



DEFENCEx: BENEFITS AND RISK ANALYSIS

Lieutenant-Commander Cameron Evelyn

JCSP 50

Service Paper

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DEFENCEx: BENEFITS AND RISK ANALYSIS

AIM

1. The aim of this service paper is to evaluate the Department of National Defence's (DND) efforts to modernize its Enterprise Resource Management (ERM) Software through the DEFENCEx project and its ability to support the Canadian Armed Forces' (CAF) components in future operations. It will highlight potential gaps and deficiencies within the project and provide some recommendations on how best to improve the department's agility with respect to modernizing IT-enabled business processes.

INTRODUCTION

2. DEFENCEx is the new re-branding of the Defence Resource Management Information System (DRMIS) Modernization project. The largest initiative found within the larger Defence Resources Business Modernization (DRBM) programme, it is sponsored by the Digital Transformation Office (DTO) (formerly known as Assistant Deputy Minister (Data, Innovation, Analytics) (ADM(DIA)) and implemented by Assistant Deputy Minister (Information Management) (ADM(IM)). It is a critical component of the Chief of Defence Staff's (CDS) Operational Sustainment Modernization Strategy where DEFENCEx is expected to achieve business transformation through "process standardization, digitalization, and data integration."¹ The project is stated to "deliver a secure, sustainable and user-focused digital solution that will allow for modernization and critical business transformation of resource management across the DND/CAF in support of future operations."² While funding for the project was made available in the 2018 Defence Investment Plan, the project has yet to enter the Project Definition phase, which it is scheduled to enter into this upcoming Spring 2024.³ The project is at risk of not being completed before the current version of DRMIS reaches its end of life in December 2027.³

3. This paper will first look at the benefits of DEFENCEx, its impact on CAF operations, and draw attention to how important its modernization efforts will improve work processes and make them more efficient to end users. Next it will discuss how the project is at great risk of not being complete before the current version of DRMIS reaches its end of life and how that will impact CAF operations. Finally it will conclude the discussion with some recommendations on the CAF can soften the impact of a late project delivery by improving Information Technology (IT) governance to embrace concepts of agility and innovation.

DISCUSSION – DEFENCEx BENEFITS

4. DRMIS is DND's primary ERM software and is responsible for a wide variety of business processes, data repository, data transactions, and organizational functions. All CAF components and other Level 1 (L1) organizations use it in their day to day business. From the finance clerk entering in a payment to a member for a claim, to an engineer requesting materiel in order to conduct repairs, CAF personnel are either using the system directly or a host of other

¹ Chief of Defence Staff. 'Operational Sustainment Modernization Strategy,' 6.

² Doyle, 'DEFENCEx,' slide 32.

³ DTO, 'DEFENCEx Info Sheet.'

auxiliary software (i.e. ClaimsX, the Automated Cashier System (ACS), etc.) that has been integrated within the DRMIS ecosystem. The only domain DRMIS is not responsible for is Human Resources (HR). The HR domain uses an Oracle based software called PeopleSoft, and is therefore out of scope for the DEFENCEx project.

5. First acquired by DND in 2009, DRMIS is the system of record for the department. Developed by German software developer SAP, the current version of DRMIS used by DND is the SAP Enterprise Resource Planning (ERP) Central Component (ECC). ERPs integrate digital information entered into the system from one domain with information from other domains, all in real-time. This enables senior decision makers as they can review, correlate data, and produce reports making better and more informed data-driven decisions. You can think of the ECC as one large database of information containing all of DND financial transactions, as well as material and asset inventories. Layered on top of the ECC is the Business Warehouse. This area takes all of the raw data found within ECC and summarizes it for SAP's Easy Access Reporting module, as well as other reporting mechanisms. For example, the Business Warehouse may collate fiscal data transactions pertaining to a specific fiscal year, financial coding, etc. and summarize it so that it could be pulled into a report for viewing at a later time. The final layer is SAP's Business Objects (BOBj) application. First released in 2009, it offers DND users the ability to query the ECC database for analytics, performance measurement and planning purposes. Within DND, Assistant Deputy Minister (Finance) (ADM(Fin)) has developed the Financial Planning and Forecasting (FP&F) application within BOBj to take advantage of this functionality. FP&F is primarily focused on in-year quarterly forecasting where end users are able to pull financial information directly from the other two layers and use it to make decisions on how to forecast the current fiscal year.

