

Green & Black Belt Financial Impact Analysis

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San Antonio, Texas



Agenda

- ◆ TMAC Background
- ◆ Certification Requirements
- ◆ Financial Impact
- ◆ Aggregate Financial Impact by Industry & Type of project
- ◆ Comparisons Between GB & BB projects
- ◆ GB & BB Financial Impact by Industry & Type of project
- ◆ Keys to Project Completion
- ◆ Q & A Session

TMAC Background

TMAC is hosted at the University of Texas in Arlington

- Started delivering Lean Six Sigma training in 2003
- Yellow, Green, Black & Master Black Belt training
- Training takes place in the form of open enrollment or as a dedicated class
- Classes typically vary from 8 to 24 students
- Sponsor & Champion workshop
- Coaching to belts and management
- Our Engineers can lead & facilitate Kaizen events

Certification Requirements

Green Belts

- Attend 2 weeks course and pass final exam (80% passing grade)
- Submit a full DMAIC project or 2 Kaizen events

Black Belts

- Attend 4 weeks course and pass final exam (80% passing grade)
- Submit two full DMAIC projects or 1 full DMAIC project and 2 Kaizen events

Certification Requirements Cont.

- GB & BB have 1 year to submit a completed project after training is completed
- Completed projects are submitted, via a Power-Point file, to our MBB's for review
- We also ask for a letter of support from the project Sponsor

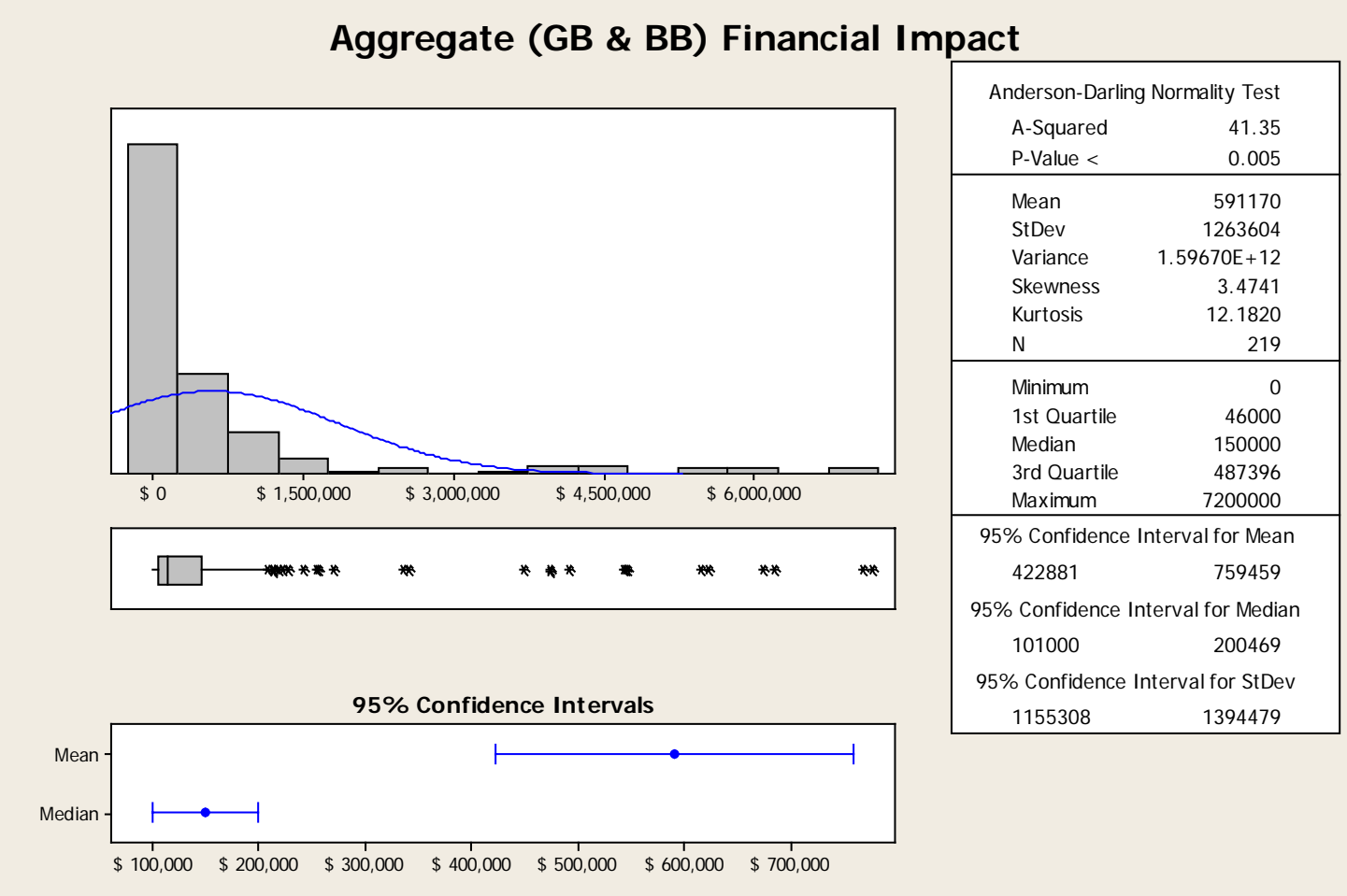
Financial Impact

- There is no minimum financial impact toward certification
- TMAC does NOT have the capability to audit the financial impact submitted for each project
- A few companies require the financial manager to review the project's financial impact
- For most projects, the financial impact is calculated by the belts
- The financial impact is a combination of Soft & Hard Savings
- Submitted projects encompass years 2009 to 2013

Company Segments

Company Segments	Examples
Aerospace	Machining, Structures, Seats, etc.
Continuous/Batch	Chemical Process, Paper Mill, Plywood, Dry-Wall, Paint Booth, Reactors, etc.
Discrete Process	Clothing, Assembly, Manufacturing, Machining, etc.
Food & Beverage	Soda Drinks, Sausage, etc.
Healthcare IT	Hospitals, Labs, Equipment Fabrication, Blood Center, etc.
Logistics	Transportation
Oil Industry	Assembly, Machining, Chemical Process, Drill Bits, etc.
Service	Insurance, Banking, Electric Utilities, Cities, etc.

