

GeBIZ -

From Vision to Reality

ABSTRACT

The Government Electronic Business (GeBIZ) of Singapore is a public sector-wide e-procurement portal developed by DSTA in collaboration with the Ministry of Finance and the Infocomm Development Authority of Singapore. GeBIZ has been cited in many dissertations as an excellent example of e-Government and has contributed to the then Systems and Computer Organisation's win in the inaugural Singapore e-Award in 2000. It has also helped the Singapore Government to clinch the Explorer Award at the E-Gov 2002 show in Washington, DC.

This article outlines the vision for GeBIZ and its journey from a simple electronic-catalogue purchasing system to a full-fledged central procurement portal for the public sector. It also states the challenges and lessons learnt by the project team in the journey.

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THE GeBIZ VISION

The concept of Government Electronic Business (GeBIZ) took root in mid-1998. The Ministry of Finance (MOF) decided to bring together different pockets of activities or systems in the Singapore public sector related to procurement to create a single integrated system that could support the entire procurement life cycle between public sector agencies and suppliers electronically.

To realise this intent, the GeBIZ system was envisaged to be an integrated, one-stop, non-stop government business centre, which would enable public sector officers to engage in e-commerce effectively according to the Singapore Government's Instruction Manual and provide an open and convenient channel for suppliers to source for business opportunities and conduct business with the public sector electronically round-the-clock. GeBIZ would go on to become one of the largest government electronic commerce initiatives, fostering a more transparent and fair trading environment that would result in better value for money for the public service.

REALISING THE GeBIZ VISION

Various alternatives were evaluated in 1999 to determine the most cost-effective and viable way to realise the GeBIZ vision. These included a market survey of commercial off-the-shelf (COTS) procurement solutions available. There was no COTS solution that was able to meet GeBIZ requirements without extensive customisation. As part of the market survey, a study of the Ministry of Defence's (MINDEF) existing procurement systems was conducted.

The study concluded that the best option was to develop GeBIZ based on existing procurement-related applications such as the Government Internet Tendering Information System, MINDEF Internet Procurement Systems and the Procurement Information Management System II. This approach enabled business knowledge and past experiences captured in these systems to be retained. It shortened the development cycle and achieved maximum cost-effectiveness.

Component	Roles	Functions
GeBIZ Enterprise	Easy-to-use Intranet application that caters mainly to the needs of public sector buyers to allow purchase of items through bulk tender or through Invitation to Quote (ITQ). It will also facilitate buyers in raising Purchase Requests for central purchasing and acceptance of items delivered.	Catalogue Buy; Invitation To Tender (ITT); ITQ; Framework Purchase Direct Purchase, Catalogue Management Revenue Tender; Financial Interface, Goods Receipt, Invoice Verification, Reports
GeBIZ Partner	The Internet-based GeBIZ shopfront for suppliers. All government business opportunities and revenue tenders, results of quotations and tender bids, and function to facilitate trading with the Singapore Government are available in this application.	Supplier Registration; e-Payment; Access to Business Opportunities, Response to Tenders and Quotations; Invoice Submission; Check Payment Status; Updating of Supplier Catalogues/Profile Management; Revenue Tender Activities

