



# Clear cache. Restart. Plug in.

Transforming Procurement

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# 1

# Introduction

The public sector in Singapore is facing unprecedented change, challenge and complexity. Increased public scrutiny for accountability and transparency has created a need for more rigorous governance models and performance processes.

Accountability takes on an added significance for the public sector as government ministries and statutory boards spend billions of dollars every year to provide vital services to serving the economy and the public.

The annual Auditor-General's Office (AGO), provides the check and balance in this regard. The mission of the AGO is to "audit and report to the President and Parliament on the proper accounting and use of public resources to enhance public accountability".

This publication, jointly produced by KPMG in Singapore and CPA Australia, examines 28 years of AGO Reports issued from 1990 to 2018. A key recurring theme across the years relates to issues with procurement and payments. In more recent years, with the proliferation of technology and IT systems, procurement and payment issues have featured even more prominently.

Against this backdrop, we analysed the procurement and payments findings over nearly three decades to understand the changes to the procurement process, as well as anticipate what the future of procurement will look like.

Our key observations are:

- **People:** Despite the controls established in the Government Instruction Manual, similar lapses have consistently recurred, resulting in observations raised by the AGO throughout the years. Is that a matter of a need for stronger tone from the top or a culture issue where consequence management is not strictly enforced?
- **Process:** The recurrent procurement lapses from the same agencies suggest that putting band-aids on the processes is not the right response. Such quick fixes have not addressed the fundamental causes of procurement issues and instead created operational inefficiencies. In the longer run, the layering of controls may dilute accountability.

- **System:** Exploring the use of technology is a typical comment in agencies' response to AGO's observations. While agencies have begun to leverage technology, adoption is not holistic and often only tackles identified issues. The root of procurement issues is never completely addressed. Should re-engineering be considered first or together prior to major automation projects?

This report shares some best practices in procurement and payments for consideration to further enhance the checks and balances needed to reduce gaps and lapses in public sector entities.

Public sector procurement process, data and information have been "cached" over the years and adding more layers of control will not necessarily prevent gaps and lapses. It is time to clear the legacy, reboot the way procurement is done and plug into emerging technologies to guide the transformation journey.

We hope you find this report useful reading and relevant in your professional capacity.

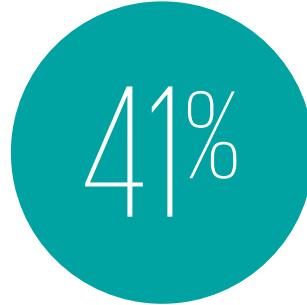
# 2

## Background of the study

In 2016, KPMG in Singapore, together with CPA Australia, launched the results of a study 'Holding the Line: Enhancing accountability in public financial management through Integrated Assurance'. The study examined the findings and root causes contained in the AGO 2016 Report, including analysis of results from the previous 25 years, and identified several recurring issues in the period from 1990 to 2016, relating to procurement, payment, revenue, grants and IT systems, demonstrating the need for a more rigorous governance model. The study found that the top three root causes over the years related to compliance with controls not being prioritised at various supervisory levels (41% of AGO findings), lack of monitoring (32%) and insufficient robust procedures (16%).

Based on 28 years of AGO Reports issued from 1990 to 2018, procurement and payment has always been a consistent theme across the years. In addition to that, there has been an increasing focus on IT Systems in recent years.

We have therefore collated the findings over this period to map the changes and anticipate what the future of procurement will look like.



**Controls not prioritised at various supervisory levels (AGO Findings)**



**Lack of monitoring**



**Insufficient robust procedures**

# 3

## The procurement journey

Across the reviewed period from 1990 to 2018, the main change involved the implementation of the GeBiz System in 2000. This allowed the public sector to post procurement requirements and invite suppliers to submit their bids electronically.

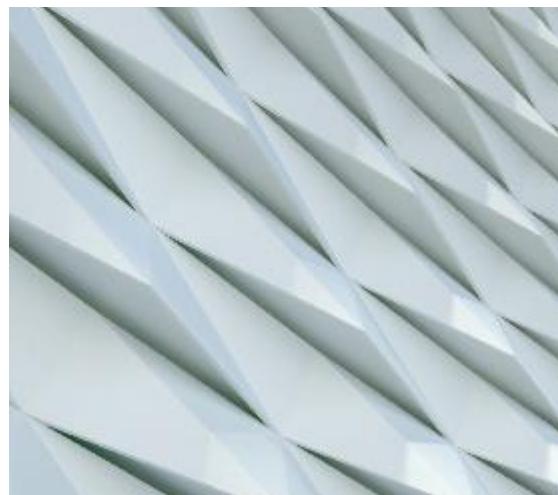
This marked the start of technology adoption to supercede the less efficient manual processes and eliminate some of the control gaps commonly seen in the manual processing of sourcing and acceptance of bids.

From 2000 to date, there have been improvements to the GeBiz System with the introduction of GeBiz Insight (2006), GeBiz Management Console (2007) and GeBiz 2.0 (2017). Following the introduction of GeBiz, key findings now relate to areas in the procurement process that require human intervention and decision making, such as the evaluation of bids.