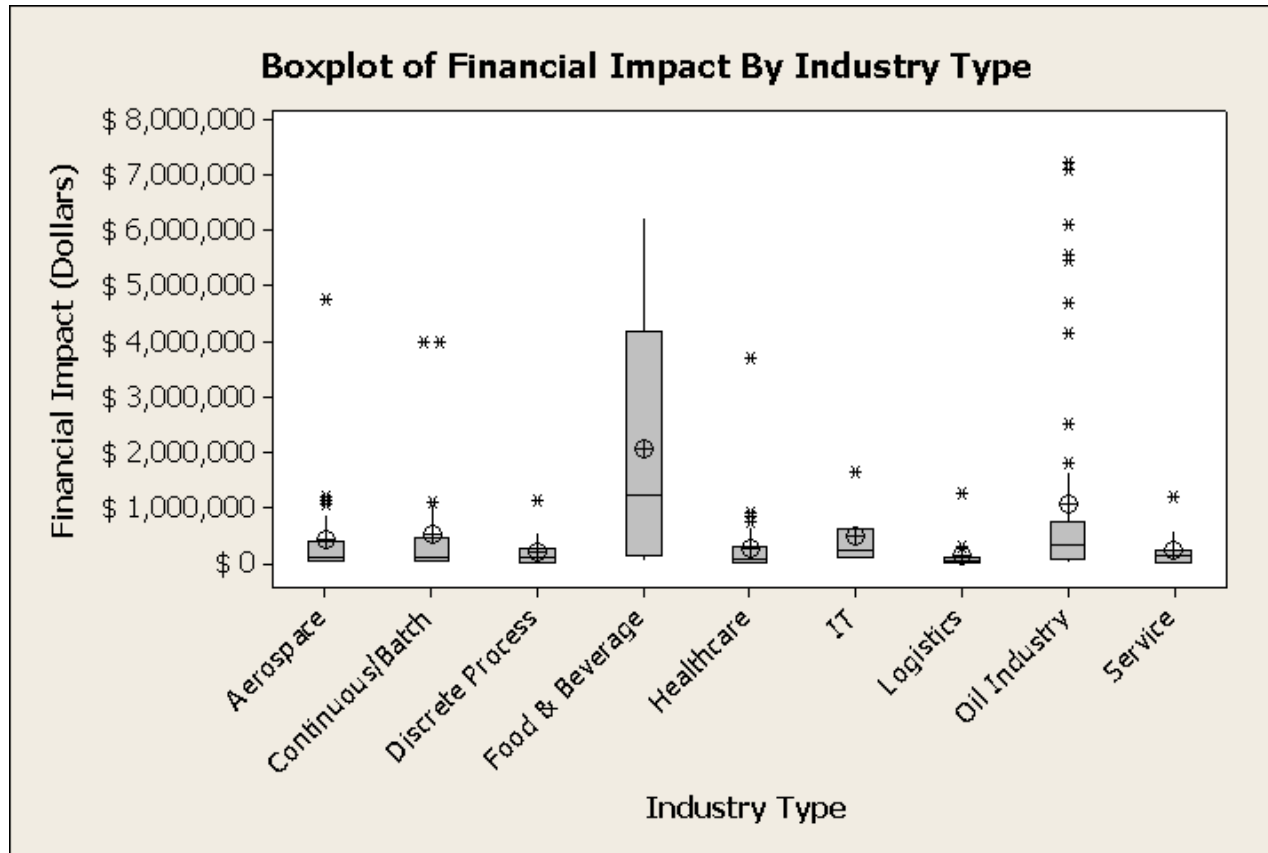
Aggregate (GB & BB) Financial Impact



**Distribution not Normal.
Median \$150,000 & Mean \$591,170**



Aggregate Box-Plot Financial Impact By Industry Type

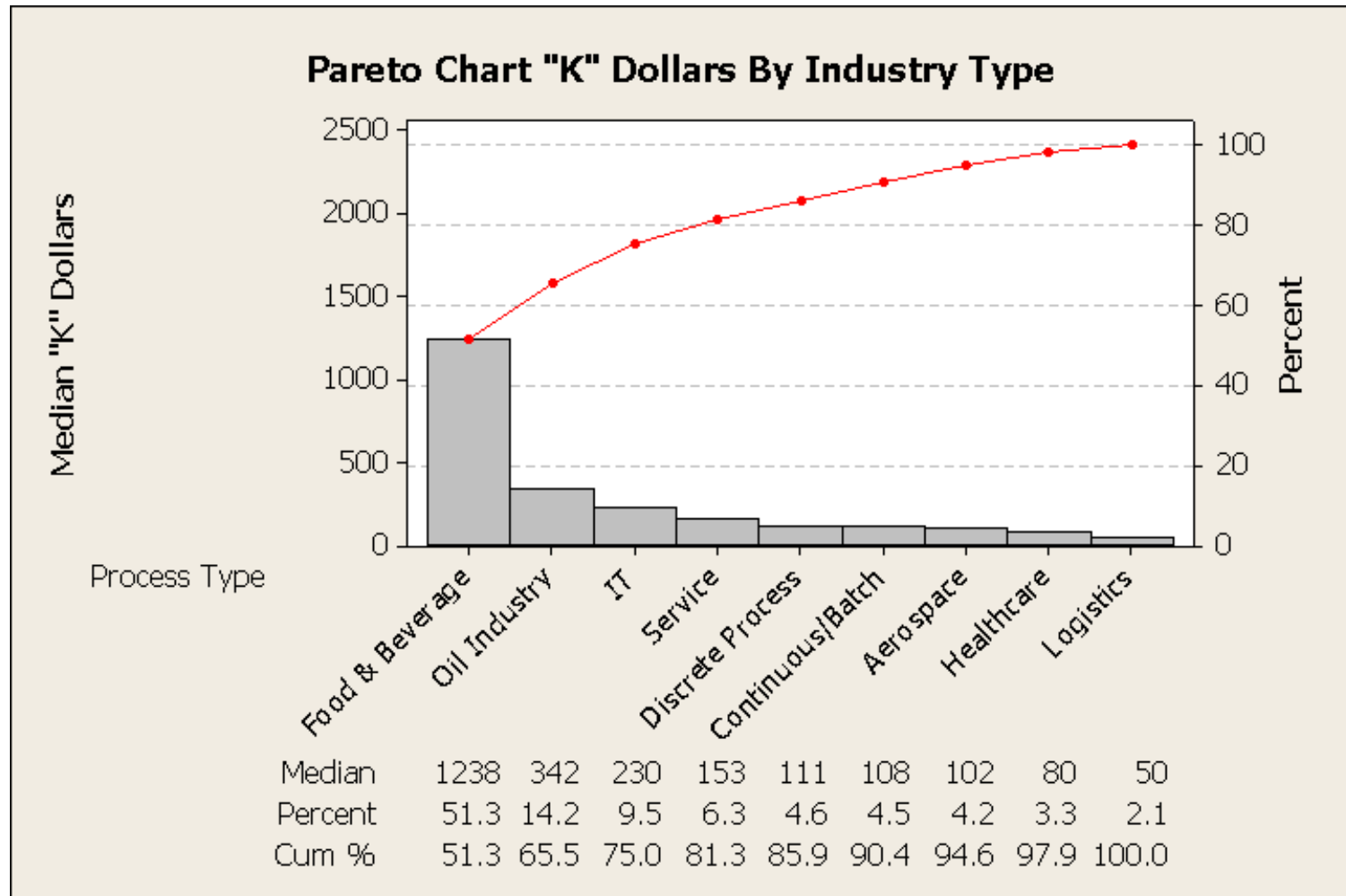


Descriptive Statistics: Financial Impact

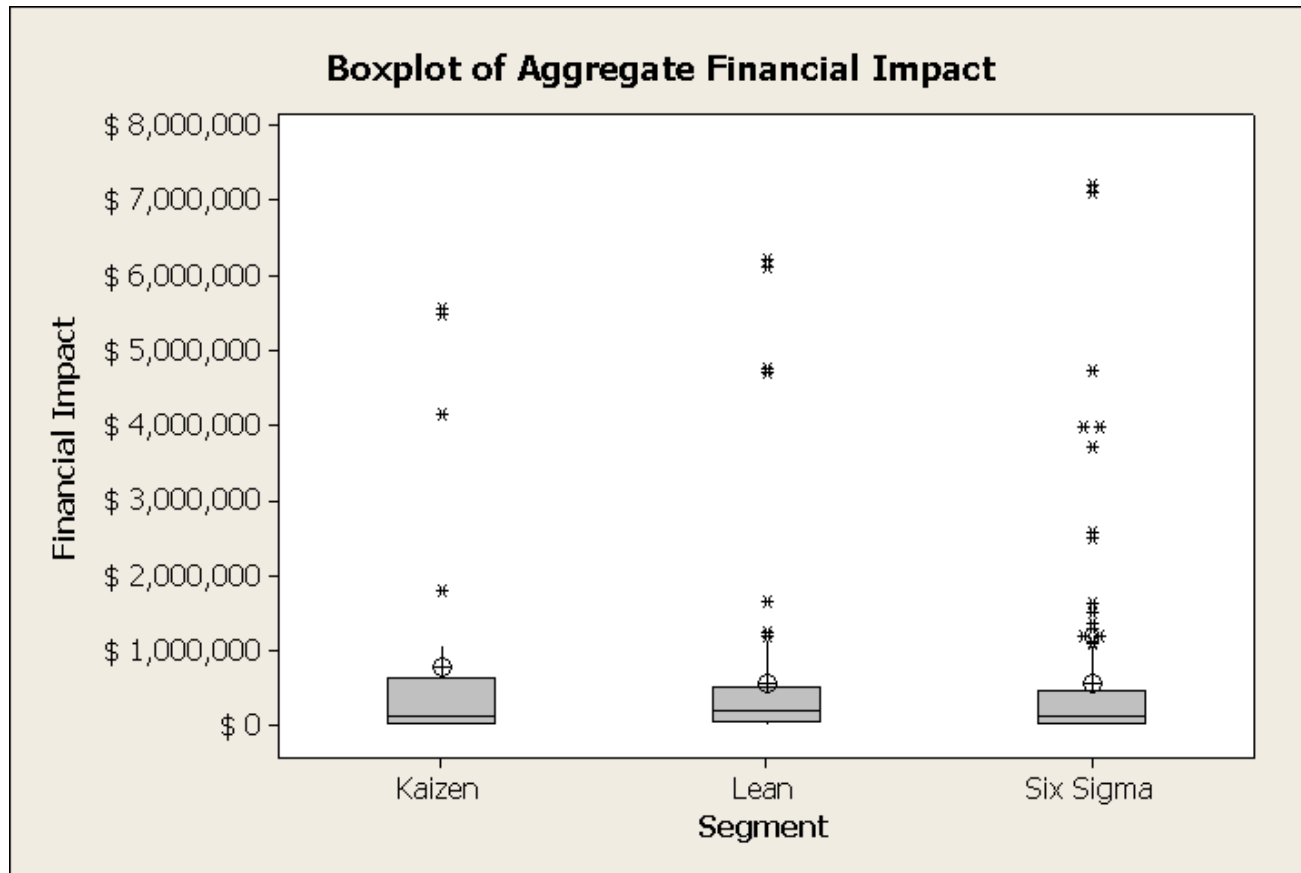
Process	N	Mean	StDev	Minimum	Median	Maximum
Aerospace	29	423828	904633	8500	102000	4743000
Continuous/Batch	24	541121	1100606	7000	108000	3980000
Discrete Process	24	201817	252847	0	110500	1124000
Food & Beverage	8	2061625	2295004	60000	1237500	6215000
Healthcare	38	271010	623159	0	80000	3702000
IT	7	491571	546306	102000	230000	1638000
Logistics	16	145808	304157	1020	50000	1250000
Oil Industry	60	1062623	1823271	0	342000	7200000
Service	13	232462	332737	0	153000	1200000

