Architecture Driven Modernization
Systematic Approach to Modernizing Legacy Applications

The Advanced Systems Management Group Ltd (ASMG) has teamed with the Software Revolution INC (TSRI), to bring Architecture Driven Modernization (ADM) to the Canadian Market.

The ASMG is a wholly owned Canadian company, founded in 1994. ASMG is focused on the delivery of open standards, technologies and solutions to address the need for enhanced levels of interoperability within and between government agencies, industry partners in the public and private sectors. Stakeholders in each of these segments are seeking to balance the need to share (release) information and the need to protect sensitive (private, confidential and classified) information. Since its inception, ASMG has focused on the policy, architecture, engineering and maintenance challenges preventing wide scale adoption of strategies and technologies needed to deliver information system interoperability within and between government agencies, allies, the private sector and the public.

- Legislation and Policy;
- Detailed Memorandum of Understanding (MOU) and Service Level Agreements (SLA);
- Business Knowledge:
  - Information Management and Exploitation Strategy,
  - Information Sharing Strategy,
  - Business/Enterprise Architecture, and
  - Information Architecture,
- Technical Knowledge
  - Security Architecture,
  - Application Architectures, and
  - Technical Architectures,
  - Network Architectures
- Standards and Technology

As illustrated in the Auditor General of Canada's Spring report, the Governments of Canada are challenged by aging information technology (IT) systems. This not only refers to the age of the systems but the issues that affect their sustainability over the short, medium and long terms. Many of the governments IM and IT environments face challenges with the availability of software and hardware support and of people with the necessary knowledge and skills to service these systems. These systems are further challenge in their ability to adequately adapt to changing business needs or emerging technologies. Some of the identified challenges include[1]:

- **Skills shortage**, fewer and fewer staff and contractors have the skills and knowledge to use older programming languages and source code structures.
- **Vendor support**, vendors (system developers and integrators) may no longer exist or no longer support older products.
- **Regulatory compliance**, outdated systems may be hard to update to comply with changing laws, regulations, and industry standards.
- **Maintenance costs**, costs go up because aging systems are very complex and difficult to maintain, there are few service providers, and parts are scarce and often very costly. These cost are consuming greater and greater portions of the IM/IT budgets of many organizations; leaving fewer resource to enhance capability.
- **Access to data**, information becomes increasingly cumbersome to extract and analyze as data structures age.
- **Meeting client expectations**, outdated systems cannot be modified to support modern technologies and meet expectations, such as 24/7 availability and workflow.
- **Security**, Legacy outdated systems cannot always be modified to conform to changing security requirements.
- **Green IT initiatives**, outdated IT systems are generally not energy efficient and are hard to modify to reduce their environmental impact.
- **Disaster recovery**, the more outdated the system, the harder it is to recover data after a disaster.
- **Interoperability**, outdated systems cannot be upgraded to support the growing needs of government to interoperate (share data in a secure and trusted manner) within and/or

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[1] Based on the 2010 Spring Report of the Auditor General of Canada, http://www.oag-bvg.gc.ca/internet/English/parl_oag_201004_e_33704.html

between government agencies, private sector agencies and the public.

Underpinning the Auditor General's report are three significant challenges/risks:

1.   **Institutional Memory**, due to the age of the systems, turnover of staff (client and vendor), and the immaturity of the IM/IT practices of the day, the knowledge needed to update and modernize legacy systems has been lost.

2.   **Documentation**, much of the architecture, development and testing data has not been maintained – providing little opportunity to train new personnel to maintain older systems.

3.   **Cost of software conversion**, without proper knowledge and documentation traditional (often manual) software conversion are very difficult and costly undertakings.

Recent activities in the Object Management Group's (OMG) Architecture Driven Modernization (ADM) Task Force and the Software Assurance Special Interest Group have provided an enhanced set of concepts and standards to address the challenges. Both ASMG and TSRI seek to bring these capabilities to the Canadian Market.

The Software Revolution Inc. was founded in 1995 and is a provider of automated modernization solutions for the military, governments and industry. TSRI has a track record of numerous, successful and published case studies of system modernization projects

TSRI products have the capability to transform legacy applications into high quality multi-tiered architectures. These can be applied as client or web based services linked to modern object oriented, relational or XML/RDF data stores over the latest IM/IT infrastructures. Using the TSRI technology, stakeholders can retain the original language or translate the system from one of 20+ programming languages to modern languages such as of JAVA, C++, C#, EGL, VB that run in scalable high assurance platforms such as .NET, J2EE/Java EE, GCSS, TBMCS.

TSRI'S Iterative and versatile end-to-end solutions can be customized to each customer's unique requirements. The TSRI process provides the ability to DOCUMENT, TRANSLATE, REDESIGN, REUSE, REHOST, RE-ARCHITECT, RE-FACTOR, RE-STRUCTURE, RE-COMPONENTIZE and WEB-ENABLE existing application ay a fraction of the cost of traditional methods.

TSRI's ability to transform Thousands or Millions of lines of code quickly, accurately, and uniformly as a repeatable, iterative and perfective model-based (rule-drive) process, minimizes human errors, and defect free outcomes are routine. The process employs Transformation Blueprints™ to model the before and after states of the code, UML design and application architectures. These products can be integrated into an organization's AS-IS and TARGET enterprise architectures, at any stage of the modernization process, to provide increased corporate knowledge and institutional memory.

To assess technical risk, assure the accuracy of its cost and schedule estimates and demonstrate the applicability of its process to prospective client systems, a no-cost Transformation Blueprint™ pilot demonstration can be performed, from TSRI office, on the client's application code during its proposal preparation process. For sensitive application environments, the Blueprint™ pilot can be supported the ASMG (Security Cleared Facility) or Government Location at a pre-agreed cost.

Both ASMG and TSRI are dedicated to the delivery of standards based solutions and industry best practices to the Canadian Market. TSRI's brings a substantial knowledge and capability in Architecture driven modernization to this teaming arrangement. ASMG brings an in-depth knowledge and experience in requirements of the governments of Canada, as well as Architecture Frameworks, Enterprise Architecture, Engineering (Systems and Information) and Interoperability. This teaming combines the strengths and capabilities of the two companies need to address to provide an integrated solution to the foundational challenges identified in the Auditor General's Spring 2010 Report:

1.   **Increased Institutional Memory**,

2.   **Enhanced documentation**, and

3.   **Reduced cost of software conversion**,

REFERENCES AND LINKS

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