

# INNOVATION EXCELLENCE AWARD 2014

## Executive Summary Report

# ORGANISATION PROFILE

DSTA was formed as a statutory board under the Ministry of Defence (MINDEF) in 2000 to provide leading-edge technological solutions to the Singapore Armed Forces (SAF) so that it continues to be a formidable fighting force for the defence and security of Singapore.

## Roles and Functions

As the executive agent of MINDEF, DSTA has roles and functions which include:

- Acquiring platform and weapon systems for the SAF
- Advising MINDEF on all defence science and technology matters
- Designing, developing and maintaining defence systems and infrastructure
- Providing engineering and related services in defence areas
- Promoting and facilitating the development of defence science and technology in Singapore



## Employee Profile

DSTA has some 3,000 staff comprising mainly engineers, IT professionals and procurement specialists.

## Our Challenges

- Competition for declining engineering resources
- Increasing complexity of systems
- Rapid technology advancement

## Our Strategies

- Tap on innovation to build a high-performance and innovative organisation
- Attract, retain, engage and develop our people to maximise their potential

# LEADERSHIP

## Management Team

Lead by Chief Executive Mr Tan Peng Yam, DSTA's management team comprises two Deputy Chief Executives, as well as Directors and a Deputy Director heading 14 Programme Centres and three corporate entities. To drive a culture of productivity and innovation in DSTA, the Chief Executive leads the organisation as its Chief Innovation Officer, and the Directors are Innovation Champions responsible for nurturing innovation in their respective entities.

## Organisational Culture

Innovation is imbued in DSTA's organisational culture, which comprises the values - Integrity, Professionalism, Excellence, Respect and Teamwork. Supporting these values are policies and practices, many of which are innovation-focused.

Values	Desired Behaviours
<b>Integrity</b>	<ul style="list-style-type: none"> <li>• We do the right thing.</li> <li>• We uphold ourselves with honesty, fairness, sincerity and accountability in our actions.</li> <li>• We have moral courage, challenge unethical practices and set them right.</li> </ul>
<b>Professionalism</b>	<ul style="list-style-type: none"> <li>• We are committed and competent in our work.</li> <li>• We are consistent and accurate in our behaviour and deliverables.</li> </ul>
<b>Excellence</b>	<ul style="list-style-type: none"> <li>• We strive to deliver the highest possible standards in our work.</li> <li>• We deliver results that exceed expectations.</li> <li>• We have a passion to be the best at what we do, continually seeking improvements and innovations.</li> </ul>
<b>Respect</b>	<ul style="list-style-type: none"> <li>• We recognise and celebrate our diversity as individuals.</li> <li>• We communicate openly and welcome diverse ideas and opinions.</li> <li>• We have trust and confidence in one another, we value and recognise one another's accomplishment.</li> </ul>
<b>Teamwork</b>	<ul style="list-style-type: none"> <li>• We work closely together for a shared purpose.</li> <li>• We foster collaboration and build strong relationships.</li> <li>• We share ideas, we learn from one another.</li> <li>• We inspire and support one another, and celebrate successes together.</li> </ul>

## Driving Innovation

Innovation in DSTA means 'Achieving More with Less'. In driving innovation, the management team has put in place the **iLEAP Innovation Framework** to encourage staff to collaborate closely, streamline processes and leverage technology for increased productivity (see chapter on Processes for more details on the framework).

# PLANNING

## Leveraging Partnerships

DSTA's strong partnership with MINDEF and the SAF lays the foundation for new ideas on capability development, thus leading to greater integration between operations and technology. DSTA largely synchronises its planning process with that of MINDEF and the SAF's, thus ensuring alignment to fulfil the defence requirements of Singapore.



To further entrench **operations-technology integration**, DSTA attaches staff to MINDEF and SAF departments to strengthen the co-generation and co-ownership of ideas on the capability development front.



## Leveraging Human Capital

DSTA leverages the collective strengths and ideas of its staff in the strategic planning process. This **Whole-of-DSTA Approach** starts with an annual strategic workshop to formulate strategic thrusts for the future. Workshop participants come from across DSTA to provide diverse ideas.