Aggregate Pareto Chart By Industry Type

Financial Impact Thousand of Dollars



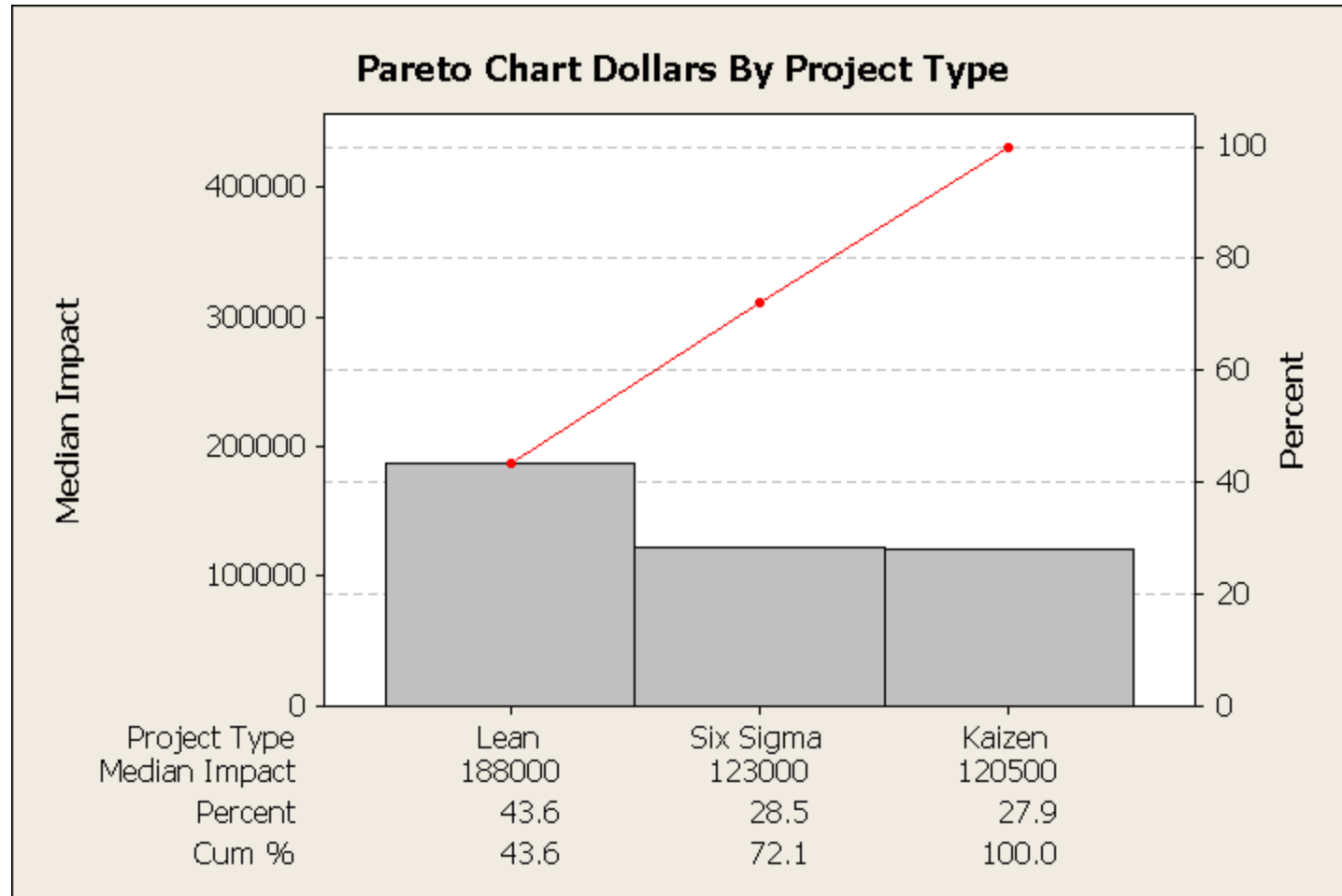
Aggregate Box-Plot Financial Impact By Project Type



Descriptive Statistics: Financial Impact

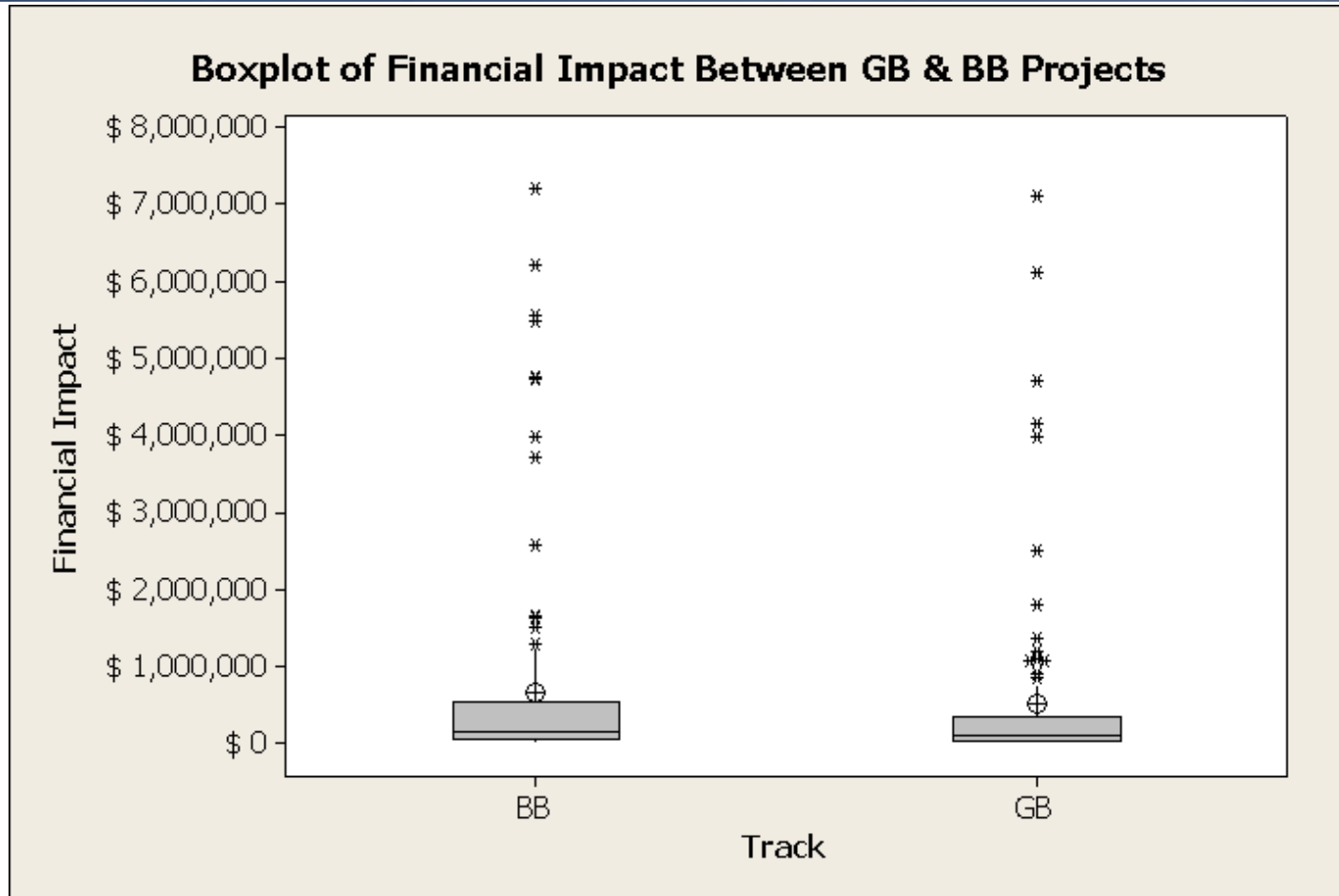
Variable	Segment	N	Mean	StDev	Minimum	Median	Maximum
Financial Impact	Kaizen	30	774433	1521519	0	120500	5547000
	Lean	78	554779	1204007	0	188000	6215000
	Six Sigma	111	567211	1236372	0	123000	7200000

