

A spiral-bound notebook with a light beige, textured cover. The spiral binding is on the left side. The text is centered on the page.

# Project Tools & Techniques

Extensive Range of Problem Solving  
Tools & Techniques



# Projects Menu

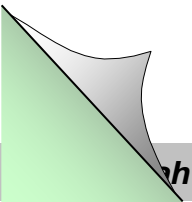
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# 6 Sigma Project



Stages	Objective	Activities	Deliverables	Applet
<b>Define</b>	To use Vital X to decide on important variables			 Project Plan
		Compare the potential importance of variables	Variables and how Vital they are	 Vital X
<b>Measure</b>	To weight variables according to their weightings	Weight variables	A weighted measure of variables	 Wghtd. Scores
<b>Analyse</b>	A pair-wise hierarchical comparison	Compare variables in pairs	Distributions of what is favoured (or not favoured)	 Hier. Comp.
<b>Implement</b>	To rank risks objectively	Assign Success Predictors according to their risk ratings	Determine the overall risk of the Success Predictors	 Risk Asses.
<b>Control</b>	To deliberate the Suppliers, Inputs, Process, Outputs and Customers	Brainstorm on the Suppliers, Inputs, Process, Outputs and Customers	Pertinent Suppliers, Inputs, Process, Outputs and Customers	 SIPOC
				 Adv. SIPOC





# Voice of Customer (VOC)



## Things Gone Wrong

Please Inform us About any trouble you have had with the product.  
Please Mark an CROSS in each box next to the item you have had trouble with.

Key  
OK  
X Trouble

Close Expand All Collapse All

- Punching In IOL
- High Thickness In Loop
- Late Delivery
- Poor Packaging
- No Efficient Customer Service

What went right?  
What went wrong?  
Perform Kano Analysis!

Identify Customer Needs Objectively

iCT-M is custom built for VOC

Export VOC data to the next step - QFD

### Voice Of Value Table 1

Demanding Quality	100	Fairchild	Rational	Philips	Sharp	Average Data
Writing at seminars	16	152	0	0	250	100.000
Needs no training to use	18	4	0	0	250	62.500
Can buy anywhere	27	150	100	0	0	62.500
Repair centres	13	200	0	0	0	90.000
Immediate replacement	23	0	255	0	200	112.500
Easy to use	34	0	0	0	75	18.750
High image value	27	0	0	0	5	0
Beautiful look	20	0	100	105	0	90.000
Reasonable price	14	0	5	175	0	43.750
Will last a long time	10	0	0	0	0	0

Insert User

ID	Name	Title	Company	Action
1	Jack Nicholson	Manager	Electronics Enterprise	Edit
2	Nina Anderson	Tip Top Fashion	Body Show	Edit
3	ad	ad	ad	Edit

### Voice Of Value Table 2

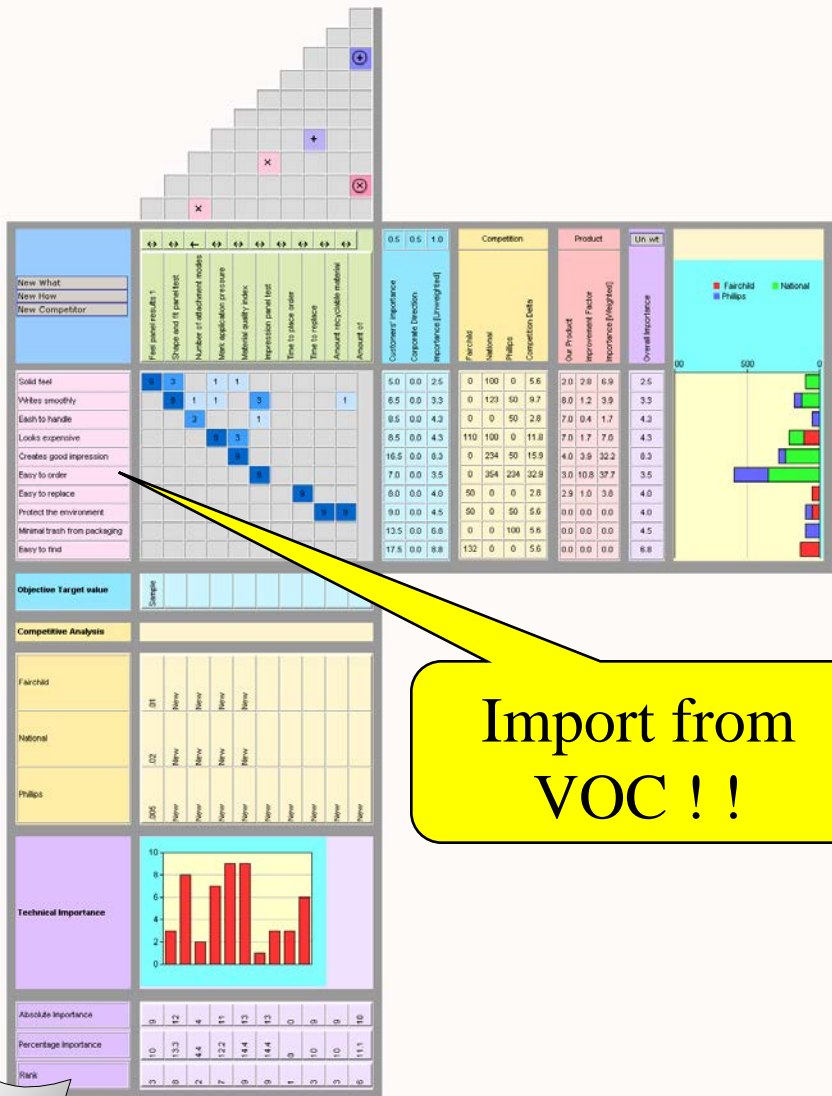
Demanding Quality	200		2006			Average Data	Importance	Value
	100	Fairchild	Rational	Philips	Sharp			
Solid Feel	20	0	100.0	0	0	100	10.00	5.00
Writes smoothly	20	0	123.0	50.0	0	173	10.00	8.65
Easy to handle	10	0	0	50.0	0	50	5.00	2.50
Easy to find	20	132.0	100.0	0	213.0	445	10.00	22.25
Looks expensive	25	110.0	100.0	60.0	0	260	12.50	13.00
Creates good impression	25	0	234.0	0	0	234	12.50	11.70
Easy to order	25	50.0	254.0	234.0	0	538	12.50	20.90
Easy to replace	10	50.0	0	0	0	50	5.00	2.50
Protect the environment	30	0	0	90.0	0	90	15.00	2.50
Minimal trash from packaging	15	0	0	100.0	0	100	7.50	5.00

Insert User

ID	Name	Title	Company	Action
1	Alexander	QA Manager	Estrada Milling	Edit
2	Grady	Finance Manager	Amsted Bank Ltd	Edit



# Quality Function Deployment (QFD)



Import from VOC !!

- ICT-Manufacturing
  - Graphic
  - Simple
  - Easy
- Alternatives
  - Using Excel?
    - Not easy to modify
    - Needs macro programming
  - Using Minitab?
    - Try teaching technicians
    - Consider site licenses
    - Consider upgrade costs

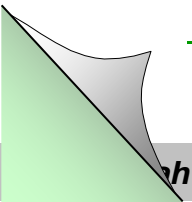


## Failure Mode And Effect Analysis

No	Part	Function	Potential Effects of Failure	Potential Causes of Failure	S	Potential Failure Mode	O	C	Current Controls Prevention	Current Controls Detection	D	RPN
-1	Imported from F-Matrix	New Function										
1.1		Ink flow rate	Ink drip	Stain on paper	5	Low viscosity	7	35	viscosity medium	Viscosity test	7	245
1.2		Lead hardness	To dry	Breaks tip	6	Not enough wax	3	18	QA Inspection	QA Inspection	3	54
1.3		Mechanical eject time	Tight spring	Nip not ejected	8	Spring hardness	5	40	Vendor quality control	Batch sampling	8	320
1.4		Mechanism slowage clearance	Barell tip size small	Jammed lead	8	Squashed barell tip	4	32	Load single stand	100% inspection	6	192
1.5		Case strength	case collapses	Pen damaged	3	Sheet thickness low	1	3	Use standard sheet	Incoming QA Inspection	5	15
1.6		Surface tackiness	Rubber Handle	Tacky pen	4	Low vulcanization	5	20	Batch test	Visual look	3	60
1.7		Clip point clearance	Not enough spring	Pen drops from pocket	6	Clip tension low	7	42	Heat temper clip	Hand pull test	4	168
1.8		Auxillary attach flatness			0		0	0			0	0
1.9		Top surface smoothness			0		0	0			0	0
1.10		Retract mechanism force			0		0	0			0	0
1.11		Writing point finish			0		0	0			0	0
1.12		Ink drying time			0		0	0			0	0
1.13		Lead antimudge			0		0	0			0	0
1.14		Shape aspect ratio			0		0	0			0	0

Import from QFD !!

- FMEA
  - Follows the criteria for FMEA application
- Import data
  - From previous QFD
  - Set criteria for import





# Control Plan Methodology (CPM)



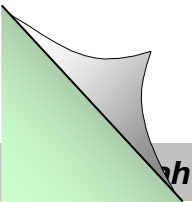
Belmah Strategies

## Control Plan

No	Part	Function	Machine, Device, Jig, Tools For Mfg.	No	Product	Process	Spec	Char. Class	Prod / Proc	Spec / Tol	Evaluation	Measurement Technique	Samp Size	Samp Freq	Control M
1	Imported from F-Matrix	New Function													
1.1		Ink flow rate	Ink injector, injection jig	138	Product	-	-		3.4 < vis	<6.5		Viscometer range read	20	5	Vis
1.2		Lead hardness	Instrom tensioned	12	Product	-	-		>1.2 Nm			Tensile Strength	5	4	Q.
1.3		Mechanical eject time	Stopwatch timer	60	Product	-	-		<0.5 sec			Timer mechanism	10	2	Vend
1.4		Mechanism slowage clearance	Go No-Go gage	3	Product	-	-		Go No-Go			Go No-Go Procedure	3	5	Use
1.5		Case strength	Forming die	118	Product	-	-		Depression of 2.125 cm			Depth micrometer	1	10	
1.6		Surface tackiness													
1.7		Clip point clearance													
1.8		Auxillary attach flatness													
1.9		Top surface smoothness													
1.10		Retract mechanism force													
1.11		Writing point finish													
1.12		Ink drying time													
1.13		Lead antismudge													
1.14		Shape aspect ratio													

- Get the traceability
  - VOC to QFD to FMEA to Control Plan

Import from FMEA !!



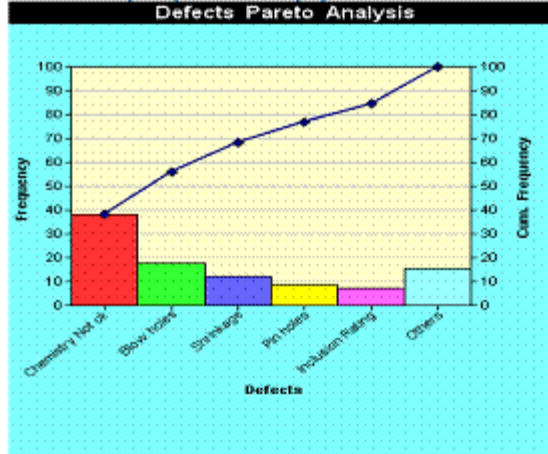


# 7 QC Tools

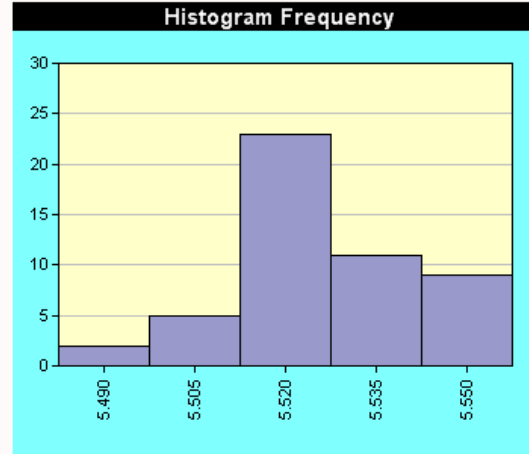


## Pareto Analysis

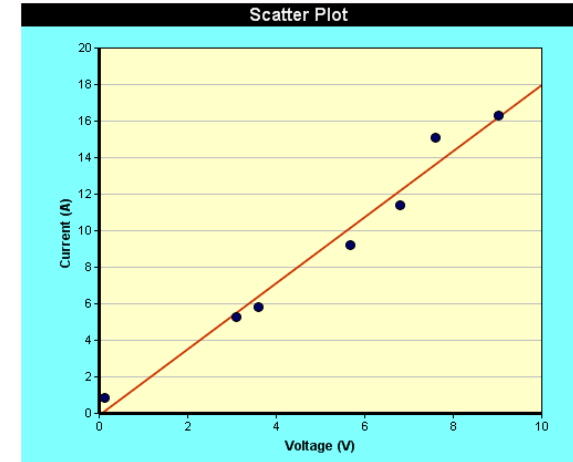
Pareto Analysis (Defects Graph)



## Histogram



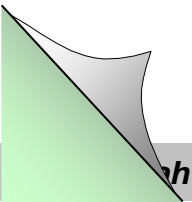
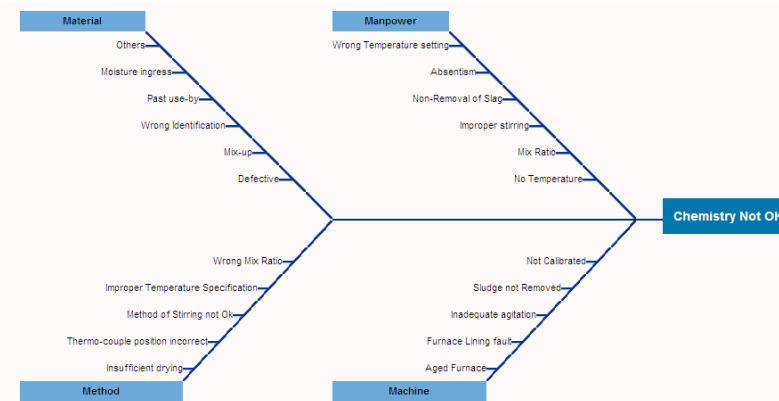
## Scatter Plot



## Tally Sheet

No.	Tasks	Total	Tally
1	Very bad	5	
2	Bad	8	 
3	Medium	7	 
4	Good	14	             
5	Very good	8	 
	<b>Total</b>	<b>42</b>	

## Cause-Effect Diagram







# New Quality Control Tools (NQCT)



## Force Field Diagram

Edit

What forces affect the implementation of 5S?					
Driving Forces			Restraining Forces		
1	Provides Visual Management	90	←	30	Requires training
2	Reduces accidents	80	←	70	Resistance to change
3	Quick error detection	50	←	60	Misunderstand concepts
4	Can find things easily	80	←	85	More work again
5	Saves space	70	←	60	What is wrong now
6	Reduces WIP	90	←	45	Loss of overtime
<b>Total</b>		<b>460</b>		<b>350</b>	

### Result

Total Driving Forces **Greater Than** Total Restraining Forces

## Affinity Diagram

Edit

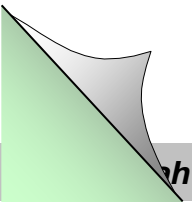
Level 1	Level 2 [Demanded Quality]	Level 3 [Reworded Data]
Tensile Strength	Temperature	High Low
	Pressure	High Low
	Material Composition	Mix Ratio 1 Mix Ratio 2 Mix Ratio 3
Surface Roughness	Grain Size	Small Medium Large
	Slag Removal	Every 2 Hours Every 4 Hours Every 6 Hours
	Impurities	Low Medium High
Dimensional Stability	Chemical Composition	Type 1 Type 2 Course
	Rapidness of Cooling	Slow Medium Fast
	Microstructure	Type 3 Fine

All tools supported by iCT-M® software

## Simple Gantt Chart

Edit

No.	Activity	Time In Weeks													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Awareness Meeting	█													
2	Managers briefing		█	█											
3	Seiri activities				█	█	█	█							
4	Seiton activities						█	█	█						
5	Seiso activities							█	█	█					
6	Seiketsu activities								█	█	█				
7	Audit									█	█	█			
8	Shitsuke activities										█	█	█		
9	Selection of best 5S area												█	█	█
10	Reward														█





# Advance Quality Control Tools (AQCT)

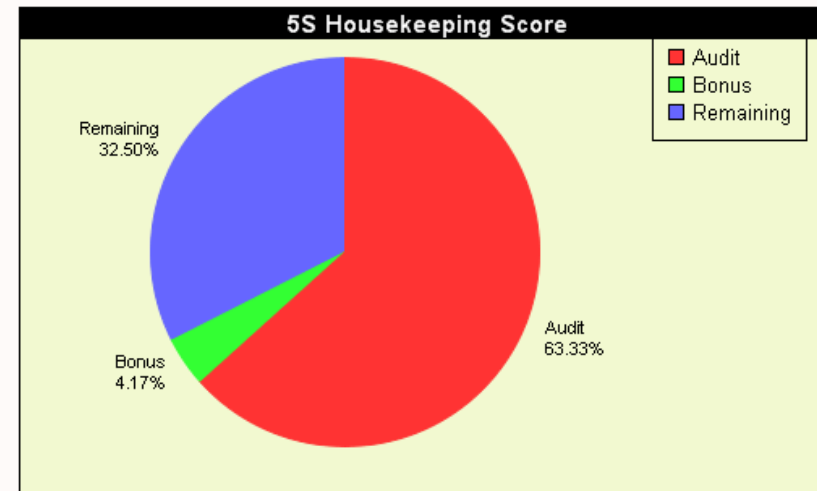


Belmah Strategies

## 5S House Keeping Evaluation Form

Expand All Collapse All Edit

Factory :		Metal Works	
Operation Site :		Site 1 - Foundry	
Department :		Quality Assurance	
Items	Focus	Scope	
<b>Working Area</b>			
1	Material parts	are they conveniently located and labeled for easy retrieval?	8
2	Work-in-process	are they conveniently located for easy handling?	4
3	Finished products	are they conveniently located and labeled for easy retrieval?	6
4	Defective/rejects	are they clearly labeled for separation from good items?	8
5	Machines/equipment	are they clean, asfe, well-maintained and convenient to operate?	10
6	Wiring/piping	are they laid out in a tidy, safe and convenient manner?	2
<b>Tools and Jigs</b>			
1	Dies/tools/jigs	are they conveniently labeled and placed at designated location?	7
2	Spare parts/lubricants	are they conveniently labeled and placed at designated location?	6
3	Containers/pallets	are they clean and conveniently placed at designated location?	8
4	Racks/shelves/cabinets	are they dust-free, tidy and conveniently labeled for items stored?	5
5	Carts/wagons/forklifts	are the well-maintained and placed at designated locations?	9
6	Lifts/conveyers/cranes	are they clean , tidy, safe, and well-maintained?	6
<b>Office Area</b>			
1	Desk/labels/chairs	are they clean and organized inside and outside?	5
2	Forms/files/records	are they up-to-date, easy to retrieve and at convenient locations?	6
3	Floors/passages/stairways	are they dust-free, tidy,safe and well-maintained?	5
4	Walls/windows/ceiling	are they dust-free, tidy,safe and well-maintained?	6
5	Lighting/ventilation	are they adequate for efficient operation?	2
6	Working wears/shoes	are they clean and do they present a good image?	9
<b>Safety Aspects</b>			
1	Safety devices	are they conveniently located for use and well-maintained?	4
2	Fire extinguishers/fire exits	are they adequate and cleaned regularly?	5
3	Cleaning tools/waste baskets	are they dust-free, tidy,safe and well-maintained?	7
4	Canteens/toilets/lockers	are they dust-free, tidy,safe and well-maintained?	8
5	External area/gardens	are they clean, tidy, safe and do they present a good image?	9
6	Security guards/car parks	are they clean, tidy, safe and do they present a good image?	7
<b>Audit Score</b>		<b>152</b>	
<b>Bonus Score</b>		<b>10</b>	
<b>Total Score</b>		<b>162</b>	
<b>No. of Items Evaluated</b>		<b>24</b>	
<b>Total Score Possible</b>		<b>240</b>	
<b>Percentage Score</b>		<b>67.50</b>	

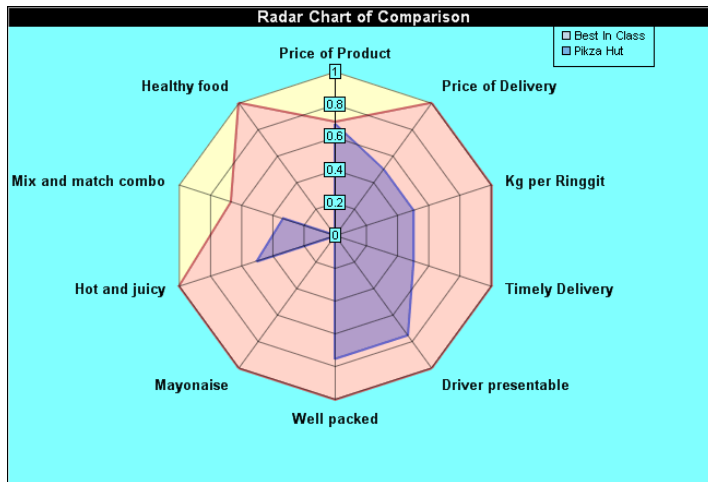




# Benchmarking (BMK)



No.	Key Success Factors	Competitor Performance				Pikza Hut Performance			
		Pikza Hut	Mac Donals	Kelly Rozers	Nandoos	Pikza Hut	Mac Donals	Kelly Rozers	Nandoos
1	Price of Product	4.90	5.00	6.40	4.80	0.68	0.67	0.48	0.69
2	Price of Delivery	2.00	1.00	3.00	3.00	0.50	1.00	0.00	0.00
3	Kg per Ringgit	0.25	0.20	0.28	0.30	0.50	0.00	0.80	1.00
4	Timely Delivery	45.00	50.00	30.00	60.00	0.50	0.33	1.00	0.00
5	Driver presentable	4.00	3.00	2.00	5.00	0.75	0.50	0.25	1.00
6	Well packed	4.00	3.00	2.00	5.00	0.75	0.50	0.25	1.00
7	Mayonaise	20.00	40.00	25.00	30.00	0.00	0.00	0.50	1.00
8	Hot and juicy	65.00	70.00	75.00	0.00	0.50	1.00	0.50	0.00
9	Mix and match combo	6.00	5.00	8.00	4.00	0.33	0.17	0.67	0.00
10	Healthy food	1.00	3.00	5.00	1.00	0.00	0.50	1.00	0.00
<b>Weighted Average</b>						<b>0.45</b>	<b>0.47</b>	<b>0.54</b>	<b>0.47</b>
<b>Rank</b>						<b>4</b>	<b>3</b>	<b>1</b>	<b>2</b>



No.	Key Success Factors	Pikza Hut	Mac Donals	Kelly Rozers	Nandoos	Competitor Check
1	Price of Product		3			Not OK
2	Price of Delivery		9			OK
3	Kg per Ringgit		9	3		OK
4	Timely Delivery				9	OK
5	Driver presentable		3		9	OK
6	Well packed			9		OK
7	Mayonaise				9	OK
8	Hot and juicy			9		OK
9	Mix and match combo		9			OK
10	Healthy food		3		9	OK



## Key Success Factors

Edit

Category	No.	Key Success Factors	Measure	Objective	Weights	Target	Units	Worst	Best
Price	1	Price of Product	Based on similar burger	Must be value provider	1.0	Small	RM	10.0	2.5
	2	Price of Delivery	Transport charges	Must be cheapest	1.0	Small	RM	3.0	1.0
	3	Kg per Ringgit	Weigh only the burger meat	Value on great meat	1.0	Large	Kg	0.2	0.3
Features	4	Timely Delivery	Time taken to deliver	Deliver within 30 minutes	1.0	Small	mins	60.0	30.0
	5	Driver presentable	Driver is neatly dressed	Smart dress, tie and shoes	1.0	Attribute	--	1.0	5.0
	6	Well packed	Comes a box without spills	Moulded trays	1.0	Attribute	--	1.0	5.0
Product	7	Mayonaise	Gives the right flavor	Just right taste	1.0	Nominal	gm	20.0	40.0
	8	Hot and juicy	Not cold and dry	Delicious to eat	1.0	Nominal	oC	60.0	80.0
	9	Mix and match combo	Good combination available	Great variety	1.0	Large	Units	4.0	10.0
	10	Healthy food	Not seen as junk food	Health conscious	1.0	Attribute	Size	1.0	5.0

### Note :

Weights may be assigned as an absolute number (e.g. 1, 5, etc.).  
 Weights may be assigned as a deviation from 1 (e.g. 0.9, 1.1, etc.).  
 All weights are normalized where necessary.

At least 3 Key Success Factor names and values are necessary to draw a Radar Chart.

Changing Weights, Target, Worst or Best values will update Benchmark results.



# Competitors



## Competitors

Edit

No.	Key Success Factors	Pikza Hut	Mac Donalds	Kelly Rozers	Handoos	Competitor Check
1	Price of Product		3			Not OK
2	Price of Delivery		9			OK
3	Kg per Ringgit		9	3		OK
4	Timely Delivery				9	OK
5	Driver presentable		3		9	OK
6	Well packed			9		OK
7	Mayonaise				9	OK
8	Hot and juicy			9		OK
9	Mix and match combo		9			OK
10	Healthy food		3		9	OK

**Note :**

The Competitor Check column must have all OK.

Not OK implies there is no suitable Competitor for that KSF comparison.



# Benchmark



## Benchmark

Edit

Measure  Objective  Weights & limits  Competitor Notes  Competitor Points  Competitor Marks  
 Best In Class  Best Practice

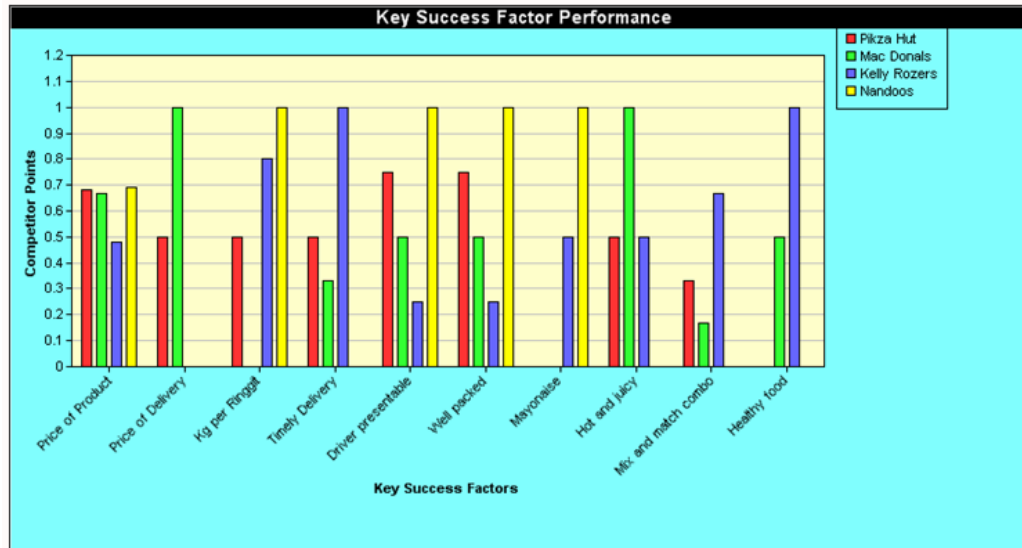
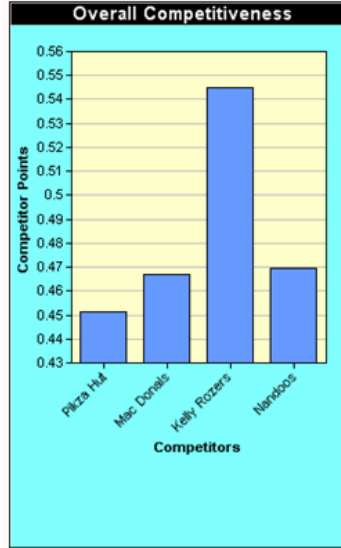
No.	Key Success Factors	Measure	Objective	Pikza Hut	Mac Donals	Kelly Rozers	Handoos	Pikza Hut	Mac Donals	Kelly Rozers	Handoos	Best Practice
1	Price of Product	Based on similar burger	Must be value provider	4.90	5.00	6.40	4.80	0.68	0.67	0.48	0.69	Less than RM5.00
2	Price of Delivery	Transport charges	Must be cheapest	2.00	1.00	3.00	3.00	0.50	1.00	0.00	0.00	Deliver to 2 km
3	Kg per Ringgit	Weigh only the burger meat	Value on great meat	0.25	0.20	0.28	0.30	0.50	0.00	0.80	1.00	0.28 kg
4	Timely Delivery	Time taken to deliver	Deliver within 30 minutes	45.00	50.00	30.00	60.00	0.50	0.33	1.00	0.00	30 mins
5	Driver presentable	Driver is neatly dressed	Smart dress, tie and shoes	4.00	3.00	2.00	5.00	0.75	0.50	0.25	1.00	Neat and tidy
6	Well packed	Comes a box without spills	Moulded trays	4.00	3.00	2.00	5.00	0.75	0.50	0.25	1.00	Styrofoam
7	Mayonaise	Gives the right flavor	Just right taste	20.00	40.00	25.00	30.00	0.00	0.00	0.50	1.00	30 gms
8	Hot and juicy	Not cold and dry	Delicious to eat	65.00	70.00	75.00	0.00	0.50	1.00	0.50	0.00	70 °C wrap in foil
9	Mix and match combo	Good combination available	Great variety	6.00	5.00	8.00	4.00	0.33	0.17	0.67	0.00	8 combinations
10	Healthy food	Not seen as junk food	Health conscious	1.00	3.00	5.00	1.00	0.00	0.50	1.00	0.00	OK
Weighted Average								0.45	0.47	0.54	0.47	
Rank								4	3	1	2	



# Benchmark Results



## Benchmark Results





# Radar Chart



## Radar Chart

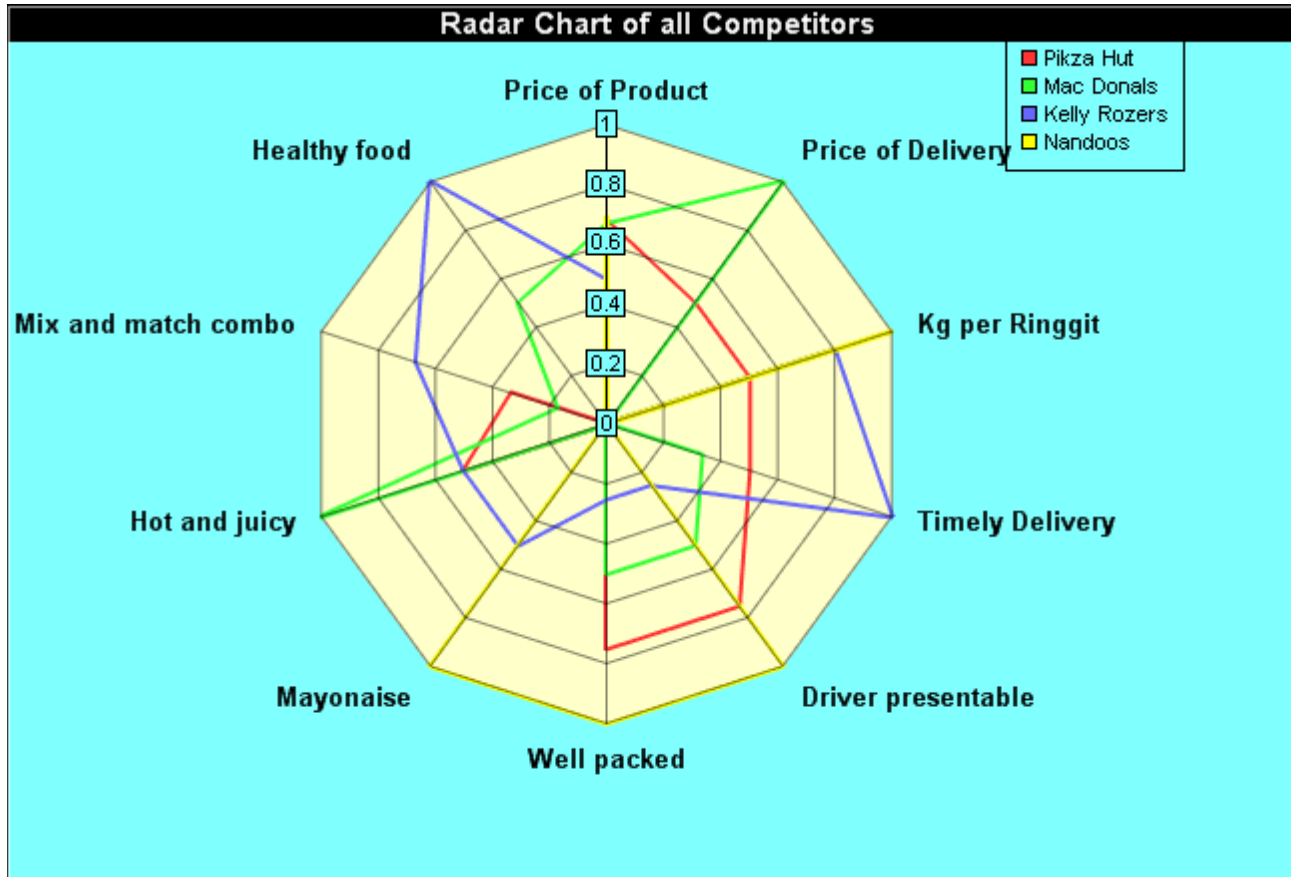
+.0  
 .00  
 Competitor Marks
  Best In Class
  Best Practice
 [View](#)

