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ABSTRACT

It has been more than a decade since DSTA embarked on its Knowledge Management (KM) journey in 2003. The next step in DSTA’s KM journey lies in the evolution of its Intranet portal from an information-centric to a social-centric workplace.

This article describes how DSTA implemented enterprise social collaboration in its Intranet portal through the use of modern web technologies and user-centric design. This has created a conducive environment to improve engagement, learning, collaboration and productivity within the organisation.

Keywords: collaboration, knowledge management, sharepoint, social collaboration

INTRODUCTION

Since embarking on its Knowledge Management (KM) journey in 2003, DSTA has attained major milestones which included the creation of the eHabitat Intranet Portal, the DSTA Extranet platform, as well as the Content and Document Management System – DSTA’s records repository that archives enterprise content, collaboration tools, and Action and Issues Management System meeting tools.

From 2003 to 2009, the growth of KM in DSTA was evident from the usage of different KM applications and tools, to the contribution of documents and sharing of information. A community of Knowledge Managers, who acted as change agents for their respective entities, was also established to help proliferate the ground-up adoption of KM in the organisation.

The following phase of DSTA’s KM journey was in transforming its eHabitat Intranet platform from an information-centric to a social-centric workplace. This involved implementing enterprise social collaboration through the use of modern web technologies and user-centric design. Enterprise social collaboration describes the technologies and processes used to boost collaboration in the workplace.

This new wave shifted the paradigm of how people created, stored and shared knowledge by leveraging Web 2.0 and social computing tools. It was thus timely for DSTA to ride on these emerging technologies to address existing gaps in KM, redefine its landscape and transform the way staff work.

At the same time, there were significant changes in the IT landscape of DSTA and the Ministry of Defence (MINDEF). These changes included network separation¹, heightened security concerns and an increased need for cross-domain collaboration to solve complex and large-scale problems.

These were the driving factors behind the transformation of DSTA’s eHabitat Intranet platform into its current form – eWorkplace.

eWorkplace is DSTA’s next-generation digital workplace designed to transform how people create, organise, store, search, use and share knowledge. As a result, it will enhance work effectiveness, knowledge sharing and engagement within the organisation.
EWORKPLACE STRATEGY

The basis of the eWorkplace transformation involved a move from a content strategy to a connection strategy (see Figure 1).

Content strategy focuses on codifying knowledge in DSTA into reusable knowledge assets that are stored into repositories to be retrieved at a later time. It also focuses on the management of enterprise records. Codifying knowledge assets maximises knowledge retention and the efficient reuse of knowledge assets.

Connection strategy focuses on connecting people to collaborate and solve problems by tapping their collective wisdom. It also involves connecting people to content in the repositories through efficient search and retrieval. Connection strategy emphasises the creation of new knowledge through the building of DSTA’s enterprise social network to facilitate people-to-people dialogue and collaboration.

EWORKPLACE PARADIGM OF SPACES

The basic tenet of eWorkplace is thus centred on DSTA's paradigm of three main spaces: corporate space, team space, and personal space (see Figure 2).
Corporate space is the authoritative source of all official enterprise content and an important communication channel for staff. In addition to information dissemination, it should leverage social computing tools to provide a role-based, seamless and multimodal work experience for the end user.

Team space is a contextualised one-stop page for staff to collaborate, store, access and work on shared content together.

Personal space is a personalised page for staff to manage their own productivity. It also serves as a one-stop channel to provide specific information to staff based on their activities, memberships and subscriptions within the workplace. In addition, staff use this space as a platform for social networking.

**DESIGN PRINCIPLES**

To ensure a simple and secure platform, eWorkplace was designed with three main principles:

a) **One-stop Secured and Integrated Front** – Staff would be able to find information they need quickly and easily via a one-stop integrated front which pools together information from disparate sources.

b) **Person-centric** – The emphasis would be on the individual and how he or she works. Staff would experience a highly personalised experience via intuitive user interfaces and receive contextualised information through, for example, subscriptions and notifications.

c) **Process-centric** – As a large part of work in DSTA revolves around processes, there was a need for eWorkplace to enable staff to comply with processes via a contextualised and personalised user interface.

**TRANSFORMING DSTA’S WORKPLACE USING ENTERPRISE SOCIAL COLLABORATION**

Locating a subject matter expert, social commenting and accessing newsfeeds and enhanced search features are some of the new norms that have changed the way people work, share information and increase productivity in an organisation.

There was a lack of social tools in DSTA’s previous Intranet platform. The project team thus evaluated several technologies and selected a reliable and powerful platform that could provide collaboration, social media, search, enterprise content management and business intelligence features.