Figure 1. The GeBIZ System

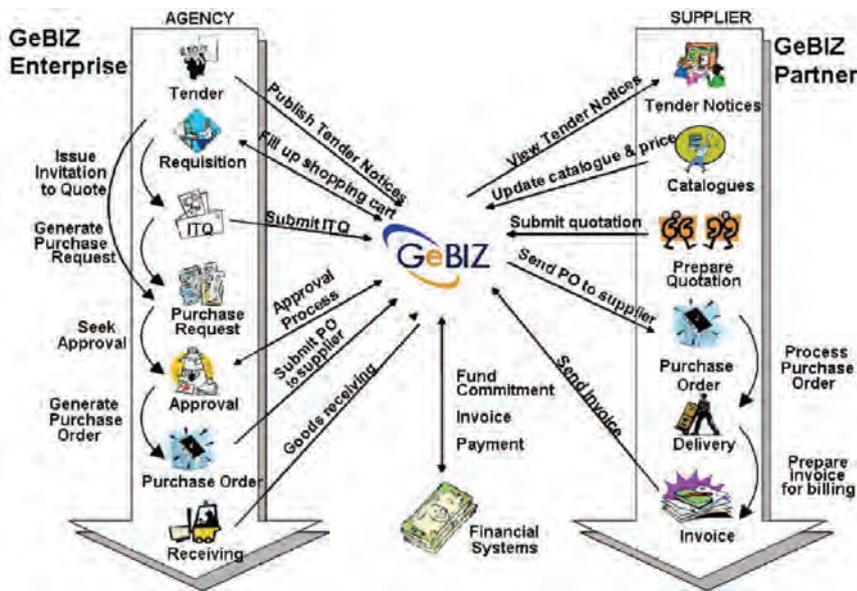


Figure 2. GeBIZ - Procurement to Payment

PROJECT OVERVIEW

The GeBIZ project was initiated in mid-1999. MOF funded the initial development and infrastructure cost of GeBIZ, and the system's operational cost for the first two years. DSTA was engaged as the application developer and system integrator while the Infocomm Development Authority of Singapore (IDA) managed the overall project and infrastructure.

THE GeBIZ SYSTEM

The GeBIZ application comprises two major sub-systems, namely GeBIZ Enterprise, and GeBIZ Partner, as described in Figure 1.

PROJECT IMPLEMENTATION

The DSTA project team developed the GeBIZ application in phases. GeBIZ Phase I, deployed in June 2000, supported the Catalogue Buy (including the management of the electronic catalogue) and the online publication of Tender Notices in GeBIZ. More

system features such as the following modules were introduced progressively over a two-year period from 2001 to 2003:

- Online supplier registration
- Online invitation and responses to quotations and tenders
- Purchase from framework agreements
- Small-value purchases
- Interfaces to various financial systems

By the end of 2003, GeBIZ evolved from a simple e-catalogue purchasing-and-tender publication system to a sophisticated central procurement portal, which effectively supports all business transactions between public sector agencies and suppliers. Figure 2 depicts the end-to-end procurement-to-payment process in GeBIZ.

As of December 2005, there were more than 9,000 users in the public sector from 120 government agencies using GeBIZ for their procurement and other e-commerce activities. In the Financial Year (FY) 2004 (April 2003-March 2004), there were more than 45,000

business opportunities worth a total of \$10 billion published in GeBIZ. With an average of more than half a million hits on the GeBIZ website daily, it has become the single most important means for the business community to seek business opportunities with the Singapore Government.

CHALLENGES IN THE GeBIZ PROJECT

In the development and implementation of the GeBIZ system, the DSTA project team had to overcome a number of challenges.

Technical Challenges

In the initial stage of the GeBIZ development, the challenges were mainly technical ones. These included the selection of the application development platform, the design of the GeBIZ base engine, the backend database configuration, security and audit logs. These were needed to support the stringent demand of a robust Internet-facing system, capable of handling high volume and complex transactions across multiple networks without compromising the confidentiality of bids.

In designing the GeBIZ system, one key challenge was the 'structural migration' of the existing paper-based procurement process to an electronic framework which links users, approving officers and suppliers. A 'workflow engine' to route the flow of procurement-based documents in an efficient manner within GeBIZ was necessary. Though several commercial workflow engines were evaluated, the more cost-effective option of developing the workflow engine in-house was adopted. In addition, the project team also introduced a web-based approval system so as to be less dependent on specific email platforms. Development of the workflow engine commenced in November 1999 and was implemented in April 2000. This was done at a fraction of the cost of adopting the commercial workflow engine.

Another challenge was preventing unauthorised access to the GeBIZ Enterprise database by GeBIZ Partner users (the suppliers) located in different networks, while allowing secured transfer of data between the databases of GeBIZ Partner and GeBIZ Enterprise. After careful consideration, the project team decided to adopt the Oracle replication technology in order to ensure physical data separation. The technology was implemented within a week with the help of Oracle consultants.

Following the successful implementation of the workflow engine and the Oracle replication technology within GeBIZ, GeBIZ Phase I was launched on 26 June 2000.

Organisational Barriers

Overcoming technical challenges was only part of the 'equation'. Greater challenges were encountered in trying to coax people to change their existing work processes and procedures.

First, there were differences in procurement practices across the ministries and other government agencies. The team had to expend much effort to streamline the procurement processes and to implement a 'standard' workflow that would best fit the existing practices.

The initial resistance from public sector buyers in switching from the manual to the electronic procurement workflow process was another uphill task. The team had to persuade buyers to look at procurement differently. This included having to knock on the doors of the buyer agencies to promote GeBIZ. To give them time to adjust to this change, the implementation of GeBIZ had to be done in phases. Hence the various features and enhancements to GeBIZ were progressively implemented based on the users' feedback.

