Executive Summary

SAMCO Machinery Ltd, is a world class manufacturer of a wide range of material handling solutions. Samco requested our team to explore solutions and strategies which reduce paper usage in its product development process.

The primary scope of the project concerned Milestone 6 (M6) and Milestone 7 (M7) of SAMCO's process, since most of the paper generation is the byproduct of the communication between those two milestones. However, upon interviewing the staff and SAMCO managers, it is reasonable to also consider M3,M4,M5,M8 and M9 in hindsight, because some of the software solutions offered in this report will cover a broader spectrum of Milestones by default. The scope includes a range of hypothetical technical solutions, high level strategies for implementation, the sample case studies, and the advantages or disadvantages of employing our proposed strategies, but the ROI or cost and benefit numbers are not covered.

The project duration was approximately three months and regular weekly contact with Samco engineering document team were arranged in order to gather information.

The problem-solving approach utilized 17 steps of innovation methodology as a reference framework to guide the project, but some steps were omitted due to time constraints or scope limitations.

Three major sources of paper generation were identified:

1) *Paper usage during drawing verification.*
2) *Paper usage for document control management.*
3) *Paper usage for generation of shop floor folders.*

By applying the 5 whys in the root cause analysis, the causes were identified and refined to a degree where solutions could be applied.

For paper usage during drawing verification, two solutions are provided:
   a) Applying Paper-Like Analogues, which simply is using paper alternatives to emulate the traditional pen-on-paper feel.
   b) Fully utilizing the current File Sharing Software (Autodesk Vault) and further investigating its capabilities for cloud sharing.

For paper usage at document control management, we suggest improving the part library management practice.

For paper usage in generating the shop floor folders, three solutions are offered:

   a) Manufacturing Execution Systems (MES)
   b) Electronic Work Instructions (EWI).
   c) Barcode System.

Some of the strategies and solutions offered by our team contain case studies and summaries of their pros and cons.

While various strategies have been suggested to reduce paper usage in SAMCO's process, it is additionally important to have a well defined roadmap of the vision of the technological advancements of the company, particularly more insights regarding MES,EWI and Barcode Systems would be invaluable to navigate the company into the envisioned Industry 4.0 goal.

Meanwhile, we propose any process change to be completed incrementally to minimize risk. Emphasis should be placed on piloting these implementations on relatively contained processes in parallel to the current processes, to minimize the risk of a new implementation while maximizing the proof of concept and lessons learned about its implementation.

Finally, hiring Information systems (IS) consultants to recalibrate the softwares and train the employees, and familiarizing them with the culture of change, would ultimately raise their confidence in their role and minimize error due to a change in workflow.