**Collaboration, Learning and Sharing**

Communities of practice and team sites allow staff to share and acquire new knowledge and insights easily. Within eWorkplace, staff can share tacit knowledge through noteboards, blogs and discussion forums within the corporate and team spaces. An example would be the eLibrary, a central repository that consolidates and shares technical documents authored by DSTA staff. It enables staff to conduct work-related research into technical documents that are either produced by a staff through the course of a project or by independent research. eWorkplace provides a proper underlying file structure and classification system for the sharing of these technical documents.

As eWorkplace is an integrated enterprise productivity suite, the user experience in performing co-authoring and review during collaboration is enhanced greatly. With office web apps and different service applications powering eWorkplace and the enterprise productivity suite, multiple authors are now able to review and edit different segments of a document simultaneously.

For traditional users accustomed to checking in and out files, eWorkplace has transformed the way they work. Building on existing versioning conventions, eWorkplace allows differentiation between published and draft versions of documents. Workflows can also be put in place if there is a need to set up a formal approval process for sensitive documents that require approval before publication.

Staff can also keep up to date on documents that are of importance to them by subscribing to alerts via e-mail and newsfeeds pushed to their personal pages and team sites.

Wiki page is another social collaboration tool which collates authoritative and informative content to promote staff learning. The ease of use of a Wiki page as a content publishing tool encourages users to create and share content with the rest of the organisation.
Staff Engagement

One fundamental shift for eWorkplace was from an information-centric to a social-centric paradigm. Management blogs were developed to allow management to share their thoughts and engage staff in an inviting and accessible environment. Through social networking capabilities, staff are able to comment on these blog posts and contribute opinions and feedback. They can also subscribe to these blogs to keep abreast of any latest development.

Community discussion forums can also be used to generate social conversations and feedback related to specific organisation initiatives and events. For example, prior to the DSTA Staff Conference, a community discussion forum was used to gather feedback from staff on pertinent engagement issues which were subsequently addressed during the conference.

This allows management to sense the pulse of the organisation constantly and receive feedback directly from the ground.

Personal Productivity

One key innovation and a cornerstone of eWorkplace was the consolidation of disparate information into a one-stop personal page. Previously, users had to navigate to different pages of interests to retrieve information. Now, they can receive updates from these pages instantly through newsfeeds and notifications.

The new personal page feature in eWorkplace also serves as a directory that profiles each individual staff within the organisation. Staff can list down their expertise and competencies, which are combined with pertinent information such as secondary appointments. This enables staff to locate subject matter experts and also provides a platform for staff to develop social networks within the organisation.

The newsfeed and notifications features allow staff to stay updated on latest happenings in a productive and interactive manner. Staff members are able to subscribe to sites which they are interested in and receive newsfeeds on updates made to these sites. Staff can also receive notifications regarding events they have registered for, tagged items, social activities, upcoming meetings and assigned tasks.

Furthermore, eWorkplace provides Twitter-like features to staff microblogs. In addition to allowing images and videos to be posted with status updates for richer interaction, eWorkplace also introduced hashtags and mentions to create an immersive digital equivalent of a real-time conversation and networking session.

When staff follow a hashtag, they will be notified via their newsfeed on current conversations of interest for them to join. New and direct connections can also be made among staff through the use of mentions within conversations.

To further augment productivity, each staff was provided with a personal repository to store private files. This allows staff to access their files from anywhere within DSTA.

Corporate information on the Intranet was reorganised into a newly defined information architecture. Policies and guidelines were consolidated into a one-stop site instead of disparate corporate portals. Access to services, like transactional applications and online forms, was also centralised. This improved information architecture enhanced information findability and overall user experience and productivity greatly.

Innovation and Crowdsourcing

Social collaboration tools provide crowdsourcing capability to complement problem-solving and idea-generating processes. Through the use of discussion forums, tags and ratings features, staff can contribute ideas and opinions on various content throughout the workplace. This influences the visibility of salient information and contributes to the innovation process.

Introduction of implicit (hashtags) and explicit (mentions) ways for staff to network and engage with one another within eWorkplace also allows multi-dimensional channels to promote crowdsourcing and innovation in the organisation.

Reliable Information at One’s Fingertips

The search feature in eWorkplace uses a new ranking model to determine the items to display and the order in which results are displayed. Behind the scenes, the analytics component in eWorkplace tracks and analyses how content is connected continuously, how often an item appears in search results and which search results people clicked to determine and improve the relevance of search results. Previously searched results
Though the previously released version would be supported until 2020, the project team recognised the importance of harnessing advances in technology to optimise current investments and future-proof DSTA’s IT landscape. The new product version would also improve user experience and provide better performance. Hence, the decision was made to upgrade to the new version and reuse existing developed modules.