Aggregate Box-Plot Financial Impact By Project Type



Box-Plot Financial Impact Between GB & BB

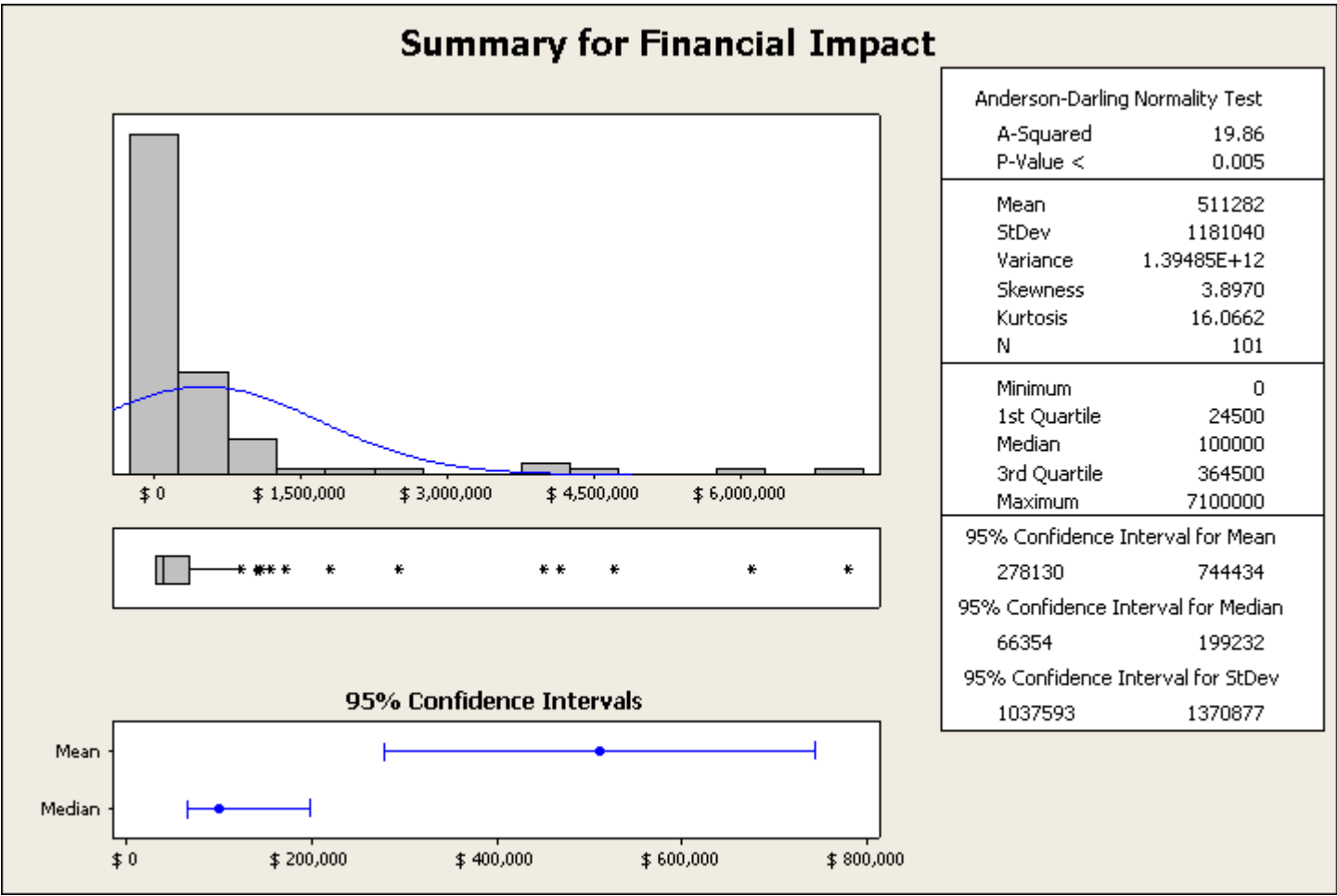
Last



Descriptive Statistics: Financial Impact

Track	N	Mean	StDev	Minimum	Median	Maximum
BB	117	663604	1336396	0	160000	7200000
GB	102	508083	1175623	0	100500	7100000