No.	Key Success Factors	Pikza Hut	Mac Donalds	Kelly Rozers	Handoos	Pikza Hut	Best in Class	Difference	Best Practice
1	Price of Product	0.680	0.667	0.480	0.693	0.680	0.693	-0.013	Less than RM5.00
2	Price of Delivery	0.500	1.000	0.000	0.000	0.500	1.000	-0.500	Deliver to 2 km
3	Kg per Ringgit	0.500	0.000	0.800	1.000	0.500	1.000	-0.500	0.28 kg
4	Timely Delivery	0.500	0.333	1.000	0.000	0.500	1.000	-0.500	30 mins
5	Driver presentable	0.750	0.500	0.250	1.000	0.750	1.000	-0.250	Neat and tidy
6	Well packed	0.750	0.500	0.250	1.000	0.750	1.000	-0.250	Styrofoam
7	Mayonaise	0.000	0.000	0.500	1.000	0.000	1.000	-1.000	30 gms
8	Hot and juicy	0.500	1.000	0.500	0.000	0.500	1.000	-0.500	70 °C wrap in foil
9	Mix and match combo	0.333	0.167	0.667	0.000	0.333	0.667	-0.333	8 combinations
10	Healthy food	0.000	0.500	1.000	0.000	0.000	1.000	-1.000	OK
Weighted Average		0.451	0.467	0.545	0.469	0.451	0.551		
Rank		4	3	1	2				





# Radar Chart of all Competitors





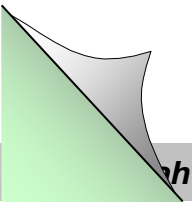
# Action Program



## Action

Best In Class
  Improvements
  Planning

No.	Key Success Factors	Proposed Action	Improvement Target	PIC	Dateline	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Price of Product	No action needed		Allen	27-Feb-2007	█	█														
2	Price of Delivery	Increase our distance		Brian	13-Mar-2007		█	█	█												
3	Kg per Ringgit	Best No action		Collin	13-Feb-2007			█	█	█	█	█									
4	Timely Delivery	Reduce the time	25 minutes	Denise	06-Mar-2007					█	█	█									
5	Driver presentable	Improve neatness	Dress code	Elaine	13-Mar-2007						█	█	█	█	█						
6	Well packed	Use sealed bags	Aluminium foil	Frances	20-Mar-2007								█	█	█	█					
7	Mayonaise																				
8	Hot and juicy																				
9	Mix and match combo																				
10	Healthy food																				

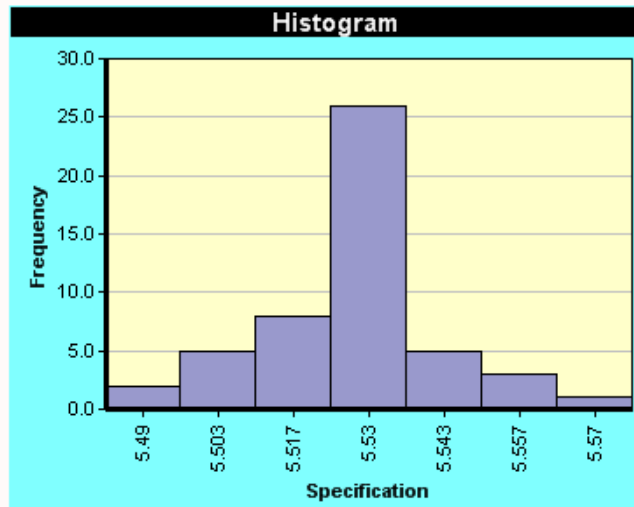




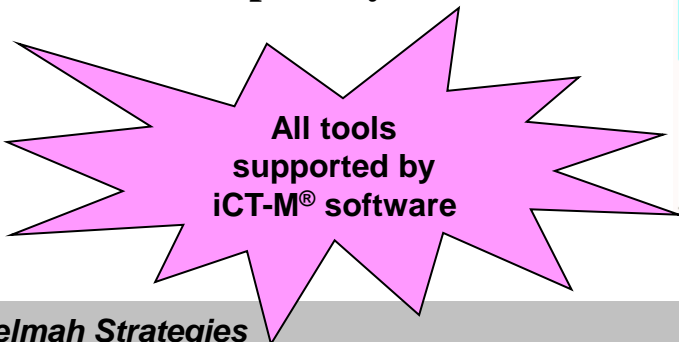
# Statistical Process Control (SPC)



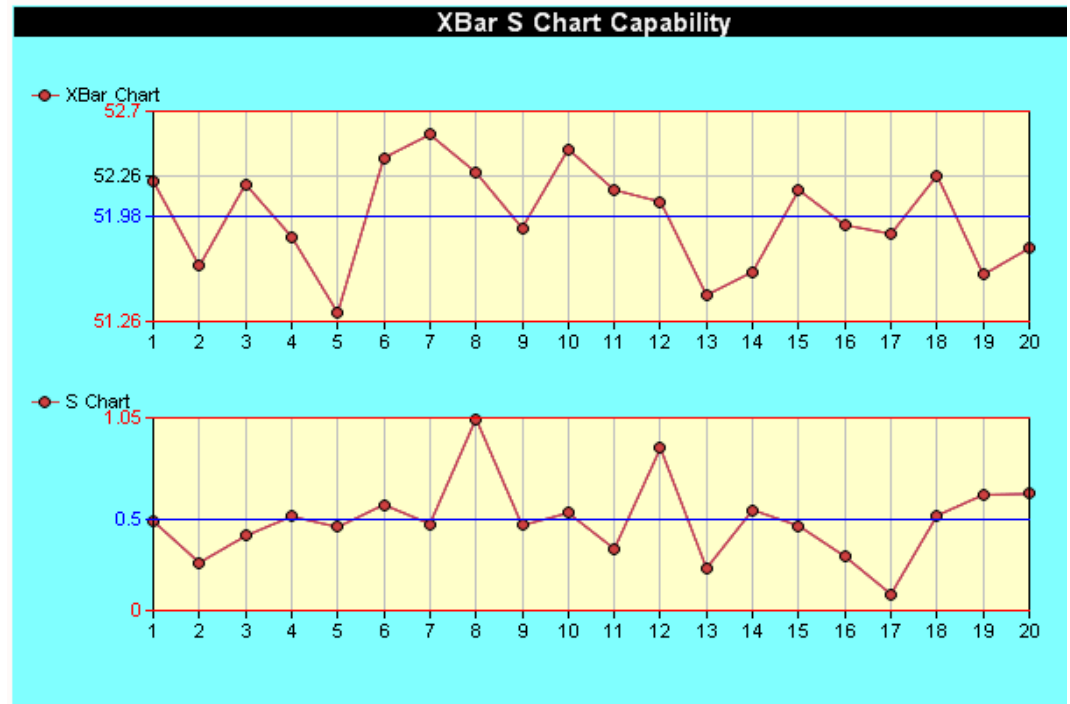
Graph Interval		Reading	
No. Of Cells	7	Slope	59.810
Cell Interval	0.013	Constant	-330.160
Display By	Freq.	Int 3s	5.570
Spreads		Machine Capability	
Spec	0.100	Cm	0.997
Process	0.100	Machine Capability Index	
Half Process	0.050	Cmk	0.589



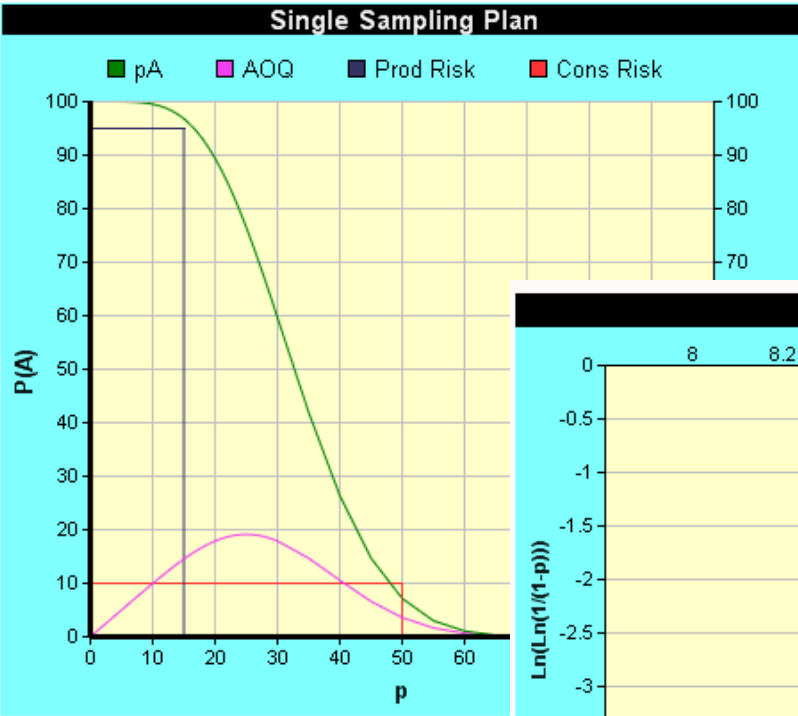
## Machine Capability



## Xbar Sigma Chart

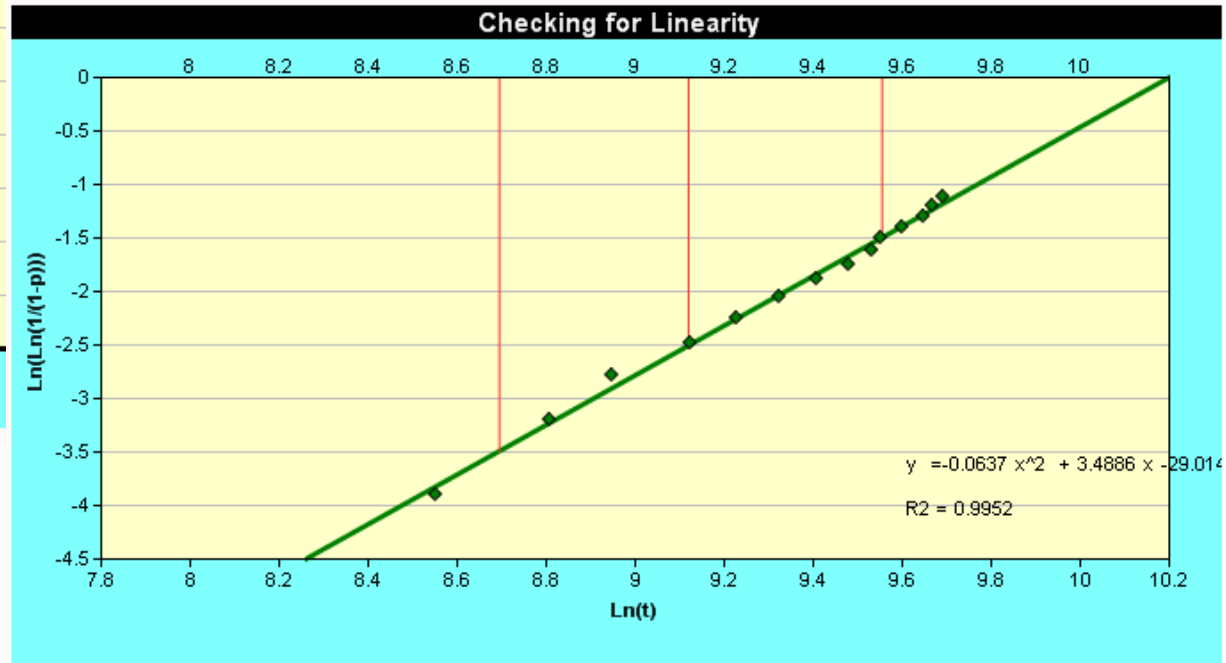


No	Remark
5	Point is noted to be close to the Lower Control Limit.
6	Resample shows the process is under control.

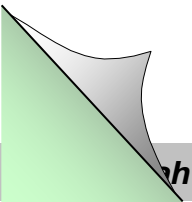


**Single Sampling Plan**

## Reliability Studies



Corrected Predictions					Shape factor Beta (b)		3.484	2.320	Wear Out
% Failure	Time (t)	P(Fail)	Ln(t)	Ln(Ln(1/(1-p)))	Minimum life	4817.767	5285.359	(i.e. 0% of population fails)	
10.000	10208.667	0.100	9.231	-2.250	<b>B10 Maintenance replacement life</b>	15249.706	15026.434	(i.e. 10% of population fails)	
50.000	22996.687	0.500	10.043	-0.367	Mean life	26186.849	27814.454	(i.e. 50% of population fails)	
63.200	26929.152	0.632	10.201	0.000	Characteristic life Alpha (a)	29088.953	31746.919	(i.e. 63.2% of population fails)	



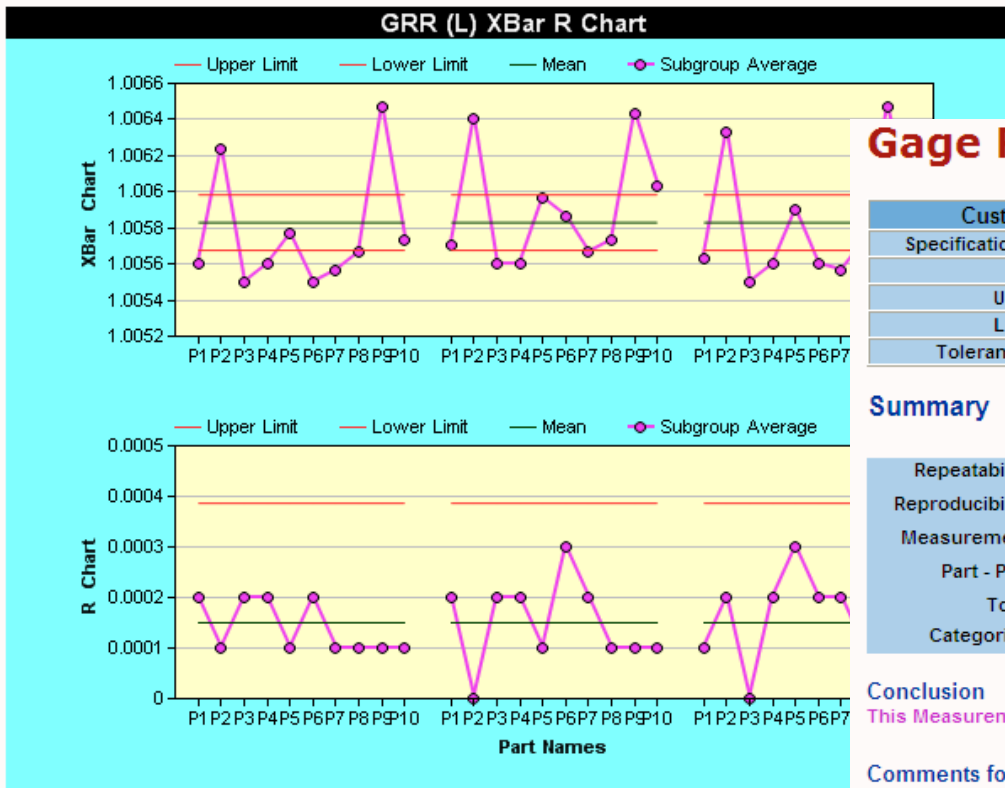


# Measurement Systems Analysis (MSA)



## Gage Repeatability and Reproducibility (Long Term)

	X-Bar	R
UCL	1.0060	0.0004
Mean	1.0058	0.0001
LCL	1.0057	0.0000



## Gage Repeatability and Reproducibility (Long

Customer Specification			
Specification	1.006	+	0.002
		-	0.002
USL	1.008		
LSL	1.004		
Tolerance	0.004		

### Summary

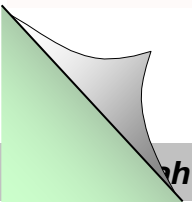
		m	g	d2*	Stdev	5.15x	%TV	%tol		
Repeatability	Se	Trials=r	3	30	1.693	0.00009	0.0005	28.48	11.41	EV
Reproducibility	So	Apprs=k	3	1	1.91	0.00007	0.0004	22.40	8.97	AV
Measurement	Sm				0.00011	0.0006	36.23	14.51	GRR	
Part - Part	Sp	Parts=n	10	1	3.18	0.00029	0.0015	93.21	37.34	PV
Total	St				0.00031	0.0016	100.00	40.06	Total	
Categories	ndc		3.6							

### Conclusion

This Measurement System is Conditionally Acceptable

### Comments for this Study

ICT-Manufacturing software provides an easy method of conducting the GRR Long Method. The Method is also integrated with the ANOVA Method.





# Hypothesis Testing (HYP)



## Decision Rule

### Left Tail

Alpha = 0.05

$t_{\alpha, v} = 1.73$

Accept  $H_0$  if  $-t_{\alpha, v} < t_{\text{sample}}$

Reject  $H_0$  otherwise

### Both Tails

Alpha = 0.05

$t_{\alpha/2, v} = 2.09$

Accept  $H_0$  if  $-t_{\alpha/2, v} < t_{\text{sample}} < t_{\alpha/2, v}$

Reject  $H_0$  otherwise

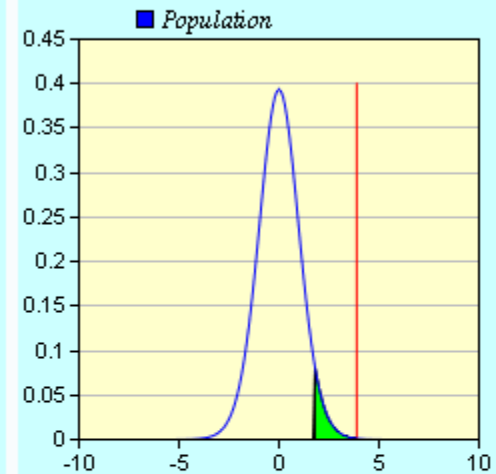
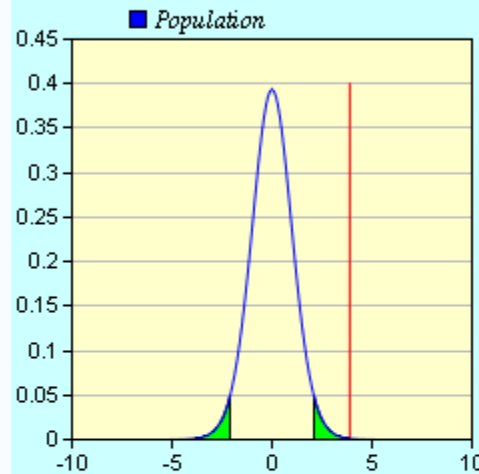
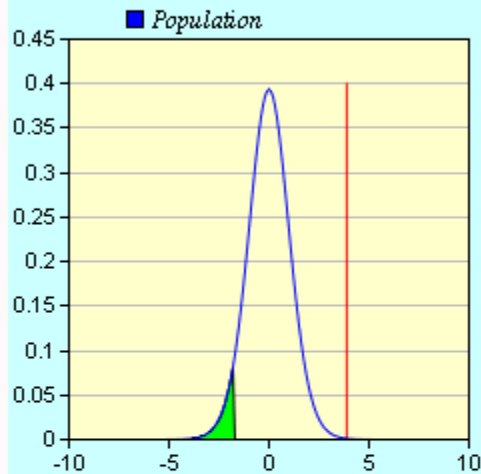
### Right Tail

Alpha = 0.05

$t_{\alpha, v} = 1.73$

Accept  $H_0$  if  $t_{\text{sample}} < t_{\alpha, v}$

Reject  $H_0$  otherwise



## Calculate Test Statistic

$$t_{\text{Sample}} = \frac{(\bar{x} - \mu)}{\sqrt{\frac{S^2}{n}}} = 3.88$$

$H_0$  Accept

Test Statistic is not significant at 0.05

$$t_{\text{Sample}} = \frac{(\bar{x} - \mu)}{\sqrt{\frac{S^2}{n}}} = 3.88$$

$H_0$  Reject

Test Statistic is significant at 0.05

$$t_{\text{Sample}} = \frac{(\bar{x} - \mu)}{\sqrt{\frac{S^2}{n}}} = 3.88$$

$H_0$  Reject

Test Statistic is significant at 0.05

## Conclusion

Not enough statistical evidence that the true mean is < than 24.00 .

Enough statistical evidence that the true mean is not 24.00 .

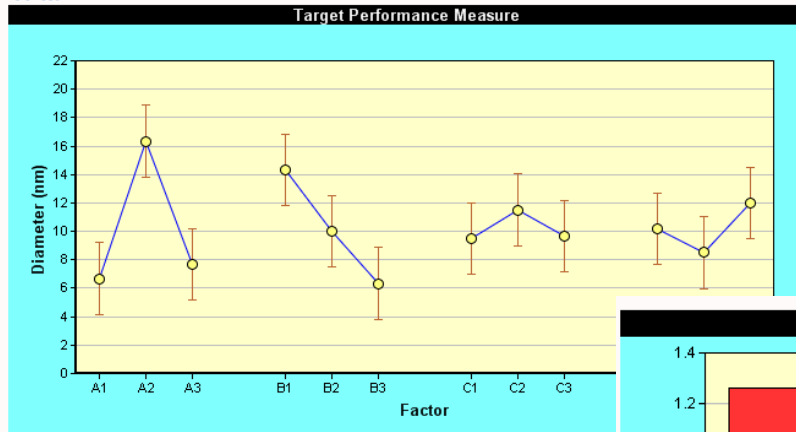
Enough statistical evidence that the true mean is > than 24.00 .



# Design of Experiments (DOE)



## TPM

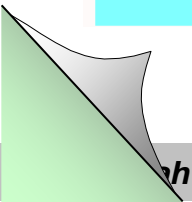
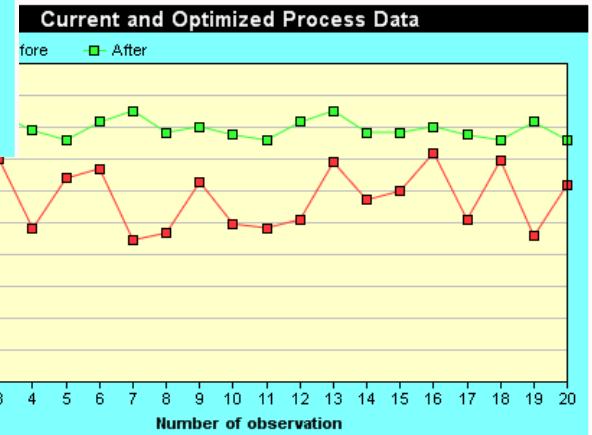
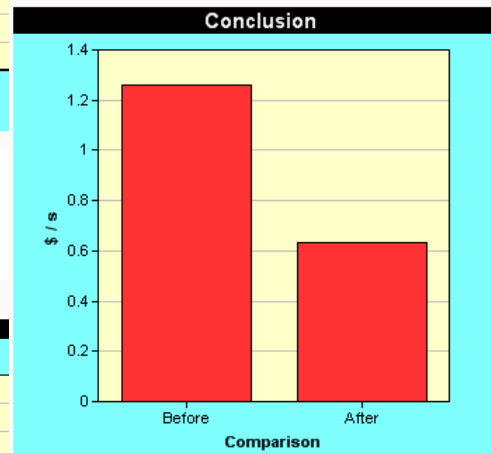
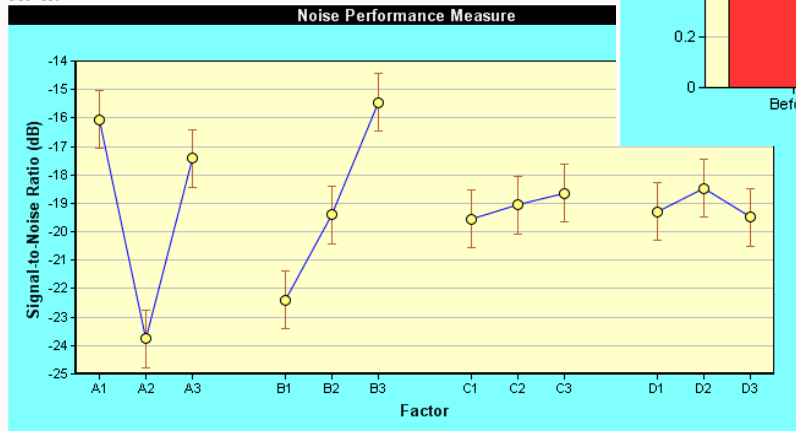


## Analysis of Variance (TPM)

Source	Pool	SSQ	Df	Var	F ratio	SSq	Rho
A	0	678.22	2	339.11	73.46	668.99	55.46
B	0	384.89	2	192.44	41.69	375.66	31.14
C	1	29.56	2	14.78			
D	1	73.56	2	36.78			
Err	1	40.00	27	1.48			
Pool		143.11	31	4.62	1.00	161.58	13.40
St		1206.22	35	34.46		1206.22	100.00
		3761.78	1				
		4968.00	36				

as a pooled error suggests low error

## NPM





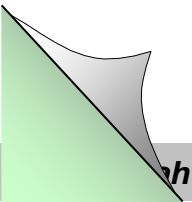
# Dynamic Control Plans (DCP)



## Pre-launch Dynamic Control Plan

Note : FMEA changes should be made in FMEA.

No.	Part / Function	Potential Failure Mode	Spec	Type	Imp	Critical Factor	Control Method	Tool	Gage	Grr	CM	CP	Reaction Plan
1	Imported from linked QFD												
1.1	Material Data Sheet	Non compliance											
1.2	Viscosity test	Ink hardens											
1.3	Dimensional checks	Non fitting parts											
1.4	Printed manual	Missed in package											
1.5	Tight rollers	Roller housing crimp											
1.6	Standard sizes	Non fitting of parts											
1.7	Microfoil burst	Marking pressure high											







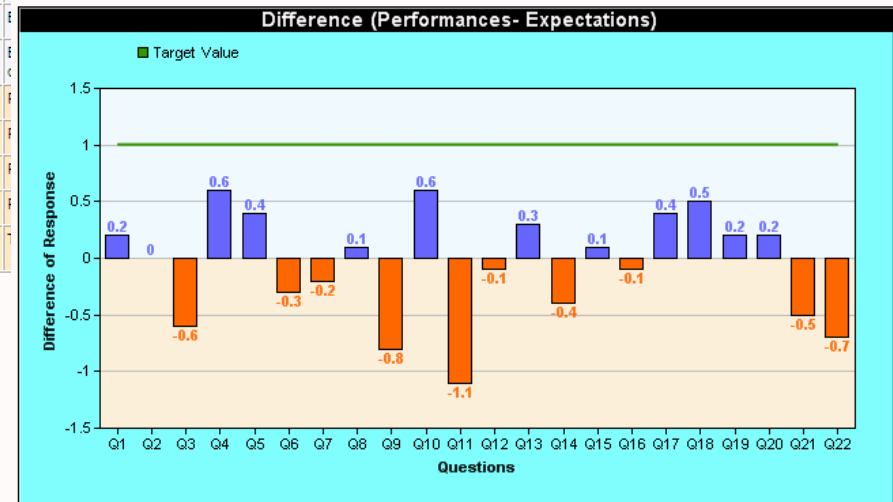
# Service Quality



Expectation						
No.	Description	1	2	3	4	5
Q1	Excellent Hospitals will have modern looking equipment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Q2	Physical facilities at excellent Hospitals will be visually appealing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q3	Employees at excellent Hospitals will be neat appearing.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4	Materials associated with the service (such as menu cards, pamphlets or marketing literature) will be visually appealing at an excellent Hospitals.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q5	When excellent Hospitals promise to do something by a certain time, they do.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6	When a customer has a problem, excellent Hospitals will show a sincere interest in solving it.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7	Excellent Hospitals will perform the service right the first time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q8	Excellent Hospitals will provide the service at the time they promise to do so.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q9	Excellent Hospitals will insist on error free records.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q10	Employees of excellent Hospitals will tell customers exactly when services will be performed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q11	Employees of excellent Hospitals will give prompt service to customers.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q12	Employees of excellent Hospitals will always be willing to help customers.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q13	Employees of excellent Hospitals will never be too busy to respond to customers requests.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q14	The behavior of employees in excellent Hospitals will instill confidence in customers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q15	Customers of excellent Hospitals will feel safe in transactions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Q16	Employees of excellent Hospitals will be consistently courteous with customers.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17	Employees of excellent Hospitals will have the knowledge to answer customers questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Q18	Excellent Hospitals will give customers individual attention.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q19	Excellent Hospitals will have operating hours convenient to all their customers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q20	Excellent Hospitals will have employees who give customers personal attention.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q21	Excellent Hospitals will have their customers best interests at heart.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q22	The employees of excellent Hospitals will understand the specific needs of their customers.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Performance						
No.	Description	1	2	3	4	5
Q1	Rawatbagus Hospital has modern looking equipment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q2	Rawatbagus Hospital physical facilities are visually appealing.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q3	Rawatbagus Hospital host desk employees are neat appearing.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4	Materials associated with the service (such as menu cards, pamphlets or brochures) are visually appealing at Rawatbagus Hospital.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q5	When Rawatbagus Hospital promises to do something by a certain time, it does so.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6	When you have a problem, Rawatbagus Hospital shows a sincere interest in solving it.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7	Rawatbagus Hospital performs the service right the first time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q8	Rawatbagus Hospital provides its service at the time it promises to do so.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q9	Rawatbagus Hospital insists on error free records.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q10	Employees in Rawatbagus Hospital tell you exactly when services will be performed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q11	Employees in Rawatbagus Hospital give you prompt service.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q12	Employees in Rawatbagus Hospital are always willing to help you.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q13	Employees in Rawatbagus Hospital are never too busy to respond to your request.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q14	The behavior of employees in Rawatbagus Hospital instills confidence in you.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q15	You feel safe in your transactions with Rawatbagus Hospital.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

W1	The appearance of physical facilities, equipment, personnel and communication materials.	Tangibles	<input type="text" value="30"/>
W2	Ability to perform the promised service dependably and accurately.	Reliability	<input type="text" value="30"/>
W3	Willingness to help customers and provide prompt service.	Responsiveness	<input type="text" value="20"/>
W4	Knowledge and courtesy of employees and their ability to convey trust and confidence.	Assurance	<input type="text" value="10"/>
W5	Caring, individualised attention the firm provides its customers.	Empathy	<input type="text" value="10"/>
<b>Total</b>			<b>100</b>





# Likert Scale



**Likert Scale : 5      Direction : (1) Strongly Disagree --- (5) Strongly Agree**

Scale	Description	Bahasa Malaysia
1	Strongly Disagree	Sangat Tidak Setuju
2	Disagree	Tidak Setuju
3	Indifferent	Tidak Kisah (Tidak Berkecuali)
4	Agree	Setuju
5	Strongly Agree	Sangat Setuju

Grade No	Grade	Category	Description
-4	F	Dissatisfied	Sev dissatisfied
-3	F	Dissatisfied	Sev dissatisfied
-2	E	Dissatisfied	Sev dissatisfied
-1	D	Dissatisfied	Mid satisfied
0	C	Satisfied	Mid satisfied
1	B	Satisfied	Mid satisfied
2	A	Satisfied	Most satisfied
3	A	Satisfied	Most satisfied
4	A	Satisfied	Most satisfied