**Change Management and User Engagement**

With a large-scale implementation catering to more than 3,000 users, user engagement through change management was key to the success of the project. The team was able to solicit feedback on eWorkplace quickly and improve the system design through the help of Knowledge Managers and Assistant Directors (Planning and Control) as change agents. Walk-in clinics (instead of the usual classroom-based training) were conducted after eWorkplace went live and served as an avenue for users to request for assistance or provide feedback easily.

It was also important to promote the use of the system in a fun and informal way. Quizzes, logo design competitions, blog articles, feedback sessions and various other engagement campaigns were organised throughout the first year of implementation. This encouraged users to discover more about eWorkplace and familiarise themselves with its new features.

**GOING FORWARD**

Since its implementation, eWorkplace has achieved success as DSTA’s next-generation information work space. This is evident from the content that has been accumulated – more than 1,000 team sites, 7,000 wiki pages, 1.4 million documents, 46,000 photos and 25,000 announcements.

eWorkplace implemented a secure and robust content infrastructure and leveraged Web 2.0 technologies to achieve the goal of connecting people to people and people to content via person-centric workspaces. These include a one-stop personalised space, team spaces with workflows for simple approvals and proper filing of project documents, and a reorganised corporate Intranet based on the information architecture and taxonomy developed in Phase 1.
Focus for the next phase will be on the infrastructure, processes and strategies needed to build social channels for communication and collaboration within and beyond the organisation. Enterprise social technologies combined with data analysis and mobile technologies will connect people to spot trends and leverage the knowledge of the organisation to complete tasks rapidly and surface previously hidden pockets of valuable information (see Figure 3).

ENDNOTES

1 Network separation refers to the initiative to secure the organisation’s work environment by means of information segregation.

2 DSTA-authored technical documents include trip and study reports, conference papers, post-grad theses and case studies.

3 The waterfall model is an approach used in software development. It is a sequential design process that comprises the phases of Initiation, Design, Testing, Implementation and Maintenance.

4 Big bang adoption is a software release method that involves getting rid of the existing systems and transferring all users to the new system simultaneously.
**BIOGRAPHY**

**KOO Yih Liang Kevin** is the current Ops Manager of eWorkplace in DSTA’s Chief Information Office (CIO). He is responsible for driving the adoption of eWorkplace and the continual improvement of the platform. He was also part of the Enterprise IT (EIT) team that transformed the human resource IT landscape for the Ministry of Defence and the Singapore Armed Forces. Kevin obtained a Bachelor of Science (Electrical and Computer Engineering) degree and a Master of Engineering (Operations Research and Information Engineering) degree from Cornell University, USA, in 2002 and 2003 respectively.

**SOH Yun Lin Jason** is a Senior Engineer (Enterprise IT) from the Business Information Analytics and Database Services team. He is responsible for the development and adoption of sentiment analysis, data mining and visualisation. He was previously part of the EIT-DSTA Systems team involved in the support of operations for eHabitat and Ops-Support Net, and their eventual transformation into eWorkplace. Jason obtained a Bachelor of Computing (Information Systems) degree, with specialisation in Service Science, Management and Engineering, from NUS in 2011.

**LiM Lay Har Evon** is Assistant Director (Planning and Control) from Enterprise IT Programme Centre. She led a team to implement eWorkplace and other Knowledge Management (KM) projects in DSTA to deliver the next wave of KM and social enterprise capabilities. She was previously involved in business development and planning as well as in competency development programmes to drive the development of SAP Enterprise Resource Planning capabilities and competency build up within Enterprise IT Programme Centre. Evon obtained a Bachelor of Science (Computer and Information Sciences) degree from the National University of Singapore (NUS) and a Master of Technology (Software Engineering) degree from the Institute of Systems Science in 1999 and 2004 respectively.

**HO Wei Ling Angela** is Head Design Thinking (Enterprise IT). She was previously the Ops Manager of eWorkplace in DSTA’s CIO. She co-created DSTA’s KM vision and strategic roadmap, and oversaw the successful roll-out of eWorkplace. A recipient of the DSTA Overseas Undergraduate Scholarship, Angela graduated with a Bachelor of Science (Computer Science) degree with Honours, with a focus on Human-Computer Interaction from Carnegie Mellon University, USA, in 2004. She further obtained a Master of Science in Technology and Policy, with a focus on Aeronautics and Human Factors, from the Massachusetts Institute of Technology, USA, in 2006.