**Item of SR&ED work**

One page per project is ideal. Bullet form is sufficient

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| **SRED Project Name** | SG Legacy System Modernization Program |
| **Key Contacts** | Amit Koul, VP Digital & IT |
| **Project** | SG Legacy System Modernization Program |
| **Sub-project** | n/a |
| **Start date** | Aug 2018 |
| **End Date** | Aug 2019 |
| ***Technical Advancement*** | ***PROJECT BACKGROUND:***  *What was the state of the common body of knowledge at the company in respect to the technology surrounding the obstacle at the start of the project? (include technical platform, and the improvement sought or achieved)*  *(Include all activities and due diligence (for example, literature search, technology review)*  Established in 2005, Stargate Logistics is fast growing company in transportation industry providing transportation/logistics services across North America.  In today’s customer-centric, digitized way doing business, Stargate was under constant pressure to remain competitive, deliver quality customer service, and find innovative ways to optimize their operations. The following is a list of specific challenges that were impacting the operations and profitability of the company   * increasing operational costs * manual business processes * outdated legacy systems * stricter regulations imposed by federal, provincial, state and local authorities * environmental issues * driver shortage and retention * lack of a technology strategy & implementation   ***4. Was the overall approach undertaken for the purpose of achieving a scientific or a technological advancement? Explain.***   * + ***Advancements can occur in knowledge of new techniques, but also in our understanding how best to use them and which solutions, techniques, are appropriate for which purposes.***   **Strategy:**  Stargate appointed TSI to complete a comprehensive end to end assessment of their industry and business operations and devise an overall business transformation strategy to achieve the following business objectives   * Fleet Visibility and Tracking * Increase Operational Efficiency * Decrease Operating Expenses * Increase Compliance and Safety * Modernize Fleet Management & Maintenance   **Scope:**  To address the above challenges and meet the company’s business objectives, TSI established the SGL Modernization Program with the following scope:   * End to end review and assessment of current business processes, technology and organizational structure * Understanding and documentation of requirements for the future state * Design, Development and Delivery of Integrated solutions for   1. Dispatch Management   2. Fleet Management   3. Human Resource Management   4. Finance Management   5. Warehousing   6. Repairs and Maintenance   For the SGL Modernization Program, TSI leveraged partnerships with the following technology vendors and proprietary software companies in order to successfully implement integrations using various APIs.   * Microsoft for Azure Cloud services * Samsara for GPS tracking devices * IngramMicro & * Various software vendor   As part of this engagement, TSI fully resourced the Program Team with the following key roles   * Business/Systems Analysts * Solution Architect * Technical Lead * Software Engineers * Middleware/Integration Specialist * Database Administrators * Test Engineers * Project Manager * Training Lead * Organization Change Management Lead   **Application Integration**  Key challenges was integration with various applications which were all developed/bought from various vendors without understanding the integration complexities. |
| **Activities**  (*approaches,*  *Iterations,*  *outcome, success, failures)* | ***2. Did the effort involve formulating hypotheses specifically aimed at reducing or eliminating that uncertainty? Explain.***  TSI deployed multiple strategies in order to meet project objectives and overcome issues involving scope and timing:  First and foremost, TSI worked with the client to ensure key decisions regarding scope, schedule and budget were clearly understood, documented and communicated to various client and TSI resources. This helped to clear ambiguity around the extent of features and functionality that the solutions would deliver.  Secondly, TSI maintained steady and continual focus on Stakeholder Engagement at all levels by   * Consistent and regular communication about the progress of the program to stakeholders with a clear identification of risk and issues along with accountable owners * Tailoring of communication styles to address various types of stakeholders (senior management vs front line staff) * Constantly applying a ‘seek to understand’ attitude client contacts so that solutions being offered would address their pain points head-on.   Thirdly, deploying a strong executive leadership presence and governance through an Executive Steering Committee that comprised of the client and TSI’s executives.   * The ESC received frequent updates on the overall status progress of program deliverables * Any obstacles and challenges impeding progress were escalated through the appropriate channels for quick resolution   Finally, strong collaboration and partnership with vendors, including frequent checkpoints to ensure vendors were meeting their target deadlines.  ***3. Was the overall approach adopted consistent with a systematic investigation or search, including formulating and testing the hypotheses by experiment or analysis? Explain.***  Our processes and methods for knowledge transfer focused on ensuring the cost of ineffective transfer is mitigated. To facilitate knowledge transfers from/to our IT experts to our clients’ permanent employees we employed a multitude of methods to meet each customer’s individual needs.  We worked with the client to understand and document knowledge transfer requirements and agreed to methods of delivery (documentation, presentations, tool demos, process walkthroughs etc.)  The client was responsible for ensuring adequate resources/time for knowledge transfer and associated tasks was allocated to ensure timely completion.  Every step was taken to address gaps in knowledge requirements and approach was tailored to meet the unique needs of the knowledge recipients. Knowledge methods included, but were not limited to:   * Training (Classroom and Virtual) * Shadowing * Coaching * Knowledge repository * Desktop process and procedure updates * Short-form content (job ads, quick reference guides)   Through out the Knowledge Transfer processes we collected feedback to ensure end-users were able improve knowledge capabilities (e.g. lessons learned/observed, periodic surveys, feedback, after action reviews).  ***5. Was a record of the hypotheses tested and the results kept as the work progressed? Explain.***  *When describing work, focus on the following:*   * *Chronological Milestones of the process (initial design, different versions of prototype development, alpha testing, beta testing, black-box testing etc.)* * *Barriers /challenges encountered and how they were solved (or not solved)* * *What results were obtained? What conclusions were drawn? What happened next?*   *Also identify/describe the work done by subcontractors (if applicable).*  *Include all activities (for example,initial designs, experiments, analysis, data collection, prototype design/testing/modification, all testing, small scale and large scale beta testing and their results, re-work due to problems, re-design, etc.)*  *Provide dates by month if possible (example: “the version was developed by June 2017")*  Yes, we did not keep timesheets but overall spent well over 2,000 effort hours |
| **Major Technological Obstacles,**  **Issues** | ***1. Was there a scientific or a technological uncertainty?***   * + *Explain the Specific constraints and technological challenges, they are often due to the specific nature of the product, which technologies are to be used, and/or the setting in which the software is to be used.*   + *What were the technical issues / challenges / limitations /constraints in this setting?*   *(Underline technology issues, not product functions and features.)*   * ***Need to understand the specific constraints or technological barriers*** * ***Use specific technical terminology*** *Examples of constraints:*   + *Volume of data (Process more than 150 terabytes of data)*   + *Footprint (Consume less than 100k of memory)*   + *Scalability (Gracefully adapt to increase/decrease of load)*   + *Response time (Requests performed within 100ms)*   + *Concurrency (Handle 1,000 users simultaneously)*   + *Synchronization (Synchronize with a sessionless system)*   + *Stability (Mean Time Between Failure > 1 year)*   + *Legacy & Compatibility Issues (Work seamlessly with legacy data model)*   + *Open Source Tools and Plug-ins did not work as intended (Needed to develop new uses/extend capabilities* * Integrated Dispatch Management, GPS Tracking and Account systems togethers * Reduced the billing & invoicing time by 60% * Provided real time access to load tracking * Reduced the on-boarding time by 80% * Reduced # of systems within the company from 12 to 4 |