Support Structure for End Users

A major challenge in the GeBIZ project was to put in place an end-user support centre structure that could be scaled to handle a large

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supplier and buyer community. To this end, the GeBIZ Service Centre was set up in 2000 as a one-stop centre to perform three key functions, namely call centre support, infrastructure support, and application maintenance and enhancements. The GeBIZ Service Centre also allowed the project team to systematically collate user feedback and improve the functionalities of the GeBIZ system.

In terms of processes, the call centre provided users (mainly buyers) a channel to highlight technical problems such as connectivity issues. They could also submit reports of problems encountered and make changes to requests based on their experience in using the GeBIZ system.

Beyond the call centre, the infrastructure support team tackled technical problems related to the server's hardware component while the application maintenance and enhancement team would debug the software to make the GeBIZ system more robust. To date, the 16 helpdesk staff members at the GeBIZ Service Centre provide call centre and email support to a user base of more than 26,000 from both the public sector agencies and supplier community.

Integration with Financial Systems

The other challenge was the interfacing of the GeBIZ system to the different back-end financial systems used by the various government agencies. Such interfaces were important for GeBIZ to support the entire procurement process end-to-end without the need for users to submit entries twice. Hence, resources were allocated to develop the various financial interfaces. By November 2001, the first two generic financial interfaces for the Oracle and SAP financial systems were made available. This was followed by the interface for the PeopleSoft financial system.

A major milestone was achieved when the GeBIZ-New Financial System interface was deployed in April 2004. This allowed end-to-

end procurement for all government agencies. To date, a total of 88 public sector agencies have their financial systems linked directly to GeBIZ. This means that GeBIZ is able to support the entire procurement-to-payment process from end-to-end.

Build-up of User Base

Another important aspect that the team addressed was the building of the buyer and supplier base to a critical mass. As with all e-commerce portals, there was the 'chicken-and-egg' issue of getting buyers and suppliers to support GeBIZ. A multi-pronged approach was taken. On one front, the project team worked with IDA to bring suppliers of government IT bulk tenders and period contracts to publish their items as electronic catalogues on GeBIZ. The upshot of this was the enrichment of content in GeBIZ. Road shows and briefings were also held to reach out to the suppliers.

As for the buyers, a partnership approach was taken. Apart from the team's concerted efforts to encourage the larger ministries and government agencies to use GeBIZ more actively, these agencies were also asked to 'sell' GeBIZ to the suppliers whom they frequented. The GeBIZ team supported the efforts by giving briefings and demonstrations at various locations to this group of suppliers. This joint effort saw the user base of GeBIZ expand from 4,291 users and 4,393 supplier accounts in FY2001 to 8,919 and 12,465 respectively in FY2002. This was a 52% jump in the user base and a 65% rise in supplier accounts within one year.

TRANSITION FROM A FULLY-FUNDED PROJECT INTO A SELF-FUNDED PORTAL

In line with the policy on efficient use of resources, a decision was taken by MOF for DSTA to manage and operate GeBIZ as a central procurement portal for the public sector on a

self-funding model from 1 April 2004. Instead of getting funds from MOF directly, DSTA was to recover the operational cost of GeBIZ directly from its users through the fees collected.

For the DSTA project team, it was a journey into uncharted waters. Several key tasks were identified. The first was to work out a 'fair' charging model together with MOF. This was a huge challenge as the team had to estimate future transaction volumes and steady state user figures with limited historical data. Plus, they were uncertain of how the usage patterns would evolve. Several business modelling and forecasting techniques were tried out to get a better understanding of sensitivity in demand forecast and the business risks. The principal consideration was to come up with a charging model that would be easy to administer and equitable to both buyers and sellers without discouraging the use of the system or creating a 'buffet syndrome' among its users. The charging model based on the principle of cost recovery was finally agreed on after many rounds of discussion with MOF and IDA.

GeBIZ AS A SELF-FUNDED CENTRAL PROCUREMENT PORTAL

Overcoming the Initial Operational Challenges

The project team had its first taste of the challenges of operating a self-funded portal in the months of March and April 2004.

On 1 March 2004, emails were sent to all 10,000 registered suppliers to remind them of the implementation of GeBIZ subscription charges, which was to take effect from 1 April 2004. The message also reminded them of the termination of the supplier account for non-paying accounts. In the weeks that followed, the number of calls to GeBIZ Service Centre increased seven-fold. These calls were from suppliers who wanted to know more about the rationale for charging as well as details on

making payment. This period was extremely taxing on the staff but the team became adept at dealing with the public through this experience.