Along with changes in the procurement system, there were changes in requirements with the introduction of Framework Agreements and Demand Aggregation to further enhance and streamline with procurement processes for public agencies.

Are there ways to reduce the findings in the procurement and payment process? Will changes in the environment call for greater use of emerging technology and automation of more aspects? These challenges and questions are discussed in this report.

## How can we integrate technology and automation into the procurement and payment process?



4

Clear cache

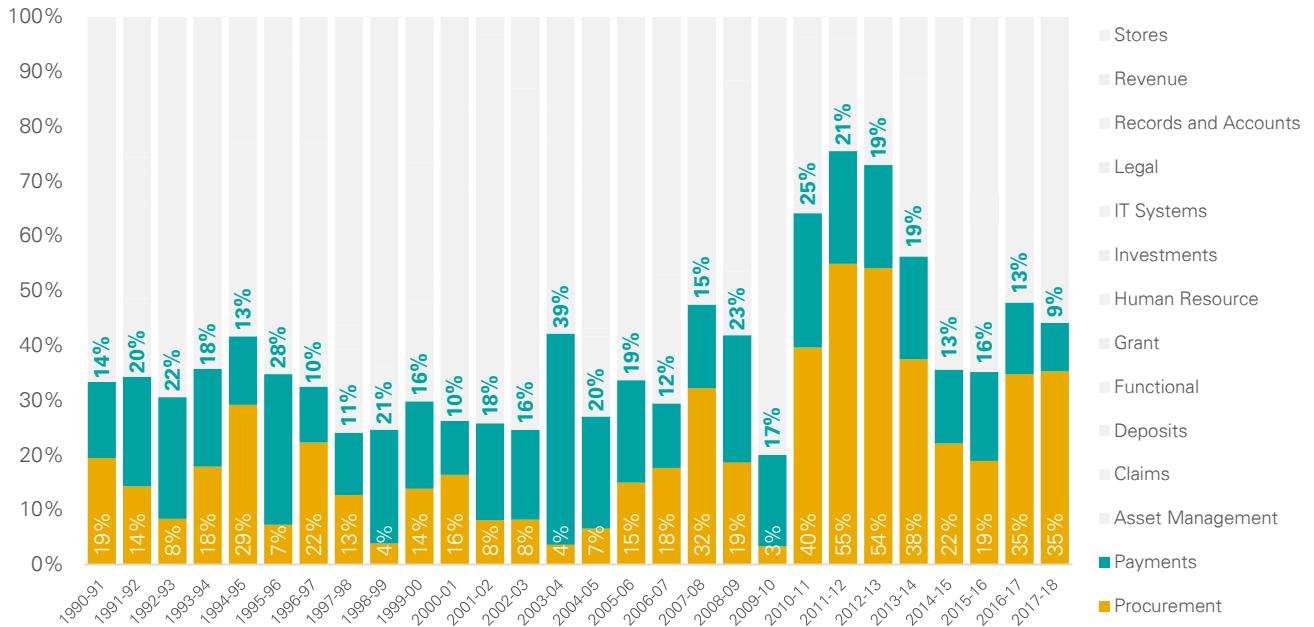


Figure 1: Types of findings across the 28 years

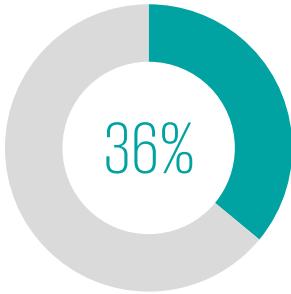
### 28 years of cached data

As observed in the chart above, procurement and payments account for more than 50% of the observations highlighted for almost all of the years. This is not surprising given the need for accountability for the use of public funds.

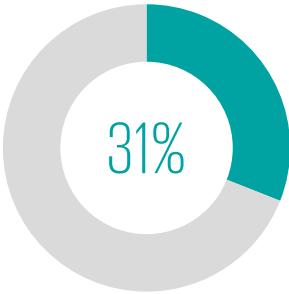
In the next section, we will delve further into specific procurement and payment findings and present selected case studies from AGO Reports from the years 1990 to 2018. Specific agencies are not named.

### 4.1 Procurement

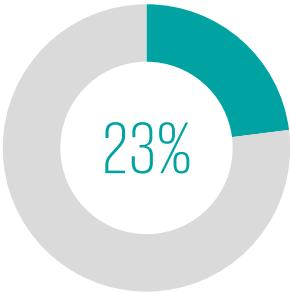
The top three categories of observations relate to sourcing procedures, evaluation procedures and timely and appropriate approvals.