6. Starting in 2015 SAP has begun to roll out the next generation of ERP called S/4HANA. Of the three layers mentioned above it is focused on replacing ECC as an enterprise's software architecture and represents a significant change in how data is structured and organized in a software database. To understand some of the benefits of these changes it is important to understand the difference between traditional row-based relational databases and columnar databases. ECC uses a traditional row-based relational database. In these types of databases sets of data are organized in rows with each "transaction" representing each row. In order to pull information from the database, a query would have to read each row separately. While this may work sufficiently for small to medium sized organizations, large organizations like DND with billions of transactions, row-based relational databases can take a long time to search the entire database for information. This is the central reason why when end users are using DRMIS and enter in a query, there will be a 10-30 second delay (sometimes more) before a response is provided by the system. Columnar databases were developed to resolve some of these issues of scaling with large databases. In a columnar database, such as S/4HANA, the database only searches along the columns that are directly related to the query; this speeds up the search for information significantly.

7. One of DEFENCEx's central activities will be focused on the upgrading of DND's ECC into S/4HANA, therefore it should achieve the database efficiencies mentioned above. However S/4HANA has a few other upgrades that DEFENCEx is hoping to bring to the CAF. According to a presentation given by DTO last November, DEFENCEx will also deliver "enhanced

business analytics [in order] to enable data-based decision making,”⁴ “increased standardization and integration of Enterprise business processes,”⁴ “increased data reliability and improved data security posture”⁴ and “enhanced deployed capability”⁴ in order to support operations. CAF business process modernization is essential for it to remain operationally effective.

Technological solutions have advanced greatly in the past few years with respect to database management, business analytics, algorithms, and of course generative artificial intelligence. Many organizations have taken advantage of these advances in order to streamline their operations, make them more efficient, and provide them with a way of making improved evidenced based and data driven decision making. Particularly in an era of risk adverse decision making and CAF Reconstitution, these types of technologies would go a long way towards improving CAF operations. DEFENCEx is hoping to capitalize on many of these advances, but faces a few risks with respect to its completion.

DISCUSSION – DEFENCEx RISK ANALYSIS

8. The greatest risk facing everything that DEFENCEx is promising to deliver is its completion date. Currently DEFENCEx is scheduled to reach Initial Operating Capability (IOC) in the Spring of 2027, with Final Operating Capability (FOC) being achieved in the Summer of 2029.⁵ The challenging aspect to these dates is that SAP has said that it will cease support to ECC in December 2027. Now it is possible that SAP could provide an extension to supporting ECC further into the future, as they have done so in the past; previous dates of ceasing support to ECC have been as early as 2023. However DEFENCEx project timelines have already been compressed increasing the risk of late delivery. While a DTO Info Sheet released in November 2023 shows that the Project Definition phase is set to begin in the Spring of 2024⁵, a previous presentation given at a Comptroller Conference nine months earlier had the Project Definition phase beginning in June 2023.⁴ Continued delays of the project will only serve to greatly increase the risk of late delivery and potentially jeopardize DND’s software architecture. SAP cannot support ECC indefinitely and DND must progress DEFENCEx initiatives as quickly as possible, in order to not only not miss the deadline of SAP ceasing support of ECC, but also so that the CAF can realize and utilize the benefits and advantages described above, and meet the demands of conducting military operations in a modern world.

9. DEFENCEx is faced with the very complex problem of migrating billions of data from ECC into S/4HANA, across multiple L1s and integrated business processes including finance, supply chain management, engineering and maintenance, and real property. Data migration is no easy task under any circumstances, and given the project delays seen above, there also exists the risk that project costs may increase drastically in order to maintain project timelines. If project costs do end up ballooning out of control, there is a serious risk that the scope of the project would be reduced in order to keep costs below thresholds as well as to meet timelines. This means that many of the above advantages including enhanced deployed capability, increased integration of other business processes and increased analytics may be removed from scope, in order to just focus on the data migration aspects of the project. While certainly some of these aspects could always be added in future projects, their delay in implementation could impact the full realization of the benefits of S/4HANA. Upgrading the underlying database infrastructure

⁴ Doyle, ‘DEFENCEx,’ slide 32.

⁵ DTO, ‘DEFENCEx Info Sheet.’

could lead to faster load times and more efficient business processes as described above, but if no other changes are made to any of the integrated business processes, the result for the end user may be the same. Think of it similar to upgrading a car engine from a V6 to a V8, if the other components are not upgraded as well (i.e. transmission, exhaust system, suspension, etc.), the full power of the V8 may not be realized.