# Questionnaire



No.	Catch Line	Expectation	Performance
Q1	Up-to-date equipment. <i>Peralatan terkini.</i>	I expect government clinic to use appropriate up-to-date equipment. <i>Saya harap klinik kerajaan akan menggunakan peralatan terkini yang bersesuaian.</i>	I find Health Clinic uses appropriate up-to-date equipment. <i>Saya dapati Klinik Kesihatan menggunakan peralatan terkini yang bersesuaian.</i>
Q2	Visually appealing. <i>Kelihatan menarik.</i>	I expect government clinics physical facilities to be visually appealing <i>Saya harap kemudahan fizikal klinik kerajaan kelihatan menarik.</i>	I find the physical facilities in Health Clinic visually appealing <i>Saya dapati kemudahan fizikal Klinik Kesihatan kelihatan menarik.</i>
Q3	Keep promises. <i>Menepati janji.</i>	I expect government clinic to provide their services at the time they promise to do so. <i>Saya harap klinik kerajaan memberi perkhidmatan pada masa yang dijanjikan.</i>	I find Health Clinic provides their services at the time they promise to do so. <i>Saya dapati Klinik Kesihatan memberi perkhidmatan pada masa yang dijanjikan.</i>
Q4	Right first time service. <i>Betul setiap kali.</i>	I expect government clinic staff to perform the services right everytime. <i>Saya harap anggota klinik kerajaan sentiasa melaksanakan perkhidmatan dengan betul</i>	I find Health Clinic perform the services right everytime Rawatbagus Hospital. <i>Saya dapati Klinik Kesihatan sentiasa melaksanakan perkhidmatan dengan betul .</i>
Q5	Prompt service. <i>Cepat.</i>	I expect government clinic staff to give prompt service. <i>Saya harap anggota klinik kerajaan memberi perkhidmatan yang cepat.</i>	I find Health Clinic staff gives prompt service. <i>Saya dapati anggota Klinik Kesihatan memberi perkhidmatan yang cepat.</i>
Q6	Sincere interest to help. <i>Sedia membantu.</i>	I expect government clinic staff to be willing to help with sincere interest. <i>Saya harap anggota klinik kerajaan sedia membantu apabila diperlukan.</i>	I find Health Clinic staff willing to help with sincere interest. <i>Saya dapati anggota Klinik Kesihatan sedia membantu apabila diperlukan.</i>
Q7	Competently. <i>Cekap.</i>	I expect government clinic staff to perform their job competently <i>Saya harap anggota klinik kerajaan dapat melaksanakan tugas mereka dengan cekap.</i>	I find Health Clinic staff performs their job competently <i>Saya dapati anggota Klinik Kesihatan menjalankan tugas mereka dengan cekap</i>



# Questionnaire Groups



<b>Tangibles</b> <i>Benda yang dapat dikesan</i>	<b>Catch Line</b> <i>Kandungan ringkas</i>	<b>Questionnaire Survey questions</b> <i>Soalan Questionnaire Survey</i>	
<b>Q1</b>	Up-to-date equipment. <i>Peralatan terkini.</i>	I expect government clinic to use appropriate up-to-date equipment. <i>Saya harap klinik kerajaan akan menggunakan peralatan terkini yang bersesuaian.</i>	I find Health Clinic uses appropriate up-to-date equipment. <i>Saya dapati Klinik Kesihatan menggunakan peralatan terkini yang bersesuaian.</i>
<b>Q2</b>	Visually appealing. <i>Kelihatan menarik.</i>	I expect government clinics physical facilities to be visually appealing <i>Saya harap kemudahan fizikal klinik kerajaan kelihatan menarik.</i>	I find the physical facilities in Health Clinic visually appealing <i>Saya dapati kemudahan fizikal Klinik Kesihatan kelihatan menarik.</i>
<b>Reliable</b> <i>Kekukuhan</i>	<b>Catch Line</b> <i>Kandungan ringkas</i>	<b>Questionnaire Survey questions</b> <i>Soalan Questionnaire Survey</i>	
<b>Q3</b>	Keep promises. <i>Menepati janji.</i>	I expect government clinic to provide their services at the time they promise to do so. <i>Saya harap klinik kerajaan memberi perkhidmatan pada masa yang dijanjikan.</i>	I find Health Clinic provides their services at the time they promise to do so. <i>Saya dapati Klinik Kesihatan memberi perkhidmatan pada masa yang dijanjikan.</i>
<b>Q4</b>	Right first time service. <i>Betul setiap kali.</i>	I expect government clinic staff to perform the services right everytime. <i>Saya harap anggota klinik kerajaan sentiasa melaksanakan perkhidmatan dengan betul</i>	I find Health Clinic perform the services right everytime Rawatbagus Hospital. <i>Saya dapati Klinik Kesihatan sentiasa melaksanakan perkhidmatan dengan betul .</i>
<b>Responsive</b>			
<b>Q5</b>	Prompt service. <i>Cepat.</i>	I expect government clinic staff to give prompt service. <i>Saya harap anggota klinik kerajaan memberi perkhidmatan yang cepat.</i>	I find Health Clinic staff gives prompt service. <i>Saya dapati anggota Klinik Kesihatan memberi perkhidmatan yang cepat.</i>
<b>Q6</b>	Sincere interest to help. <i>Sedia membantu.</i>	I expect government clinic staff to be willing to help with sincere interest. <i>Saya harap anggota klinik kerajaan sedia membantu apabila diperlukan.</i>	I find Health Clinic staff willing to help with sincere interest. <i>Saya dapati anggota Klinik Kesihatan sedia membantu apabila diperlukan.</i>



# Respondents



<< < Carmlye ▾ > >>

<b>Name</b>	Carmlye
<b>Address</b>	Penang
<b>Age</b>	51 - 55
<b>Gender</b>	Male
<b>Citizenship</b>	Malaysian
<b>Race</b>	Others
<b>Marital Status</b>	Single
<b>Highest Education Level</b>	Secondary Education
<b>Occupation</b>	Retired
<b>Visiting Clinic</b>	Specialist Clinic
<b>No of visit to Clinic</b>	Twice
<b>Waiting Time</b>	40-59 mint
<b>What is your main problem that you encounter at this clinic?</b>	Waiting too long



# Data Collection



Respondents Eleanor

Edit Switch to Bahasa Malaysia

Likert Scale : 1 Strongly Disagree 2 Disagree 3 Indifferent 4 Agree 5 Strongly Agree

Expectation						
1. This questionnaire deals with your Expectations of the Service Provider.						
2. Please indicate the level of Expectation you think the Service Provider should have in the following Dimensions.						
3. The Survey needs a number that best represents your Expectations of the Service Provider.						
No.	Description	1	2	3	4	5
Q1	I expect government clinic to use appropriate up-to-date equipment.		█			
Q2	I expect government clinics physical facilities to be visually appealing				█	
Q3	I expect government clinic to provide their services at the time they promise to do so.		█			
Q4	I expect government clinic staff to perform the services right everytime.				█	
Q5	I expect government clinic staff to give prompt service.			█		
Q6	I expect government clinic staff to be willing to help with sincere interest.	█				
Q7	I expect government clinic staff to perform their job competently					█
Q8	I expect government clinic staff to be polite		█			
Q9	I expect government clinic staff to always understand patients needs.				█	
Q10	I expect government clinic staff to give patient personal attention.			█		

Performance						
1. This questionnaire deals with your Perception of the Service Provider.						
2. Please indicate the level of Perception you experienced from the Service Provider in the following Dimensions.						
3. The Survey needs a number that best represent your Perceptions of the Service Provider.						
No.	Description	1	2	3	4	5
Q1	I find Health Clinic uses appropriate up-to-date equipment.			█		
Q2	I find the physical facilities in Health Clinic visually appealing		█			
Q3	I find Health Clinic provides their services at the time they promise to do so.				█	
Q4	I find Health Clinic perform the services right everytime Rawatbagus Hospital.					█
Q5	I find Health Clinic staff gives prompt service.	█				
Q6	I find Health Clinic staff willing to help with sincere interest.			█		
Q7	I find Health Clinic staff performs their job competently				█	
Q8	I find Health Clinic staff is always polite		█			
Q9	I find Health Clinic staff always understand patients needs.			█		
Q10	I find Health Clinic staff gives patients personal attention.				█	



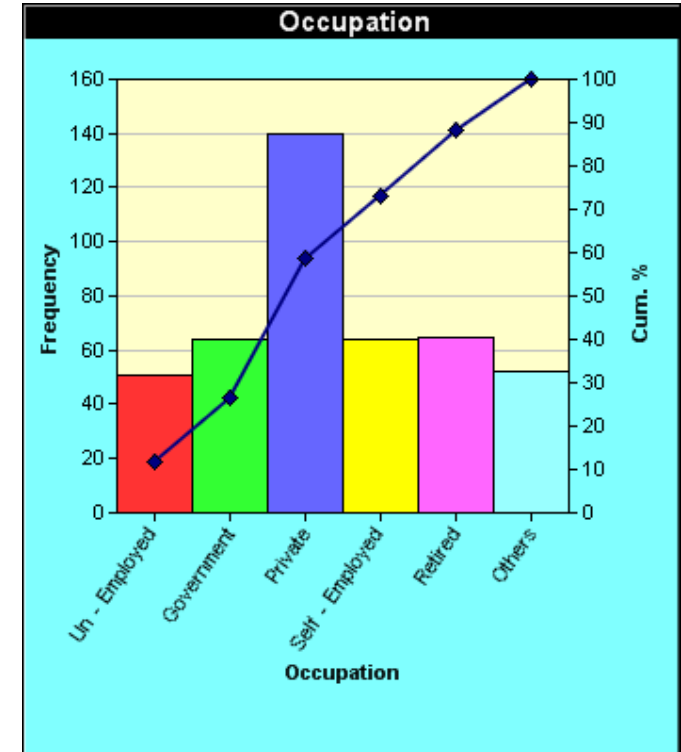
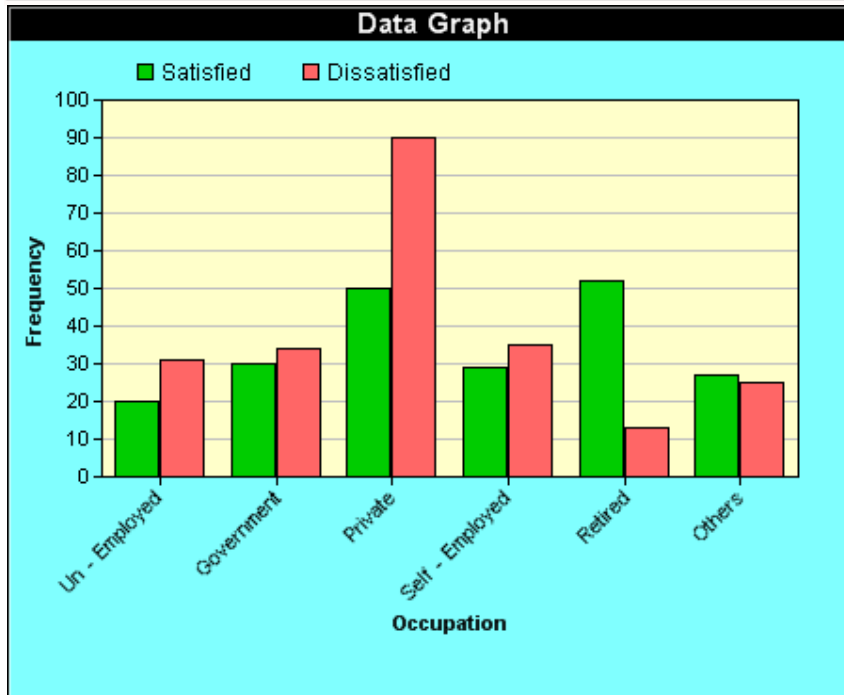
# Demographics



Belmah Strategies

Demographics : Occupation

Data	Frequency			Percentage			Cumulative %
	Satisfied	Dissatisfied	Total	Satisfied	Dissatisfied	Total	
Un - Employed	20	31	51	4.587	7.110	11.697	11.70
Government	30	34	64	6.881	7.798	14.679	26.38
Private	50	90	140	11.468	20.642	32.110	58.49
Self - Employed	29	35	64	6.651	8.028	14.679	73.17
Retired	52	13	65	11.927	2.982	14.908	88.07
Others	27	25	52	6.193	5.734	11.927	100.00
<b>Total</b>	<b>208</b>	<b>228</b>	<b>436</b>	<b>47.706</b>	<b>52.294</b>	<b>100.00</b>	<b>100.00</b>



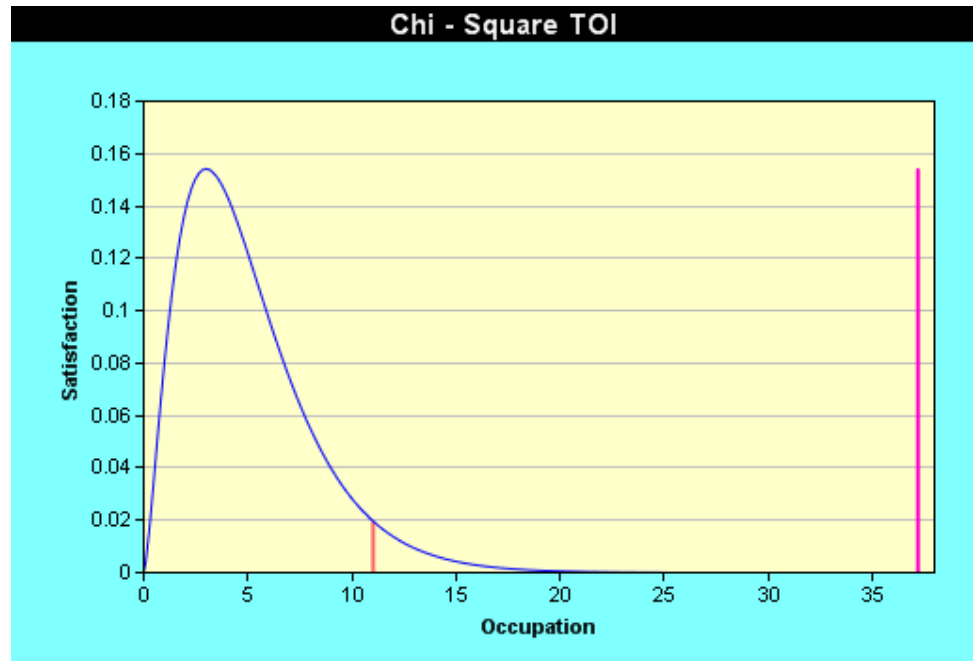


# Chi-Sq Test



## Calculate Test Statistic

			Satisfaction		
			Satisfied	Dissatisfied	
Occupation	1	Un - Employed	0.771	0.703	<b>1.474</b>
	2	Government	0.009	0.008	<b>0.018</b>
	3	Private	4.220	3.850	<b>8.070</b>
	4	Self - Employed	0.077	0.070	<b>0.147</b>
	5	Retired	14.209	12.963	<b>27.172</b>
	6	Others	0.194	0.177	<b>0.371</b>
			<b>19.480</b>	<b>17.771</b>	<b>37.251</b>





# Affinity Diagram



Edit    Brief Text    Full Text   Display Graph : Empathy

Level 1	Level 2 [Demanded Quality]	Level 3 [Reworded Data]
Tangibles	6 Premises	1 The hospital is not clean.
	Employees/Staff	4 Poor customer service
		Banyak slow.
staff are very rude		
	hospital staff are good	
	Equipments	1 Some equipments are faulty
Responsive	3 Fast	1 good service
	Slow	2 Please speed up your process. Waiting too long
Reliability	4 Dependability	1 Good Service.
	Accuracy	3 Too Lambat
Doctor was too slow in diagnosis.		
wrong medications		
Empathy	1 Understanding	1 know and understand patients feelings
Assurance	4 Knowledge	2 Medicine is not good enough. cannot understand doctors explanation
		Trustworthiness
	Courtesy	1 staff smiles and greets everybody
Teamwork	1 level 9	1 Ok but slow.
Caring	4 level 10	4 no immediate attention
		not caring to patients
		dont listen to patients request
		doctor spent less time

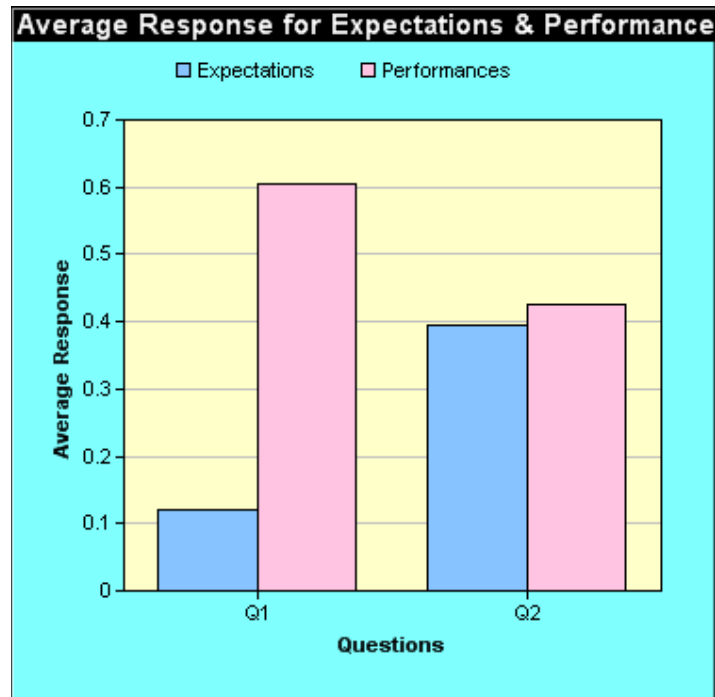


# Dimensions



Dimensions Tangibles +0 +00 Report Setup

Expectation											Performance					T-Test									
No.	1	2	3	4	5	Tot.	Expt.	Var.	+CI	-CI	1	2	3	4	5	Tot.	Perf.	Var.	+CI	-CI	Diff	Pvar.	T-Val.	Decision	
Q1	10	1	5	9	8	33	0.121	2.547	0.666	-0.423	1	2	11	14	5	33	0.606	0.871	0.925	0.288	0.485	0.322	1.506	Good	
Q2	2	9	4	10	8	33	0.394	1.684	0.837	-0.049	2	3	11	13	4	33	0.424	1.064	0.776	0.072	0.030	0.289	0.105	Improve	
<b>Total</b>	<b>12</b>	<b>10</b>	<b>9</b>	<b>19</b>	<b>16</b>						<b>3</b>	<b>5</b>	<b>22</b>	<b>27</b>	<b>9</b>										



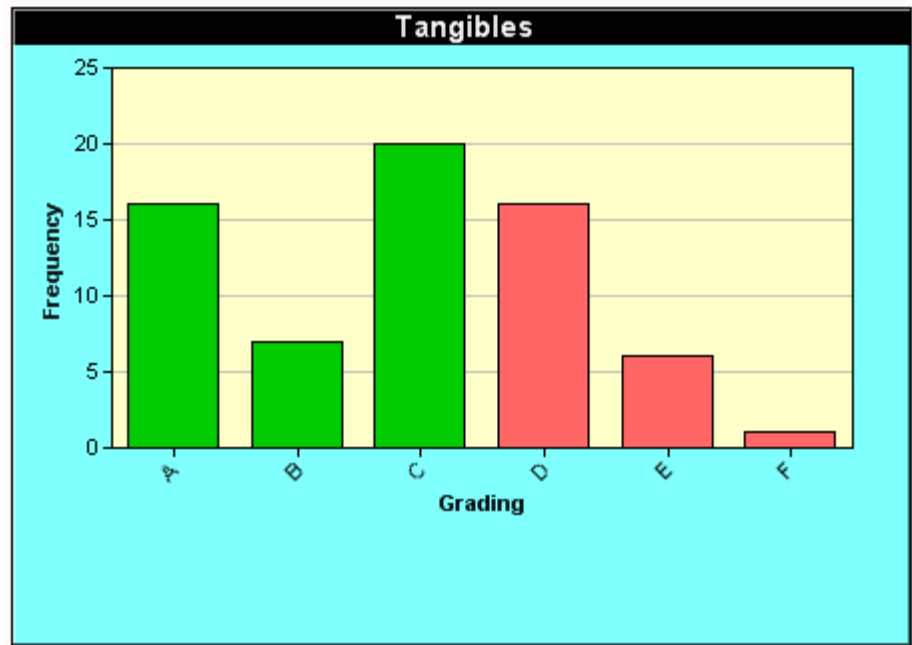


# Satisfaction



Dimensions  Questions

Q. No.	Description	Grading						Satisfaction		Total
		A	B	C	D	E	F	Satisfied	Dissatisfied	
Q1	Up-to-date equipment.	9	3	12	7	2	0	24	9	33
Q2	Visually appealing.	7	4	8	9	4	1	19	14	33
<b>Total</b>		<b>16</b>	<b>7</b>	<b>20</b>	<b>16</b>	<b>6</b>	<b>1</b>	<b>43</b>	<b>23</b>	<b>66</b>



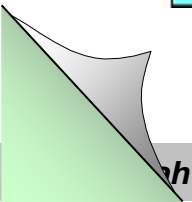
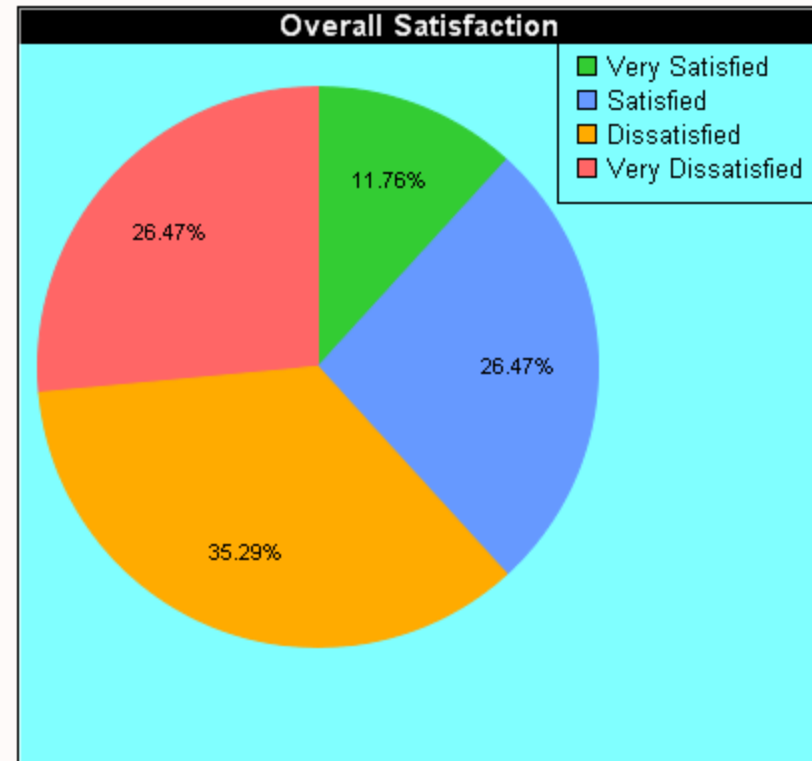
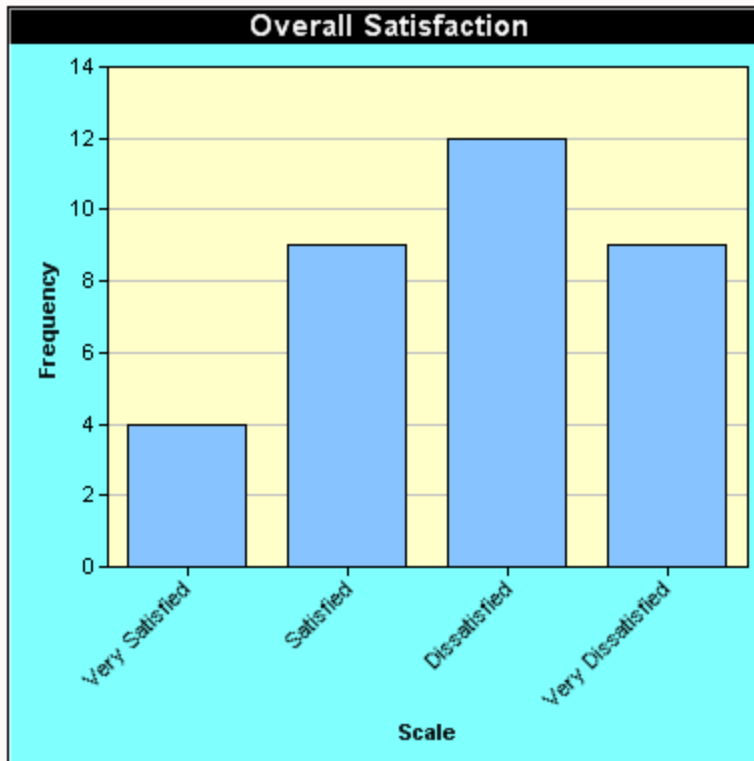


# Overall Satisfaction



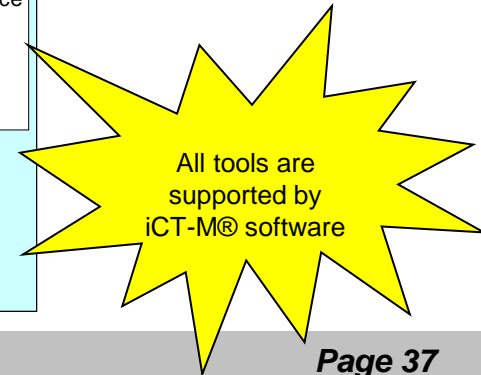
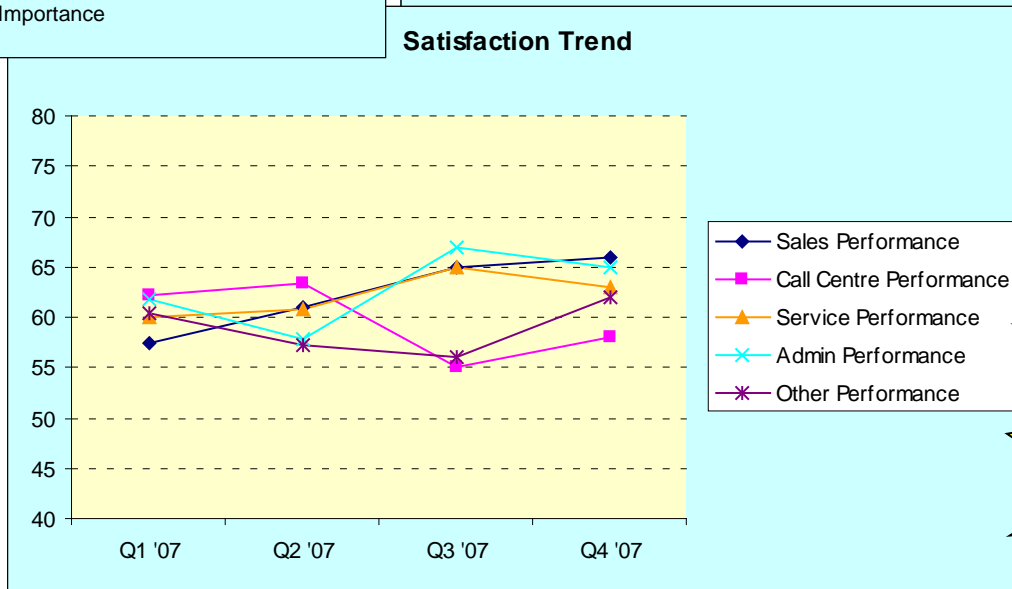
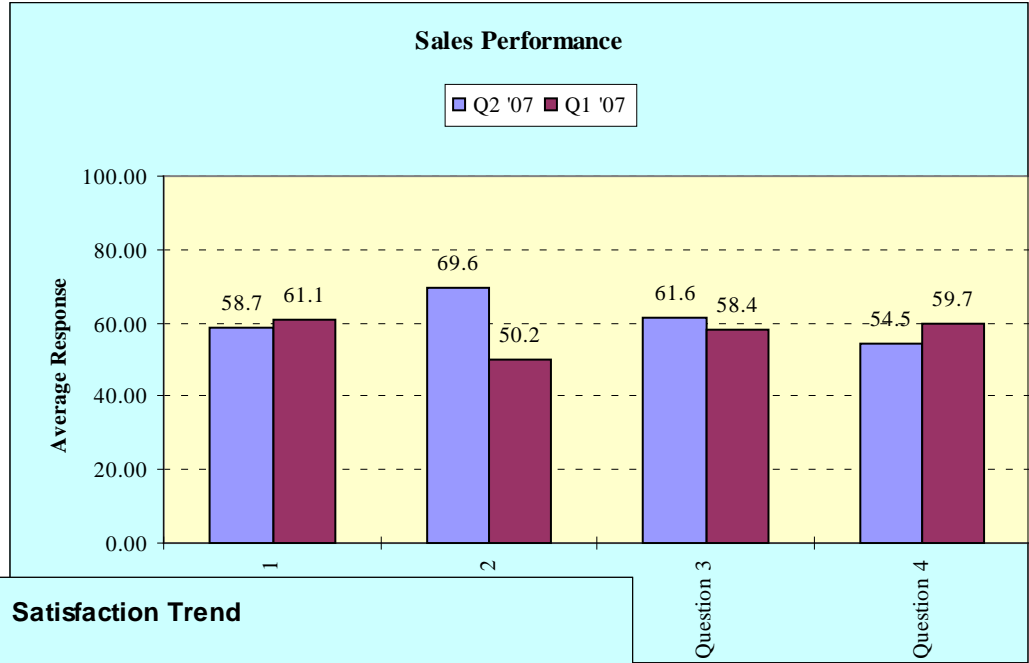
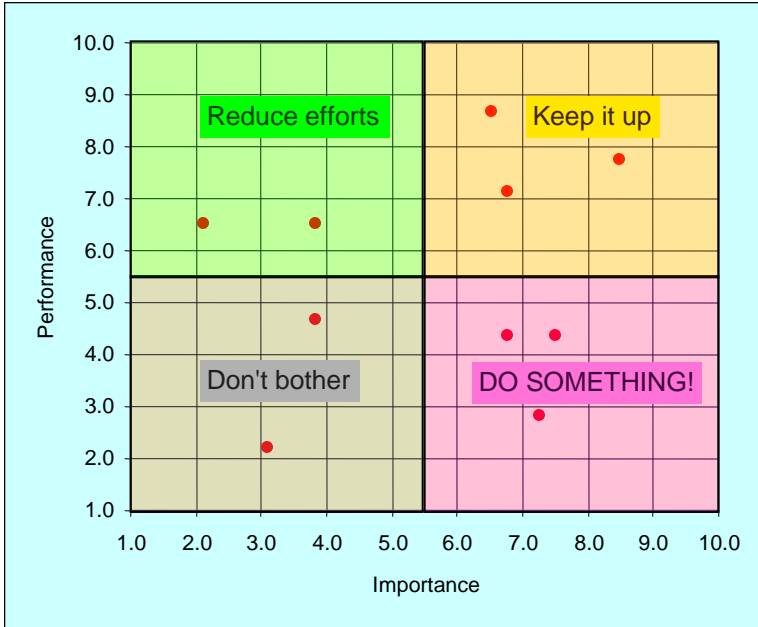
Questions

No.	Question Description	1	2	3	4	Total
Q18	Overall, the level of satisfaction towards services provided by Health Clinic is:	4	9	12	9	34
<b>Total</b>		<b>4</b>	<b>9</b>	<b>12</b>	<b>9</b>	<b>34</b>
<b>Percentage (%)</b>		<b>11.76</b>	<b>26.47</b>	<b>35.29</b>	<b>26.47</b>	





# Customer Satisfaction Index (CSI)





## Respondents

<< < 01 > >>

[New](#) [Edit](#) [Delete](#) [Report Setup](#)

Name	01
Address	Bandar
Age	>=51
Gender	Male
Nationality	Chinese
Education	Master
What is the main problem you encountered in this Service?	lambat
Created Date	16-Nov-2007



## Data Collection

Respondents

**Likert Scale :** 1 Very Low 2 Fairly Low 3 Low 4 Slightly Low 5 Just Low 6 Just High 7 Slightly High 8 High 9 Fairly High 10 Very High