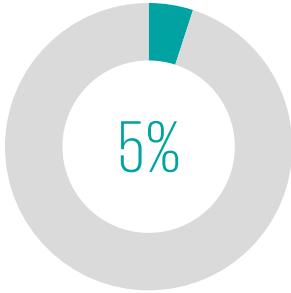
Sourcing Procedures



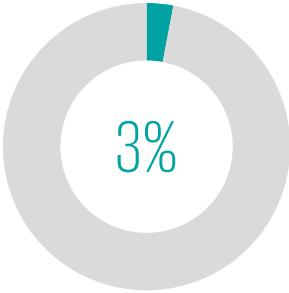
Evaluation Procedures



Approving Authorities



Offline Tender Procedures



Conflict of Interest



Ethical Practices

Figure 2: Types of procurement findings by category

### 4.1.1 Sourcing procedures

The process of sourcing covers areas of inviting vendors or communicating with tenderers prior to committing to the purchase and is not restricted to particular types of procurement (e.g. tenders, quotations or direct purchases). Sourcing is key

especially in direct purchases and the request for quotation process where agencies select or limit the tenderers invited to quote. Hence, it is important to ensure the sourcing procedures are transparent and adequate, and that robust background assessments and checks of vendors are performed.

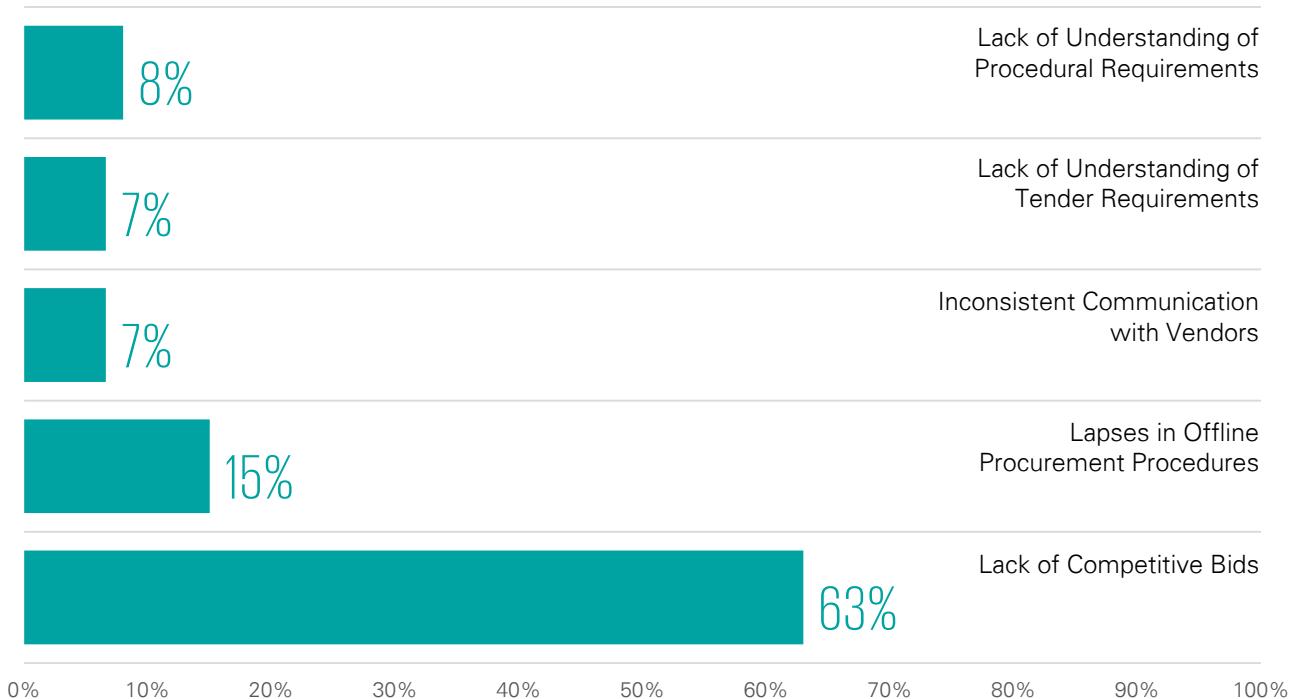


Figure 3: Breakdown of findings over sourcing procedures

Some of the key observations on sourcing procedures are:

### **i) Insufficient competitive quotes**

Nearly two-thirds (63%) of the sourcing issues highlighted by the AGO were due to insufficient competitive quotes where the agencies had primarily (i) weak grounds for waiver of competition; (ii) called invitations to quote instead of invitations to tender and (iii) made direct purchases from overseas suppliers.

*“It’s urgent, we needed to start the work immediately and initiating an invitation to tender or quote process would have taken too long...”*

This was the common explanation used in the observations raised in a number of AGO reports, such as twice in 1997/98 and again in 2006/07. In both scenarios the AGO observed purchases where the waiver of competition was questionable and unjustified. The agency involved explained that these were due to urgent work and there was pressure to complete in a short time frame.

*“The suppliers are incumbent and are highly experienced, had proven records or provided reasonable quotes...”*

The above was another common reason provided by a statutory board where the AGO found non-compelling reasons for not procuring via open competition as stated in the AGO Report 2013/14.

### **ii) Inconsistent communication**

Clear and consistent communication to tenderers is an important impetus for the right vendors to respond and also in the most appropriate and accurate manner.