Once consensus is obtained, these strategies are translated to implementable initiatives.

Respective entities take alignment from these to develop innovation and productivity initiatives in their Annual Business Plans (ABP). These ABPs are reviewed in the middle of the financial year to monitor performance and determine if adjustments are necessary.

## Leveraging Risk Management Frameworks

DSTA puts in place comprehensive risk management frameworks to safeguard operations and manage resources optimally. There are two levels of risk management in DSTA - Enterprise Risk Management (ERM) and project risk management.

ERM comes under the governance of DSTA's Board of Directors, who determine DSTA's risk policies and level of risk tolerance. DSTA's risk portfolio comprises 12 risks grouped under five risk clusters - Procurement, Human Resource, Security, Workplace Safety and Health, and Capability Delivery. Each risk cluster is managed by a risk owner who reviews the effectiveness of risk measures and ensures progress on risk mitigation plans. The framework was introduced to guide project teams in the identification, mitigation and management of risks.



# INFORMATION MANAGEMENT

DSTA manages information as a strategic asset to deliver user-centric services, achieve quality policy formulation, catalyse innovations, and facilitate analysis and research.

## Corporate IT Systems

Information is created, shared and managed through investments in corporate IT systems for a more efficient, connected and intelligent DSTA.

In line with leveraging technology to maximise business productivity, DSTA launched the **eWorkplace - DSTA's Next Generation Intranet** – a new intranet which serves as a one-stop workplace for collaboration and innovation. With its information architecture and repository, the eWorkplace provides a seamless platform for staff to manage and share information systematically through Communities of Practice or Team Sites. Its social collaboration tools provide crowd-sourcing capabilities to complement problem solving and idea generation.



The **DSTA Enterprise System (DES)** was introduced to integrate, optimise and automate business processes. User-friendly IT systems were implemented to provide easy access to data. The DES requires little maintenance and can be scaled up easily to meet expanding business needs.

## Advanced Analytics

DSTA uses advanced analytics in human resources and procurement to enable efficient sense-making and analysis of staff and public sentiments from sources of unstructured data. This enables management and users to discover information and gain timely insights from data collected through surveys, feedback and open sources.

## Comparison and Benchmarking

DSTA employs an innovative approach to Comparison and Benchmarking (C&B) in its annual business planning, project work and day-to-day operations. Underpinning DSTA's C&B methodology are three dimensions of business - **Strategic, Performance and Process**; and four levels of benchmarking - the **benchmark-setter, formal benchmarking, informal benchmarking** and **comparative data/benchmarks for target setting**.

DSTA's C&B criteria to improve innovation performance include looking out for:

- Benchmarks and benchmark setters to help improve efficiency and effectiveness of work or sustain current achievements
- Potential disruptive technological innovations that could be adapted to develop innovative solutions
- Cost-effective solutions

# PEOPLE

## Human Resource Planning

DSTA's Human Resource (HR) planning process is aligned to its strategic plans, with relevant resources catered.

HR Strategy	HR Plans
<b>Talent Attraction</b>	<ul style="list-style-type: none"> <li>• DSTA outreach strategies and programmes to reach out to the schools</li> <li>• DSTA recruitment strategies with robust recruitment processes to assess potential recruits fit for the organisation</li> <li>• DSTA Undergraduate Scholarship to attract engineers with a keen passion for science and technology, and leadership qualities</li> </ul>
<b>Talent Development and Retention</b>	<ul style="list-style-type: none"> <li>• Staff Development Framework to create a meaningful and rewarding career for all staff</li> <li>• Competency Development structure for holistic competency build-up and depth in technical knowledge</li> <li>• Staff Engagement Survey and dialogue sessions to continuously improve and engage staff</li> </ul>
<b>Performance and Recognition</b>	<ul style="list-style-type: none"> <li>• Recognise Productivity and Innovation as key achievement in performance-based assessment</li> <li>• Competitive total rewards</li> <li>• DSTA Innovation Awards for individuals and groups</li> </ul>