DISCUSSION – AGILITY AND INNOVATION IN CAF IT GOVERNANCE

10. Despite these challenges and risks that the DEFENCEx project faces its initiatives are important to CAF business process modernization and should be prioritized accordingly. The CAF should also look to modernizing its IT governance structure to be more agile and innovative as it would help to mitigate some of the risks associated with DEFENCEx. Even if DEFENCEx is not late it is still years away from completion. Therefore the question is can the CAF modernize some of its business processes in the interim? This can be difficult given that IT governance structures are known to be slow and full of bureaucratic red tape and risk adverse processes that are difficult to overcome.

11. Fortunately, the CAF is full of very talented people, many of whom are hard at work at developing their own initiatives in the absence of solutions provided by the L1s. During the pandemic when most personnel were forced to work from home, a unit out of CFB Valcartier developed their own application (Finances, Administration, Resources Organization - FARO) to allow finance clerks to conduct claim audits completely online. Their application included a full suite of analytics that greatly aided managers in making decisions on audits as well as tracking the progression of claims. In another case the comptroller shop in CFB Cold Lake leveraged Power BI to provide quarterly financial reporting to their senior leaders that they can review on their own cell phones. The issue with some of these solutions is that they are not always integrated with the DRMIS ecosystem, and therefore as DRMIS is the system of record for the department, users end up entering the same data multiple times across systems. Also while these solutions have utility across the CAF, information sharing is not well practiced and that prevents the entire CAF from benefitting from these solutions.

12. In order for the CAF to remain operationally effective in an increasingly modernized world, and help address some of the challenges associated with DEFENCEx, its IT governance structure needs to embrace the concepts of agility and innovation. The Royal Canadian Navy (RCN) attempted to address innovation by creating Command Analytic Support Capability cells (CASC) within each of their L2s. While it was a good initiative, they have become tech support cells focused on maintaining the status quo. CASC cells should be found within each CAF element/component. They need to be led by non-IT staff and linked into all senior leadership meetings within their respective formations so that they can better understand the information requirements that are needed to support decision making (and the data sets associated with them). They also need to be linked to one another to encourage information sharing of products and solutions developed within their respective formations, and provide required training to all senior leaders in the CAF on the usage and benefits of analytics, as they will act as champions for these initiatives within their respective units. Addressing agility and integration with DRMIS is a little bit more challenging as ECC is not as easy to achieve integration with as S/4HANA is. However, depending upon funding and resource constraints, ADM(IM) and the DTO should

strive to work regularly with the CASC cells to determine if any products or solutions developed at the lower levels are worth investing in integrating with the rest of the DRMIS ecosystem.

CONCLUSION

13. DEFENCEx is a CAF project that is stated to modernize CAF critical business processes transform resource management across the DND/CAF in support of future operations. While its primary activity will be to migrate the data found within ECC into the more efficient and faster S/4HANA software architecture, it is also expected to improve other capabilities including integration, analytics and support to deployed operations. While expected to reach IOC in Spring of 2027, the project has not even yet begun the Project Definition phase which has already been delayed, and with SAP set to cease support for ECC in December 2027, there are risks associated with late delivery, increased costs and reduced scope.

RECOMMENDATIONS

14. In order to meet the requirements in the CDS's Operational Sustainment Modernization Strategy, it is recommended that the CAF:
- a. prioritize the DEFENCEx project and ensure that it has the “adequate resources and expertise to continue developing processes and activities that are key to the Programme's success;”⁶
 - b. establish CASC cells within each L2 of the elements/components. CASC cells are to:
 - i. be led by a non-IT senior LCol/Cdr;
 - ii. participate in all senior leadership meetings/committees within each L2;
 - iii. provide required analytics familiarization training to all senior leaders within each L2;
 - iv. meet on a bi-annual basis with the CASC cells within other L2s to share information on best practices and product/solution development; and
 - v. maintain a database easily accessible to all users with information on products/solutions that are developed within each CASC cell, and how to implement within their own L2.
 - c. ADM(IM) and DTO to work with CASC cells on evaluating developed products and solutions for further investment in integrating within the larger DRMIS ecosystem.

⁶ ADM(RS), ‘Assessment of the Defence Resource Business Modernization Programme.’ 16.

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