The GeBIZ charging model underwent a significant review in February 2005. A high level policy decision was made to grant each supplier one free user account with effect from 1 April 2005. It was also decided that suppliers be refunded pre-paid user account fees, on a pro-rated basis. This complex exercise again required tremendous coordination effort and was completed successfully.

Set Up of Billing Operation

Even though the team had put in place an online billing system for both the suppliers and the government buyers, it turned out that the operation involved in billing and revenue collection was much more complicated than what the team had envisaged. There was a full set of policies, processes and procedures concerning bill generation and verification, financial accounting, payment tracking and discrepancy handling that had to be established. A clear set of principles and guidelines in handling user appeals and disputes was given to the team to ensure consistency in practice.

Sharpening the Customer Focus

Since the start of the GeBIZ project in 1999, the team had placed much focus on translating buyer requirements into the system design. The buyers and the policy-makers were the key customers. With the self-funding model in place, the customer focus was slightly different. The new customers were the suppliers and previous experience taught the team the importance of handling suppliers' expectations of the portal.

With this new business focus, the team embarked on a revamp of the GeBIZ Partner user interface in November 2004. The objective

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was to enhance the user experience for the suppliers using the GeBIZ portal. This turned out to be a major development effort as the entire GeBIZ Partner component had to be re-coded.

After nearly a year of development, the new user interface was successfully launched in October 2005. Despite the scope of the change, it was a relatively smooth transition. The previous lessons learnt in handling change management and communication served the team well.

Coping with Rapid Growth

Despite the fact that GeBIZ started charging users in FY2004, the number of government users and the supplier companies actually increased. The FY2004 business volume in GeBIZ almost tripled that of FY2003. In FY2004, more than \$1.1 billion of purchase orders were issued in GeBIZ and the total value of tenders awarded in GeBIZ was \$8.8 billion. These figures attest to the DSTA team's success in overcoming the challenges and developing GeBIZ into a one-stop centre for suppliers to conduct business electronically with the Singapore Government, as set out in the original vision.

By the end of 2004, the rapid growth of business activities in the GeBIZ portal generated pressure for the upgrading of the technical infrastructure at the GeBIZ Data Centre. The project team undertook this task and completed a major infrastructure upgrade for the entire GeBIZ system within three months.

To accelerate the training for suppliers, DSTA collaborated with NUS Extension in November 2004 and the Institute of Public Administration and Management in October 2005 to provide hands-on training to existing and potential suppliers, and to equip them with the background knowledge to handle transactions with public procurement agencies through GeBIZ.

BENEFITS OF GeBIZ

The successful implementation of GeBIZ has brought about many benefits to policy-makers, government agencies and suppliers.

Many of these benefits are beyond what was envisaged in the original GeBIZ vision.

Policy-makers

As a custom-built system, GeBIZ is designed to adhere strictly to public sector procurement policies and its principles of transparency, fair and open competition, and value-for-money. By implementing a centralised procurement system, policy-makers in MOF were able to standardise practices and processes while supporting a decentralised model of procurement amongst the government agencies. GeBIZ has also facilitated the implementation of the various commitments on Government Procurement spelt out in international agreements such as the 1994 Agreement on Government Procurement under the World Trade Organisation.

Another key area that GeBIZ was able to bring value to policy-makers was in allowing procurement information across the entire public sector to be readily available. This information was previously not available due to the decentralised nature of public sector procurement. The analysis of the transactional data on GeBIZ has enabled the MOF to review and revise procurement policies in areas such as the Expenditure Procurement Policy Unit's (EPPU) supplier registration criteria and financial grading.

The analysis of GeBIZ data has also helped the MOF identify potential areas for public-sector wide demand aggregation. The GeBIZ platform has enabled lead agencies such as IDA and DSTA to put in place cross-ministry period contracts which other government agencies can make use of to enjoy bulk discounts from

the economies of scale. For example, in FY2004, DSTA undertook demand aggregation exercises for 18 procurement categories and brought about a total potential annual savings of \$15 million for the public sector.

Government Agencies

For the government agencies, not only has GeBIZ helped to increase transparency and fair competition in procurement, it has also improved work efficiency, reduced procurement lead-time, and enabled a global reach to suppliers. The use of GeBIZ helped ensure that the purchases are value-for-money. It is estimated that the cost savings from better procurement visibility and control, increased access to more suppliers and use of cross-ministry period contracts could result in a typical saving of 3% - 20% of procurement value, depending on the procurement category.