## Employee Engagement

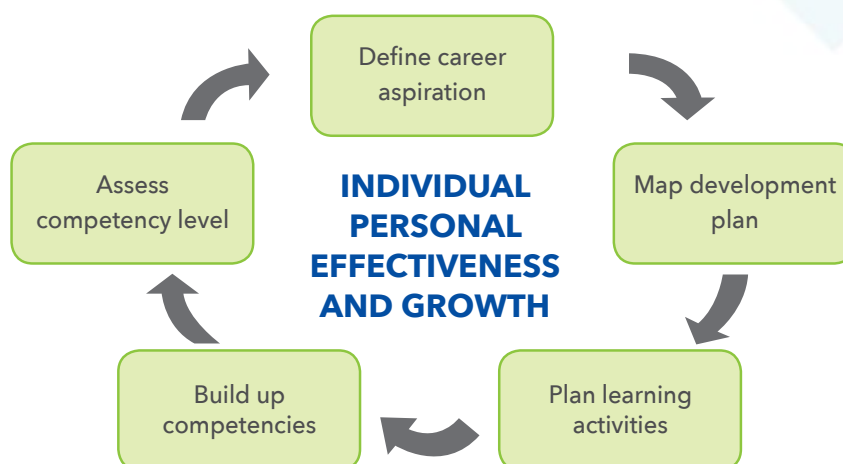
DSTA adopts a structured process in employee engagement to ensure that staff engagement initiatives are aligned with DSTA's strategies. The effectiveness and relevance of the overall employee engagement process is continually reviewed by the HR department and DSTA's Management.

## Employee Learning and Development

### Competency Development Process

DSTA employs a structured approach to define competencies required to sustain its core capabilities and develop staff. The focus is on competency development to achieve excellence, innovate, stay relevant, fine-tune deployment selection, identify learning and development needs, facilitate career progression, and enhance organisational and staff performance.

The Competency Development Process helps staff build competencies that will support their career aspirations and build up competency domains to meet not only current but also future needs of MINDEF and the SAF.



*DSTA's Competency Development Process*

## Achieving Personal Aspirations

In DSTA, staff are grouped into competency communities. Their skills and competencies are honed in different career tracks through a structured and customised competency development approach.

DSTA also focuses on the holistic development of staff through building leadership abilities, broad business knowledge, and depth in technical know-how. DSTA actively engages staff in career planning to achieve their personal career aspirations that are aligned to the organisation's goals.

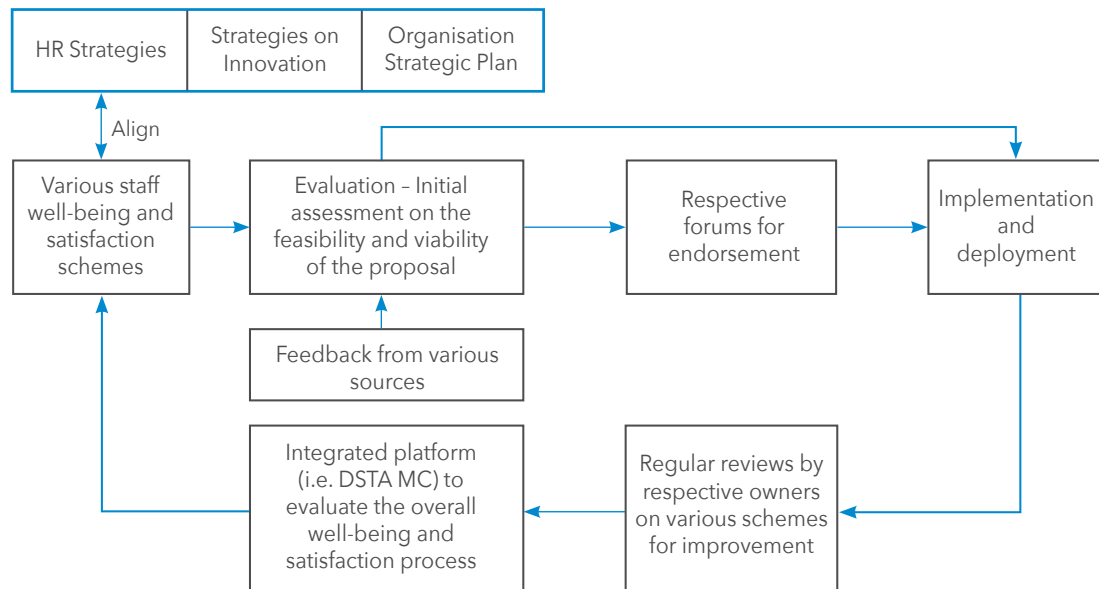


*DSTA's Staff Development Framework is anchored on five key pillars of people development*