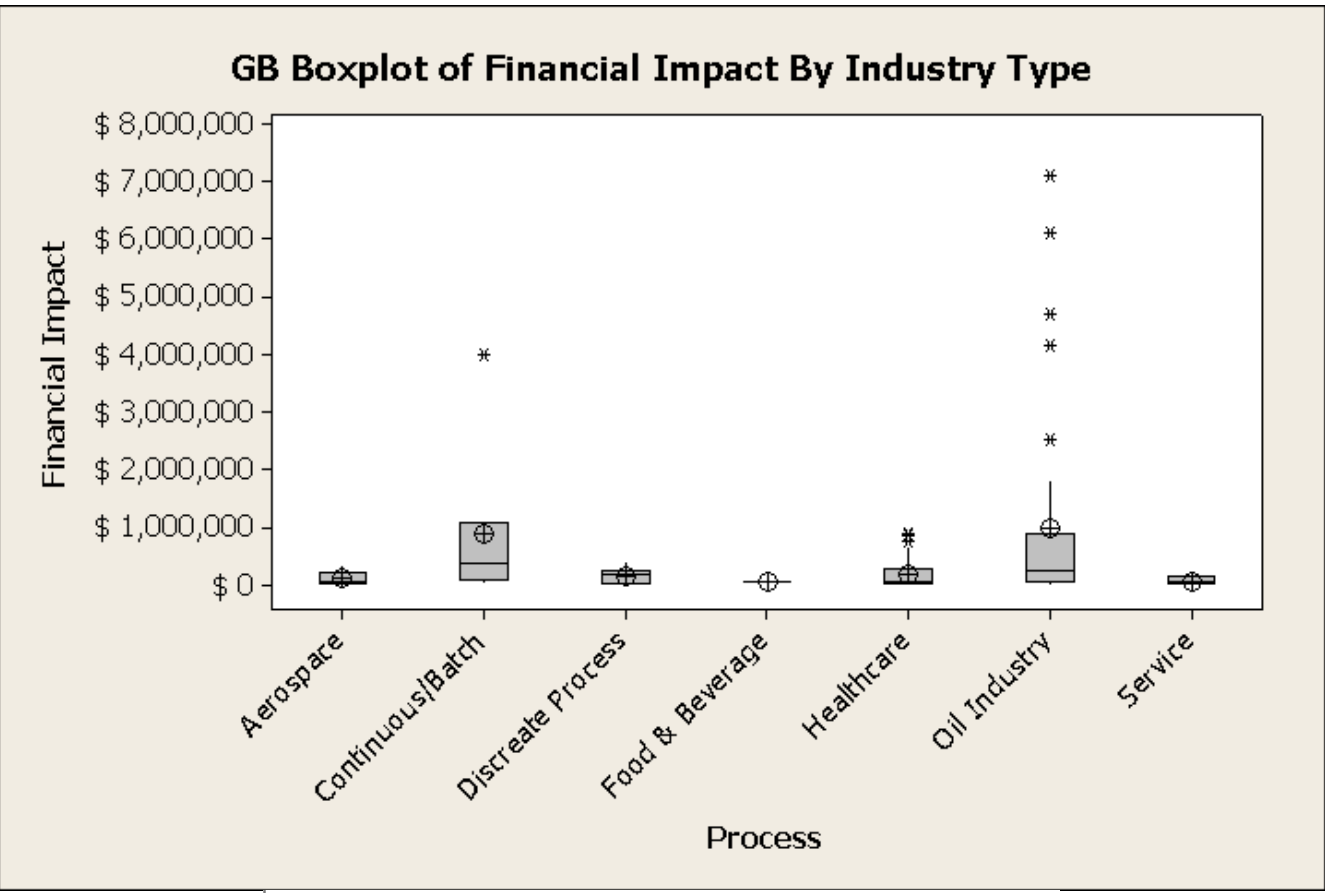
GB Financial Impact



Distribution not Normal.
Median \$100,000 & Mean \$511,282



GB Box-Plot Financial Impact By Industry Type



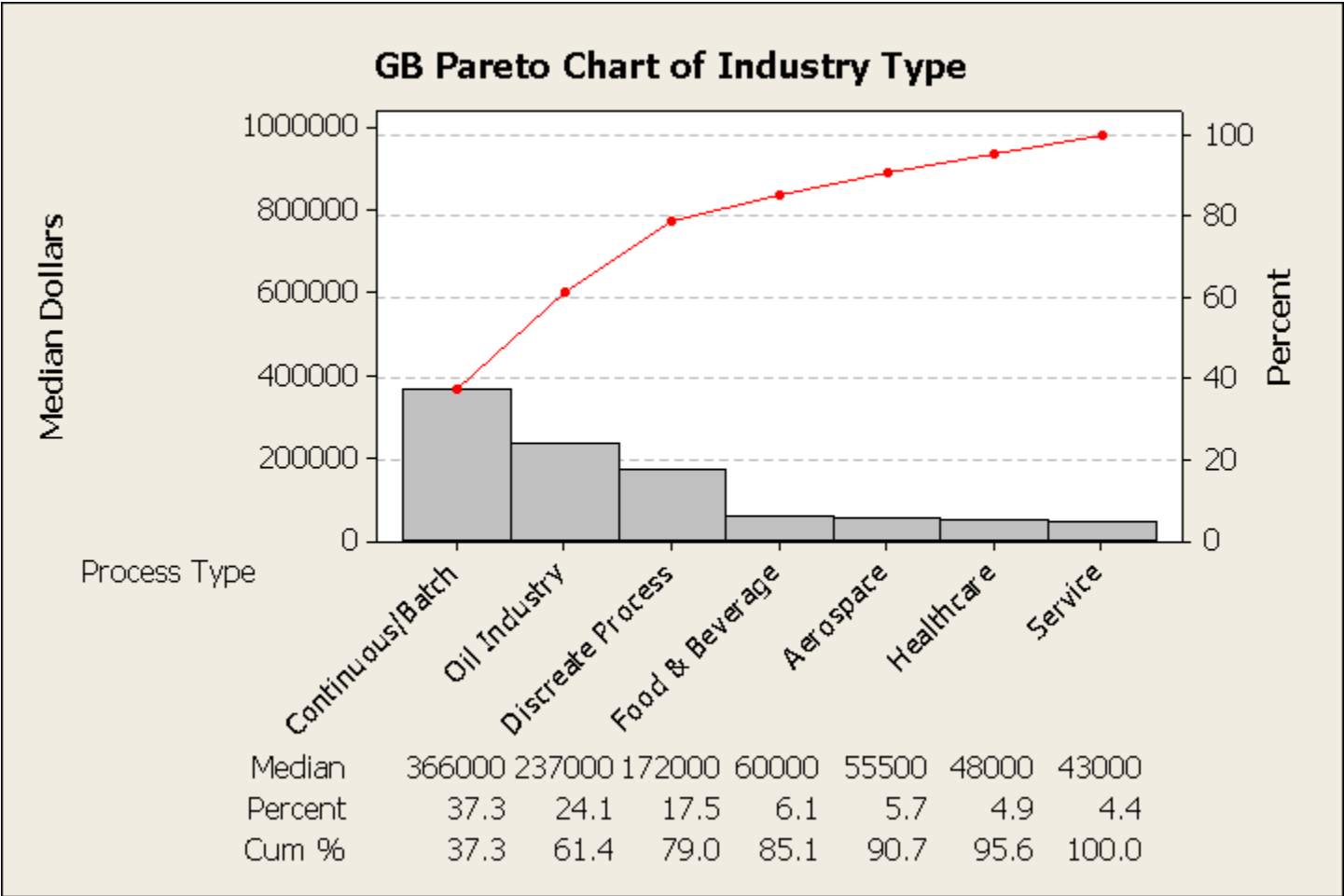
Descriptive Statistics: Financial Impact

Process	N	Mean	StDev	Minimum	Median	Maximum
Aerospace	5	108300	127065	11000	55500	330000
Continuous/Batch	8	888375	1322078	37000	366000	3980000
Discrete Process	11	152418	140226	0	172000	416000
Food & Beverage	1	60000	*	60000	60000	60000
Healthcare	35	172183	253965	0	48000	899000
Oil Industry	37	972189	1736278	0	237000	7100000
Service	4	64250	69308	12000	43000	159000