Prior to 2000, the AGO noted a couple of instances where tenderers were informed beforehand of the upcoming tender [AGO Report 1994/95] and verbal invitations were made to tenderers to submit quotations [AGO report 1997/98]. That said, the implementation of GeBIZ in 2000 facilitated and consolidated the receipt and request of quotes onto a single platform, where information is uploaded and publicly published during a stipulated period. However, observations due to inconsistent communication were recurrent as noted in the following reports:

- AGO Report 2008/09 - changes to the scope of work were only conveyed after the tender closed to the only tenderer that met the criteria.
- AGO Report 2014/15 - a statutory board had inappropriately required tenderers to be registered for the financial category with a tendering capacity of up to \$1 million even though the estimated procurement value of the services required was below \$70,000. This unnecessarily restricted competition to only the bigger companies and thus contravened the principles of fair and open competition.

## 4.1.2 Evaluation procedures

In this section, we explore the observations relating to evaluations of the criteria for bids submitted which may not be sufficient or adequate to support the purchase decision made.

About 30% of the procurement findings related to the evaluation of the bids received and performed by the evaluation officer(s). More than half of findings were due to a lack of robust evaluation over the quotes, while the rest of the other explanations were mainly:

- Acceptance of tender bids where mandatory tender requirements were not met.
- Revision of tenderers' bids after the stipulated deadline and were subsequently awarded after the revision.

The common pitfalls because of a lack of robust evaluation procedures can be summarised into these scenarios:

- **Tender/quotation recommendation report did not provide adequate comparison and analysis**

It is necessary for the recommendation report to present the cost assessment and comparison on a like-for-like basis to allow the approving authorities to make an informed decision. This was highlighted in the AGO Report 2013/14 where, in one tender held by a statutory board, the cost assessment presented in the tender evaluation report was not for the same items, and thus evaluation was not based on a like-for-like basis.

In the AGO Report 2017/18, the statutory board awarded the tender to an overseas vendor for the manufacture of street light-up items for local festive seasons even though all the costs and obligations were not documented in the tender evaluation report and tender recommendation. The key to addressing this observation is to ensure all areas considered are adequately documented and explained to support the decision made.

Independent reviewers are also key as their review of the explanations are a litmus test of the justifications provided.

- **Evaluation criteria not clearly defined and communicated**

To allow for a robust evaluation, the scoring methodology used to evaluate the bids received should align with the procurement needs, while bearing in mind the costs involved.

In AGO Report 2015/16, the AGO noted that a Ministry purchased a computer system only to realise that it could not be integrated with its existing system. The AGO noted that the Ministry's evaluation process was lacking as it did not consider the integration between the old and new systems.

Key tender requirements and evaluation methodology that are established upfront should not be changed or amended in the midst of a tender. This is to ensure the procurement process is fair, transparent and competitive. This is further reiterated in AGO Report 2017/18 where a ministry amended part of the quality criterion after the close of tender and this amended criterion was used to evaluate the bids. The AGO also found in other tenders carried out by the same ministry that there was no documentary evidence that the criterion for quality attributes was established before the close of tenders.

▪ **Inadequate due diligence conducted for contract variation**

In another important aspect of the procurement process, evaluation of the quotes received for variation works was placed under even greater scrutiny due to the higher value of purchases and complexity in carrying out development and construction projects. Bearing in mind that contract variation in many instances could exceed 50% of the original contract value, the validity of the initial tender specifications should be probed.

As part of due diligence, agencies and statutory boards carry out feasibility studies when embarking on development projects. These feasibility studies should include an overall assessment of the market

in order to assist the allocation of fees during the budgetary process. Such practices were, however, lacking in the following reports:

- AGO Report 2015/16, an agency was rapped for not conducting sufficient assessment of the reasonableness of the consultancy fees charged for additional consultancy services. The consultancy fee was found to be 87.2% of the construction cost.
- AGO Report 2012/13, a contract variation of additional security services which amounted to 77.7% of the original contract value was awarded. AGO noted that there was no independent check or assessment of the fees quoted.

### 4.1.3 Approving authorities

Under approving authorities, which constitute 23% of the procurement observations, the common observations revolved around (i) split purchases, where purchases were separated to circumvent the need for higher approving authorities, and (ii) procurement of goods and services prior to approval. The latter is especially prominent in the management of variation works in development and construction projects.

#### **i) Split purchases**

Split purchases were first highlighted in AGO Report 1994/95, where the AGO noted that a statutory board had deliberately split the purchases to avoid the need to seek approval from higher authorities.

Observations relating to split purchases have been consistently raised throughout the years, indicating the need for constant monitoring and continuous oversight of the items and services procured.

#### **ii) Procurement of goods and services prior to approval – variation works**

The observations relating to procurement of goods and services either prior to approval or where approvals were not sought from the required authorities were especially prevalent in the management of variation works for development and construction projects.