The processes to ensure that the learning and development needs of staff are met are fine-tuned regularly. Feedback is obtained from staff through course evaluations, reviews of training objectives between staff and supervisor, the Staff Engagement Survey, and staff dialogue. These inputs are reviewed by relevant process owners and deliberated at DSTA management meetings.

## Employee Well-Being and Satisfaction

DSTA has a comprehensive process to support and promote the well-being and satisfaction of staff.



*DSTA's employee well-being and satisfaction process*



## Conducive Work Environment

DSTA constantly looks into innovative ways to provide staff with a conducive work environment. These include

- An open-office concept work environment
- Common spaces to enable networking
- Collaborative spaces and mobile workspace concept to encourage cross-functional collaboration for innovative work
- Laptops for all staff to access the eWorkplace, various enterprise systems, databases and the internet



## Balanced Work-life and Family Friendliness

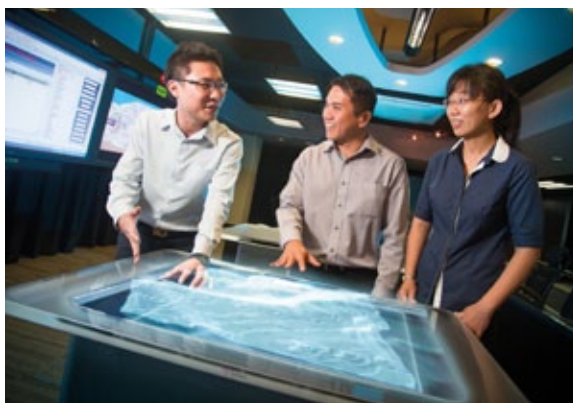
DSTA's welfare benefits and wellness programmes promote a healthy, balanced work-life and a family-friendly work environment.

For such efforts, DSTA has been awarded the pinnacle Singapore Health Sciences Authority National HEALTH Platinum Award consecutively in 2008 and 2012.

## Meaningful and Impactful Work

DSTA believes in creating meaningful work for all through a shared future where staff aspirations are aligned with organisational goals. Thus, a career planning tool was designed to support staff in achieving their unique career aspirations.

A key instrument in developing this tool is the one-on-one dialogue between staff and supervisor, which focuses on career aspirations, strengths, competencies, and learning and development. Another feature is allowing staff to indicate their time frame for readiness of next job assignment. Staff's career plans are deliberated at DSTA management meetings.



This initiative, coupled with the availability of multiple career tracks, empower staff with a choice of career opportunities.

## Special Interest Groups

DSTA has a network of Special Interest Groups (SIG) to facilitate staff bonding through their various interests in a specific area of knowledge, learning, technology or cause. To complement the SIGs, the DSTA Sports and Recreation Committee (DSTA SPARK) was formed in 2011 to look into staff cohesion organisation-wide.

The initiatives put in place by DSTA SPARK and the various SIGs are monitored and evaluated regularly for effectiveness through staff feedback, committees, policy changes and management forums.



## Employee Performance and Recognition

### Structured Performance Management System

The Performance and Development Process (PDP) is a key process that complements the Staff Development Framework in DSTA. In 2011, the Staff Appraisal Form was revised to enable staff to include their contributions toward innovation and productivity.

To promote a culture of innovation, the form was enhanced in 2012 to enable supervisors to document how they have supported staff in their innovation journey. Nominees for the DSTA Innovation Award are identified from staff's documentation of their innovative contributions in the Staff Appraisal Form.