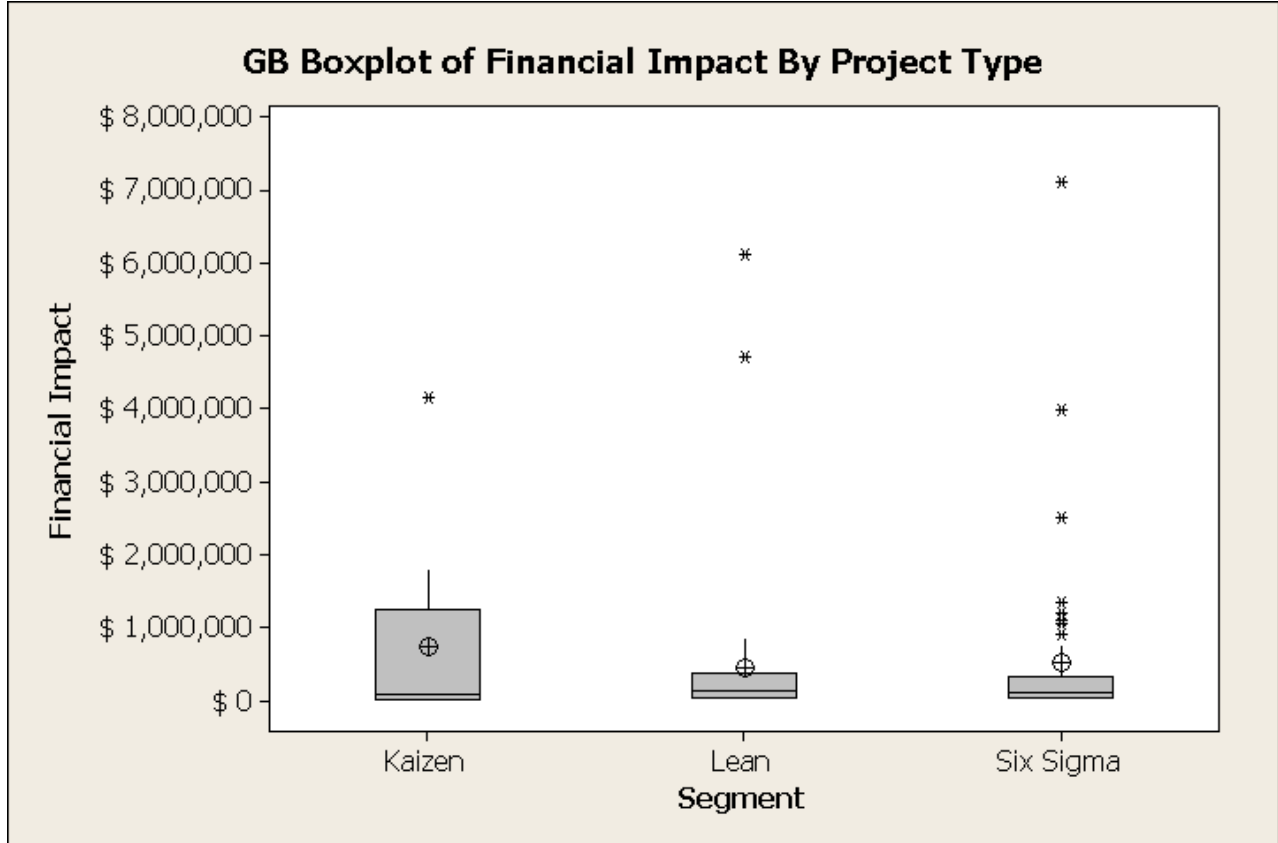


GB Pareto Chart By Industry Type

Financial Impact In Dollars



GB Box-Plot Financial Impact By Project Type

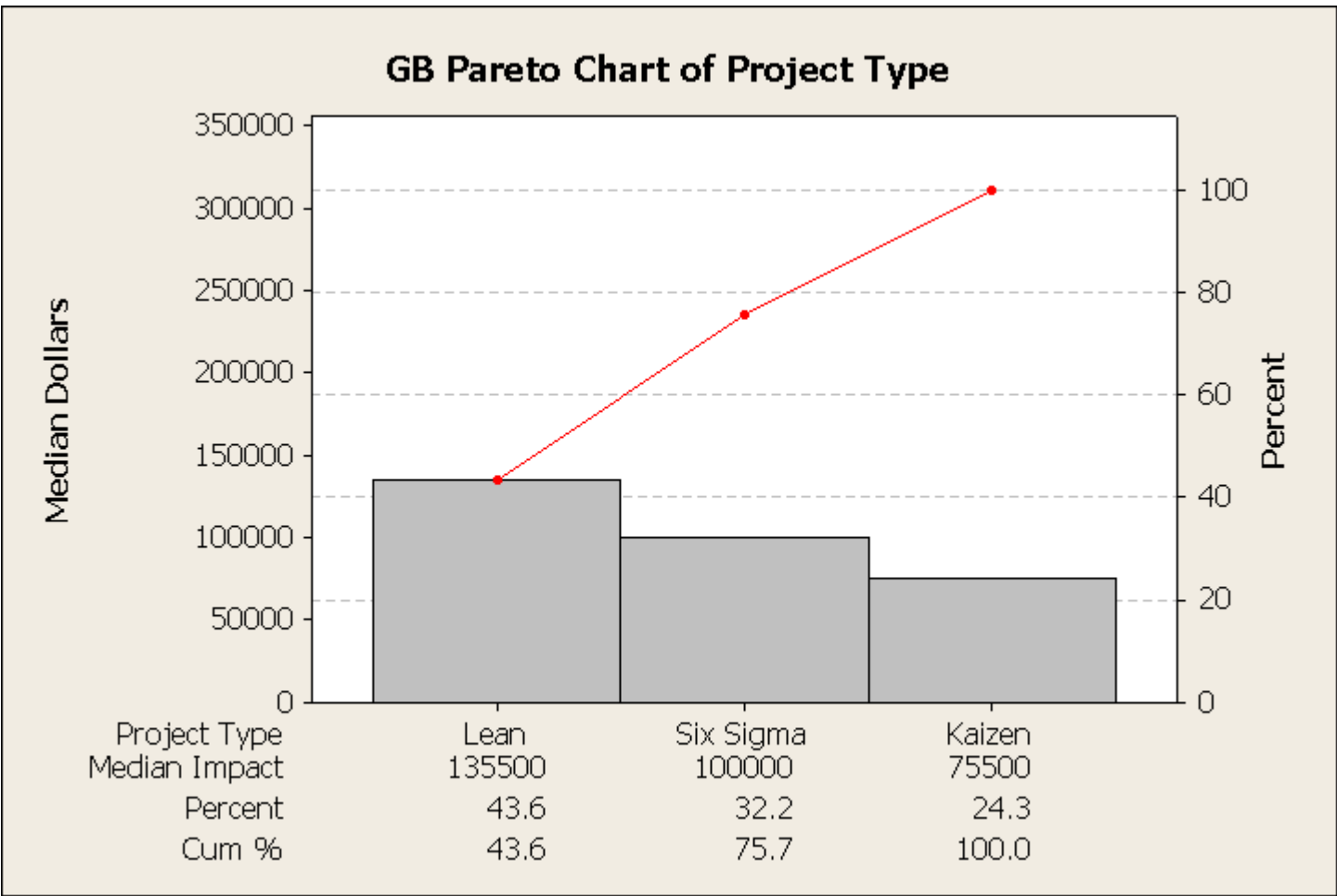


Descriptive Statistics: Financial Impact

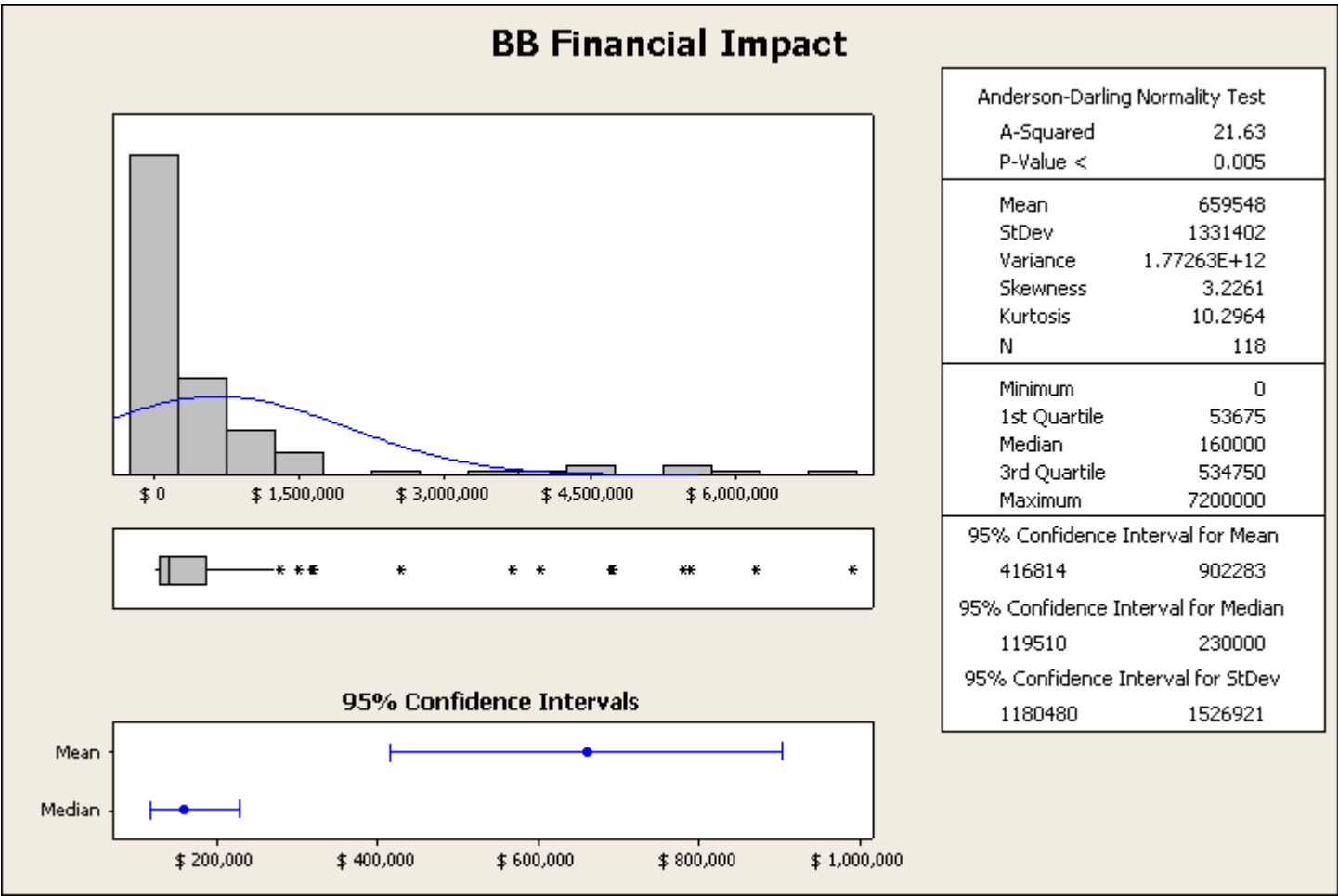
Segment	N	Mean	StDev	Minimum	Median	Maximum
Kaizen	10	746300	1337357	0	75500	4150000
Lean	44	443692	1126813	0	135500	6100000
Six Sigma	47	524554	1216103	0	100000	7100000