*“Delays by consultants in submitting the requests for variation works...”*

Most agencies mentioned the lapses by appointed consultants as a common reason for the exceptions in approvals of variance works.

In AGO Report 2015/16, the AGO’s check on six contracts by a statutory board revealed a total of 47 out of 164 variations where variation works commenced before approvals that were obtained. Furthermore, for 38 of these variations, the subsequent approval papers did not highlight that works had commenced. Such issues were repeated across the years between AGO Reports 2011/12 and 2017/18.

#### 4.1.4 Conflict of interest

Conflict of interest has been a widely discussed topic in recent years – in both the public and private sector. To ensure an evaluation has been carried out in a fair and transparent manner, evaluation officer(s) and approving authorities should disclose and abstain from the procurement process if the conflict of interest is established or apparent.

In AGO Report 2014/15, the AGO highlighted instances in a statutory board where conflict of interest was not adequately managed. The approving authorities required for awarding of contracts and payments in the statutory board were also part of the senior management or a shareholder of the contracted vendor. However, these interests were not disclosed in the transactions.

Whilst the evaluation and award of contracts was the collective decision of a committee, these interests should have been disclosed upfront and the approving authorities that are conflicted should have abstained from the evaluation and approving process.

#### 4.1.5 Ethical practices

*“Creating and backdating of documents to satisfy audit queries is a serious irregularity”* – AGO Report 2013/14

*“It weakens the system of public accountability and impedes the work of AGO.”* – AGO Report 2017/18.

While there were no instances of fraud found, the following activities indicate weak ethical values and risk culture:

- Documents were created and backdated for the purpose of audit and to regularise the gaps. This was raised in AGO Report 2013/14 and again in AGO Report 2017/18.
- Agency outsourced the sourcing of quotes to the supplier to fulfill the three quotation criteria. The AGO further highlighted tell-tale signs that the quotations had been falsified. Such arrangement with the vendor reduces the transparency of the procurement process and could potentially expose agencies to increased risks of fraud.

These issues highlight the need to continuously strengthen ethical values and culture within the agencies and statutory boards. The right values, coupled with robust processes, can better ensure the procurement process is adequately carried out.

#### 4.1.6 Offline procurement procedures

Findings under this category relate to the late acceptance of bids, weak security over bids, no segregation of keys to tender boxes and incorrect approvals of bid awards. These occurred before GeBIZ was introduced as the central procurement platform. Tenders are now conducted via GeBIZ and these lapses have since been resolved.

The above observations reiterate the importance of having a robust process of evaluation to ensure procurement is done in a fair and transparent manner. As we have seen with the implementation of technology (GeBIZ), “process”-related findings could be resolved. However, most of the findings still raised by the AGO are “people”-related findings. Can new technologies be leveraged to assist in implementing controls and eventually lower the risks and number of findings noted in future?

#### 4.2 Payment

About half (49%) of the payment findings highlighted were due to the lack of a three-way match. The majority of these instances resulted in overpayments.

Other payment observations include the following:

- Late payments
- Payments incurred without appropriate approvals

#### Lack of three-way match

The AGO has almost, on an annual basis, brought up issues relating to the lack of a three-way match. These observations can be summarised to the following:

- Lack of monitoring procedures to reconcile goods and services received against the contracted schedule of works and goods ordered. These could be due to overly specific criteria established where it is hard for officers to perform the necessary reconciliation. However, in these instances, the officers at the agencies had indicated that services rendered and goods were received in satisfactory condition.
- Payment was not computed in accordance with stipulated rate. An instance raised in AGO Report 2011/12 reported that the data maintained in the system was outdated, thus resulting in inaccurate rates used during payment computation.

Similarly, as mentioned above, can agencies leverage technology to digitalise routine procedures like the three-way match and most importantly, to address human lapses?