### Performance Rewards and Compensation

DSTA ensures salary competitiveness through an annual salary benchmarking process. To motivate staff to perform to their best ability, DSTA differentiates and rewards staff based on their performance and contributions toward the objectives as an individual and team.



The DSTA Excellence Awards (DEA) is DSTA's most prestigious award for demonstrating exemplary leadership, teamwork and innovation. The DEA places emphasis on leadership, competency, productivity, teamwork and innovation. Every year approximately 30 awards are given out.

# PROCESSES

## Innovation Processes

With the fast changing technological landscape, DSTA's management recognised that innovative ideas and solutions had to be systematically harvested, evaluated and implemented. As such, various innovation-related initiatives were reviewed and the iLEAP Innovation Framework was introduced in 2012.



The iLEAP framework, which represents imagination, Leadership, Environment, Appreciation and Process, is elaborated as follows:

### Imagination

This signifies the power of imagination and the ability to bring innovation to work. It also represents every staff as the foundation of innovation in DSTA.

### Leadership

Leaders in the organisation must create and sustain a nurturing climate and culture for innovation by allowing time and space for innovation, acknowledging and recognising ideas, supporting experimentation and prototyping, and facilitating the innovation process.

They should also be innovation role models to staff. Some leadership innovation roles are:

- Chief Executive - Chief Innovation Officer
- Programme Centre Head - Innovation Champion
- Deputy Director - Technology Innovator
- Supervisor - Nurture staff's innovation

## Environment

For a culture of innovation to flourish, it is important to create the right environment for staff to be forthcoming with creative ideas to respond to challenges. Below are some measures DSTA has taken to create such an environment:

- DSTA Innovation Fund to encourage bottom-up innovation for staff to explore and carry out innovative ideas that could potentially yield significant benefits
- An Integrated Project Management Team environment that allows staff from different disciplines to cross-pollinate ideas to deliver whole-of-DSTA solutions
- An open and people-centric environment that encourages innovation and learning



## Appreciation

In DSTA, staff and entities are appreciated for their innovation efforts. To this end, the “contribution to innovation and productivity” is one of the important indicators in the staff appraisal form. “Innovation and productivity initiatives” is also a key feature in entities’ ABP to identify and track innovation and productivity-related initiatives.

## Process

In creating capacity, time and space for staff to innovate, DSTA constantly explores ways to improve work processes. Innovation is always addressed upfront in projects. It is also embedded in the organisation’s systems and processes, like the Quality Management System for project management and implementation.

DSTA takes a holistic approach to identify and eliminate obstacles that hinder innovation and productivity. This includes implementing initiatives like the Reducing Red Tape Task Force. An active approach is also taken toward benchmarking projects to ensure that innovative capabilities are delivered to customers.

## Process Management

### Improving Business Processes

DSTA constantly seeks to improve business processes. Since 2011, the Reducing Red Tape Task Force has implemented 22 initiatives to streamline some 350 internal and external work processes (with MINDEF and the SAF), thus creating more capacity for staff to innovate.





## Breakthrough Improvements

DSTA continually searches for latest developments and best practices in other leading defence establishments, academia, and industries to achieve breakthrough improvements in projects and processes.

**Procurement** – DSTA pioneered the use of procurement best practices such as the Analytic Hierarchy Process, Demand Aggregation and Reverse Auction, the GeBIZ (government-wide e-commerce portal) system, and the Public-Private Partnership approach. These procurement practices have resulted in

greater efficiency and substantial cost savings, and have since been adopted at the whole-of-government level.

**Building and Infrastructure** – DSTA broke new ground in defence construction with the designing and building of Singapore's first large-scale **Underground Ammunition Facility** (UAF). This project achieved a 90% reduction in land needed as safety buffers, thus freeing up some 300ha of land in land-scarce Singapore. The UAF has since been referenced for the construction of the Jurong Rock Caverns and other large-scale underground projects by our national land planners.



In developing the **Multi-Mission Range Complex** combining seven ranges within the area required of a 100m outdoor range, DSTA has also leveraged advanced technology to maximise space and training quality. It is a first-of-its-kind marksmanship training hub for the Third Generation SAF.