GB Box-Plot Financial Impact By Project Type



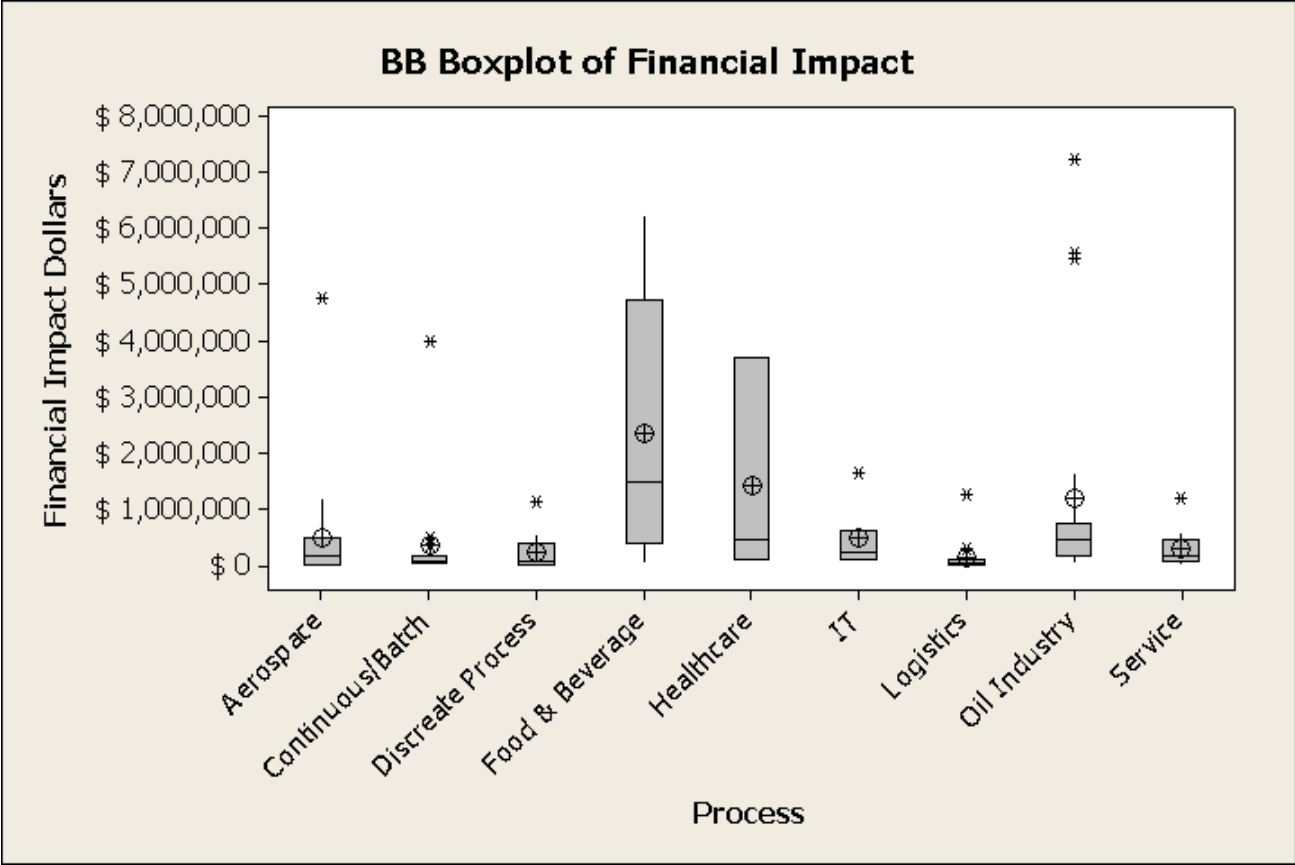
BB Financial Impact



Distribution not Normal.
Median \$160,000 & Mean \$659,548



BB Box-Plot Financial Impact By Industry Type



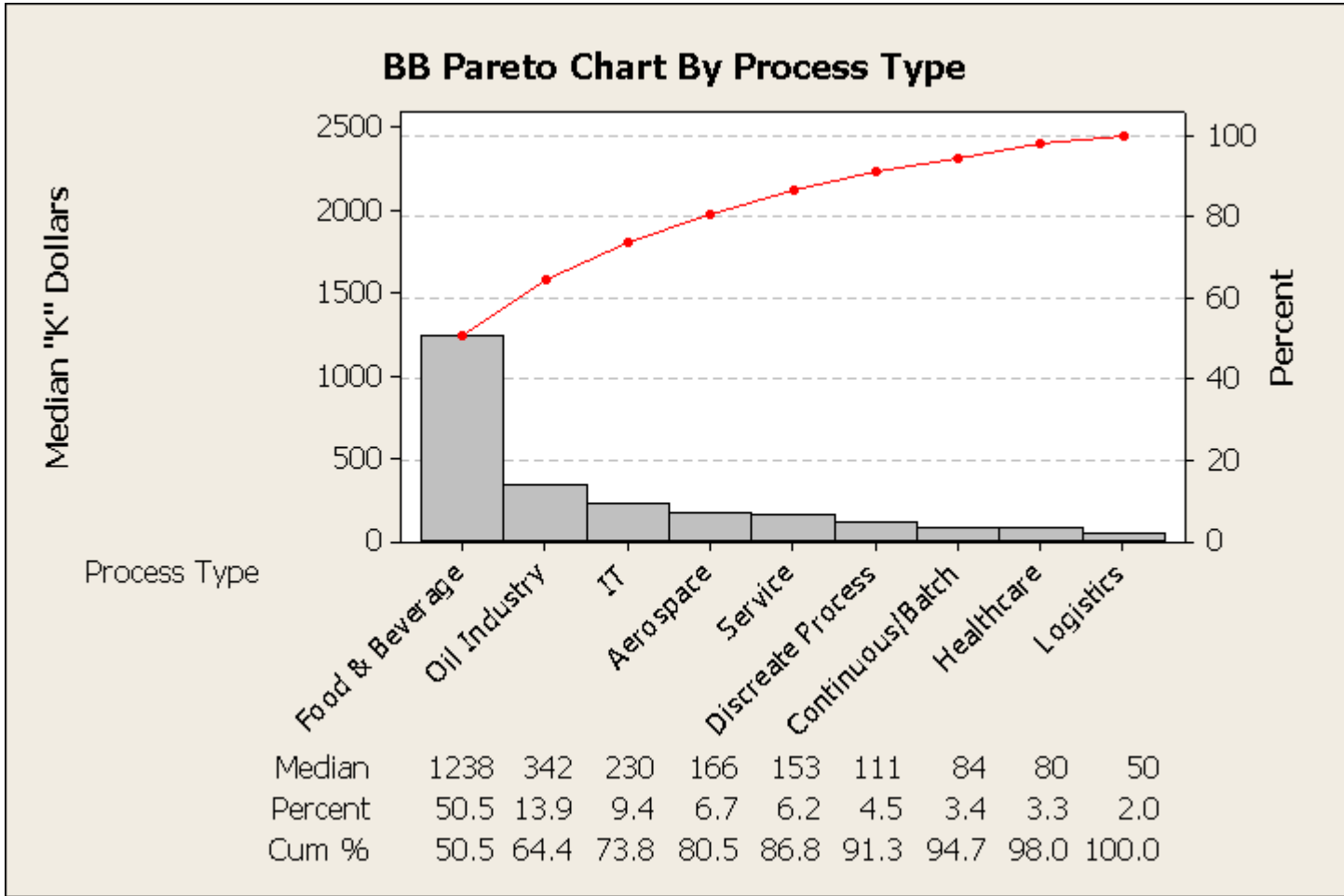
Descriptive Statistics: Financial Impact

Process	N	Mean	StDev	Minimum	Median	Maximum
Aerospace	24	489563	983517	8500	165500	4743000
Continuous/Batch	16	367494	972229	7000	83500	3980000
Discrete Process	13	243615	319405	19000	88000	1124000
Food & Beverage	7	2347571	2319858	60000	1500000	6215000
Healthcare	3	1424000	1980552	110000	460000	3702000
IT	7	491571	546306	102000	230000	1638000
Logistics	16	145808	304157	1020	50000	1250000
Oil Industry	23	1208104	1986517	43500	457000	7200000
Service	9	307222	379254	0	160000	1200000

