, Kapepo M (2018) Exploring e-procurement adoption in the context of a developing country: the case of Lesotho. Lagos, AFRICOM. Available in: https://eudl.eu/pdf/10.1007/978-3-319-98827-6_30. Accessed on: May 15 2023.
- Republic of South Africa (1996) *Constitution of the Republic of South Africa*. Pretoria: Government Printers.
- Republic of South Africa (1999) *Public Finance Management Act, No. 1 of 1999*.
- Republic of South Africa (2003) *Municipal Finance Management Act, 56 of 2003*.
- Robinson OC 2014 *Sampling in Interview-Based Qualitative Research: A Theoretical and Practical Guide*. *Qualitative Research in Psychology* 11:25-41. DOI: DOI: 10.1080/14780887.2013.801543
- Rotchanakitumnuai S (2013) The governance evidence of e-government procurement. *Governance Evidence* 7:309-321.
- Rotich GK, Okello B (2015) Analysis of the use of e-procurement of performance of the procurement functions of country government in Kenya. *International Journal of Economics, Commerce and Management* 3:1381-1398.
- Rukuni T F, Maziriri ET, Mulaudzi H (2020) Assessing Electronic Procurement at a State-Owned Enterprise in South Africa. *Journal of Contemporary*

Management 17. Available in: <https://hdl.handle.net/10520/ejc-jcman-v17-n2-a17>. Accessed on: June 20 2023.

Shore L, Power V, De Eyto A, O'Sullivan LW (2018) Technology Acceptance and User-Centred Design of Assistive Exoskeletons for Older Adults: A Commentary. *Robotics* 7:3. Available in: <https://doi.org/10.3390/robotics7010003>. Accessed on 19 July 2023.

Smart Procurement (2009) SA public procurement: poor value for money. Available in: <https://smartprocurement.co.za/the-value-for-money-approach-to-public-sector-procurement/>. Accessed on: July 22 2023.