Satisfaction											
1. This questionnaire deals with your Perception of the Service Provider.											
2. Please indicate the level of Perception you experienced from the Service Provider in the following Dimensions.											
3. The Survey needs a number that best represent your Perceptions of the Service Provider.											
No.	Description	1	2	3	4	5	6	7	8	9	10
Q1	Staff are courteous and friendly										
Q2	Staff are helpful										
Q3	Staff explained admission procedure										
Q4	Overall satisfaction with the admission services										
Q5	How much have the admission services met with your expectation?										
Q6	Nurses are concern / caring										
Q7	Nurses are friendly & courteous										
Q8	Nurses are reassuring & give support										
Q9	Prompt of service										
Q10	Provide clear explanation of discharge process										
Q11	Overall satisfaction with nursing services										
Q12	How much have the nursing services met with your expectation?										
Q13	Doctors are concern / caring										
Q14	Doctors are courteous & friendly										
Q15	Doctors are reassuring & give support										



# Demographics

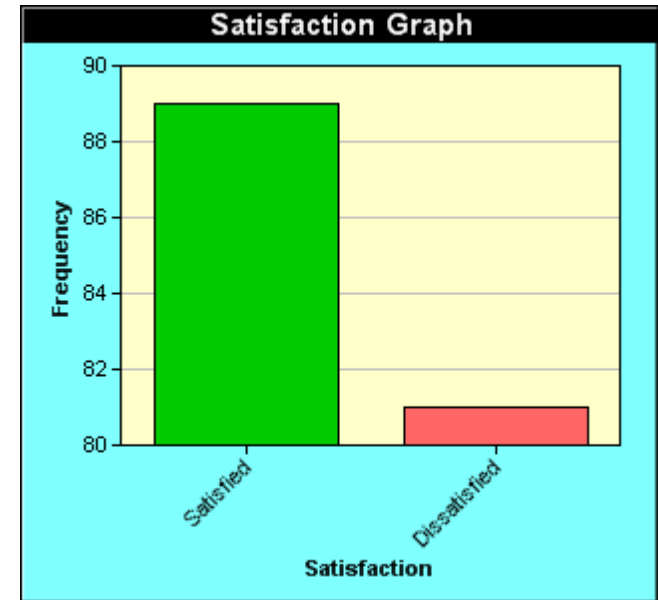


## Demographics

Demographics :

Time Periods :

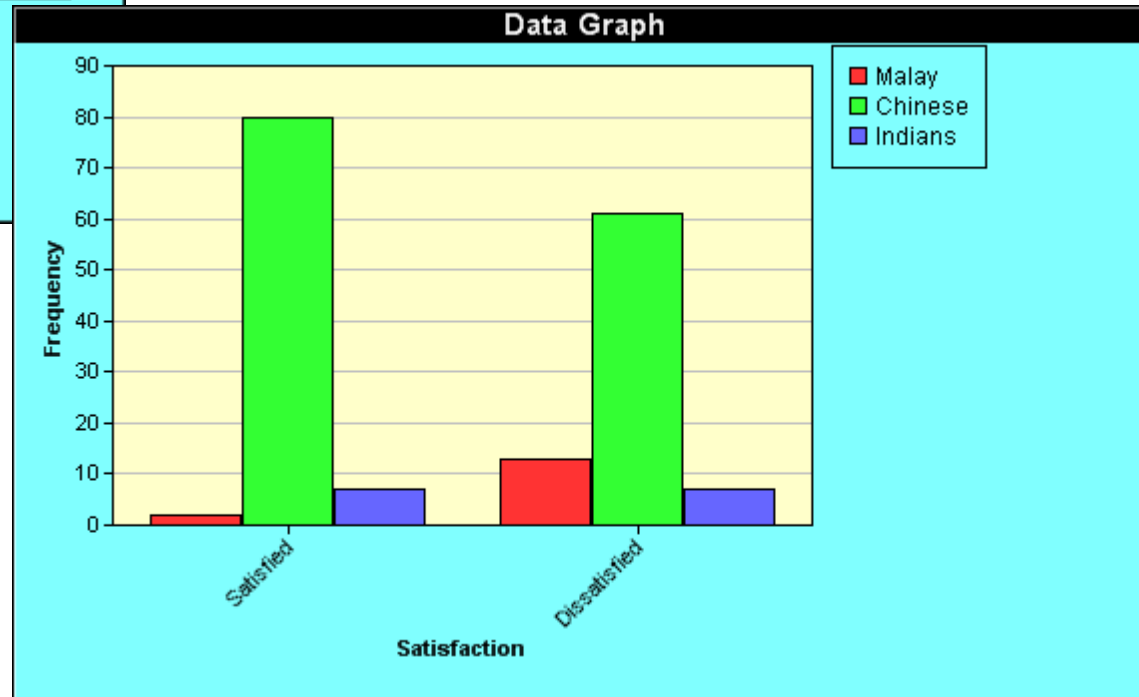
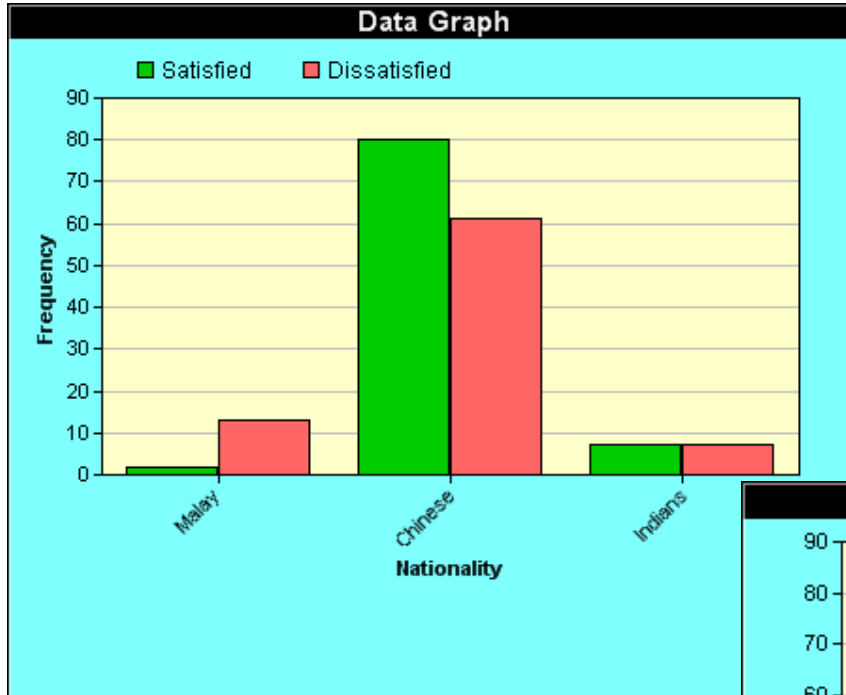
Data	Frequency			Percentage			Cumulative %
	Satisfied	Dissatisfied	Total	Satisfied	Dissatisfied	Total	
Malay	2	13	15	1.176	7.647	8.824	8.82
Chinese	80	61	141	47.059	35.882	82.941	91.76
Indians	7	7	14	4.118	4.118	8.235	100.00
<b>Total</b>	<b>89</b>	<b>81</b>	<b>170</b>	<b>52.353</b>	<b>47.647</b>	<b>100.00</b>	<b>100.00</b>







# Satisfaction Measures





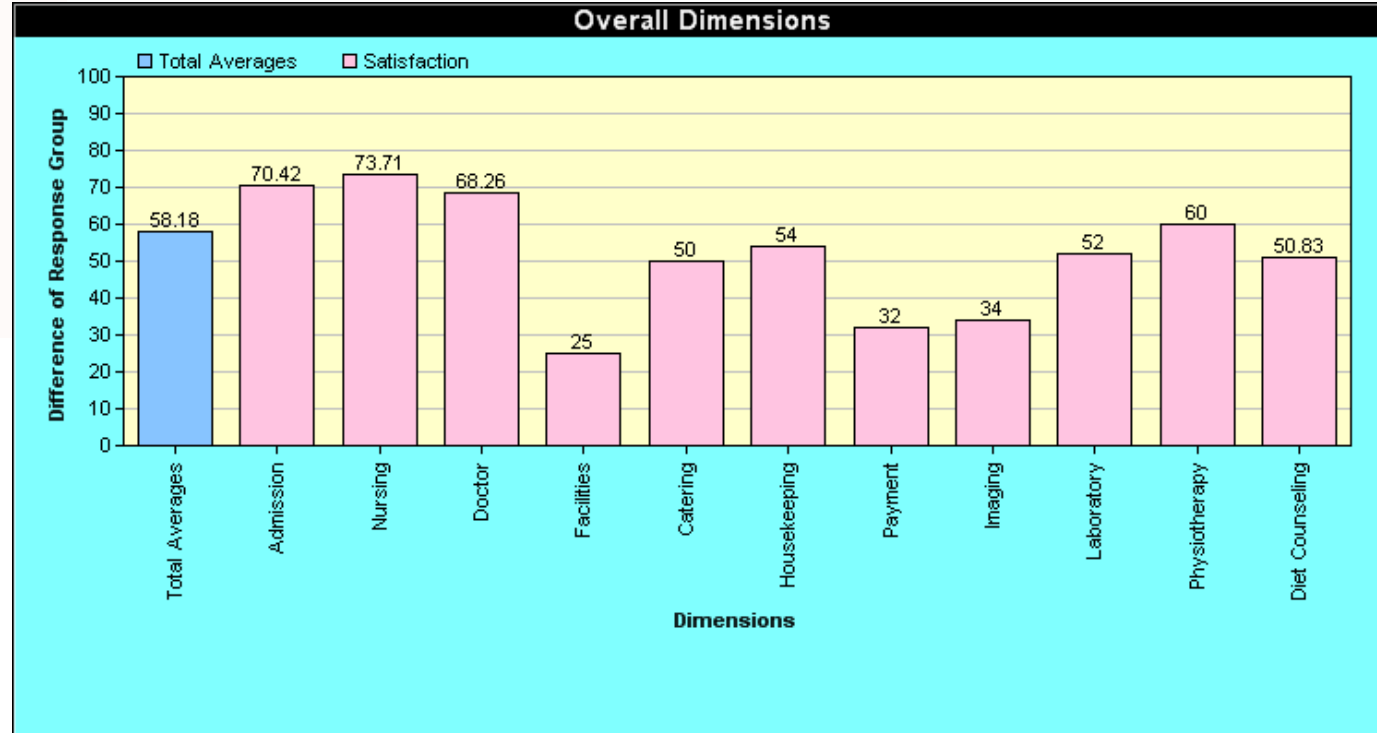
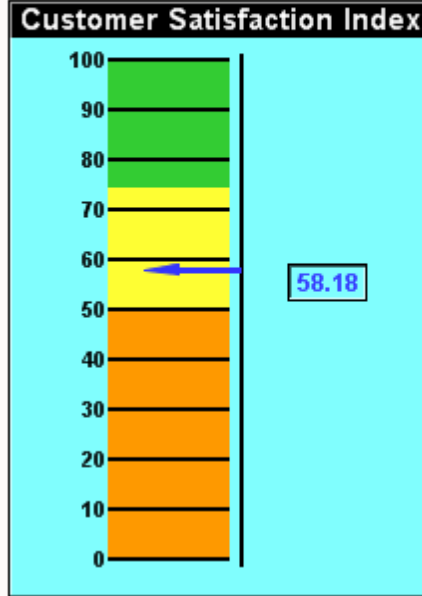
# Overall Dimensions



Belmah Strategies

## Overall Dimensions

Time Periods : 2007 - Feb





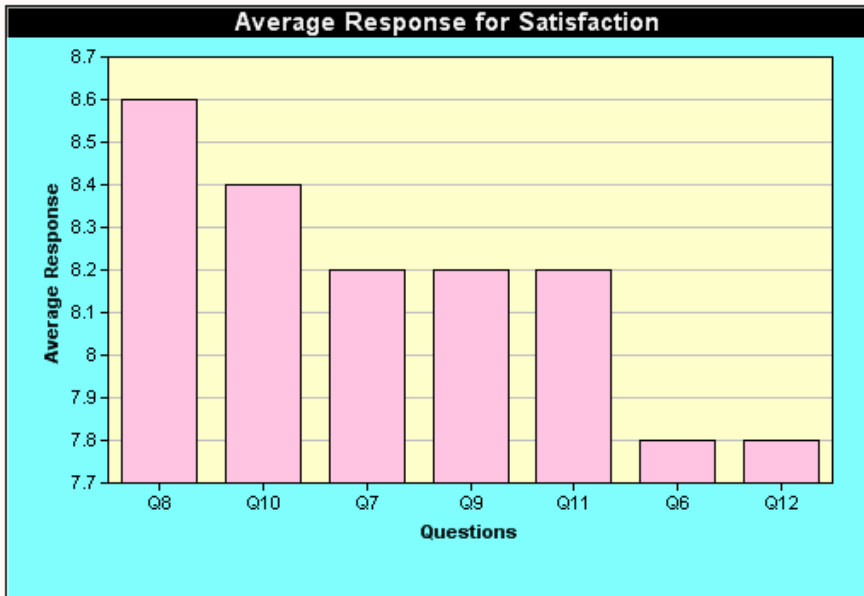
# Dimensions



## Dimensions

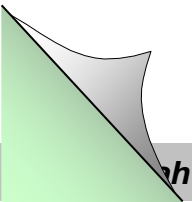
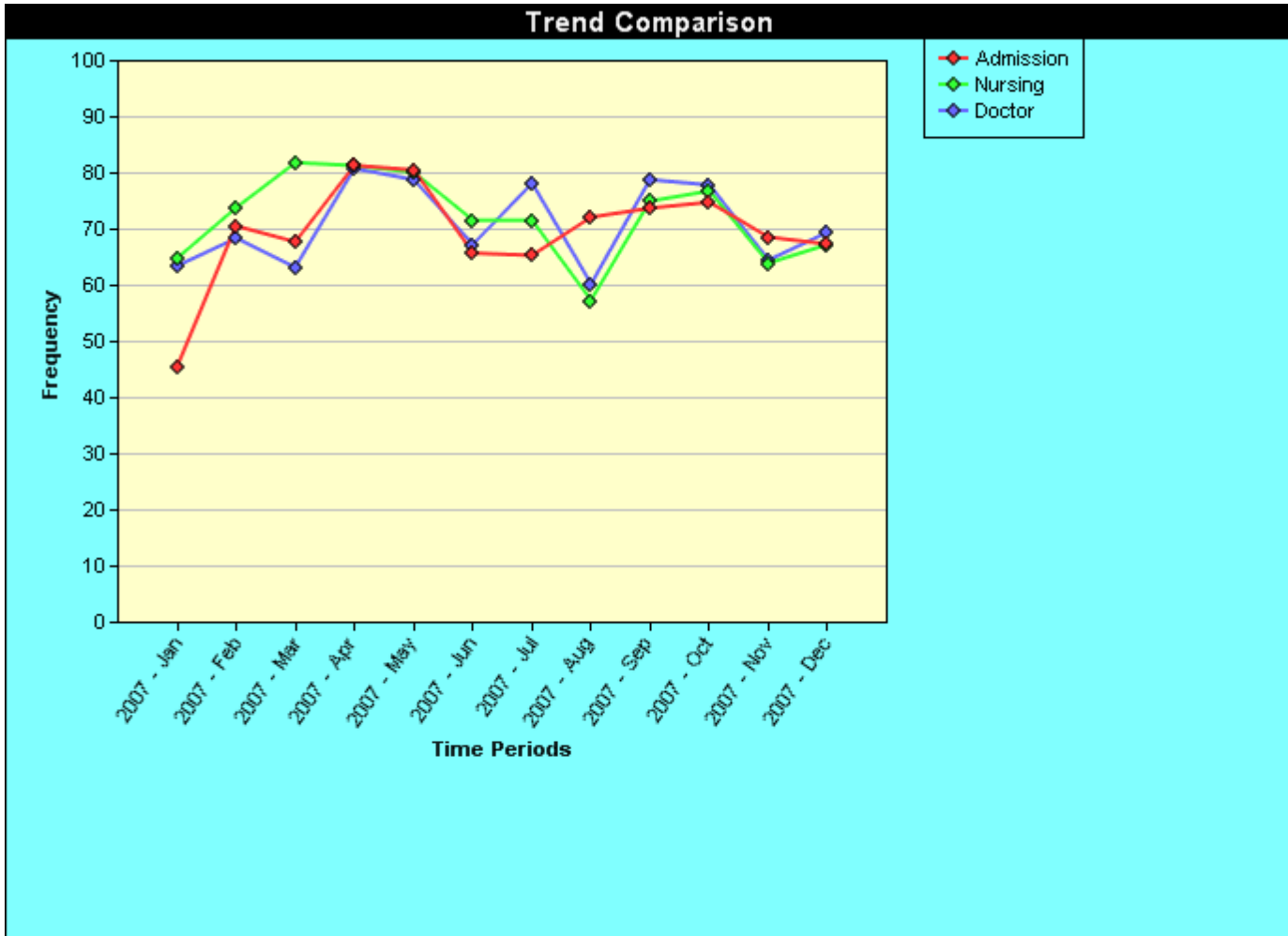
Dimensions: Nursing Time Periods: 2007 - Mar 0.00 0.00 Descending Report Setup

No.	Satisfaction										Weights (%)				T - test			
	1	2	3	4	5	6	7	8	9	10	Tot.	Sat.	Var.	+CI	-CI	Sat.	T-Val.	Decision
Q6	0	0	0	0	0	1	1	1	2	0	5	7.800	1.700	8.943	6.657	78.000	1.764	Decision 90
Q7	0	0	0	0	0	0	1	2	2	0	5	8.200	0.700	8.933	7.467	82.000	3.227	Decision 99
Q8	0	0	0	0	0	0	0	3	1	1	5	8.600	0.800	9.384	7.816	86.000	3.466	Decision 99
Q9	0	0	0	0	0	0	1	2	2	0	5	8.200	0.700	8.933	7.467	82.000	3.227	Decision 99
Q10	0	0	0	0	0	0	1	2	1	1	5	8.400	1.300	9.399	7.401	84.000	2.543	Decision 99
Q11	0	0	0	0	0	0	1	2	2	0	5	8.200	0.700	8.933	7.467	82.000	3.227	Decision 99
Q12	0	0	0	0	0	0	1	4	0	0	5	7.800	0.200	8.192	7.408	78.000	5.143	Decision 99
Total	0	0	0	0	0	1	6	16	10	2	35	8.171	0.793	8.467	7.876	81.714	3.228	Decision 99





# Trend Comparison





# Customer Complaints Management (CCM)



Belmah Strategies

## 3: Containment

Not applicable – basic investigation undertaken by local manager

Date:

Containment Response Date:

Containment Completed Date:

Investigation Level:

Description of Issue:

The Nurse gave the wrong dose of injection.

The Team leader shall ensure that the following Corrective Actions are completed timely.

Administrator's Brief description:

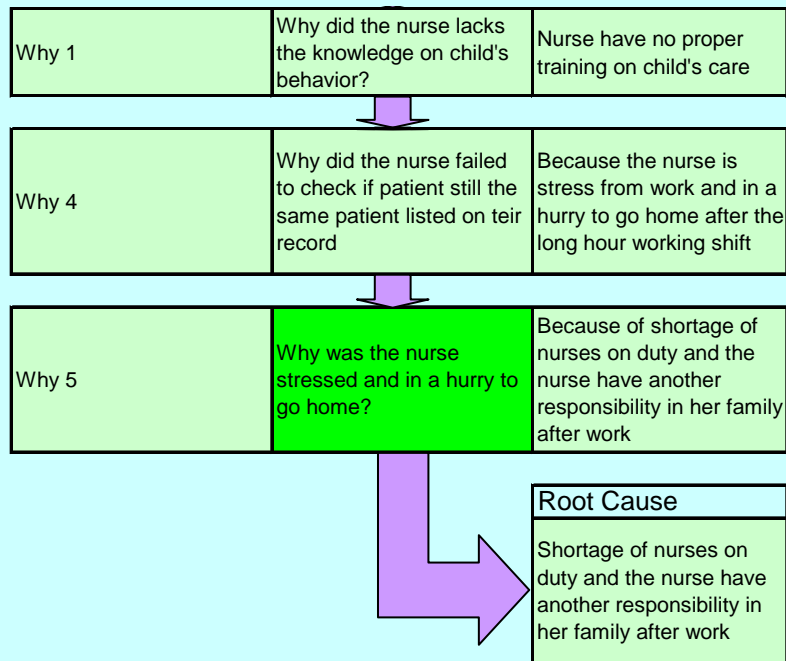
This incident is causing much public interest. Please act on this with utmost care.

Containment Action

This incident is causing much public interest. Please act on this with utmost care.

## 6: Determine Root Cause

Possible use of 'Five Whys' approach  
No formal meeting necessary



Root Cause	Progress	Date Completed	PIC	2005 01 01	2005 01 02	2005 01 03	2005 01 04	2005 01 05	2005 01 06	2005 01 07	2005 01 08	2005 01 09	2005 01 10	2005 01 11	2005 01 12	2005 01 13	2005 01 14	2005 01 15	2005 01 16	2005 01 17	2005 01 18	2005 01 19	2005 01 20	2005 01 21	2005 01 22	2005 01 23	2005 01 24
Shortage of nurses on duty and the nurse have another responsibility																											
1 Increase staffing to decrease workload and responsibilities.	Completed	2005 01 10	Allan																								
2 Nurses should have checklist to prevent errors in their work.	Completed	2005 01 13	Brian																								
3 5' S Housekeeping must be implemented in their workplace.	Completed	2005 01 15	Collin																								
4 The following should be implemented: Creative scheduling options, Let nurse choose their overtime, and offer referral bonuses to employees.	Completed	2005 01 22	Doreen																								



# Event Registry



## Event Registry

<< < 1 > >>

<b>Complaint No</b>	1	<b>Relationship</b>	Other Health Prof.
<b>Date of Incident</b>	08-Nov-2007	<b>Date of Complaint</b>	13-Nov-2007
<b>Person Affected</b>		<b>Person Complaining</b>	
<b>Name</b>	Annaletchumi	<b>Name</b>	Siti Nur Bayah
<b>Gender</b>	Female	<b>Gender</b>	Female
<b>NRIC No</b>	570311-04-7743	<b>NRIC No</b>	600825-09-6578
<b>Date Of Birth</b>	30-Oct-2007	<b>Date Of Birth</b>	22-Nov-2007
<b>Race</b>	Indian	<b>Race</b>	Malay
<b>Incident Type</b>	Customer Complaint		
<b>Describe the Incident</b>	Too high charge for the treatments.		
<b>Immediate Corrective Action</b>	To check on the invoice and a reduction in payment.		
<b>What the complainant wants to see happen</b>	A revised bill with only the necessary charges.		
<b>Department</b>	Surgery Neuro	<b>Complaint Type</b>	Access Inadequate or no service Absence of a service
<b>Impact</b>	Major	<b>Status</b>	Resolved
<b>Risk</b>	Unlikely	<b>Completion date</b>	02-Dec-2007
<b>Investigation Level</b>	3 Serious		
<b>Final Remarks</b>	A case worth considering as the charges seems to be high for the nature of complaint.		



## Containment

[Edit](#)

### Time should be within the stated time

#### Description Of Incident

Too high charge for the treatments.

Date of CAR Issued	14-Nov-2007
Date of CAR Issue Completed	15-Nov-2007

Date of Containment	18-Nov-2007
Date of Containment Completed	20-Nov-2007
Investigation Level	3 (Serious)

### Description of Issue

No.	Description
1	The Nurse gave the wrong dose of injection

### Administrator's Brief description

No.	Description
1	This incident is causing much public interest. Please act on this with utmost care.

### Containment Action

No.	Description
1	This incident is causing much public interest. Please act on this with utmost care.
2	Maximum chages have been lowered.



## Investigation

[Edit](#)

### Investigation by manager and some others

#### Description Of Incident

Too high charge for the treatments.

No.	Investigation	Date	Time	Person	Comments	Attachments
1	The customer claimed that the salesgirl shouted at him.	19-Dec-2007	11:15 Am	Allan		Event Image sentinel
2	The salesgirl denies shouting.	20-Dec-2007	10:30 Pm	Brain		Important picture
3	Copy of protocol/guidelines for IVTT	12-Dec-2007	11:00Am	Collin		Accident
4	Copy of patient record	06-Dec-2007	09:00 Pm	Deborah		Text file
5	Written statement	26-Dec-2007	10:00 Am	Ellaine		





# Identify Root Causes



## Identify Root Causes

Edit

Identify all important factors

<b>1 Nurse lacks the knowledge on childs behavior</b>			
1	Why 1	Why did the nurse lacks the knowledge on childs behavior?	Nurse have no proper training on childs care
2	Why 2	Why the nurse mistakenly given the medication on the wrong patient?	Because the nurse not aware patient moved to the other bed without informing the nurse
3	Why 3	Why did the nurse not aware patient move to other bed?	Because the nurse dont bother to check if the patient on the bed same patient listed
4	Why 4	Why did the nurse failed to check if patient still the same patient listed on teir record	Because the nurse is stress from work and in a hurry to go home after the long hour working shift
5	Why 5	Why was the nurse stressed and in a hurry to go home?	Because of shortage of nurses on duty and the nurse have another responsibility in her family after work
			<b>Root Cause</b>
			Shortage of nurses on duty and the nurse have another responsibility in her family after work





# Corrective Action Plan



## Corrective Action Plan

[Edit](#) [Report Setup](#) From Date  To Date  [View](#)

### Detailed risk reduction by manager and team

**Root Cause :**  
Shortage of nurses on duty and the nurse have another responsibility in her family after work

Action	PIC	From Date	To Date	Duration	Nov - 2007												
					12	13	14	15	16	17	18	19	20	21	22	23	24
		12-Nov-2007	20-Nov-2007	8	█	█	█	█	█	█	█	█	█	█	█	█	█
1	Increase staff	Allan	12-Nov-2007	20-Nov-2007	8	█	█	█	█	█	█	█	█	█	█	█	█
2	5 S Housekeepin	Brain	13-Nov-2007	18-Nov-2007	5		█	█	█	█	█	█					
3	Train nurses on	Collin	19-Nov-2007	20-Nov-2007	1								█	█			



# Corrective Action Implementation



## Corrective Action Implementation

[Edit](#) [Report Setup](#) From Date  To Date  [View](#)

Detailed action plan is necessary

**Root Cause :**

Shortage of nurses on duty and the nurse have another responsibility in her family after work

Action	PIC	From Date	To Date	Duration	Progress	Date Completed	Nov - 2007														
							12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
		12-Nov-2007	20-Nov-2007	8			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
1	Increase staff	Allan	12-Nov-2007	20-Nov-2007	8	More staff	20-Nov-2007	█	█	█	█	█	█	█	█	█	█	█	█	█	█
2	5 S Housekeepin	Brain	13-Nov-2007	18-Nov-2007	5	Housekeepi	20-Nov-2007	█	█	█	█	█	█	█	█	█	█	█	█	█	█
3	Train nurses on	Collin	19-Nov-2007	20-Nov-2007	1	Nurses tra	20-Nov-2007	█	█	█	█	█	█	█	█	█	█	█	█	█	█



# Verification



## Verification

[Edit](#)

To verify all actions

Root Cause :

Shortage of nurses on duty and the nurse have another responsibility in her family after work

Action	Risk Reduction	Key Indicators	Monitoring and Review	Communication Strategies
1 Increase staffing to decrease workload and responsibilities.	Assign more nurses that are knowledgeable and well-experienced to prone-medical error workplace.	More qualified nurses added.	Nurses able to do work easily and finish their work faster without a mistake.	
2 Nurses should have checklist to prevent errors in their work.	Nurses should use checklist in all types of work.	All nurses use checklist in all their tasks.	Usage of checklist is being implemented after 1 month.	
3 5 S Housekeeping must be implemented in their workplace.	Apply 5S Housekeeping in the workplace.	Nurse station and the ward is well arranged and organized.	5S is being applied in the workplace immediately after the workshop.	
4 Let nurse choose their overtime, and offer referral bonuses to employees.	Design and develop a creative scheduling options for nurses and provide them with better incentives and benefits.	Decrease number of complaints recieved. No medical errors reported.	Nurses are more more focus on their work. They are happy with their working schedule.	
5 Train nurses on patient care				

### Final Remarks by Board / Committee

All actions required have been satisfactorily implemented.