## Supplier and Partnership Management

Over the years, DSTA has cultivated an eco-system of partners and suppliers, and engaged them in various innovation projects.

### Communicating Innovation to Partners and Suppliers

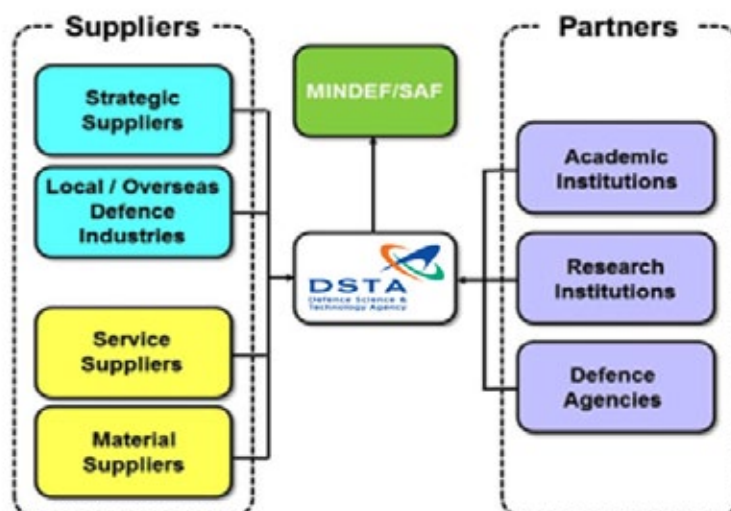
DSTA has put in place several touch-points with partners and suppliers to gather information and feedback to enhance innovation. Such exchanges have also led to future system upgrades.



At large-scale defence-related events like the Singapore Air Show, DSTA organises Suppliers Networking Sessions where the management host and interact with local and overseas suppliers.

### Supplier Audit Programme

As part of its close working relationship with suppliers and partners, DSTA establishes plans and processes to ensure that they continually improve on their products and services. The supplier audit programme was introduced to provide assurance that the entire process - from suppliers through DSTA and to the SAF - is put in place.



*DSTA's Eco-system of Suppliers and Partners*

# RESULTS

## Customers Results

### Delivering Defence Systems and Capabilities to MINDEF and the SAF

DSTA delivers and maintains many critical capabilities that are integral to Singapore's defence and security.

One such capability is the Missile Corvette (MCV) which have been upgraded and are significantly more capable than before. The upgraded MCVs are able to detect targets at greater range, enable faster decision making by commanders and crew, and perform aerial surveillance remotely. The upgrade exceeded requirements, was completed ahead of schedule and was within budget. In delivering the suite of upgrades to the MCVs, the team worked within the constraints of the existing platform to develop extensive systems enhancements. In recognition of the team's significant achievements, the MCV Upgrade Team was awarded the DTP 2014 Team (Engineering) Award.



### Customer Satisfaction

The various awards that DSTA staff have received from customer segments in MINDEF and the SAF reflect the high level of satisfaction customers have in the delivery of DSTA projects. Such awards include the MINDEF Innovation Award, MINDEF CIT Team Excellence Award, and Integrated Systems Engineering Teams Award, among many others.

## Financial and Market Results

### Maximising Resources to Increase Capacity

Over the years, the demand for DSTA's expertise from across the government, and the proportion of complex integration projects that DSTA manages has increased. Despite these challenges, DSTA has managed to deliver without scaling up its engineering headcount, through better cost management.

DSTA is also able to do more with the same engineering resources due to continual efforts in building up the competencies of young staff quickly, so that they can take more impactful work.

### Stretching the Defence Dollar

The Economy Drive is a government-wide drive that sets out to promote innovation, cost-consciousness and financial prudence within the civil and public service. DSTA has made increasing contributions to MINDEF's Economy Drive movement through real cash savings

from the approved project budgets.

## Point of Reference in Global Defence Arena

Singapore is often referred to as a “reference customer” in the global defence arena, which is testament to the robustness of evaluation, stringency and transparency of its defence procurement process.