As a platform that reaches out to a wide supplier community, GeBIZ has been a useful channel for government agencies to communicate key policy changes and initiatives. For example, DSTA had worked with MOF and the Standards, Productivity and Innovation Board to disseminate through GeBIZ a number of pro-business activities such as the publication of pre-procurement plans from the various government agencies, the simplification of the EPPU registration and the publicity for the launch of the Government Procurement Guide for Small and Medium Enterprises.

Suppliers

For the suppliers, GeBIZ has provided reliable government procurement information and accessibility to business opportunities with the government agencies. Being able to conduct one-stop trading with the entire government sector electronically has also brought about convenience, increased confidentiality, and above all, reduction in business costs.

THE NEXT STEP

Value-Added Services

In the initial months after the transition to the new business model, the team's focus was to ensure the system and operational stability of the portal. By early 2005, the team decided that it was timely to enhance the value-add of the GeBIZ portal for both the buyer and the supplier community.

One key initiative was to develop GeBIZ Mall, an online mall to give GeBIZ suppliers the opportunity to offer government agencies goods and services at promotional prices through electronic catalogues. The online mall would offer convenience to government agencies as their buyers could ride on the existing GeBIZ approval and procurement processes to purchase the goods and services directly off the electronic catalogues. The initiative will complement the existing procurement processes within GeBIZ, and cater to the full spectrum of procurement demands of government agencies. GeBIZ Mall was rolled out as a pro-business initiative in March 2006.

Another initiative in the pipeline is the development of a Business Intelligence module for GeBIZ Enterprise. This will allow buyers to identify similar tenders and quotations for the purpose of price research and comparison. The implementation of this module will provide an additional channel for buyers to evaluate tender and quotation responses based on the historical purchase data captured in GeBIZ. With this intelligent search algorithm, buyers can also identify and invite previous suppliers who responded to similar tenders and quotations with good offers. When implemented on a wide scale, the Business Intelligence module will become a useful tool for buyer agencies to achieve better value-for-money for their purchases.

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Commercialisation of GeBIZ Intellectual Property

The successful implementation of GeBIZ as a Singapore Government e-procurement system has brought about pleasant surprises for its stakeholders, MOF and DSTA.

From early to mid-2005, several vendors have approached the GeBIZ project team to explore the possibility of licensing the GeBIZ system for implementation overseas. To the stakeholders, the interest in GeBIZ Intellectual Property (IP) represented a window of opportunity to explore its commercial viability and value. Both MOF and DSTA have agreed to explore the licensing of the GeBIZ IP to a commercial vendor as background IP for use to market a GeBIZ-like e-procurement solution to the governments of other countries.

The idea is to outsource the application maintenance of GeBIZ and grant the awarded vendor the licence to customise and sell GeBIZ overseas with the aim of lowering the cost of maintenance.

CONCLUSION

Within a short span of five years, GeBIZ has evolved from an electronic-catalogue module to a full-fledged central procurement portal for the entire public sector and extended its use beyond what was envisaged in the original vision. The development of GeBIZ and its transition to the self-funding portal model has been transformational and it has provided the project team many learning opportunities. The business model of the GeBIZ portal is still evolving. There is still much to be done and much to be learnt as the journey continues.

BIOGRAPHY



Carol Lo is Assistant Director (E-Business Centre). She oversees the operation and management of the GeBIZ portal. She is also responsible for the development and implementation of the Electronic Procurement System and Business-to-Business Gateway for the Ministry of Defence and the Singapore Armed Forces. She obtained her Master in System Analysis and Design from the London School of Economics and Political Science, University of London in 1983.

Chia Puay Long is Programme Manager (E-Business Centre). He is responsible for the management of the GeBIZ portal, which includes development and enhancements of the portal, as well as its operation and support. A Public Service Commission scholar with a Bachelor in Computer Engineering (Honours) from the Nanyang Technological University, he also worked with the team which developed the MINDEF Internet Procurement System, the predecessor to GeBIZ.



Tey Soon Heng is Manager (E-Business Centre). He is responsible for conceptualising, implementing and marketing value-added services based on the GeBIZ portal. A recipient of the Overseas Merit Scholarship from the Public Service Commission, he graduated from Oxford University with a Master of Engineering (First Class Honours) in 1998.