# Event Timeline



## Event Timeline

Complaint Analysis	Date Set	Date Completed	07-Nov-2007	08-Nov-2007	09-Nov-2007	10-Nov-2007	11-Nov-2007	12-Nov-2007	13-Nov-2007	14-Nov-2007	15-Nov-2007	16-Nov-2007	17-Nov-2007	18-Nov-2007	19-Nov-2007	20-Nov-2007	21-Nov-2007	22-Nov-2007	23-Nov-2007	24-Nov-2007	25-Nov-2007	26-Nov-2007	27-Nov-2007	28-Nov-2007	29-Nov-2007	30-Nov-2007	01-Dec-2007	02-Dec-2007
			Date of Incident	08-Nov-2007																								
Date of Complaint	13-Nov-2007																											
Date of CAR Issued	14-Nov-2007	15-Nov-2007																										
Date of Containment Action	18-Nov-2007	20-Nov-2007																										
Date of Acknowledgement	17-Nov-2007	22-Nov-2007																										
Date of Corrective Action	18-Nov-2007	12-Dec-2007																										
Date of Preventive Action	21-Nov-2007	30-Nov-2007																										
Date of Completion	02-Dec-2007																											



# Overview of Complaints

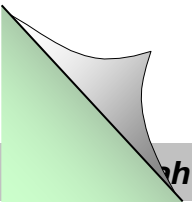


## Overview

Incident Type  Outcome  Investigation Level

Resolved within policy time frame    Resolved out of policy time frame    Not resolved and out of policy time frame

Complaint Id.	Incident Type	Outcome	Invest Level	Complaint Date	Complaint	Days
1	Customer Complaint	Resolved	Serious	13-Nov-2007	Too high charge for the treatments.	19
2	Customer Complaint	Not Resolved	Standard	03-Jan-2008	Bad incident	3

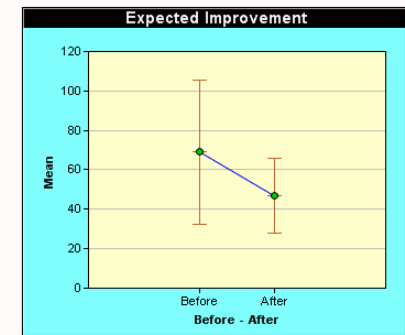
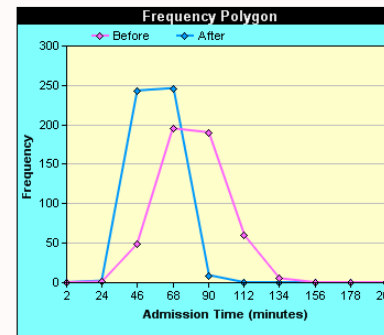
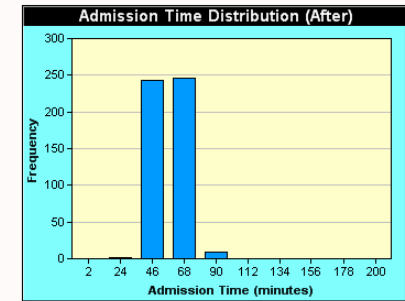
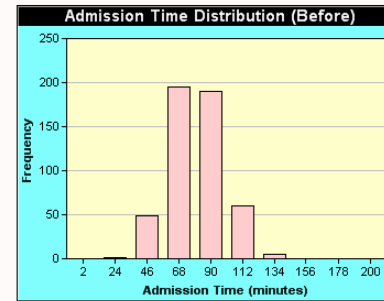




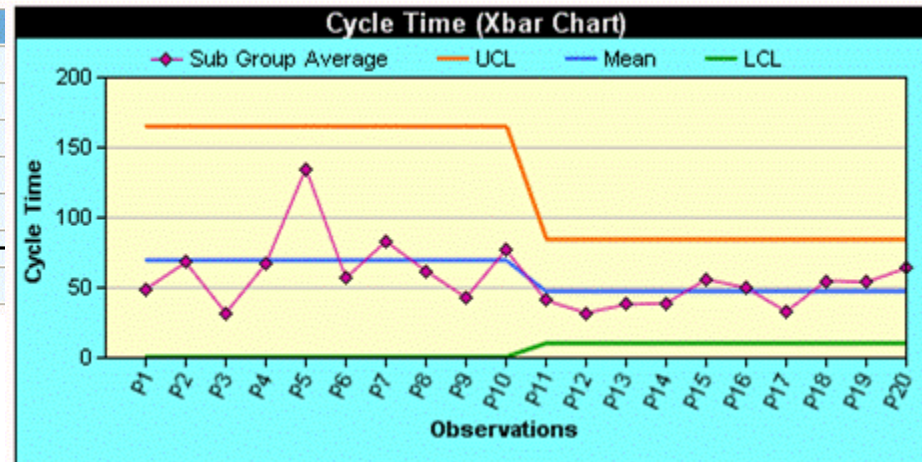
# Cycle Time Analysis (CTA)



No.	Process Steps	Start	Elapsed	Bar Graph of Times	Comments
1	Start	0.000	0.000		
2	Sign In	15.400	15.400		Computer not available
3	Triage by Nurse	8.300	23.700		Waiting
4	Exam by Doctor	7.200	30.900		Doctor Not Arrived
5	Bed Requested	7.700	38.600		Information not send
6	Bed Request Time	9.000	47.600		Incorrect bed number
7	Bed Assigned Time	10.400	58.000		Wrong Patient
8	Patient Assigned to Bed	9.300	67.300		Waiting
<b>Total</b>			<b>67.300</b>		
1	Start	0.000	0.000		Setup
2	Sign In	5.800	5.800		Setup
3	Triage by Nurse	6.100	11.900		Waiting
4	Exam by Doctor	6.500	18.400		Doctor not arrived
5	Bed Requested	8.700	27.100		Information not send
6	Bed Request Time	6.200	33.300		In correct bed Number
7	Bed Assigned Time	6.300	39.600		Wrong Patient
8	Patient Assigned to Bed	6.600	46.200		Waiting
<b>Total</b>			<b>46.200</b>		



No.	Process	Mean	Stdev	Duration	Process Cycle Time
1	Sign In	15.400	8.044	15.400	
2	Triage by Nurse	8.300	7.646	23.700	
3	Exam by Doctor	7.200	6.426	30.900	
4	Bed Requested	7.700	4.322	38.600	
5	Bed Request Time	9.000	8.857	47.600	
6	Bed Assigned Time	10.400	6.150	58.000	
7	Patient Assigned to Bed	9.300	7.718	67.300	





# Setup Process



-	<b>1</b>	<b>Doctor</b>
	1	Dr. Allan Lin
	2	Dr. Brian
	3	Dr. Collin
	4	Dr. David
	5	Dr. Eline
-	<b>2</b>	<b>Diagnosis</b>
	1	UTI
	2	Insomnia
	3	Gouty Arthritis
	4	Fever of Unk Origin
	5	Myocardial Ischemia
+	<b>3</b>	<b>Bed Type</b>
+	<b>4</b>	<b>Room No.</b>
+	<b>5</b>	<b>Delay</b>





# Data Collection



<< < DT0020 ▾ > >>    [Edit](#)   [New](#)   [Delete](#)   [Report](#)

<b>Data Code</b>	DT0020
<b>Patient Name</b>	P20
<b>Start</b>	07-Apr-2007 12:32 PM
<b>Sign In</b>	07-Apr-2007 12:39 PM
<b>Triage by Nurse</b>	07-Apr-2007 12:46 PM
<b>Exam by Doctor</b>	07-Apr-2007 12:50 PM
<b>Bed Requested</b>	07-Apr-2007 01:03 PM
<b>Bed Request Time</b>	07-Apr-2007 01:15 PM
<b>Bed Assigned Time</b>	07-Apr-2007 01:25 PM
<b>Patient Assigned to Bed</b>	07-Apr-2007 01:36 PM
<b>Doctor</b>	Dr. Elline
<b>Diagnosis</b>	UTI
<b>Bed Type</b>	Med
<b>Room No.</b>	Room E
<b>Delay</b>	No Room



# “Before” Cycle Time



No.	Process	Mean	Stdev	Duration	Process Cycle Time						
1	Sign In	15.667	8.485	15.667	↔						
2	Triage by Nurse	8.889	7.865	24.556		↔					
3	Exam by Doctor	7.556	6.710	32.111			↔				
4	Bed Requested	8.111	4.372	40.222				↔			
5	Bed Request Time	8.111	8.908	48.333					↔		
6	Bed Assigned Time	9.444	5.681	57.778						↔	
7	Patient Assigned to Bed	8.444	7.667	66.222							↔



# “Before” Cycle Time Analysis



No.	Process Steps	Start	Elapsed	Bar Graph of Times	Comments
1	Start	0.000	0.000		
2	Sign In	15.667	15.667		Computer not available
3	Triage by Nurse	8.889	24.556		Waiting
4	Exam by Doctor	7.556	32.111		Doctor Not Arrived
5	Bed Requested	8.111	40.222		Information not send
6	Bed Request Time	8.111	48.333		Incorrect bed number
7	Bed Assigned Time	9.444	57.778		Wrong Patient
8	Patient Assigned to Bed	8.444	66.222		Waiting
<b>Total</b>			<b>66.222</b>		



# Implementation of Improvements

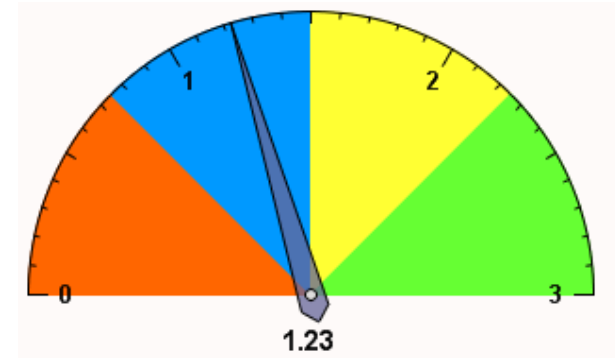
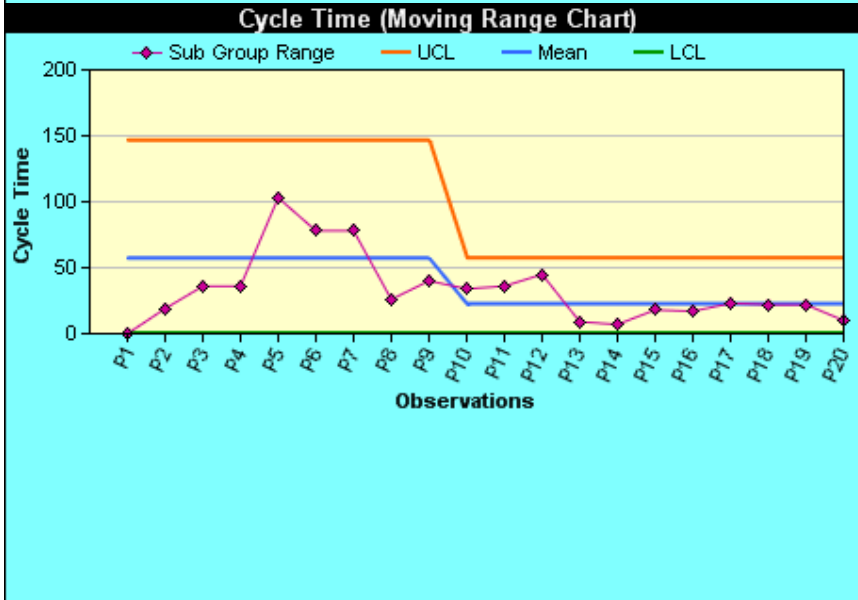
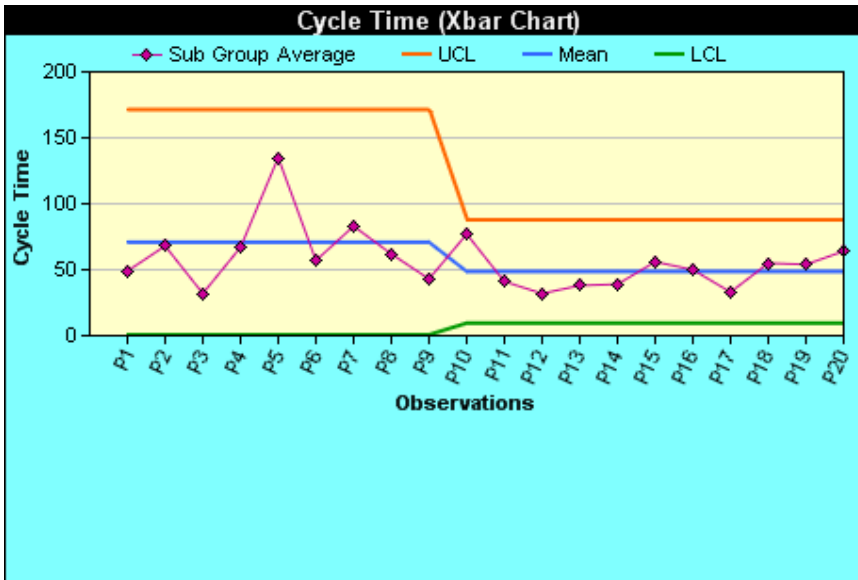


[Edit](#)
[Expand All](#)
[Collapse All](#)
[Show/Hide](#)
[Report Setup](#)
 From Date :  
 To Date : 
[View](#)

				Feb - 2008																		
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
				Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu
<b>- Punctuality</b>	<b>From Date</b>	<b>To Date</b>	<b>No. of Days</b>																			
	Late Doctors	05/08/2007	05/10/2007	3																		
	Schedule patients																					
	Remind patients of time	05/11/2007	05/17/2007	7																		
	Inform patients via SMS	05/16/2007	05/19/2007	4																		
<b>- Breaks</b>	<b>From Date</b>	<b>To Date</b>	<b>No. of Days</b>																			
	Staggered breaks	05/13/2007	05/20/2007	8																		
	Staff should keep to break times	05/14/2007	05/18/2007	5																		
	Patients should be told of their times	05/14/2007	05/22/2007	9																		
<b>- Consultation</b>	<b>From Date</b>	<b>To Date</b>	<b>No. of Days</b>																			
	Laboratory results must be inhand	05/19/2007	05/23/2007	5																		
	Use electronic records	5/21/2007	05/25/2007	5																		
	Retrieve files quickly																					



# Comparison of Before and After



## Process Capability



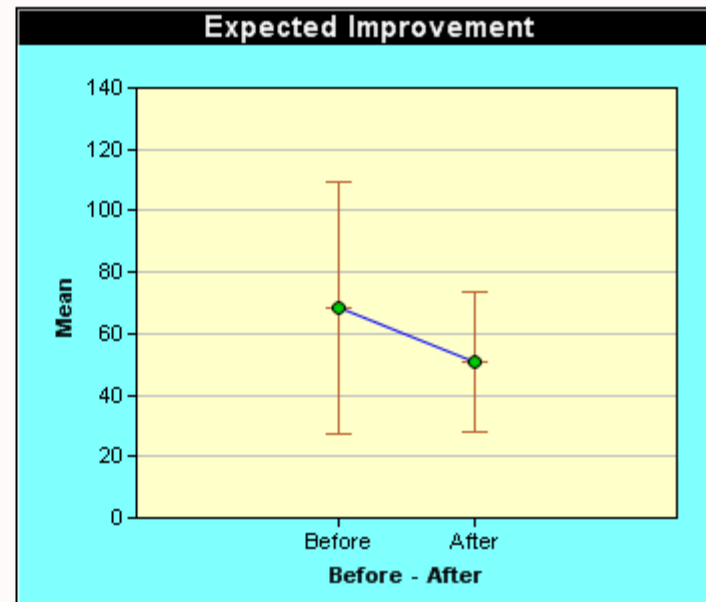
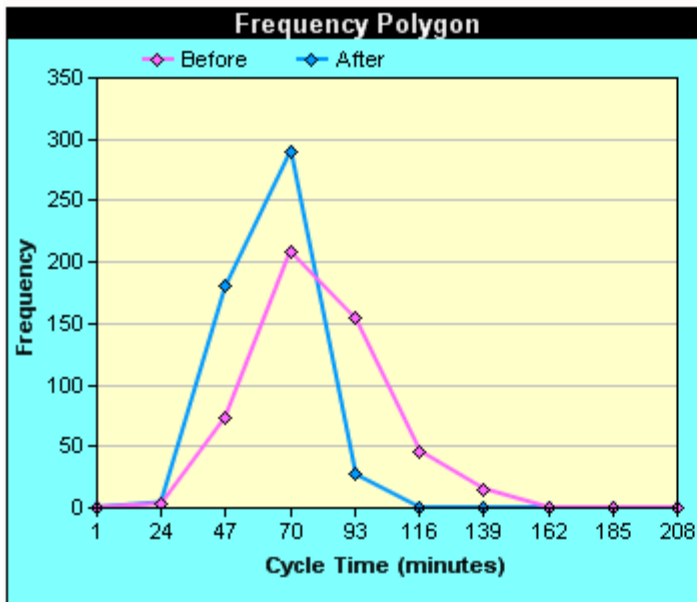
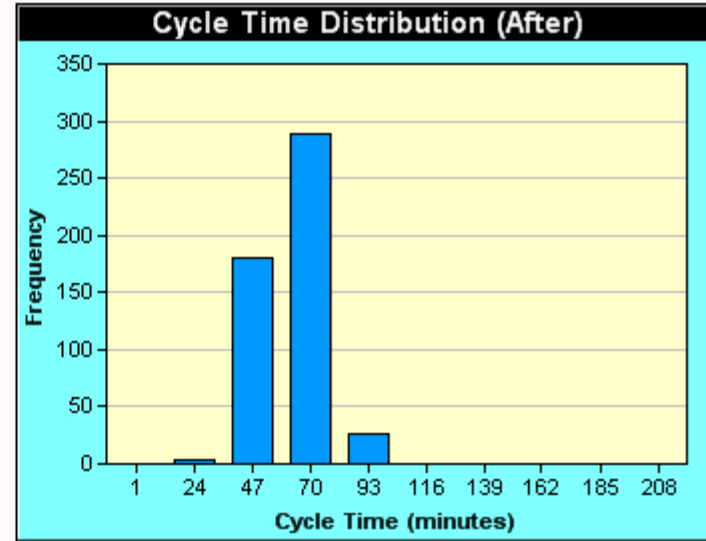
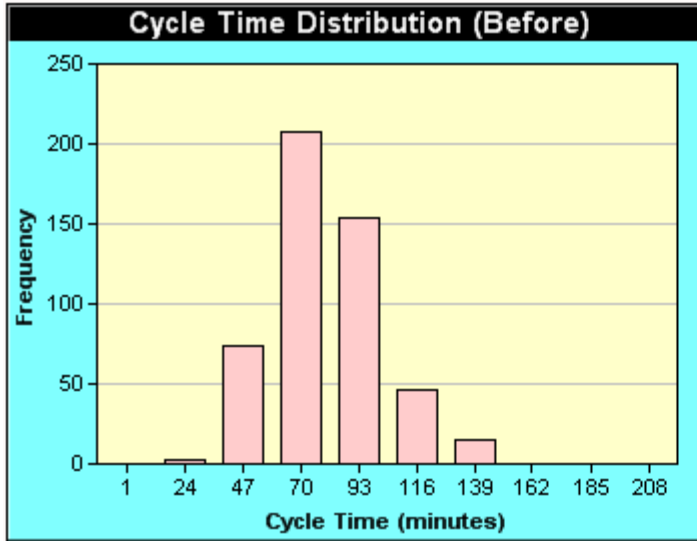
# Cycle Time Analysis



No.	Process Steps	Start	Elapsed	Bar Graph of Times	Comments
1	Start	0.000	0.000		
2	Sign In	15.667	15.667		Computer not available
3	Triage by Nurse	8.889	24.556		Waiting
4	Exam by Doctor	7.556	32.111		Doctor Not Arrived
5	Bed Requested	8.111	40.222		Information not send
6	Bed Request Time	8.111	48.333		Incorrect bed number
7	Bed Assigned Time	9.444	57.778		Wrong Patient
8	Patient Assigned to Bed	8.444	66.222		Waiting
<b>Total</b>			<b>66.222</b>		
1	Start	0.000	0.000		Setup
2	Sign In	6.455	6.455		Setup
3	Triage by Nurse	5.818	12.273		Waiting
4	Exam by Doctor	6.273	18.545		Doctor not arrived
5	Bed Requested	8.273	26.818		Information not send
6	Bed Request Time	7.182	34.000		In correct bed Number
7	Bed Assigned Time	7.455	41.455		Wrong Patient
8	Patient Assigned to Bed	7.545	49.000		Waiting
<b>Total</b>			<b>49.000</b>		

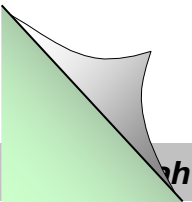
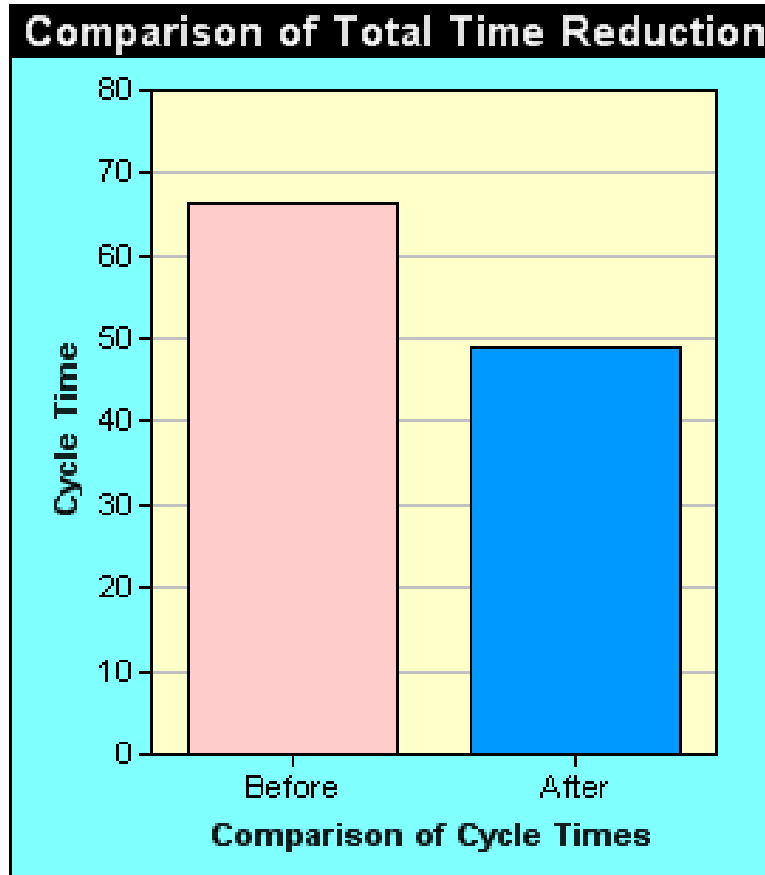


# Simulated Expectation





# Bottom Line Improvement







# Root Cause Analysis (RCA)



## Incident Details

Complaint No	2	Relationship	Vistor
Person Effected		Person Complaining	
Name	Rosita Ahmad	Name	Ahmad Ibrahim
Gender	Female	Gender	Male
IRIC No	42424353	IRIC No	7586979709
Date Of Birth	02-May-2007	Date Of Birth	01-Jun-2007
Race	Chinese	Race	Malay
Incident Type	Internal Complaint		
Describe the Incident	The patient fainted and fell to the floor after being given an IV drug.		
Immediate Corrective Action	The drug was changed immediately. The patient was assured of the correct medicine and put in intensive care.		
What the complainant wants to see happen	The nurse on duty used the drug for the patient in the next bed because both patients have similar problems but the drugs prescribed are of different concentrations.		
Department	Gen Surgery NW 11	Complaint Type	Communication Misinformation or failure in communication (but not a failure to consult) Give inaccurate/wrong information
Event Type	Agents Medication Preparation/Dispensing	Contributing Factor	Task and technology factors Decision making aids Availability, use and reliability of specific types of tests, e.g. blood testing
Impact	Moderate	Risk	Possible
Investigation Level	2 Minimal	Status	Not Resolved
Final Remarks	Successfully resolved the matter		

### Complaint Analysis

		30-Apr-2007	01-May-2007	02-May-2007	03-May-2007	04-May-2007	05-May-2007	06-May-2007	07-May-2007	08-May-2007	09-May-2007	10-May-2007	11-May-2007	12-May-2007	13-May-2007
Date of Incident	02-May-2007			■											
Date of Complaint	03-May-2007				■										
Date of Informing Department	05-May-2007					■	■	■							
Date of acknowledgement to Complainant	08-May-2007							■	■	■	■				
Date of Letter to HOD for Actioning	11-May-2007										■	■	■	■	
Date of Response from HOD after Actioning															

1	Nurses lack knowledge on child's behavior		
1	Why?	Why did the nurse lack the knowledge on child's behavior?	Nurse have no proper training on child's care
2	Why?	Why did the nurse mistakenly give the medication to the wrong patient?	Because the nurse not aware patient moved to the other bed without informing the nurse
3	Why?	Why did the nurse not aware patient move to other bed?	Because the nurse don't bother to check if the patient on the bed same patient listed
4	Why?	Why did the nurse failed to check if patient still the same patient listed on their record?	Because the nurse is stress from work and in a hurry to go home after the long hour working shift
5	Why?	Why was the nurse stressed and in a hurry to go home?	Because of shortage of nurses on duty and the nurse have another responsibility in her family after work
			<b>Root Cause</b>
			Shortage of nurses on duty and the nurse have another responsibility in her family after work



# Action Level



## Action Level

Edit

### Seriouness of Complaints

	Minimum	Minor	Moderate	Major	Serious
Rare	1	1	2	2	3
Unlikely	1	1	2	3	4
Possible	1	2	3	3	4
Likely	1	2	3	4	4
Almost Certain	2	2	3	4	4

### Setup Criteria

1	None
2	Minimal
3	Mini RCA
4	Full RCA

### Policy

<b>Time frame for resolution</b>	8 (Days)
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# Action Needed



Ilo.	Process Stage	Objective	None	Minimal	Mini RCA	Full RCA
1	Event Registry	To record the event and determine action needed	Record in ICT-M Event Registry	Record in ICT-M Event Registry	Record in ICT-M Event Registry	Record in ICT-M Event Registry
2	RCA Team	Form Team to investigate event	Not necessary to form team	Investigation manager	Investigation to be conducted by small RCA team	Investigation to be conducted by full RCA team with leader
3	Critical Events	Collect data relevant to incident	Not necessary to investigation	Investigation by manager	Investigation by manager and some others	Full investigation by manager and all stakeholders
4	Identify Causal Factors	To understand what happened	Not necessary to investigation	Basic sequence of events	Detailed sequence of events	Thorough sequence of events
5	Identify Root Causes	Identify the factors contributing to event	Identify one important factor	Identify a few important factors	Identify all important factors	Identify all important factors thoroughly
6	Recommendations	Take necessary actions	5 Why not necessary	5 Why necessary	Detailed 5 Why necessary	Thorough 5 Why necessary
7	Lesson Learnt	What did we learn?	Risk reduction action is not necessary	Basic risk reduction by manager	Detailed risk reduction by manager and team	Thorough risk reduction by manager and team
8	W3 Programme	Develop an action plan	Action plan is not necessary	Basic action plan is necessary	Detailed action plan is necessary	Thorough action plan is necessary
9	Close RCA	Take appropriate action and close RCA	Implementation action is not mandatory	Basic action plan is necessary	Detailed action plan is necessary	Thorough action plan is necessary
10	Effectiveness	Did we achieve an effective system?	Evaluation of effectiveness is not mandatory	Basic observation of effectiveness	Detailed observation of effectiveness	Detailed observation of effectiveness



# Critical Events



Edit

## Detailed sequence of events

No.	Event Date-Time	Event Location	Person(s) Involved	Event Description	Comments
1	02-May-2007 11:49 AM	Patient Ward	Nurse A	Nurse A prepared medicines on a tray for the patients	Usual procedure
2	02-May-2007 06:51 PM	Patient Ward	Nurse A	Nurse A on a phone call for 15 mins	The nurse has a new boyfriend
3	02-May-2007 06:52 PM	Patient Ward	Nurse A	Nurse A asked Nurse B to gave the medications to patients due for 8am dose	Nurse B and Nurse A are good friends
4	02-May-2007 06:53 PM	Patient Ward	Nurse B	Gave and administered prepared medications to patients	Nurse B gave the drug while Nurse A was on the phone
5	02-May-2007 06:53 PM	Patient Ward	Nurse B	Patient PDC injected with Amoxicillin known to have allergy to Penicillin	Nurse B did not know of patients allergy
6	02-May-2007 06:54 PM	Patient Ward	Nurse B	Nurse B finished giving medications to patients	Nurse B unaware of actions
7	02-May-2007 06:54 PM	Patient Ward	Nurse A	Patient PDC complaints of itchininess and difficulty of breathing	Nurse A surprised at patients reaction
8	02-May-2007 06:54 PM	Patient Ward	Nurse A	Nurse A called Patient Dr BK about the patient	Nurse A and B both scared
9	02-May-2007 06:55 PM	Patient Ward	Sister S	Patient was given Oxygen inhalation	Sister S was very helpful
10	02-May-2007 06:55 PM	Patient Ward	Patient	Patient suffered Severe Anaphylactic Shock	Patients father was very angry
11	02-May-2007 06:55 PM	Patient Ward	Dr. BK	Dr. BK came to realize that staff nurse administered wrong medication for patient	Dr. BK was visibly upset at Nurse A and B
12	02-May-2007 06:55 PM	Patient Ward	Patient	Patient was transferred to PICU (Pediatric Intensive Care Unit) ward	Patients father demanded an explanation



# Identifying Root Cause



1 Nurses lack knowledge on childs behavior			
1	Why?	Why did the nurse lacks the knowledge on childs behavior?	Nurse have no proper training on childs care
2	Why?	Why the nurse mistakenly given the medication on the wrong patient?	Because the nurse not aware patient moved to the other bed without informing the nurse
3	Why?	Why did the nurse not aware patient move to other bed?	Because the nurse dont bother to check if the patient on the bed same patient listed
4	Why?	Why did the nurse failed to check if patient still the same patient listed on teir record	Because the nurse is stress from work and in a hurry to go home after the long hour working shift
5	Why?	Why was the nurse stressed and in a hurry to go home?	Because of shortage of nurses on duty and the nurse have another responsibility in her family after work
			<b>Root Cause</b>
			Shortage of nurses on duty and the nurse have another responsibility in her family after work





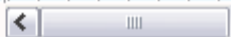
# W3 Action Program



Edit Report Setup From Date 04/10/2007 To Date 05/27/2007 View

Detailed action plan is necessary

No.	Root Cause	Recommendations	Resources	PIC	From Date	To Date	Duration	Apr - 2007																
								10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
<b>1</b>	<b>Shortage of nur</b>				<b>12-Apr-2007</b>	<b>25-Apr-2007</b>	<b>13</b>																	
	1 Increase staffi	Assign mor	Hire more	Allan	12-Apr-2007	17-Apr-2007	5																	
	2 Nurses should h	Nurses sho	Provide ap	Brian	16-Apr-2007	19-Apr-2007	3																	
	3 5 S Housekeepin	Apply 5S H	Provide nu	Collin	19-Apr-2007	25-Apr-2007	6																	
	4 The following s	Design and	Give nurse	Doreen	19-Apr-2007	25-Apr-2007	6																	
<b>2</b>	<b>Management sold</b>				<b>25-Apr-2007</b>	<b>07-May-2007</b>	<b>12</b>																	
	1 Chief Nurse sho	Design and	Chief nurs	Elaine	25-Apr-2007	07-May-2007	12																	
	2 ICT should be i	Make appoi	Encourage	Frenie	25-Apr-2007	07-May-2007	12																	
	3 If possible mus	Encourage	Provide nu	Geraldine	25-Apr-2007	07-May-2007	12																	
<b>3</b>	<b>Deliver good qu</b>				<b>07-May-2007</b>	<b>29-May-2007</b>	<b>22</b>																	
	1 Management shou	Designate	Give train	Helen	07-May-2007	22-May-2007	15																	
	2 Clinical Perfor	Plan a tra	Provide CP	Irene	22-May-2007	24-May-2007	2																	
	3 Use appropriate	Select app	Submit bud	Janete	22-May-2007	24-May-2007	2																	
	4 Provide Quality	Send hospi	Call a Gua	Karen	25-May-2007	29-May-2007	4																	





# Close RCA



## Detailed action plan is necessary

No.	Root Cause	Recommendations	Resistance Faced	How to Overcome Resistance	Progress	PIC
<b>1</b>	<b>Shortage of nurses on duty and the nurse have another responsibility in her family after work</b>					
1	Increase staffing to decrease workload and responsibilities.	Assign more nurses that are knowledgeable and well-experienced to prone-medical error workplace.	Lack of knowledgeable and well-trained nurses.	Give incentives to staff who can refer a qualified nurses for the position.	More quified nurses applied for the position posted.	Allan
2	Nurses should have checklist to prevent errors in their work.	Nurses should use checklist in all types of work.	Nurses prefer to do work on their routine way.	Provide Awareness training to all nurses.	More nurses adapt to use checklist in their daily work.	Brian
3	5 S Housekeeping must be implemented in their workplace.	Apply 5S Housekeeping in the workplace.	Nurses not interested to do 5S in the workplace.	Send nurses for a Workshop on 5S Housekeeping.	Nurse station is well-organized and arranged. Nurses able to locate things easily. Nurses done their work with ease and on time in a better way.	Collin
4	The following should be implemented: Creative scheduling options, Let nurse choose their overtime, and offer referral bonuses to employees.	Design and develop a creative scheduling options for nurses and provide them with better incentives and benefits.	Shortage of nurses.	Hire more knowledgeable and experienced nurses. Give nurses good salary, better incentives and benefits. Offer referral bonuses to employees.	More quified nurses being added. Nurses are more focus on their work. They are happy with their working schedule.	Doreen



# Summary Status



Incident Type  Outcome  Investigation Level

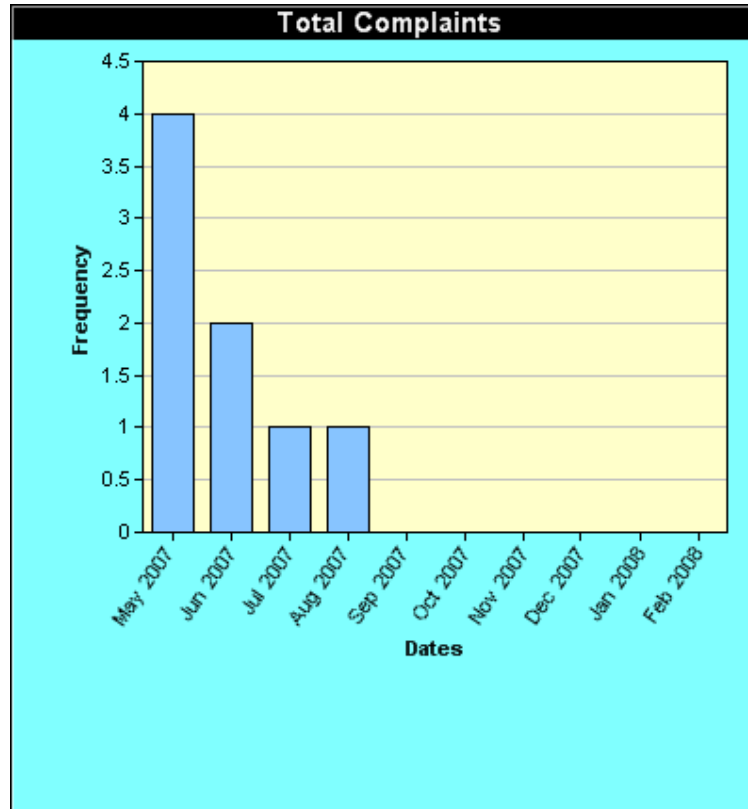
■ Resolved within policy time frame ■ Resolved out of policy time frame ■ Not resolved and out of policy time frame