## People Results

### Staff Engagement

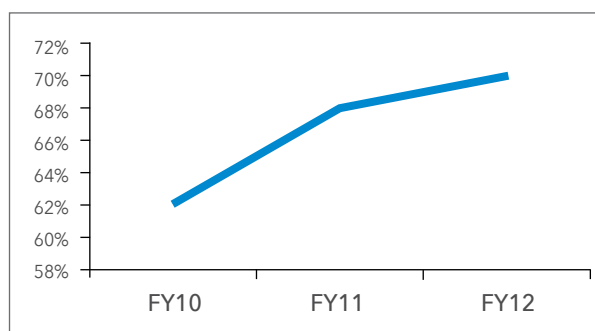
DSTA’s Staff Engagement Survey is conducted by an independent consultancy, which provides a comprehensive analysis on various aspects of DSTA’s staff engagement efforts.

Taking in staff feedback, DSTA introduced initiatives in 2011 which resulted in a 17% improvement in engagement results. These results were sustained in the 2013 survey. DSTA continues to explore various staff engagement initiatives.

### Staff Involvement in Innovation

DSTA’s innovation index shows an increasing positive perception that staff have towards innovation in their daily work. This is due to the initiatives implemented under the iLEAP Framework, and availability of DSTA Innovation Funds and facilities.

By incorporating staff contribution towards innovation and productivity into the staff appraisal, DSTA managed to attain full staff participation in innovation, even though no mandatory targets were set.



*DSTA's Innovation Index for the period from FY10 to FY12*

### Attracting Talents

To handle increasingly complex projects, DSTA seeks to attract quality hires and build their competencies quickly. According to the Brightsparks Scholarship and Education Survey 2014 conducted with some 3000 potential scholarship recipients in Singapore, DSTA achieved one of the highest rankings among engineering organisations.



In the annual JobCentral Employer of Choice Survey that provides insight into how organisations are perceived by undergraduates and fresh graduates in Singapore, engineering students and graduates from the local universities ranked DSTA among the Top three preferred government or government-linked organisation.

In the Top 20 Preferred Government/Government-linked Employer of Choice survey, DSTA has ranked consistently among the Top 10. The survey questions cover respondents' expectations of their first job and early career progression.

These results validate the effectiveness of DSTA's talent attraction strategies in attracting competent young individuals to the engineering profession.

## Operational Results



DSTA has been recognised with accolades and awards in many areas. These include the **Defence Technology Prize (DTP)**, the most prestigious accolade awarded by MINDEF. It recognises outstanding and innovative contributions in the areas of defence science and technology that have significantly enhanced Singapore's defence capabilities. Many of DSTA's DTP projects have contributed to Singapore's national defence capabilities and the SAF's technological edge.

The area of IT has also seen DSTA gain much national and international accolades. These include the multi-award winning web portal - **NS Portal**, which has won international awards like the International Service Excellence Award - Highly Commended Award for Contact Centre from the Customer Service Institute of America in 2013, and the Best IT Governance Award from the MIS Asian IT Excellence Awards in 2009. The NS Portal also won the National eGov Excellence Award for Website - Merit in 2013.

Another award winning IT project is **Enterprise Architecture**, which has won the iCMG - Enterprise and IT Architecture Global Excellence Award from the Architecture World Global Summit for three consecutive years from 2010 to 2012.

The **Serious Game "Decisive Combat"** co-developed by DSTA also clinched the Best Game in the Government Category at the eighth annual Serious Games Global Showcase & Challenge held in the United States. The game was also one of three finalists in the Best Mobile Game category out of 16 submissions.



DSTA's corporate entities have also gained recognition for their innovative systems and initiatives.

These include the **President's Social Service Award 2011** which acknowledged DSTA's efforts in achieving innovation and delivering sustainable impact through staff volunteering to the community, the **Ministry of Defence Awards 2013** which recognised DSTA for its support of Total Defence, and the **SHARE Award (Silver) 2014** for DSTA's high level of participation in the Community Chest's SHARE programme.

As an organisation, DSTA has also attained several business excellence awards. DSTA was awarded the Singapore Quality Class (SQC) in 2003 and the SQC STAR in 2010. DSTA's Quality Management System has been certified to ISO 9001:2008 standard.





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