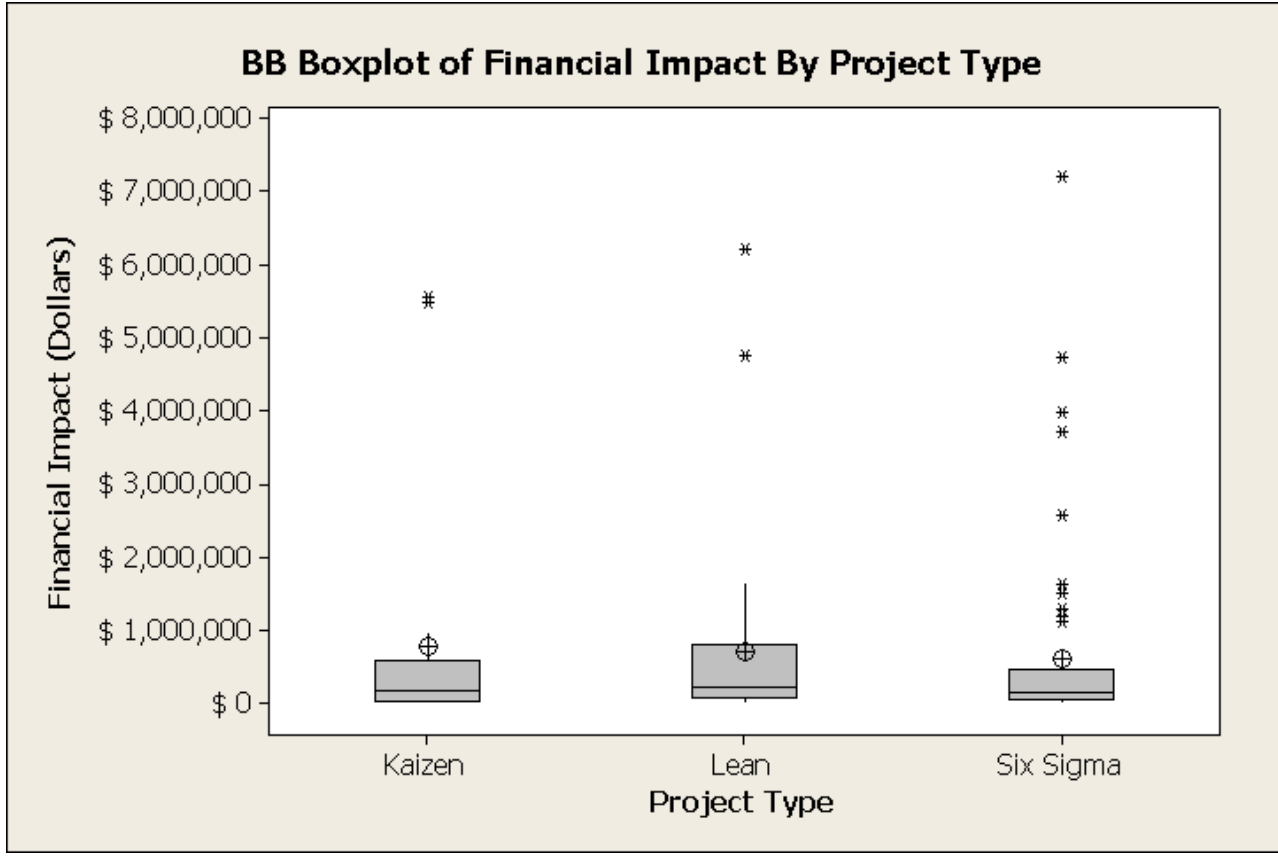


BB Pareto Chart By Industry Type

Financial Impact In Thousand of Dollars



BB Box-Plot Financial Impact By Project Type

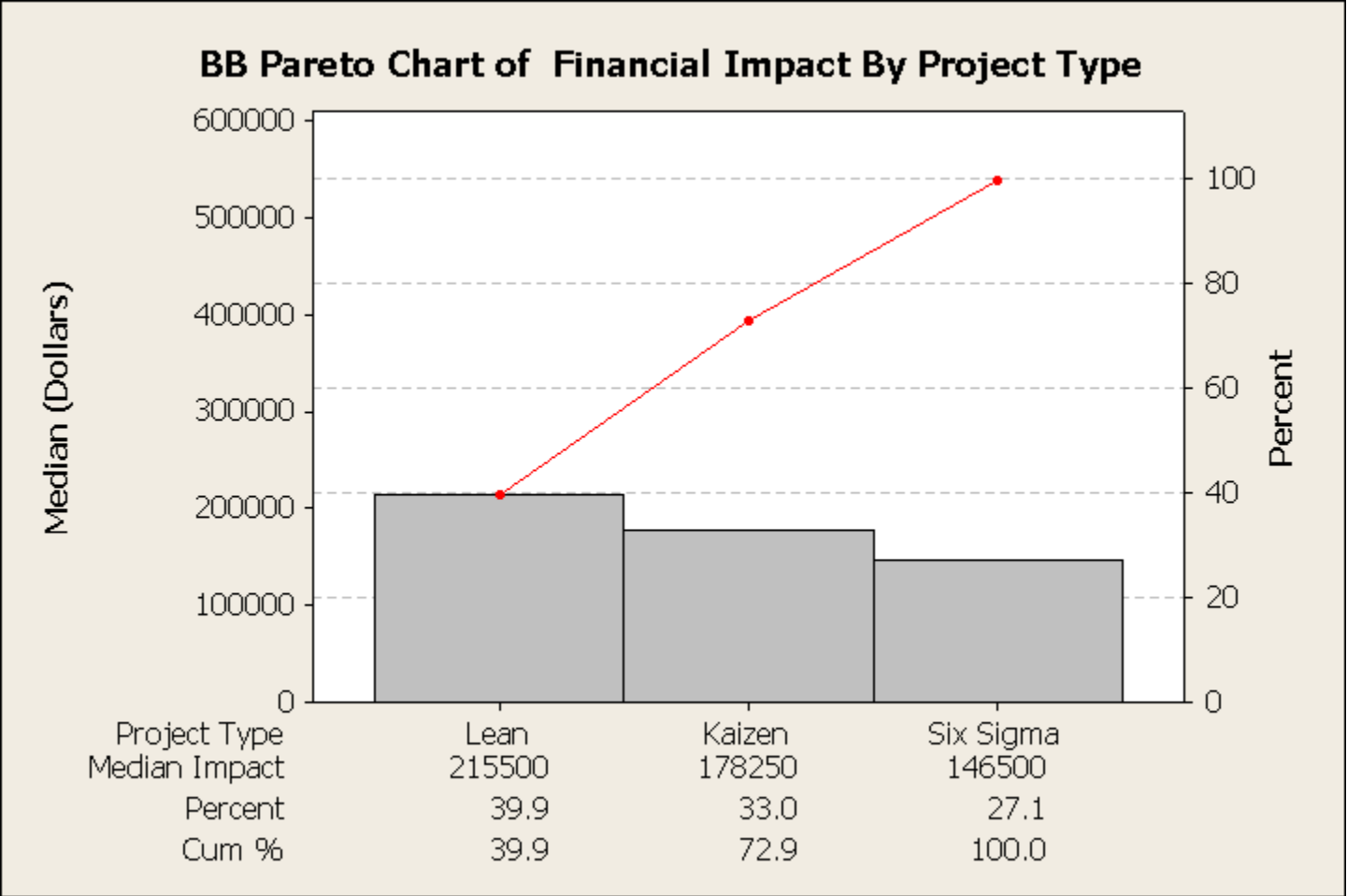


Descriptive Statistics: Financial Impact

Segment	N	Mean	StDev	Minimum	Median	Maximum
Kaizen	20	788500	1638789	6000	178250	5547000
Lean	34	698538	1300100	10000	215500	6215000
Six Sigma	64	598538	1259691	0	146500	7200000



BB Box-Plot Financial Impact By Project Type



Keys to Project Completion

- ◆ Sponsor & Champion Training
- ◆ Right SCOPE
- ◆ Projects prioritization & create a backlog of projects
- ◆ Coaching to GB, BB & Managers
- ◆ Establish a formal GB/BB selection process & determine percentage of time to LSS
- ◆ Projects linked to corporate goal/dashboard metrics
- ◆ Include finance personnel to estimate project financial impact
- ◆ Preferred sequence: Kaizen, Lean, Six-Sigma & DFLSS
- ◆ Project mix: Lean (55%), Six-Sigma (35%) & DFLSS (10%)

Questions & Answers Session

Thank You

TMAC

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