Complaint Id.	Incident Type	Outcome	Invest Level	Complaint Date	Complaint	Days
2	Patient Complaint	Not Resolved	Mini RCA	03-May-2007	The patient fainted and fell to the floor after being given an IV drug.	292
3	Customer Complaint	Not Resolved	Full RCA	02-May-2007	The patient was operated on the wrong side of the abdomen.	293
4	Internal Complaint	Pending	Minimal	18-Apr-2007	Patient went missing	307
5	Patient Incident	Resolved	Mini RCA	09-May-2007	The staff at the canteen were rude	8
6	Customer Incident	Not Resolved	Full RCA	15-May-2007	The nurse was not able to answer as to the condition of her mother	280
7	Customer Incident	Resolved	None	10-May-2007	A wrong procedure was conducted on the patient	8
8	Internal Incident	Not Resolved	Minimal	25-May-2007	The discharge took a long time	270
9	Patient Complaint	Not Resolved	None	17-May-2007	The patient did not like the food given in the wards.	278
10	Customer Complaint	Not Resolved	Minimal	11-Apr-2007	Wrong medication by the pharmacy	314
11	Internal Complaint	Pending	Mini RCA	09-May-2007	Wife was put at a very noisy area at the ward.	286
12	Customer Incident	Not Resolved	Minimal	22-May-2007	Needle stick	273





# Trend Bar Chart



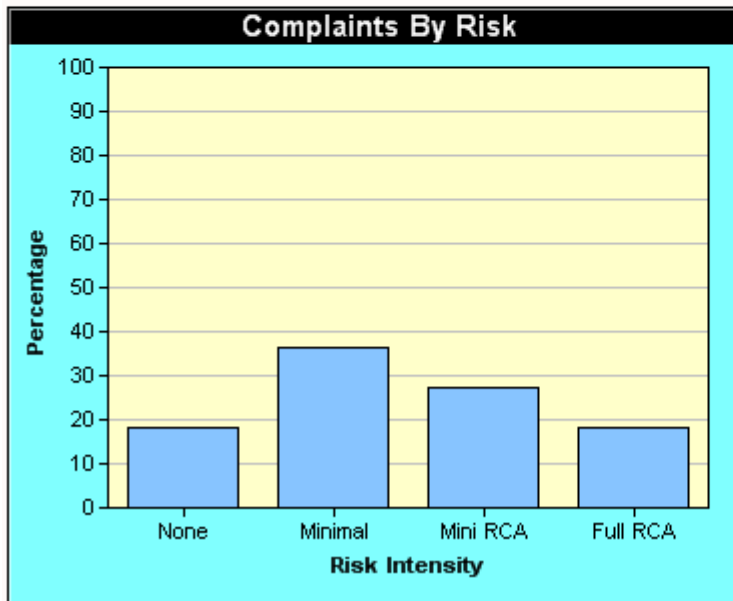


# Risk Analysis



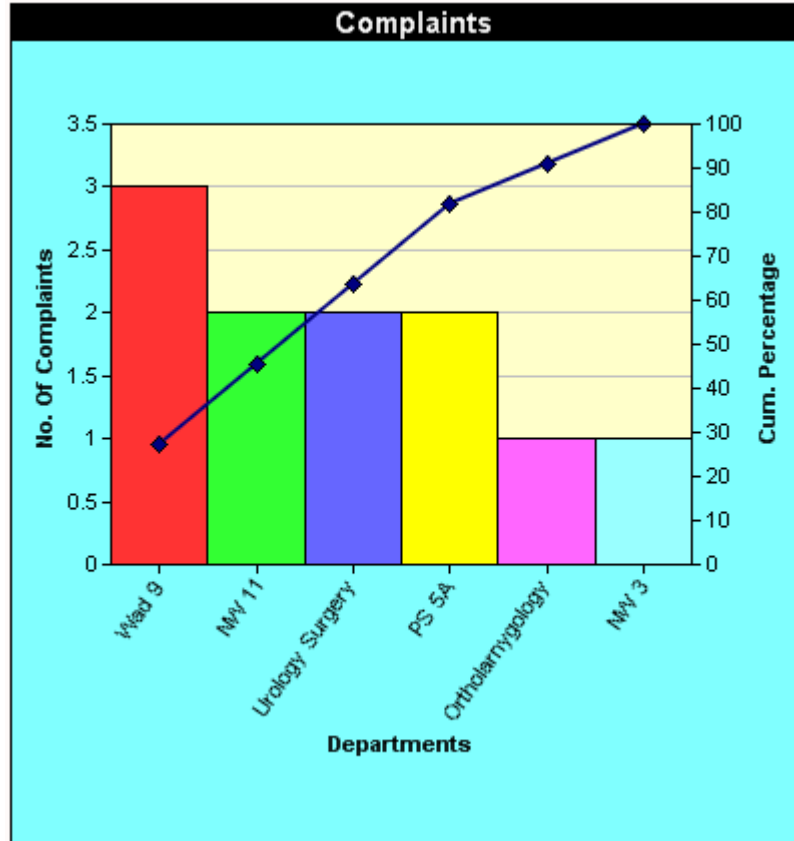
	Minimum	Minor	Moderate	Major	Serious	Total
Rare	0	0	1	0	0	1
Unlikely	1	1	1	1	0	4
Possible	0	2	1	0	1	4
Likely	0	0	0	0	1	1
Almost Certain	0	0	1	0	0	1
<b>Total</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>11</b>

1	None	2	18.18%
2	Minimal	4	36.36%
3	Mini RCA	3	27.27%
4	Full RCA	2	18.18%



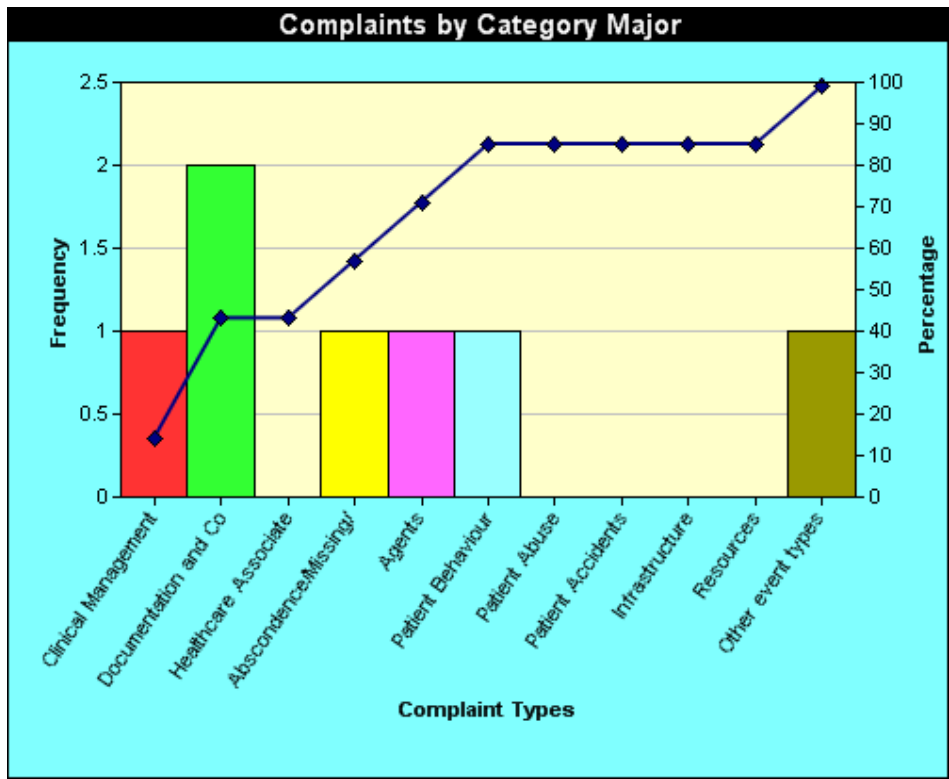


# Department Report



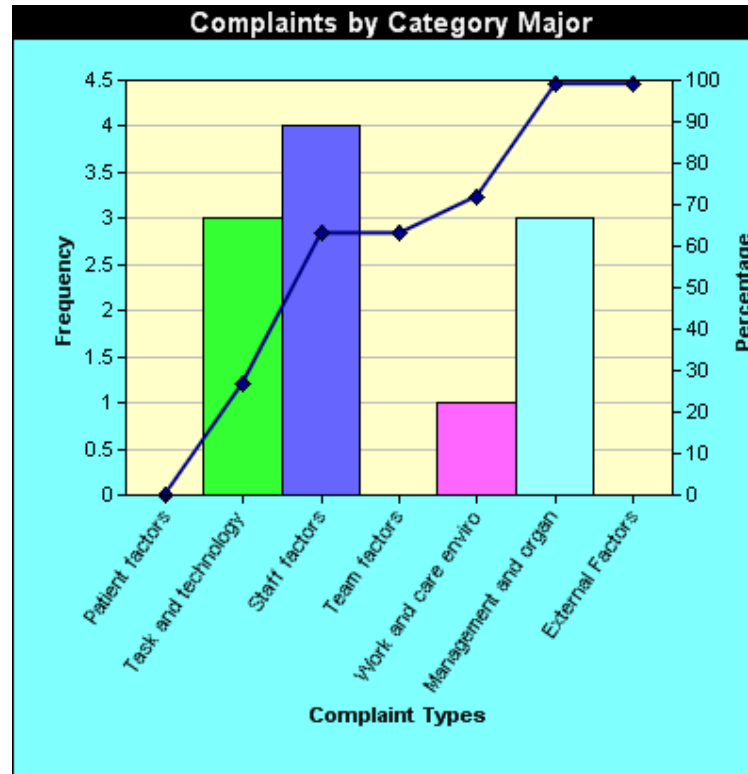


# Complaints by Category



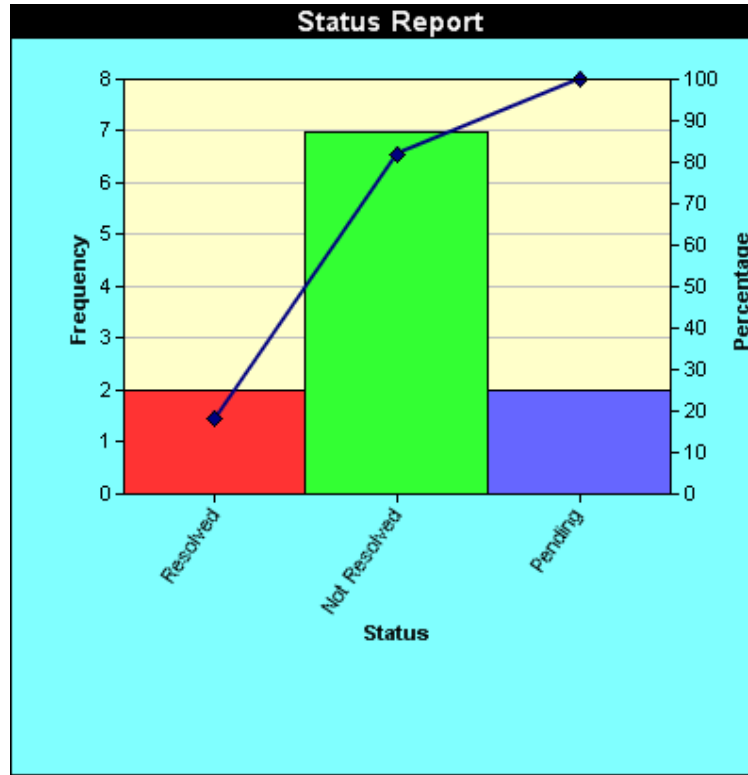


# Complaints by Causal Factors



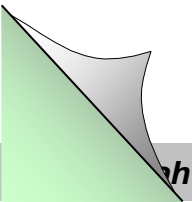
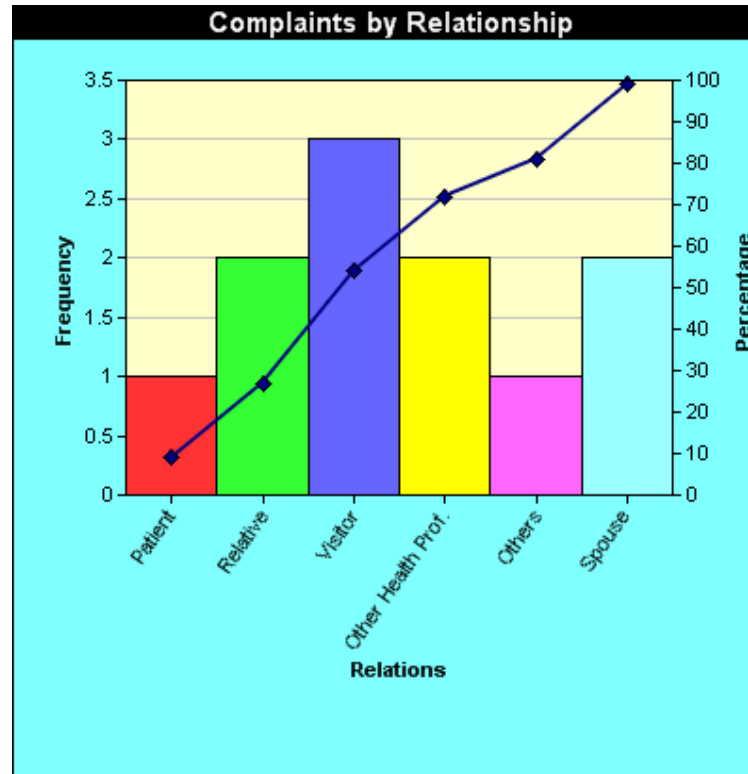


# Complaints by Status





# Complaints by Relations



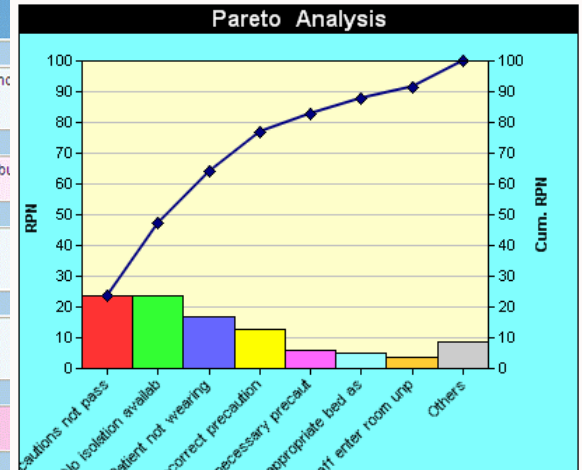


# Healthcare Failure Mode Effects Analysis (HFMEA)



Belmah Strategies

No.	Process	Potential Failure Mode	Potential Effects of Failure	S	Potential Causes of Failure	O	D	RPN	Recommended Action
<b>1 Infection control questions asked through glass partition.</b>									
1.1		Step missed questions not understood by patient. Patients dont tell truth.	Potential infection missed and others put at risk.	1	Language barrier, staff talking quickly, patient embarrassed, hoping for faster service.	4	5	20	Signage to alert patient to screening process and why necessary.
<b>2 Infection control sheet filled out.</b>									
2.1		Unnecessary precaution, inappropriate precaution.	Risk spread of infection becomes overwhelmed.	2	Inadequate assessment info and time to decide.	8	8	128	Ask questions in step 1 to protect Triage nurse by complete infection control form in step 4.
<b>3 Patient asked to carry out infection control precautions, apply mask or hand wash.</b>									
3.1		Patient refuses to comply, patient unable to comply.	Risk of spread of infection.	2	Children, cognitive impairment, too sick to wear mask, isolation unavailable.	3	1	6	Staff to wear appropriate PPE. Staff to be clear with instructions and reinforce behavior.
<b>4 Patient brought to Triage area for assessment.</b>									
4.1		Staff not wearing PPE. Temperature not recorded on screening tool.	Temperatures not recorded, all should be.	1	Interpretation of directions on form.	5	1	5	Change form, example provided. Staff ED.
<b>5 Infection control precautions entered in computer.</b>									
5.1		Incorrect precaution entered.	Risk of infection transmission.	5	Not understanding categories. Computer entry errors.	8	7	280	Change drop chart on computer add BSP for nil most used order by staff ED.
<b>6 Patient sent to waiting area.</b>									
6.1		No isolation available, patient noncompliant with infection control precaution.	Risk of spread of infection. Risk to immuno compromised patients.	8	Lack of space in department and waiting room.				
<b>7 Patient brought to room in Emerg.</b>									
7.1		Precautions not passed on to ER staff.	Infection risk to staff and other patients.	8	Infection control not on chart face. Many people taking patients to department. Signs not put on room. Infection control not on desk monitor.				
<b>8 RN enters room for initial assessment.</b>									
8.1		Staff enter room unprotected for initial assessment.	Risk of spread of infection to staff.	2	Sign not on door. Staff not checking Tracking Board.				
<b>9 Health professionals and other services enter room.</b>									
9.1		Other department staff enters room unprotected or inappropriate use of PPE.	Risk of spread of infection.	2	Signage not coordinated. Triage incorrect. Signs not visible from angles in the acute room. Not enough isolation carts.				
<b>10 Patient and family informed of required infection control precautions and risks.</b>									
10.1		Family not using PPE and other infection control measures.	Risk of spread of infection to family and community.	2	Family not informed of infection control measures to take. Family noncompliant.				



No.	Potential Failure Mode	RPN
1	Step missed questions not understood by patient. Patients dont tell truth.	20
2	Unnecessary precaution, inappropriate precaution.	128
3	Patient refuses to comply, patient unable to comply.	6
4	Staff not wearing PPE. In Yes section A temperature not recorded in section B on screening tool.	5
5	Incorrect precaution entered.	280
6	No isolation available, patient noncompliant with infection control precaution.	512
7	Precautions not passed on to ER staff.	512
8	Staff enter room unprotected for initial assessment.	80
9	Other department staff enters room unprotected or inappropriate use of PPE.	80
10	Family not using PPE and other infection control measures.	48
11	Patient not wearing necessary PPE. staff in other departments unaware of infection control precautions. Porters not wearing PPE.	360
12	Inappropriate bed assignment.	108
13	Patient sent to floor with infection control status unreported.	24
	<b>Total</b>	<b>2163</b>





# Severity



Description	Rank ▲	
<b>Severity</b>		
<b>No danger</b>	<b>1</b>	Failure causes no injury and has no impact on system.
<b>Slight danger</b>	<b>2</b>	Failure causes no injury and customer is unaware of problem however the potential for minor injury exists; little or no effect on system.
<b>Low to Moderate danger</b>	<b>3</b>	Failure causes very minor or no injury but annoys customer and/or results in minor system problems that can be overcome with minor modifications to system or process.
<b>Low to Moderate danger</b>	<b>4</b>	Failure causes very minor or no injury but annoys customer and/or results in minor system problems that can be overcome with minor modifications to system or process.
<b>Moderate danger</b>	<b>5</b>	Failure causes minor injury with some customer dissatisfaction and/or minor system problems.
<b>Moderate danger</b>	<b>6</b>	Failure causes minor injury with some customer dissatisfaction and/or major system problems.
<b>Dangerous</b>	<b>7</b>	Failure causes minor injury with customer dissatisfaction and/or major system problems.
<b>Very dangerous</b>	<b>8</b>	Failure could cause major or permanent injury and/or serious system disruption with interruption in service with prior warning.
<b>Very dangerous</b>	<b>9</b>	Failure could cause major or permanent injury and/or serious system disruption with interruption in service without any prior warning.
<b>Extremely dangerous</b>	<b>10</b>	Failure could cause death of a customer (patient, visitor, employee, staff member, business partner) and/or total system breakdown without any prior warning.



# Occurrence



Occurrence		
<b>Remote probability of occurrence</b>	<b>1</b>	Failure almost never occurs, no one remembers last failure.
<b>Low probability of occurrence</b>	<b>2</b>	Failure occurs rarely or about once per year.
<b>Moderate probability of occurrence</b>	<b>3</b>	Failure occurs occasionally or once every 6 months.
<b>Moderate probability of occurrence</b>	<b>4</b>	Failure occurs occasionally or once every 3 months.
<b>Moderate high probability of occurrence</b>	<b>5</b>	Failure occurs about once in every 2 months.
<b>Moderate high probability of occurrence</b>	<b>6</b>	Failure occurs about once per month.
<b>Very high probability of occurrence</b>	<b>7</b>	Failure occurs frequently or about once a fortnight.
<b>Very high probability of occurrence</b>	<b>8</b>	Failure occurs frequently or about once a week.
<b>Failure is almost inevitable</b>	<b>9</b>	Failure occurs predictably or occurs every 4 days
<b>Certain probability of Occurrence</b>	<b>10</b>	Failure occurs at least once a day.



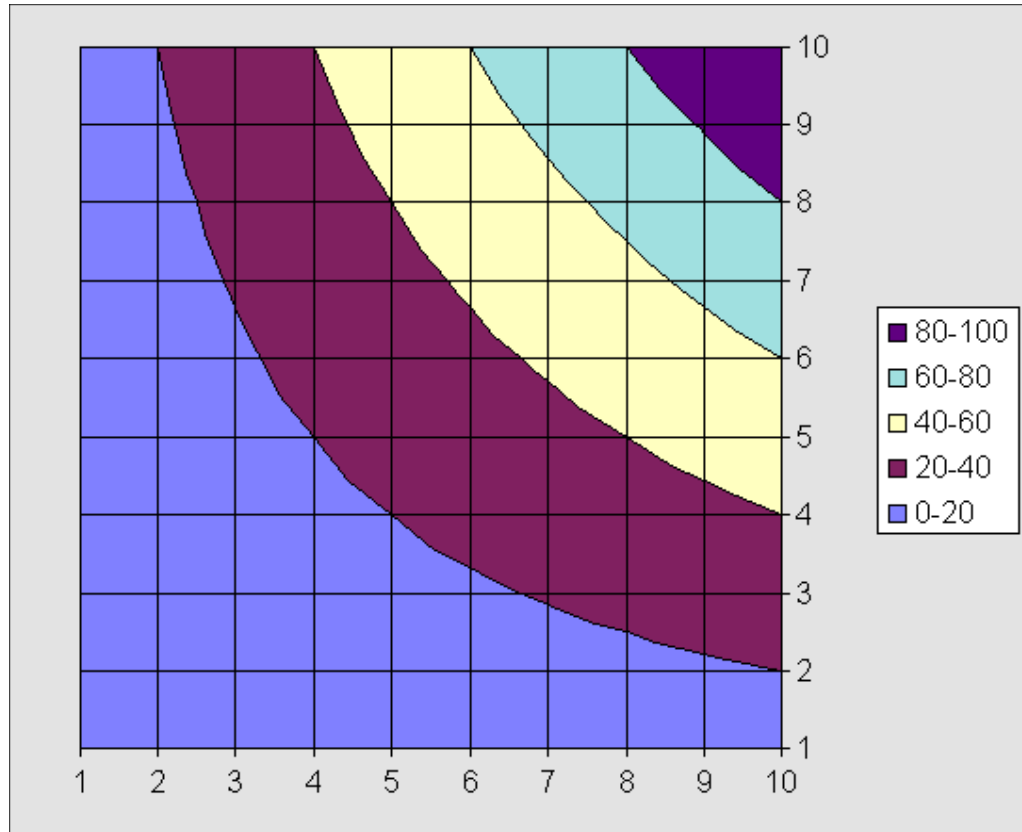
# Detection



Detection		
<b>Almost certain</b>	<b>1</b>	There are automatic "shut-offs" or constraints that prevent failure. Very likely it will be detected.
<b>Very high</b>	<b>2</b>	There is 100% inspection of the process and it is automated.
<b>High</b>	<b>3</b>	High chance the Design Control will detect a potential Cause of failure
<b>High</b>	<b>4</b>	There is 100% inspection or review of the process but it is not automated.
<b>Moderate chance of detection</b>	<b>5</b>	There is a process for double-checks or inspection but no process is in place so that detection left to chance.
<b>Remote</b>	<b>6</b>	Low chance
<b>Remote</b>	<b>7</b>	The error can be detected with manual inspection but no process is in place so that detection left to chance.
<b>Very remote/Unreliable</b>	<b>8</b>	The failure can be detected only with through inspection and this is not feasible or cannot be readily done.
<b>Very remote/Unreliable</b>	<b>9</b>	The failure can be detected only with through inspection and this is not feasible or cannot be readily done.
<b>No chance of detection</b>	<b>10</b>	There is no known mechanism for detecting the failure. Very likely it will not be detected.

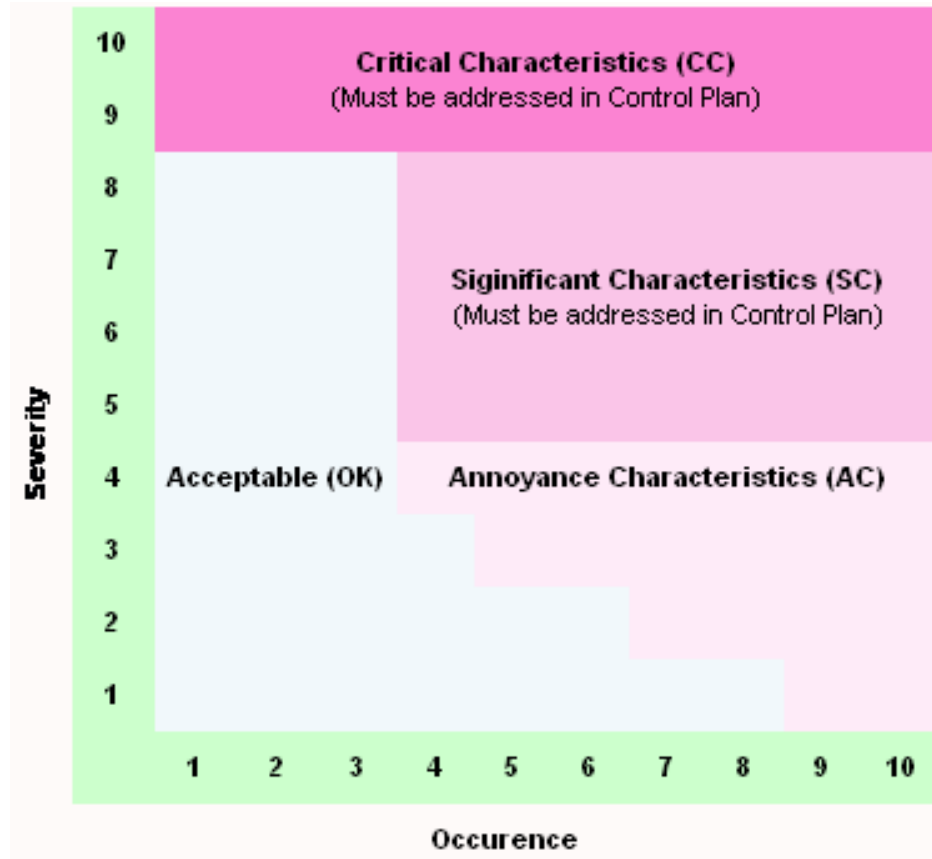


# Contour Map of Criticality





# Severity vs. Occurrence





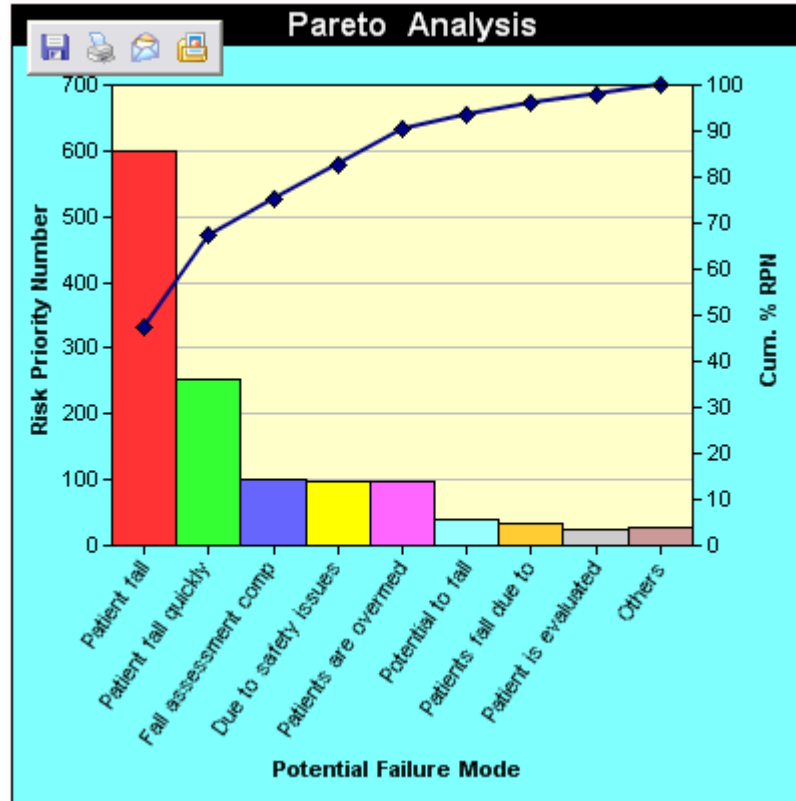
# FMEA Process



<span>Edit</span> <span>Arrange</span> <span>Expand All</span> <span>Collapse All</span> <span>Show / Hide Column</span> <span style="background-color: #FFC0CB; padding: 2px;">CC</span> <span style="background-color: #FFDAB9; padding: 2px;">SC</span> <span style="background-color: #FFDAB9; padding: 2px;">AC</span> <span style="background-color: #E0F7FA; padding: 2px;">OK</span>													
No.	Process	Potential Failure Mode	Potential Effects of Failure	S	Potential Causes of Failure	O	Class	Current Controls Prevention	Current Controls Detection	D	RPH	Recommended Action	Responsibility
<b>1 Fall Assessment</b>													
1.1	Fall assessment completed upon admission	Fall assessment completed upon admission	Potential injury	10	Effects of anesthesia, analgesia.	1	CC			10	100	Patients are ambulated with assistance for first 24 hours per policy. Placed on fall risk precautions. Dont fall call program.	Chin Yong
1.2	Patient assessment	Patient is not assessed at time of admission.	Inaccurate fall risk assigned to patient	8	Lack of staffing	2	OK			1	16	Nightly chart audits to assure completion of admission evaluation	Wahab Harun
<b>2 Inaccurate Fall Assessment</b>													
2.1	Fall assessment	Potential to fall	No injury to severe injury	8	Slip, trip, equipment, IV tubing, drains, drainge bags, liquid on floor, urinary urgency, diarrhea	1	OK			5	40	All patients are assigned fall risk category and assisted to chair first 24 hours per policy.	Abdullah
2.2	Patient opinion	Patient is evaluated to be at a fall risk not consistant with presentation.	Fall interventions are not implemented correctly.	6	Inaccurate assessment tool. Lack of training to use of tool.	1	OK			4	24	Provide in orientation training on Fall prevention. Monitor Fall events for specific criteria.	Leong Soon Lim



# Pareto Analysis





# Summary



## Comments

We experimented with many ways of doing a study on reducing patient falls. This was a new idea we tried. We are happy with the outcome.

## Observations

Initially it looked like it was going to be a difficult tasks but as we started into the project, a lot of the steps became clearer and do able.

## Lesson Learnt

Using the right method, we are able to comprehend the issue better and develop a systematic way of managing the inpatient falls to a desirable level.

## Summary

This application must be made available to all other units and departments so as to use this method in all other areas where it can be used.

## Next Action

The hospital must introduce HFMEA so that the maximum benefit of HFMEA can be capitalized to the maximum





# Incident Reporting (IR)



## Form 1

Departments :  Units :

<< < 4 > >>

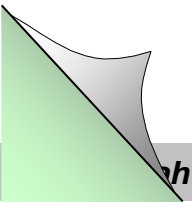
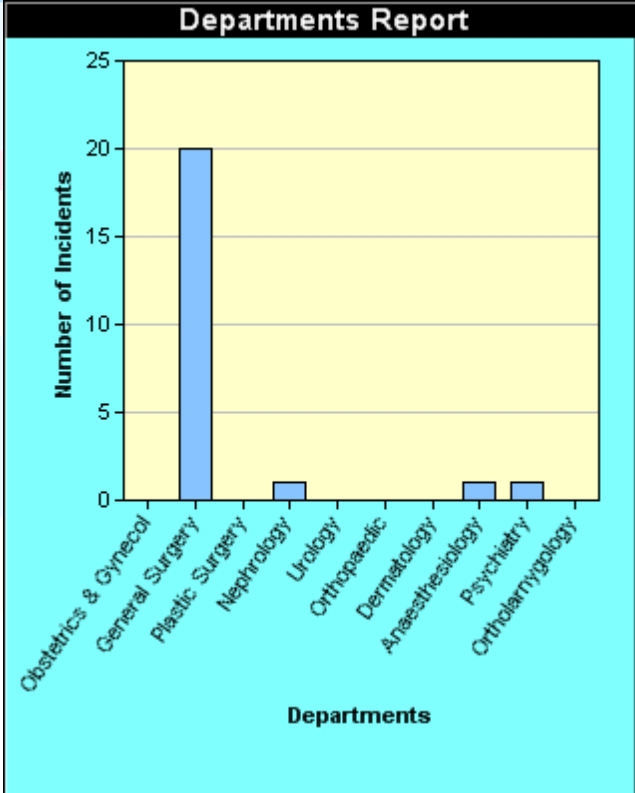
Reporting Person	Ng Swee Ling	Date of incident	01-Jun-2007 06:27 PM
Category	Others	Date of reporting	02-Jun-2007 06:27 PM
Involved in the incident		If patient is involved	
Witnessed the incident	Yes	Name	
State	Johor	R/N	
Hospital	Hospital Tuanku Ampuan Najihah, Kuala Pilah	Ward	
Incident Type	Radiology / laboratory error		

**Part A** Part B Part C

Summary of the Incident

The laboratory report was not signed off.