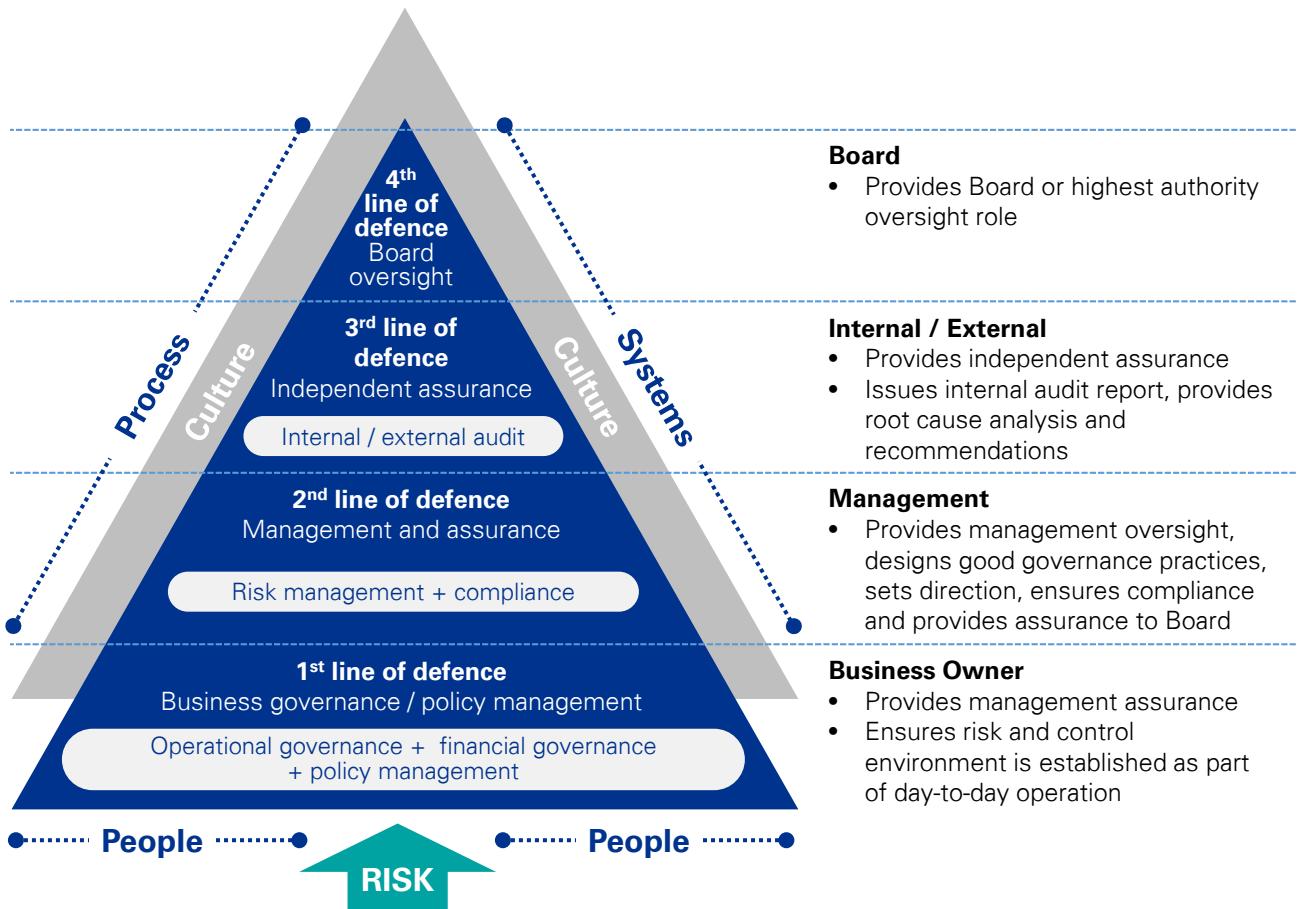
# 5 Restart

## Are we ready for procurement transformation?

In our 2016 publication *Holding the Line*, the concept of integrated assurance was introduced. Integrated assurance facilitates the provision of an opinion on the adequacy and effectiveness of risk management and internal controls across an organisation. It creates a single organisation-wide understanding of risk and control derived from assurance activity undertaken across the four lines of defence which is encompassed in the organisation's culture. Each line of defence is important in maintaining a robust risk management framework with an effective system of governance and internal controls.

*"Integrated assurance provides an opinion on the adequacy and effectiveness of risk management and internal controls across an organisation. It creates a single organisation-wide understanding of risk and control derived from assurance activity undertaken across the four lines of defence." – Holding the Line, 2016 published by KPMG*





Source: KPMG's 4 Lines of Defence

The increased use of improved systems provides organisations access to data and historical purchasing trends. Management should consider leveraging existing data to enhance the procurement process where the following may be performed in future:

- Analysis of big data to identify procurement trends
- Purchases effected automatically on a needs basis, as identified by the system based on the data
- Improved budgeting with real time updates to the amount of purchases
- Improve decision making
- Use of data analytics to identify anomalies

Using these technologies, the assurances are also moved upstream to the management level (second line of defence) instead of internal audit (third line of defence). This involves a culture shift and continuous training and employee engagement are crucial to bridging this gap.

With these changes proposed, apart from the budget to develop the new system, the next hurdle would be to update existing guidelines to ensure these do not hinder new ways to operate. We understand the Government is keen to partner organisations to explore new ways of doing things and allow for the “sand box” testing or piloting of projects.

There is a need for continuous improvements in processes, but are our guidelines and rules able to keep up with these changes? How are the rules able to stay relevant in today’s world? Rules need to follow the changes in policies which should be forward looking and not just knee-jerk reactions.

Digital transformation and disruption, although not without risks, present an opportunity for organisations to innovate and relook how things are done. This aligns with Singapore’s push towards a Smart Nation. In doing so, enablers and their relevant drivers need to be identified.

In the face of change, objectives to be achieved need to be clear. The use of technology to improve processes should be implemented as a whole.

The focus needs to be on the outcome and not solely on the output. Layering on automated controls does not fix the inherent inefficiencies of the process.

Instead, organisations need to take a step back and review the entire process and seek new ideas for a more efficient and effective process.

