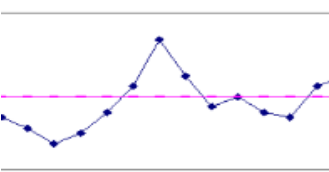
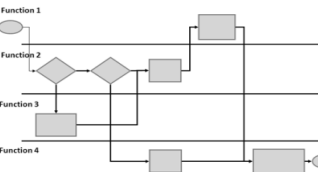

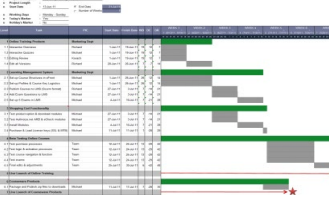
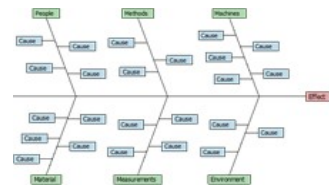

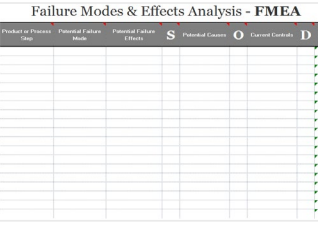
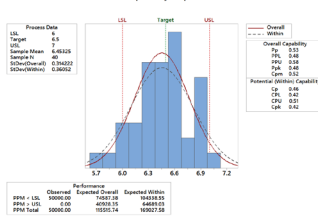
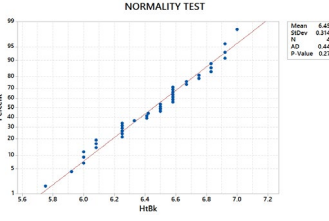
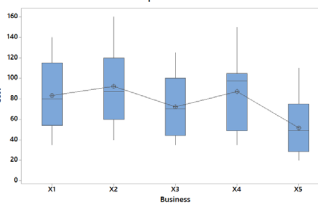
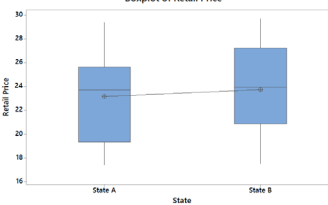
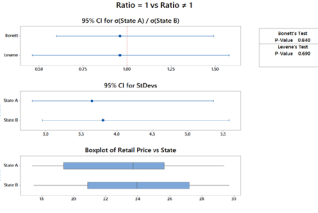
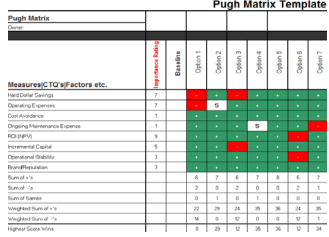
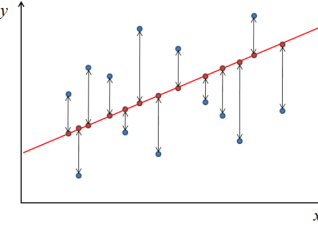
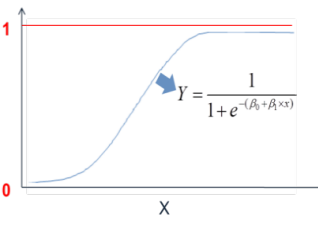
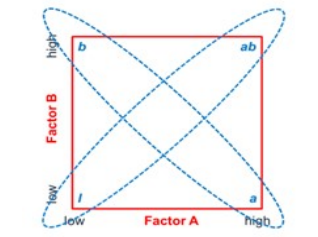

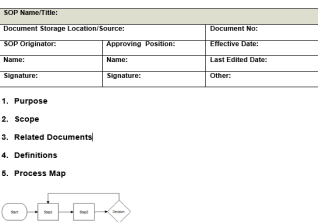
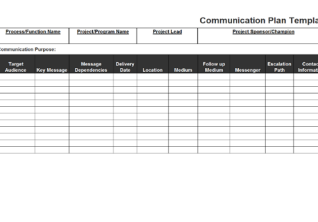
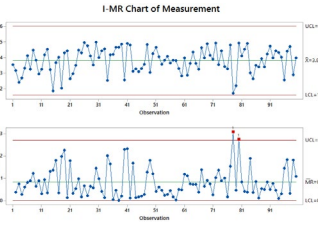




Lean Six Sigma DMAIC Roadmap

Purpose	Key Tools				Key Outputs
Define To establish a quantified problem statement, objective and business case that will become the foundation to your Six Sigma project. Conduct stakeholder analysis, select team members and kick-off your project.	Primary Metric 	Process Map 	Project Charter 	Project Plan 	<ul style="list-style-type: none"> * Process Map * Gather VOC * Translate VOC to CTQ's * QFD/HOQ * COPQ * Primary & Secondary Metrics * Establish Project Charter * Stakeholder Analysis * Team Selection * Project Plan
Measure Refine your understanding of the process. Assess process capability relative to customer specifications. Validate measurement systems. Brainstorm potential x's.	C&E 	SIPOC 	FMEA Failure Modes & Effects Analysis - FMEA 	Cpk Process Capability Report for HbK 	<ul style="list-style-type: none"> * Early Y=f(x) Hypothesis * Detailed Process Map * SIPOC * Cause & Effect Diagram * Cause & Effect Matrix * FMEA * Basic Statistics * Normality Test * Capability Analysis * Gage R&R
Analyze Conduct data collection and planned studies in order to eliminate non-critical x's and validate critical x's. Establish a stronger and quantified Y=f(x) equation.	Normality Test 	ANOVA Boxplot of Cost 	2 Sample t-test Boxplot of Retail Price 	Equal Variances Test and CI for Two Variances: Retail Price vs State 	<ul style="list-style-type: none"> * Narrowed Y=f(x) * 1 & 2 Sample t-tests * 1 & 2 Proportions tests * Equal variance tests * Normality tests * ANOVA * Moods Median * Mann Whitney * Paired t-test * Chi-Squared test
Improve Design, test and implement your new process or product under live operating conditions. Pilot solutions if feasible before broadly deploying expensive improvements or products.	Pugh Matrix 	Linear Regression 	Binary Logistic Regression 	DOE 	<ul style="list-style-type: none"> * Refined Y=f(x) * Pugh Matrix * Correlation * Simple Linear Regression * Multiple Linear Regression * Binary Logistic Regression * Full Factorial DOE * Fractional Factorial DOE
Control Plan, communicate, train and implement your product or process solutions. Ensure control mechanisms are established. Use Poke Yoke, visual controls, SOP's and SPC wherever possible.	Control Plan 	SOP's Standard Operating Procedure Template 	Communication Plan 	SPC I-MR Chart of Measurement 	<ul style="list-style-type: none"> * Control Plan * Training Plan * Refined FMEA * Communication Plan * Standard Operating Procedures * Five-S Audit * Poke Yoke * Visual Controls * Statistical Process Control