Name Jamilah  
Signature Jamilah





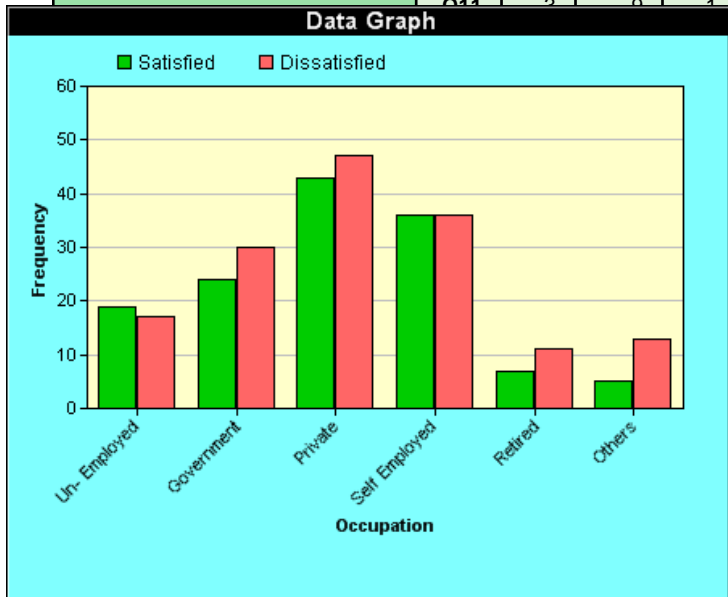




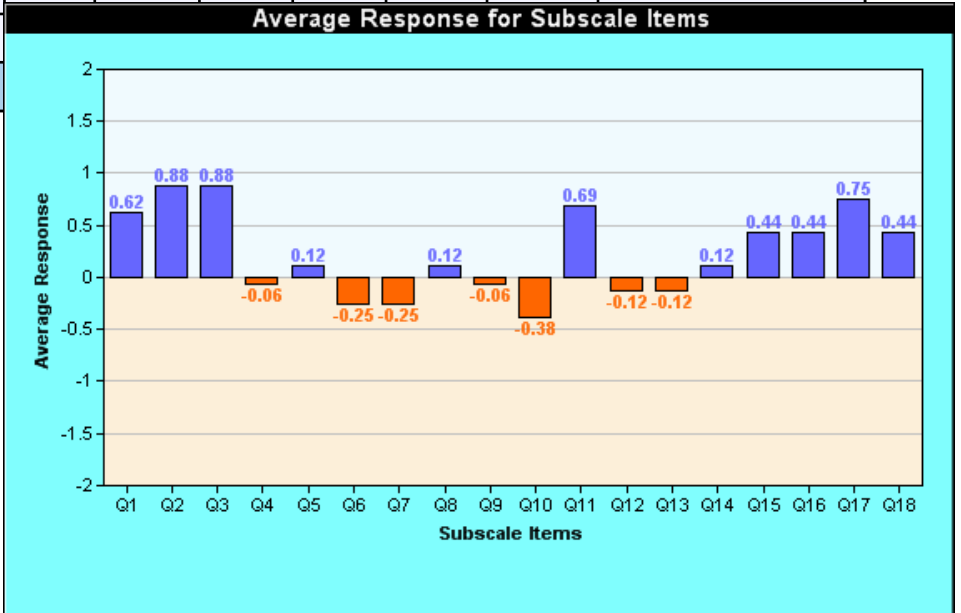
# Patient Satisfaction Questionnaire (PSQ)



	Care Received (Care Expected)											T-Test	
	No.	1	2	3	4	5	Tot.	Expt.	Var.	+CI	-CI	T-Val.	Decision
General Satisfaction	Q3	5	6	3	2	0	16	0.88	1.05	1.38	0.37	3.42	Good
	Q17	2	9	4	1	0	16	0.75	0.60	1.13	0.37	3.87	Good
Technical Quality	Q2	3	9	3	1	0	16	0.88	0.65	1.27	0.48	4.34	Good
	Q4	2	3	4	6	1	16	-0.06	1.40	0.52	-0.64	-0.21	Immediate Attention
	Q6	0	4	5	6	1	16	-0.25	0.87	0.21	-0.71	-1.07	Urgent Action
	Q14	2	6	3	2	3	16	0.12	1.85	0.79	-0.54	0.37	Improve
Interpersonal Manner	Q10	0	3	6	5	2	16	-0.38	0.92	0.09	-0.84	-1.57	Crisis Situation
	Q11	2	9	4	1	0	16	0.62	1.05	1.13	0.12	2.44	Good



2	0
5	2
60	20





# Likert Scale



**Likert Scale : 5      Direction : (1) Strongly Agree --- (5) Strongly Disagree**

Scale	Description	Bahasa Malaysia
1	Strongly Agree	Sangat Setuju
2	Agree	Setuju
3	Uncertain	Tidak Pasti
4	Disagree	Tidak Setuju
5	Strongly Disagree	Sangat Tidak Setuju

Grade No	Grade	Category	Description
1	A	Satisfied	
2	B	Satisfied	
3	C	Dissatisfied	
4	D	Dissatisfied	
5	E	Dissatisfied	



# Subscale Items



Ilo.	Catch Line	Care Received (Care Expected)	Status
Q1	Explain the reason for tests. <i>Menjelaskan alasan untuk ujian.</i>	Doctors are good about explaining the reason for medical tests. <i>Doktor baik dalam menjelaskan alasan untuk menjalankan ujian perubatan.</i>	P
Q2	Office has everything needed. <i>Pejabat mempunyai semua keperluan.</i>	I think my doctors office has everything needed to provide complete medical care. <i>Saya berpendapat pejabat doktor saya mempunyai segala keperluan yang diperlukan untuk ujian perubatan yang sempurna.</i>	P
Q3	Care just about perfect. <i>Perkhidmatan adalah sempurna.</i>	The medical care I have been receiving is just about perfect. <i>Perkhidmatan perubatan yang saya perolehi adalah sempurna.</i>	P
Q4	Wonder if diagnosis is correct. <i>Tertanya-tanya sekiranya diagnostic adalah tepat.</i>	Sometimes doctors make me wonder if their diagnosis is correct. <i>Kadang-kadang doktor menyebabkan saya tertanya-tanya sekiranya diagnostic mereka adalah tepat.</i>	N
Q5	Care without financial setback. <i>Rawatan yang murah.</i>	I feel confident that I can get the medical care I need without being set back financially. <i>Saya pasti untuk memperoleh rawatan perubatan yang diperlukan tanpa melibatkan wang yang banyak.</i>	P
Q6	Careful to check everything. <i>Pemeriksaan perubatan yang komprehensif.</i>	When I go for medical care, they are careful to check everything when treating and examining me. <i>Bila saya hadir untuk rawatan perubatan, mereka menyasat dengan berhati-hati bila merawat dan memeriksa saya.</i>	P
Q7	Pay more than can afford. <i>Membayar lebih dari kemampuan</i>	I have to pay for more of my medical care than I can afford. <i>Saya terpaksa membayar melebihi kemampuan saya untuk perkhidmatan perubatan.</i>	N
Q8	Easy access to specialists. <i>Senang berjumpa dengan doctor pakar.</i>	I have easy access to the medical specialists I need. <i>Saya boleh berhubung dengan doctor pakar yang saya perlu.</i>	P
Q9	Wait too long for emergency treatment. <i>Lama menunggu untuk perkhidmatan</i>	Where I get medical care, people have to wait too long for emergency treatment. <i>Di tempat saya mendapat perkhidmatan perubatan, orang awam terpaksa menunggu lama untuk mendapatkan perkhidmatan kecemasan.</i>	N
Q10	Too business-like, impersonal. <i>Sangat mirip perniagaan, tanpa segan.</i>	Doctors act too businesslike and impersonal toward me. <i>Tindakan doktor sangat mirip perniagaan tanpa menyegani perasaan saya.</i>	N



# Subscales



General Satisfaction		
Q3	Care just about perfect. <i>Perkhidmatan adalah sempurna.</i>	The medical care I have been receiving is just about perfect. <i>Perkhidmatan perubatan yang saya perolehi adalah sempurna.</i>
Q17	Dissatisfied with some things. <i>Tidak puas dengan beberapa perkara.</i>	I am dissatisfied with some things about the medical care I receive. <i>Saya tidak puas hati dengan beberapa perkara mengenai rawatan yang saya terima.</i>
Technical Quality		
Q2	Office has everything needed. <i>Pejabat mempunyai semua keperluan.</i>	I think my doctors office has everything needed to provide complete medical care. <i>Saya berpendapat pejabat doktor saya mempunyai segala keperluan yang diperlukan untuk ujian perubatan yang sempurna.</i>
Q4	Wonder if diagnosis is correct. <i>Tertanya-tanya sekiranya diagnostic adalah tepat.</i>	Sometimes doctors make me wonder if their diagnosis is correct. <i>Kadang-kadang doktor menyebabkan saya tertanya-tanya sekiranya diagnostic mereka adalah tepat.</i>
Q6	Careful to check everything. <i>Pemeriksaan perubatan yang komprehensif.</i>	When I go for medical care, they are careful to check everything when treating and examining me. <i>Bila saya hadir untuk rawatan perubatan, mereka menyasat dengan berhati-hati bila merawat dan memeriksa saya.</i>
Q14	Doubt about ability of doctors. <i>Meragui kebolehan doktor.</i>	I have some doubts about the ability of the doctors who treat me. <i>Saya meragui kebolehan doktor yang merawat saya.</i>
Interpersonal Manner		
Q10	Too business-like, impersonal. <i>Sangat mirip perniagaan, tanpa segan.</i>	Doctors act too businesslike and impersonal toward me. <i>Tindakan doktor sangat mirip perniagaan tanpa menyegani perasaan saya.</i>
Q11	Very friendly and courteous. <i>Ramah tamah dan berhemah.</i>	My doctors treat me in a very friendly and courteous manner. <i>Doktor merawat saya dengan ramah tamah dan berhemah tinggi.</i>



# Respondents



<< < Emma > >>   

<b>Name</b>	Emma
<b>Address</b>	Sungai Buloh
<b>Age</b>	31-35
<b>Gender</b>	Female
<b>Citizenship</b>	Malaysian
<b>Race</b>	Chinese
<b>Marital Status</b>	Widowed
<b>Highest Education Level</b>	Tertiary Education
<b>Occupation</b>	Government
<b>Visiting Clinic</b>	Specialist Clinic
<b>No. of Visits</b>	Thrice
<b>Waiting Time</b>	20-29 minutes
<b>What is your main problem that you encounter at this clinic?</b>	cannot understand doctors explanation





# Data Collection



Respondents **All Respondents** ▼

[Switch to Bahasa Malaysia](#)

**Likert Scale :** 1 Strongly Agree 2 Agree 3 Uncertain 4 Disagree 5 Strongly Disagree

## Care Received (Care Expected)

These next questions are about how you feel about the medical care you receive.  
 On the following pages are some things people say about medical care. Please read each one carefully, keeping in mind the medical care you are receiving now.  
 (If you have not received care recently, think about what you would expect if you needed care today.) We are interested in your feelings, good and bad, about the medical care you have received.  
 How strongly do you AGREE or DISAGREE with each of the following statements?  
 (Choose One Number on Each Line)

Ilo.	Description	1	2	3	4	5
Q1	Doctors are good about explaining the reason for medical tests.	4	4	6	2	0
Q2	I think my doctors office has everything needed to provide complete medical care.	3	9	3	1	0
Q3	The medical care I have been receiving is just about perfect.	5	6	3	2	0
Q4	Sometimes doctors make me wonder if their diagnosis is correct.	1	6	4	3	2
Q5	I feel confident that I can get the medical care I need without being set back financially.	2	4	5	4	1
Q6	When I go for medical care, they are careful to check everything when treating and examining me.	0	4	5	6	1
Q7	I have to pay for more of my medical care than I can afford.	2	5	5	3	1
Q8	I have easy access to the medical specialists I need.	3	3	4	5	1
Q9	Where I get medical care, people have to wait too long for emergency treatment.	2	3	5	6	0
Q10	Doctors act too businesslike and impersonal toward me.	2	5	6	3	0
Q11	My doctors treat me in a very friendly and courteous manner.	3	9	1	2	1
Q12	Those who provide my medical care sometimes hurry too much when they treat me.	4	2	3	6	1
Q13	Doctors sometimes ignore what I tell them.	2	5	2	7	0
Q14	I have some doubts about the ability of the doctors who treat me.	3	2	3	6	2
Q15	Doctors usually spend plenty of time with me.	3	5	4	4	0

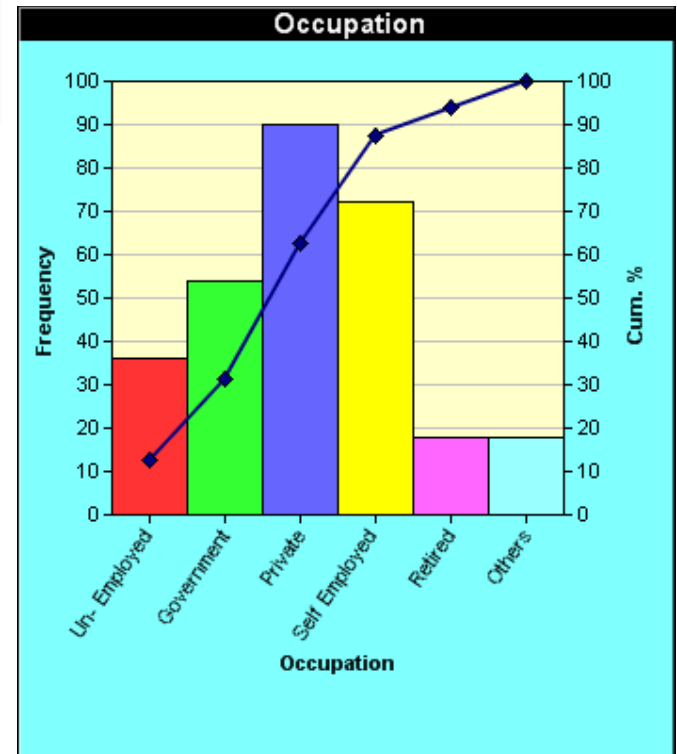


# Demographic Data



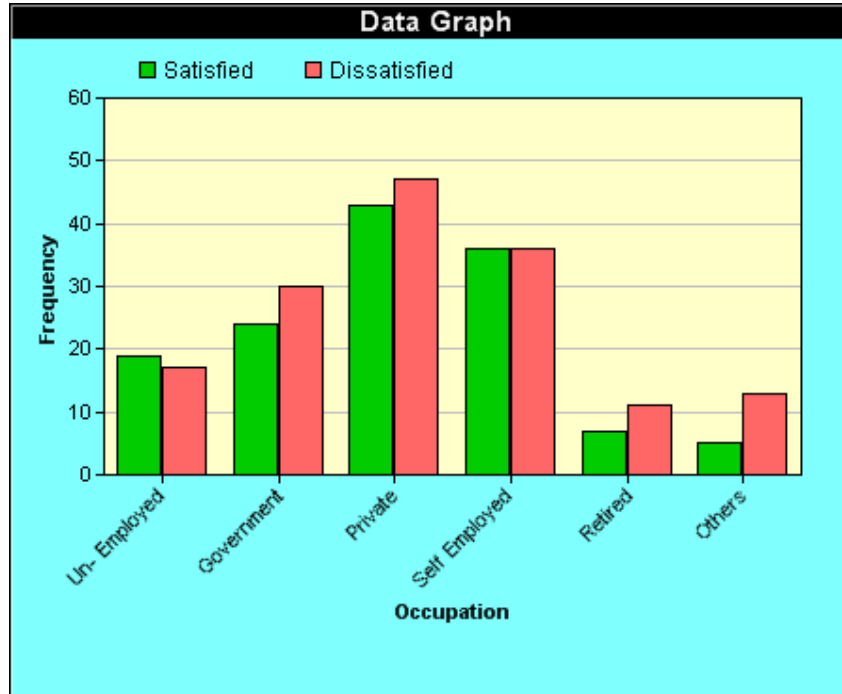
Demographics : Occupation

Data	Frequency			Percentage			Cumulative %
	Satisfied	Dissatisfied	Total	Satisfied	Dissatisfied	Total	
Un- Employed	19	17	36	6.597	5.903	12.500	12.50
Government	24	30	54	8.333	10.417	18.750	31.25
Private	43	47	90	14.931	16.319	31.250	62.50
Self Employed	36	36	72	12.500	12.500	25.000	87.50
Retired	7	11	18	2.431	3.819	6.250	93.75
Others	5	13	18	1.736	4.514	6.250	100.00
<b>Total</b>	<b>134</b>	<b>154</b>	<b>288</b>	<b>46.528</b>	<b>53.472</b>	<b>100.00</b>	<b>100.00</b>





# Satisfied vs. Dissatisfied

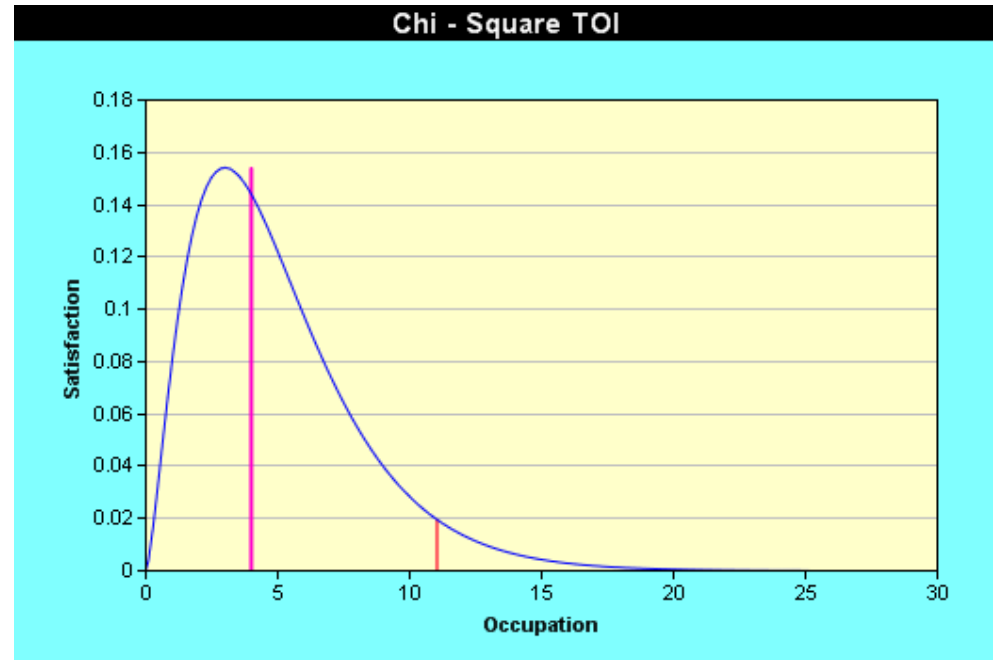




# Chi-Square Tests



		Satisfaction			
		Satisfied	Dissatisfied		
Occupation	1	Un- Employed	0.302	0.263	<b>0.565</b>
	2	Government	0.050	0.044	<b>0.094</b>
	3	Private	0.030	0.026	<b>0.057</b>
	4	Self Employed	0.187	0.162	<b>0.349</b>
	5	Retired	0.226	0.196	<b>0.422</b>
	6	Others	1.360	1.183	<b>2.544</b>
		<b>2.155</b>	<b>1.875</b>	<b>4.031</b>	



# Affinity Diagram



Level 1	Level 2 [Demanded Quality]	Level 3 [Reworded Data]	
General Satisfaction	6 Care	2 they treat patient well doctor treated me well.	
	Dissatisfied	4 treatment not good no immediate attention from staff hospital receptionist too busy nurses provide insufficient information to patient	
		1 Technical Items	0
		Diagnostics	1 lab result still not in
Interpersonal Manner	1 Businesslike	0	
	Courtesy	1 doctor is good	
Communication	3 Good Explanation	1 cannot understand doctors explanation	
	Dont Listen	2 doctor dont listen what i say difficult to communicate with doctor	
Financial Aspects	1 Expensive	1 hospital charges is too expensive	
	Affordability	0	
Time Spent with Doctor	2 Hurry	1 doctors always in a hurry when treating me	
	Spend Time	1 doctor spent less time	
Accessibility and Convenience	2 Acces to Doctor	0	
	Long Wait	2 waiting too long waiting too long	
		Long Appointment	0
	Anytime	0	



# Subscale Details

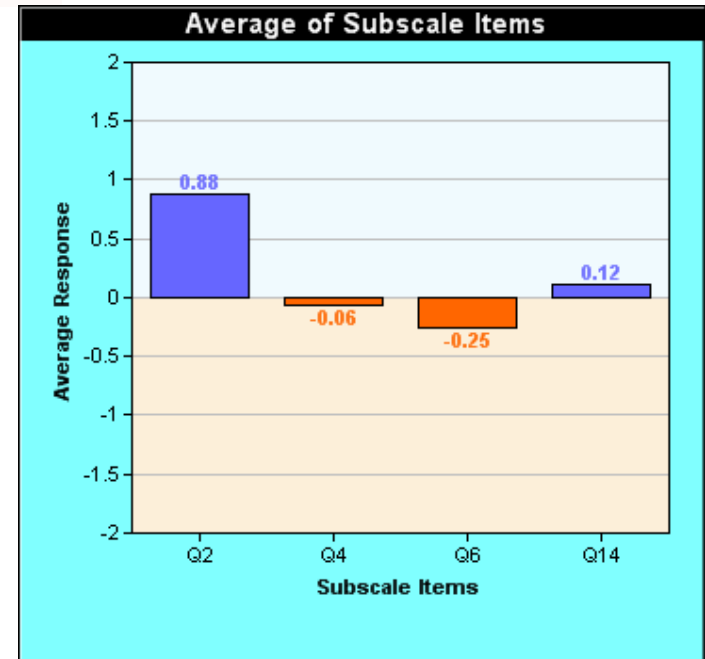


Subscales **Technical Quality** ▼

+0.00 -0.00  
-0.00 +0.00

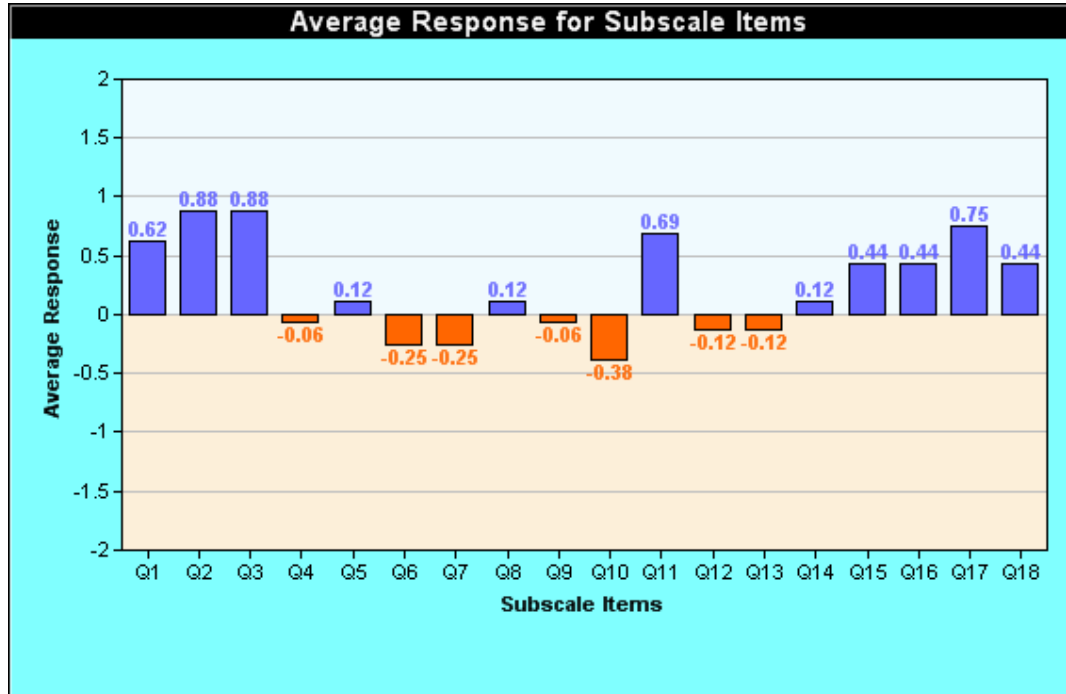
Report Setup

Care Received (Care Expected)										T-Test		
Ilo.	1	2	3	4	5	Tot.	Expt.	Var.	+CI	-CI	T-Val.	Decision
Q2	3	9	3	1	0	16	0.88	0.65	1.27	0.48	4.34	Good
Q4	2	3	4	6	1	16	-0.06	1.40	0.52	-0.64	-0.21	Immediate Attention
Q6	0	4	5	6	1	16	-0.25	0.87	0.21	-0.71	-1.07	Urgent Action
Q14	2	6	3	2	3	16	0.12	1.85	0.79	-0.54	0.37	Improve
<b>Total</b>	<b>7</b>	<b>22</b>	<b>15</b>	<b>15</b>	<b>5</b>							



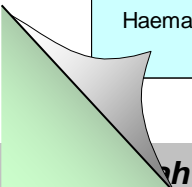
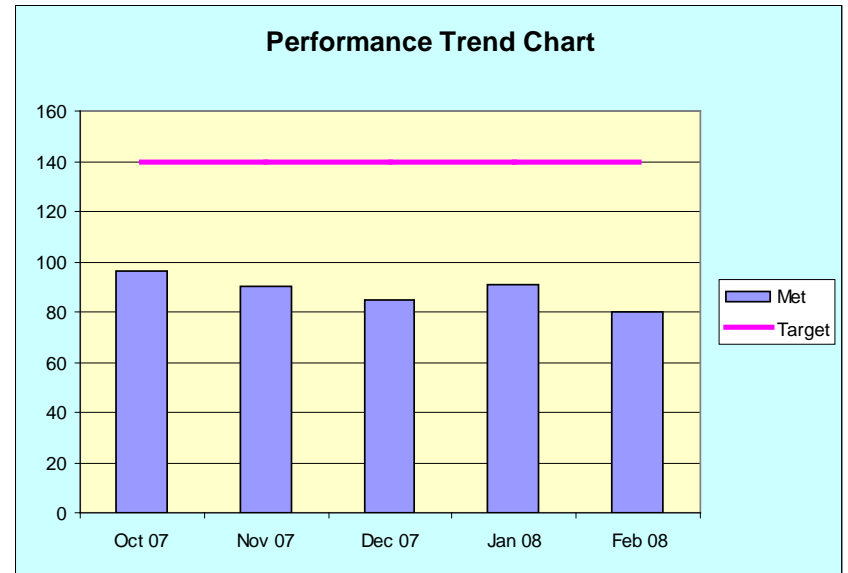
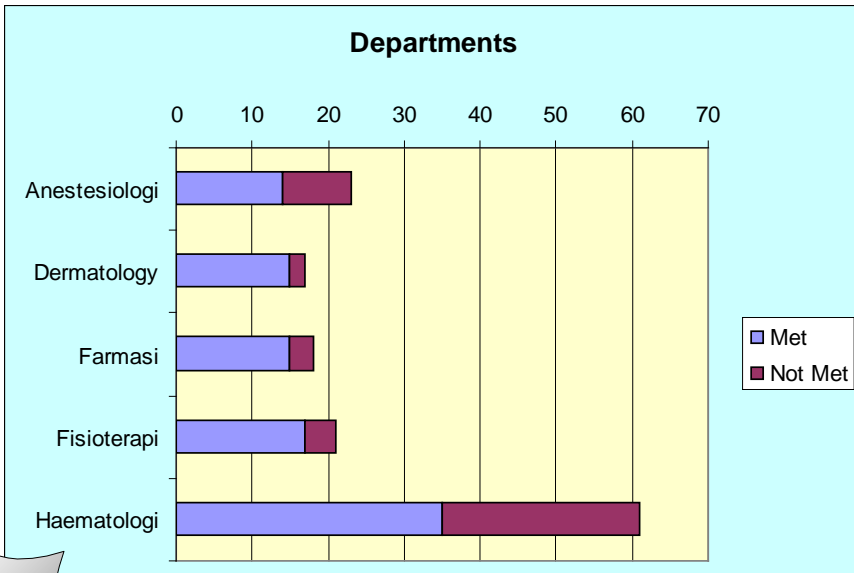
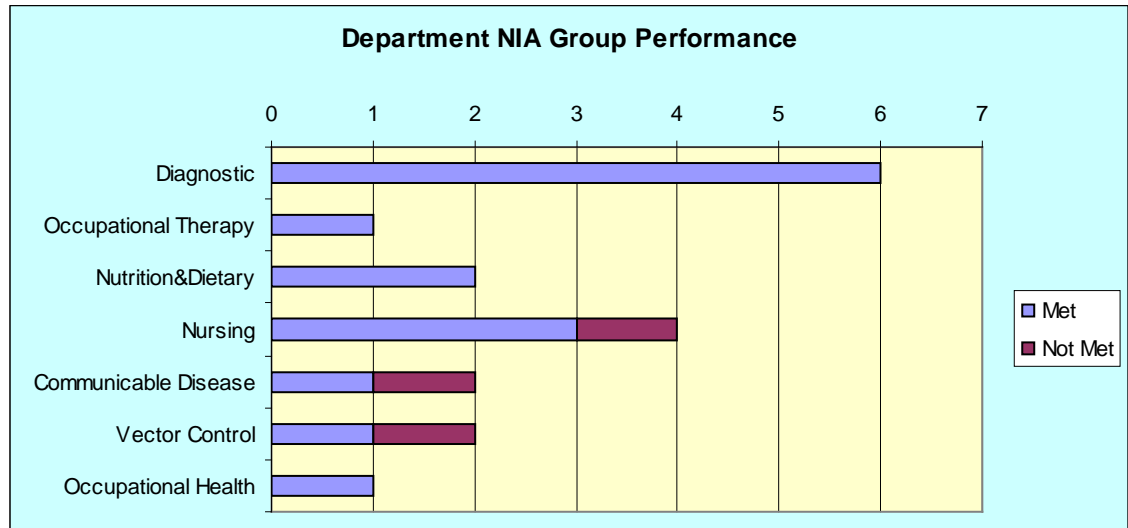
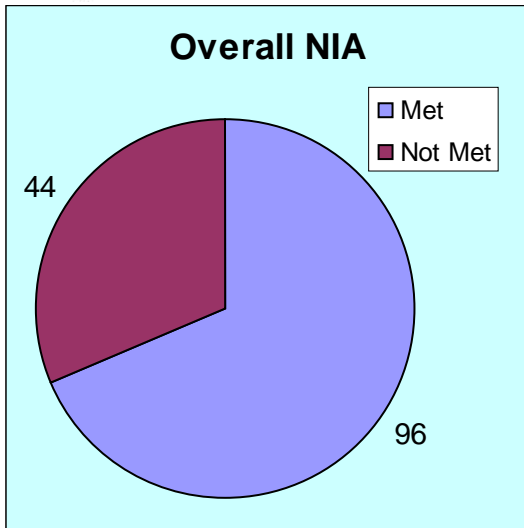


# Average Responses





# National Indicator Approach (NIA)







- Align the Organization
- Use Malcolm Baldrige National Quality Award
  - Leadership
  - Strategic Planning
  - Customers and Market Focus
  - Measurement, Analysis and Knowledge Management
  - Workforce Focus
  - Process Management
  - Results



# Malcolm Baldrige NQA (MBNQA)



**Leadership**

- Senior Leadership**
  - VISION and VALUES**

HOW do SENIOR LEADERS set organizational VISION and VALUES?