# 6<sup>▲</sup>

# Plug-in

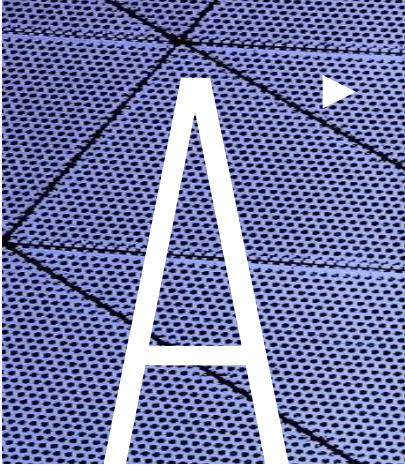
*“The Digital Government Blueprint is a statement of the Government’s ambition to better leverage data and harness new technologies, and to drive broader efforts to build a digital economy and digital society, in support of Smart Nation” – Smart Nation and Digital Government Group*

### Leveraging an “alphabet” of emerging technologies

With the push towards a Smart Nation, where people are empowered by technology to lead meaningful and fulfilled lives, procurement and payments as we know them will have to change. The establishment of GeBiz assisted with procedural changes to convert a manual process to an automated one. However, as the process of procurement evolves, with more online purchases and procurement platforms established, and coupled with more modes of online payments, there is a need to continuously review and improve the procurement and payment process.

In today’s world, the key is in understanding and embracing digital transformation and emerging technologies. Traditional buying activities and transaction execution, as well as the management of suppliers, contracts, transactions and sourcing activities, may soon be replaced by robots and e-procurement platforms.

An “alphabet” of emerging technologies is helping shape the future of procurement.



## Artificial Intelligence (robotic process automation, cognitive automation)

The landscape of intelligent automation technologies can be broken down into three primary classes that lie on a spectrum from simplest to most complex.

### Robotic process automation (RPA)

### Cognitive automation (CA)

#### Rules



Automation based on documented process rules

#### Learning



Recognise patterns from unstructured data: automation based on accuracy ratings

#### Reasoning



Hypothetics-based reasoning: automation based on confidence ratings

Macro based	Unstructured data	Natural language processing	Knowledge base	Adaptive alteration	Macro based	Unstructured data	Natural language processing	Knowledge base	Adaptive alteration	Macro based	Unstructured data	Natural language processing	Knowledge base	Adaptive alteration
●						●	●	●			●	●	●	●
Predictive analytics	Machine learning	Reasoning	Large-scale processing	Big data analytics	Predictive analytics	Machine learning	Reasoning	Large-scale processing	Big data analytics	Predictive analytics	Machine learning	Reasoning	Large-scale processing	Big data analytics
●	●				●	●		●	●	●	●	●	●	●

Source: Intelligent Automation and Internal Audit, 2017



**Basic robotic process automation (RPA)** is at one end of the spectrum and consists of software- and app-based tools like rules engines, workflow, and screen scraping. RPA tools automate manual and routine activities that follow clear-cut rules, such as comparing records and processing transactions.

**Enhanced process automation** is in the middle of the spectrum. These technologies have the ability to process unstructured data, build and use repositories of knowledge and learn from experience. These capabilities allow them to automate more complex processes that are less structured, more specialised and require some human judgment such as fulfilling purchase orders and onboarding new employees.

**Cognitive automation (CA)** lies at the far end of the spectrum, targeting activities that require higher-level skills, judgment and critical thinking. CA systems combine advanced technologies such as natural language processing, artificial intelligence, machine learning and data analytics to mimic human activities such as inferring, reading emotional cues, reasoning, hypothesising and communicating with humans. The value goes beyond the ability to automate processes. Cognitive automation can augment what human employees do, making employees more informed and more productive.

## Food for thought

Evaluate the procurement operations throughout your agencies with regard to the suitability for RPA. As a start, some of the first places to look for RPA activities is the set of repetitive, duplicative and standardised tasks performed. For example, a procurement bot can review tenders and quotations, compare against standard criteria and point out non-compliance with terms and conditions, after which a summary report can be provided as part of the evaluation process.

We have shared previously the benefits of an integrated assurance framework and likewise, for governance of RPA to work, the collaboration with other functions such as IT or finance is a critical success factor.



# B

## Blockchain

Blockchain is a method of logging and verifying transactions in a multi-party environment. It provides a distributed database that holds a growing number of records. Instead of existing in one place, the ledger is continually updated and synchronised across multiple computers in a network. Therefore, any participant in the network with the proper authorisation can view the entire ledger without relying on an intermediary or any one authority.

The internet as we know today is the internet of information which reduces the cost of connections. Blockchain is the next evolution of the internet. It is the internet of value which reduces the cost of transactions.

### Key features of blockchain:

- **Distributed:** Each node has an identical copy of the ledger
- **Immutable:** Information cannot be tampered with
- **Smart contracts:** Pre-defined terms that self-execute on every node
- **Secure:** Transaction data is encrypted via complex cryptography rules

### Food for thought

Explore the possibility of establishing smart contracts to streamline the procurement process. This can be through incorporating back-to-back contracts and aligning the contracts with the requirements of the operating model. As part of a private blockchain, this means that computer protocols can be tailored to identify the right trigger points to kick start the procurement process. With such dynamic procurement, middle-man costs can be reduced and allow for a seamless and secure stream of transactions.

In turn, having a network of smart contracts also enhances the payment ecosystem where the key terms and conditions stored enable a three-way match to be performed at an instant. This interfacing of procurement and payment processes eliminate typical errors that arise from manual payment computation.

# C

## Cloud Computing

Cloud computing, connected devices, “going digital”, “going mobile” and robotics may no longer be considered “emerging” technologies as they have been around for some time. Adopting them is critical to staying relevant today.

Other technologies such as cloud services have also developed well beyond being just a storage utility or low-cost server. Solutions such as infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) can help organisations become more self-sufficient, reduce demand for traditional technology and free up resources to work on more complex, higher value initiatives.

Cloud computing enables agencies to increase their use of systems to store, manage and process data with more ease. This is especially important if agencies are embarking on changes in their IT systems where a large amount of storage space is required.

## Food for thought

Cloud computing is under even greater scrutiny from users and regulators as a result of increased security breaches and wider adoption by governments and agencies worldwide. When embarking on a digital transformation journey, it is essential to consider the IT infrastructure as well as governance around it. It is also important to ensure resources for establishing and maintaining a private cloud server are relevant and sufficient and that sufficient due diligence is conducted prior to appointing the IT cloud vendor.

# D

## Data Analytics – harnessing big data

The use of technology enables agencies to harness data from all transactions in the system and gain real-time visibility into demand and consumption patterns such as cost per transaction, per unit, or per supplier. To fully utilise the data for analytics, agencies need to ensure quality data is captured in the system. For instance, details of all transactions should be captured consistently across the various departments who use the system.

With increased visibility, this would allow business units to make better procurement decisions, as well as respond to future market demands and shifts that may potentially allow them to collaborate with suppliers to transform and meet the challenge.

## Food for thought

Normalising the data across all enterprise applications relevant to the procurement function should be the first step before employing data analytics. Once the data is cleaned, agencies can utilise it to gain greater clarity into procurement trends and spending habits. This helps agencies to maximise their budget and achieve the three E's of Value for Money Framework – Economy, Efficiency and Effectiveness.

In addition, agencies can perform continuous monitoring which helps improve the level of compliance though all lines of defense. Moving from manual sampling and surveillance of data to proactive surveillance allows exceptions and/or non-compliances to be brought up earlier and rectification to be performed.

## Economy



Acquisition of resources in appropriate quality and quantity at minimum cost

Spending LESS

## Efficiency



Maximum output for any given set of inputs or the minimum inputs for any given quantity and quality of goods and service provided

Spending WELL

## Effectiveness



Extent to which predetermined goals and objectives of a policy or programme are being achieved

Spending WISELY

Source: KPMG's Value for Money Framework

# 7

## Conclusion

## Embracing the procurement transformation journey

There is significant potential in deploying automation in public sector procurement. Relative to other options, intelligent automation is low cost, non-invasive and has richer capabilities. This will allow organisations to derive greater efficiency in processes that were previously deemed too costly and/or complex to automate. The ability to transition from legacy infrastructures, processes and ways of working will allow agencies to unlock the potential of the data at their disposal, turning data into insights and insights into action.

However, organisational culture also needs to be addressed. Culture could be a significant impediment to the successful implementation of large scale transformation projects. However, cultural change requires individual engagement and accountability, with the tone coming from the top.

The benefits of digital transformation can only be achieved with the right blend of people, skills and organisational structure. Digital confidence and education are equally important in drawing up the procurement digital transformation roadmap, agencies could relook procurement roles, capabilities and the collaboration model as technology adoption increases.

There has to be a proactive effort to start this process by beginning an open dialogue with employees and offering to retrain or redeploy those affected through specially designed programmes.

Emerging technologies represent compelling value but also pose new risks and threats, in particular with cybersecurity. The reputation of many multinational corporations and government agencies around the world have been severely damaged in recent years due to increasing incidence of cyber attacks and financial crimes.

Successful procurement digital transformation also requires proper controls and oversight. So think risk and governance before embarking on the journey. Agencies could demystify the risks of new emerging technologies and develop an agile tech risk framework through dynamic risk assessment that combines the risk appetite of the agency with adoption of new technologies. Agencies could also leverage data analytics and continuous monitoring to change the way they manage technology risk.

## About KPMG

KPMG in Singapore is part of a global network of professional services firms providing Audit, Tax and Advisory services. With 200,000 people in the network working together to deliver value in 154 countries and territories, we offer a globally-consistent standard of service based on professional capabilities, industry insight and local knowledge.

In Southeast Asia, KPMG member firms operate across all 10 ASEAN member countries. Our industry focus helps KPMG professionals develop a rich understanding of clients' businesses and the insight, skills and resources required to address industry-specific issues and opportunities.

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