HOW do SENIOR LEADERS personally promote an organizational environment of organizational performance management that results in legal and ETHICAL BEHAVIOR?

HOW do SENIOR LEADERS create a SUSTAINABLE organization?
  - Communication and Organizational PERFORMANCE**

HOW do SENIOR LEADERS communicate with and engage the entire WORKFORCE?

HOW do SENIOR LEADERS create a focus on action to accomplish the organization's mission?
- Governance and Social Responsibilities**
  - Organizational GOVERNANCE**

HOW does your organization review and achieve the following KEY aspects of organizational performance?

HOW do you evaluate the PERFORMANCE of your SENIOR LEADERS, including their ethical behavior?
  - Legal and ETHICAL BEHAVIOR**

HOW do you address any adverse impacts on society of your products, services, or processes?

HOW does your organization promote and ensure ETHICAL BEHAVIOR in all organizational activities?
  - Support of KEY Communities**

HOW does your organization actively support and strengthen your KEY communities?

Welcome To Malcolm Baldrige National Quality ...

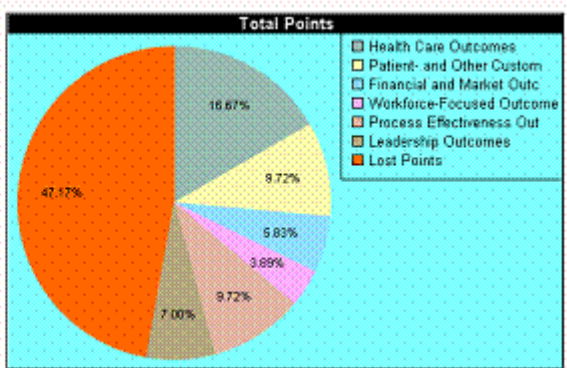
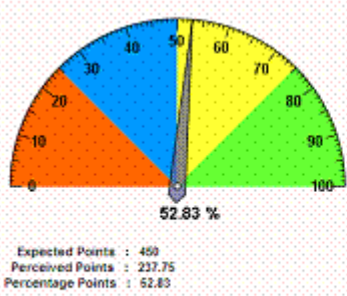
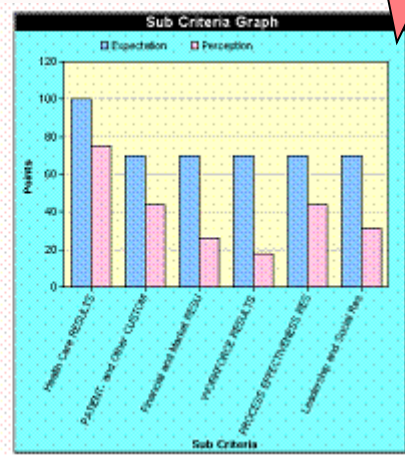
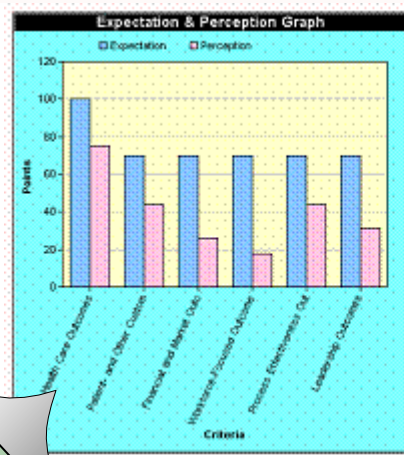
q/Mbnq/GetPert.aspx?dmid=1&respid=1&questid=8&stid=4&tp=0&ft=0

Close

Percent	Description
0	No vision and value set
25	Some vision and value considered
50	Vision and value talked about
75	Vision and value appears in documents
100	Organization operates according to the vision and values set

	Expt.	Perception	Pt. Expt.	Pt. Per.
			70	42
			42	31.5
	100	75	14.00	10.5
Integrated approach to	100	75	14.00	10.5
	100	75	14.00	10.5
			28	10.5
	100	25	14.00	3.5
	100	50	14.00	7
			50	22.5
			20	7.5
	100	25	10.00	2.5
	100	50	10.00	5
			20	7.5
	100	25	10.00	2.5
	100	50	10.00	5
			10	7.5
	100	75	10.00	7.5
<b>Total</b>	<b>1000</b>	<b>525</b>	<b>120</b>	<b>64.5</b>

All tools are supported by ICT-M® software





- We are looking for a Hospital partner
  - to develop all 11 standards and
  - 1032 Measurable elements



- Access To And Continuity Of Care
- Patient And Family Rights
- Assessment Of Patient
- Care Of Patient
- Patient And Family Education
- Prevention And Control Of Infection
- Staff Qualification And Education
- Governance, Leadership And Direction
- Facility Management And Safety
- Management Of Information
- Quality Improvement And Patient Safety

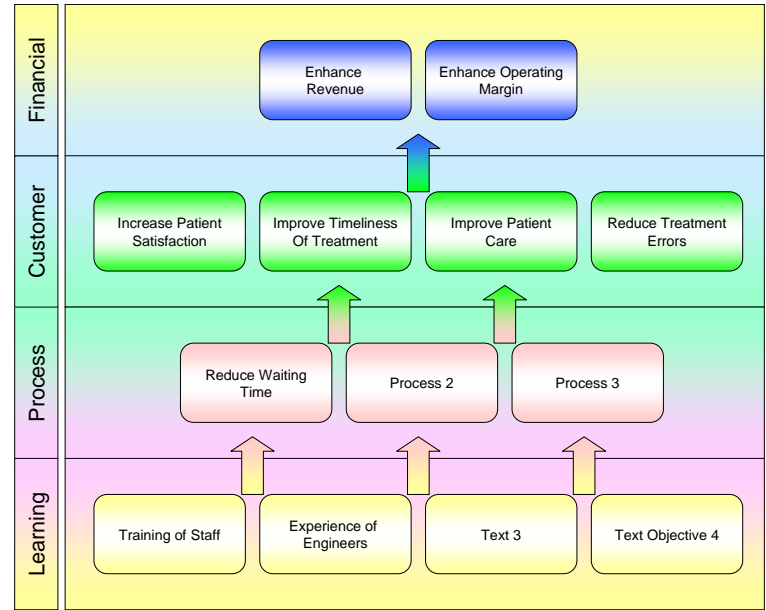




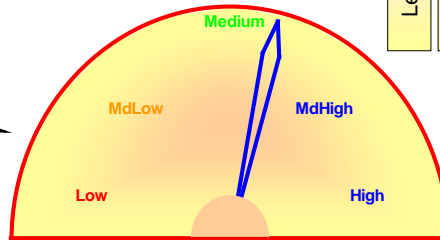
# Balanced Scorecard



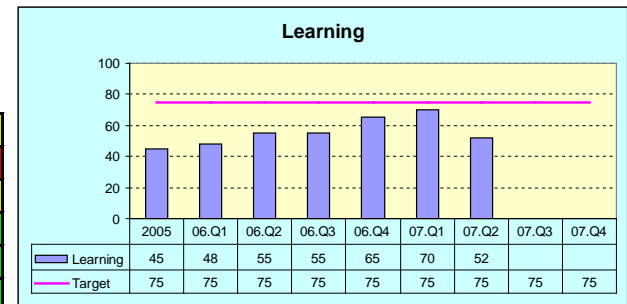
- Organizational Performance
  - Financial
  - Customer Satisfaction
  - Internal Processes
  - Growth and Learning



All tools supported by iCT-M® software

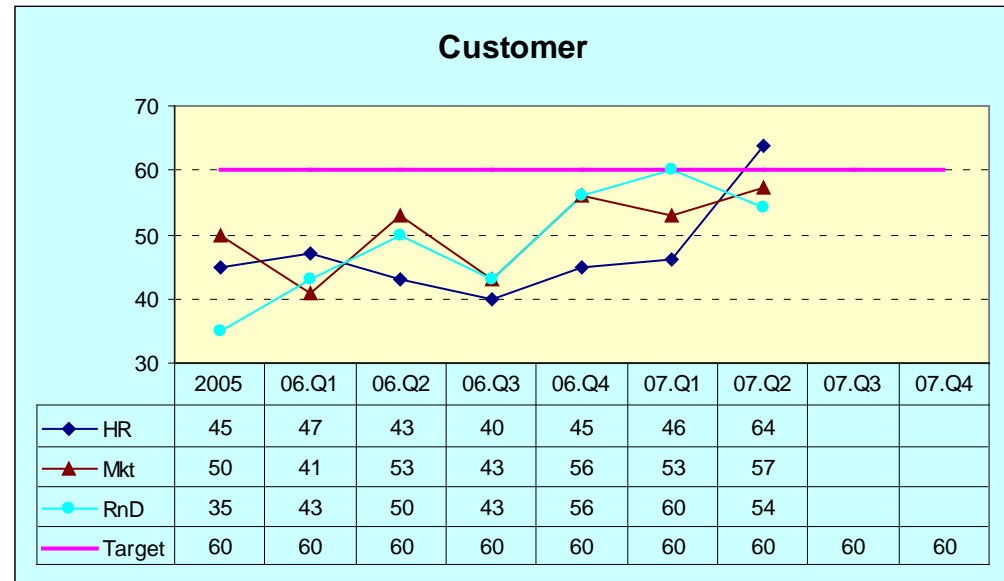
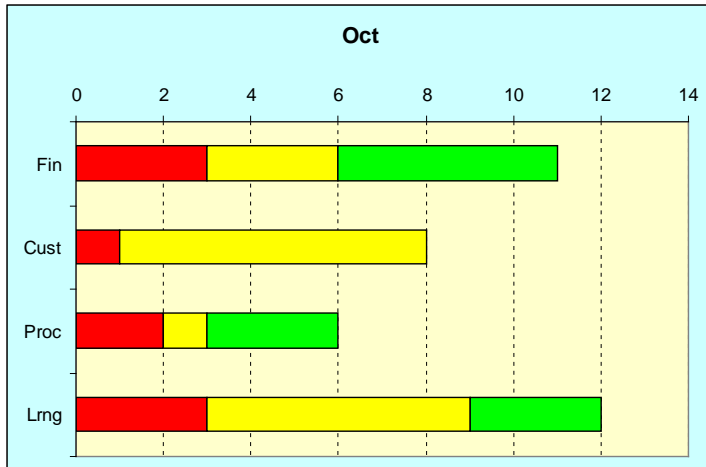
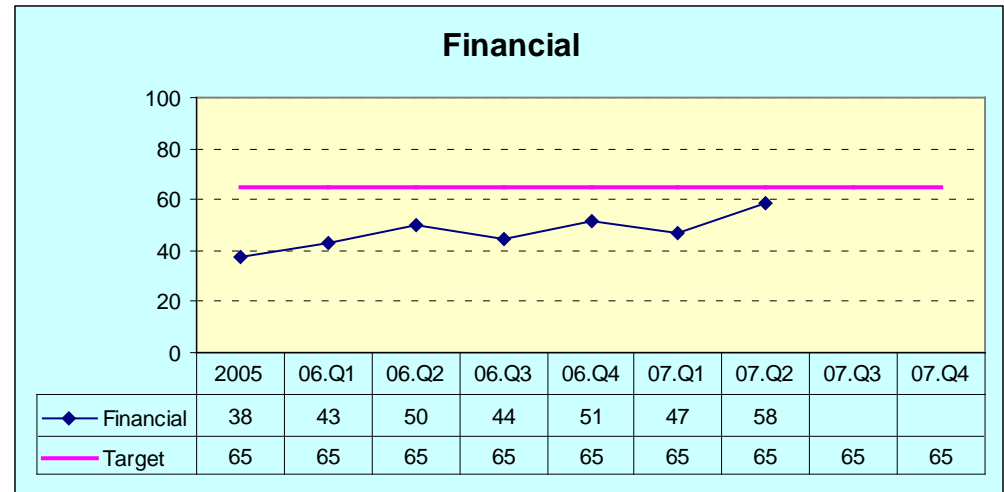
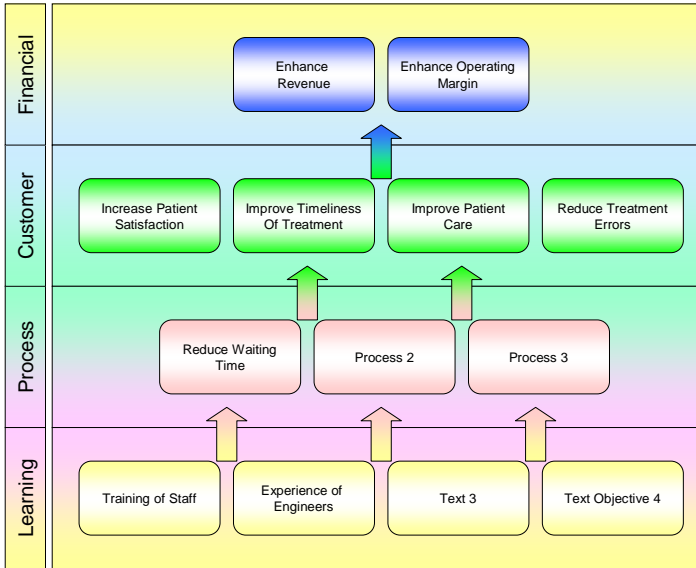


No.	Learning	Objective Description	Target Best	Measure 2007.Q2
1	Price of Product	Must be value provider	2.5	53
2	Price of Delivery	Must be cheapest	1	25
3	Kg per Ringgit	Value on great meat	100	55
4	Timely Delivery	Deliver within 30 minutes	30	50
5	Driver presentable	Smart dress, tie and shoes	5	75
All	Overall Learning Index			52





# Balanced Scorecard

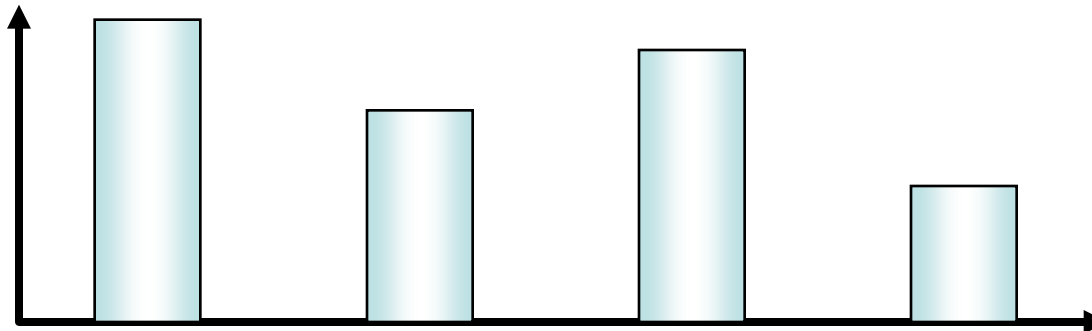
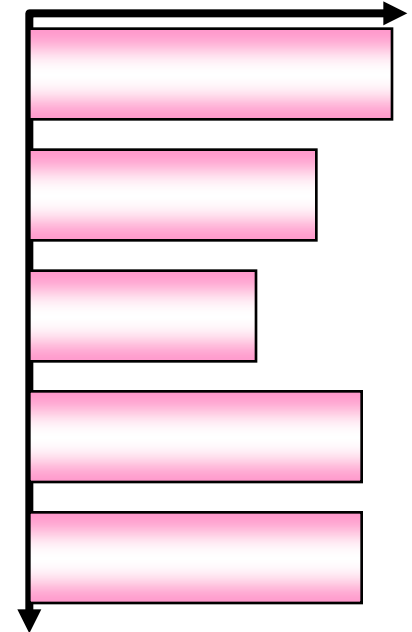


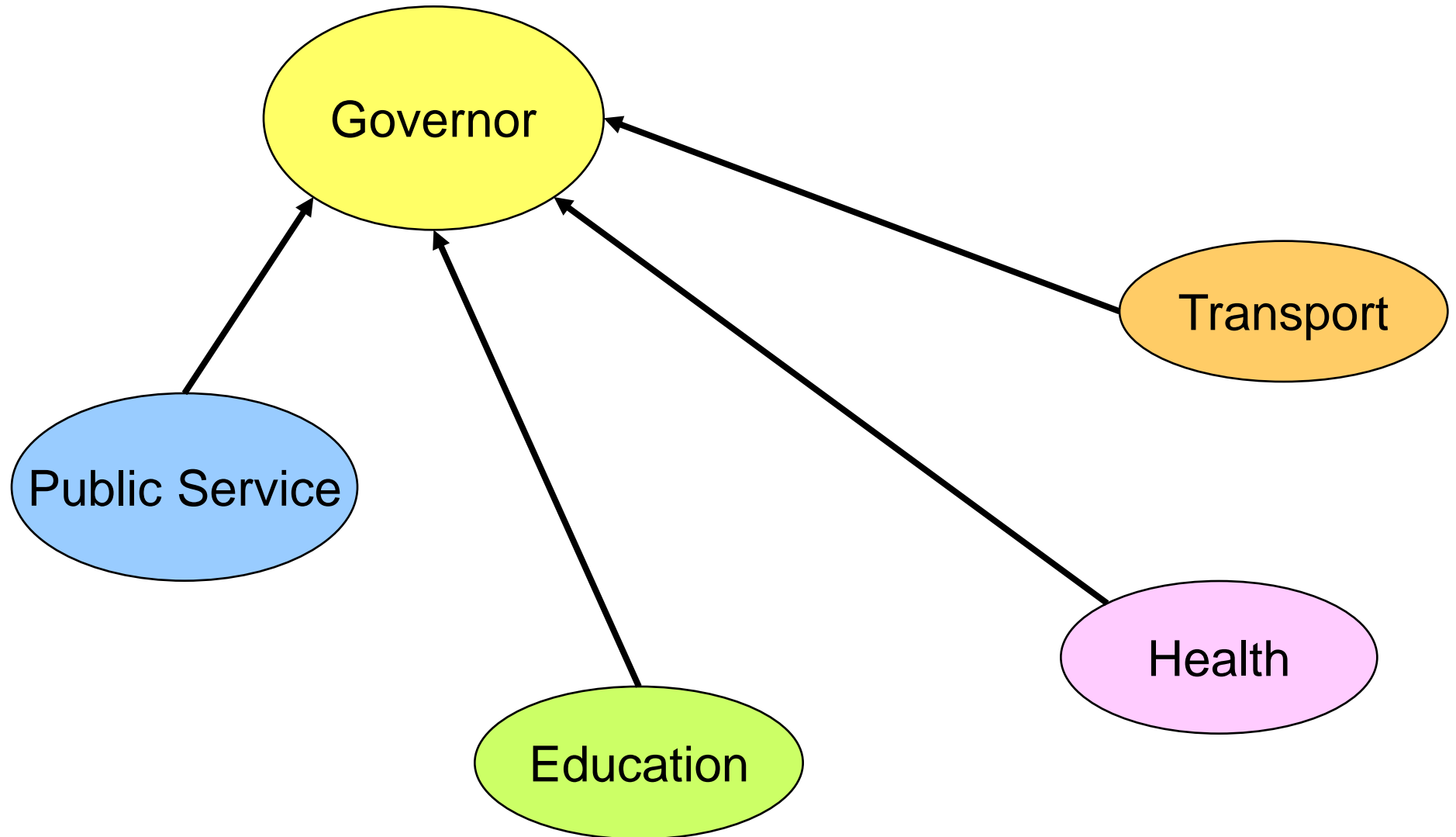


# Advanced Analysis



	Finance	Customer	Process	Learning
Education				
Health				
Transport				
Public Servic				
Economy				







# Perspectives and Metrics



	Objectives	Properties			Target		Observation			Measure		Result	
		Weight	Tg. Type	Units	Worst	Best	What To Measure	Lower	Upper	Value	Score		
<b>1 Financial</b>													
1	Price of Product	Must be value provider	1	▼	RM	20.00	10.00	Measure price	40.00	80.00	10.00	100.00	Green
2	Kg per Ringgit	Value on great meat	1	▲	Kg	20.00	60.00	Weight per Ringgit	25.00	75.00	40.00	50.00	Yellow
3	Well packed	Moulded trays	1	▲	-	5.00	25.00	Food arrangement	30.00	70.00	8.00	15.00	Orange
4	Mayonaise	Just right taste	1	✕	Gm	10.00	100.00	Amount of mayonaise	40.00	90.00	10.00	0.00	Orange
Cumulative											41.25		
<b>2 Learning</b>													
1	Operator Training	Skilled staff	1	▲	Hrs	5.00	10.00	Training hours	15.00	50.00	12.00	140.00	Green
2	Service orientation	Know the importance of customer satisfaction	1	▲	-	10.00	50.00	Graded test	20.00	60.00	18.00	20.00	Yellow
3	Attain minimum hours	Must meet minimum hours of training	1	✕	%	5.00	10.00	Training hours	35.00	75.00	55.00	0.00	Orange
Cumulative											53.33		





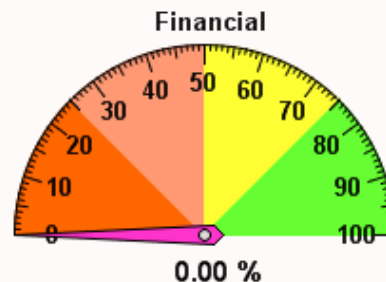
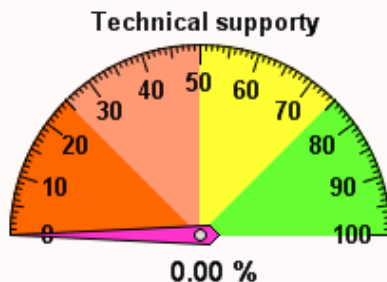
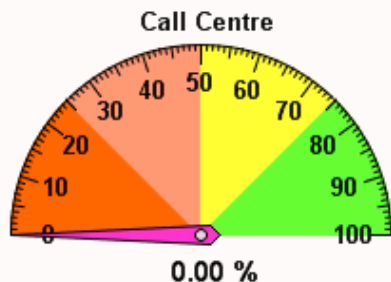
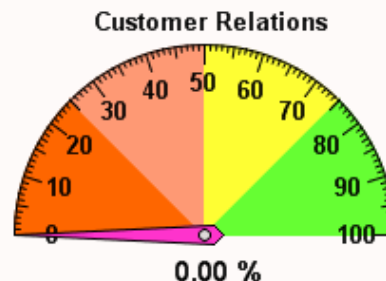
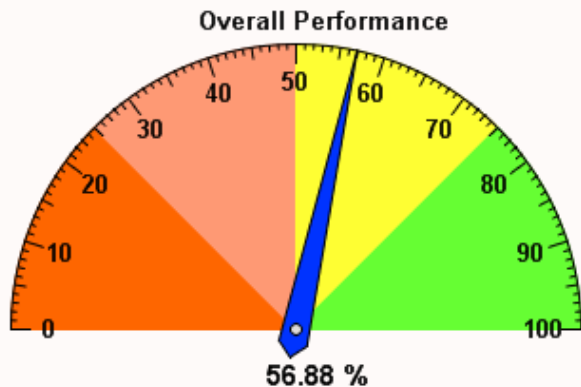
# Perspective Score Dials



## Perspective Score Dials

Time Periods :  Perspectives :

Time Frame : 01-Jan-2008 To 31-Jan-2008





# Perspective Score Gaps



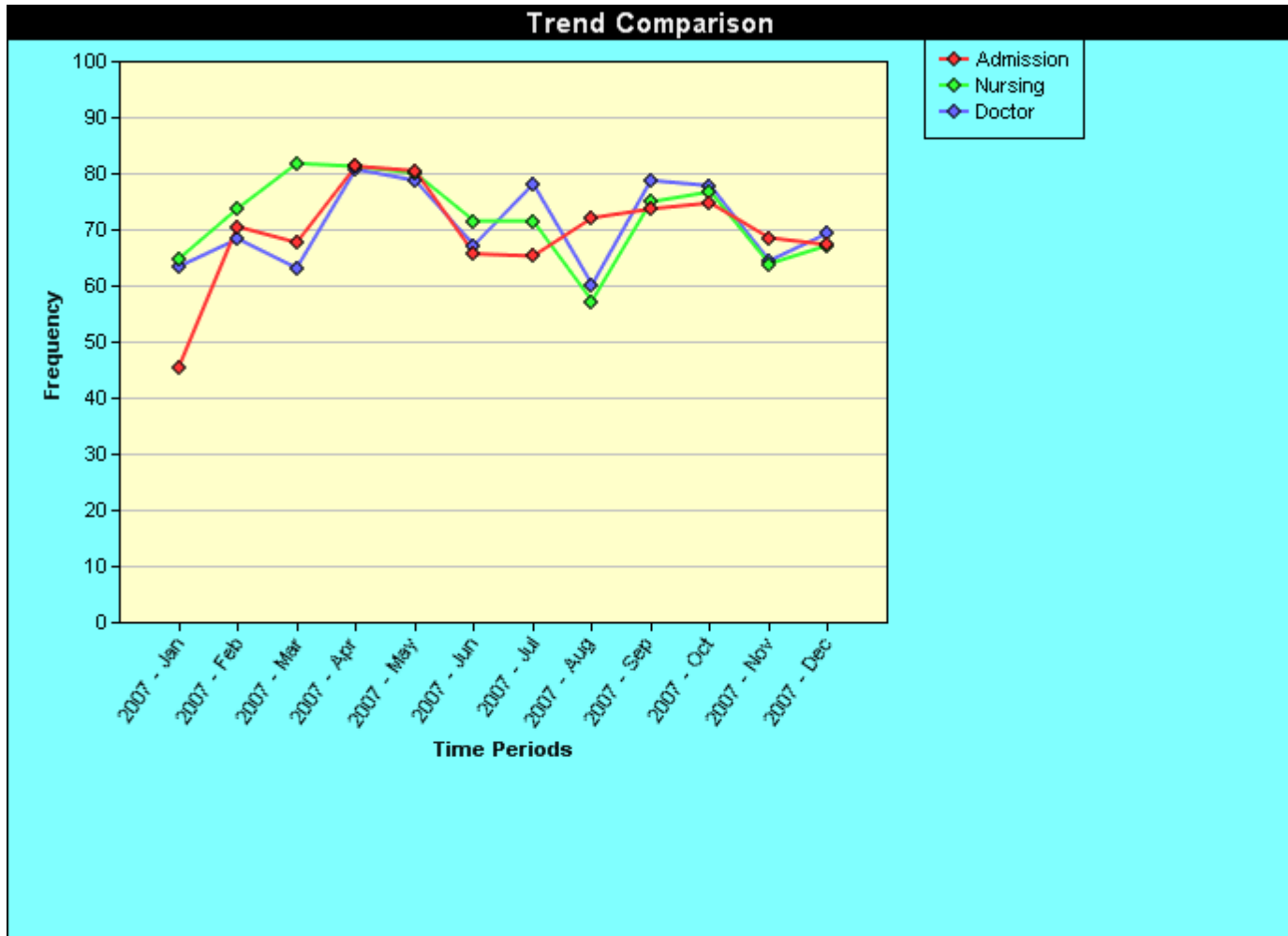
## Perspective Score Gaps

Time Periods : 2008 Jan Perspectives : Financial

Time Frame : 01-Jan-2008 To 31-Jan-2008

		Graphs
<b>1</b>	<b>Human Resources</b>	41.25
1	Price of Product	100
2	Kg per Ringgit	50
3	Well packed	15
4	Mayonaise	0
<b>2</b>	<b>Marketing</b>	26.111
1	Price of Product	0
2	Kg per Ringgit	26.111
3	Well packed	0
4	Mayonaise	0
<b>3</b>	<b>Research &amp; Development</b>	72.5
1	Price of Product	70
2	Kg per Ringgit	0
3	Well packed	75
4	Mayonaise	0

# Performance Trend





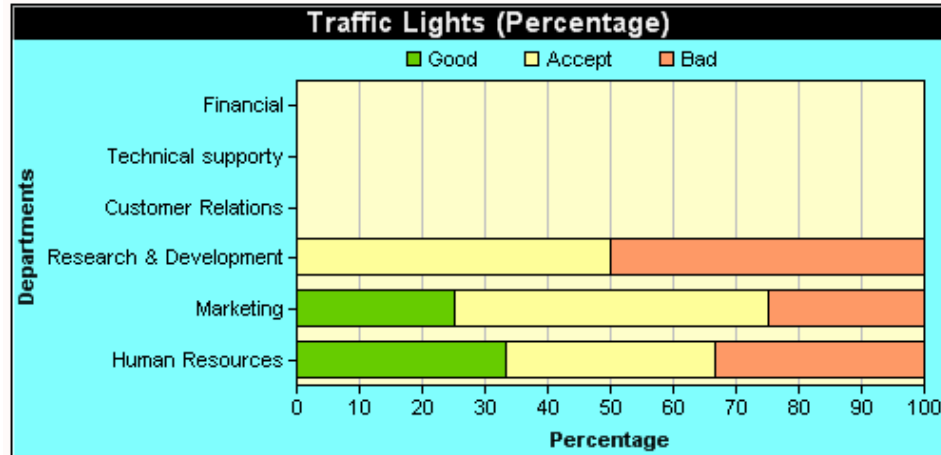
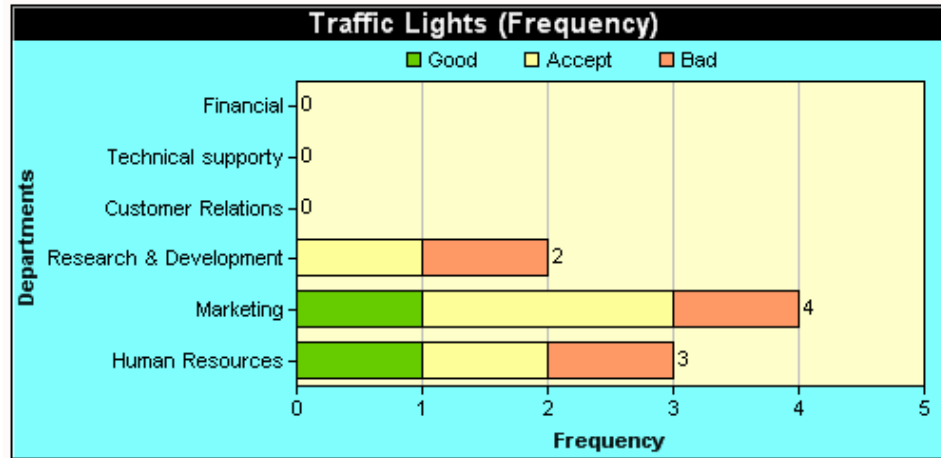
# Perspective Traffic Lights



## Perspective Traffic Lights

Time Periods :  Perspectives :

Time Frame : 01-Jan-2008 To 31-Jan-2008





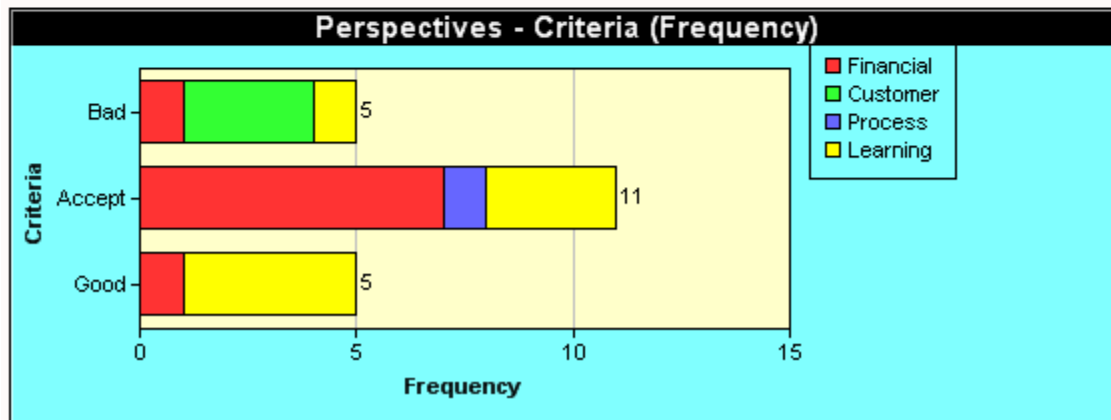
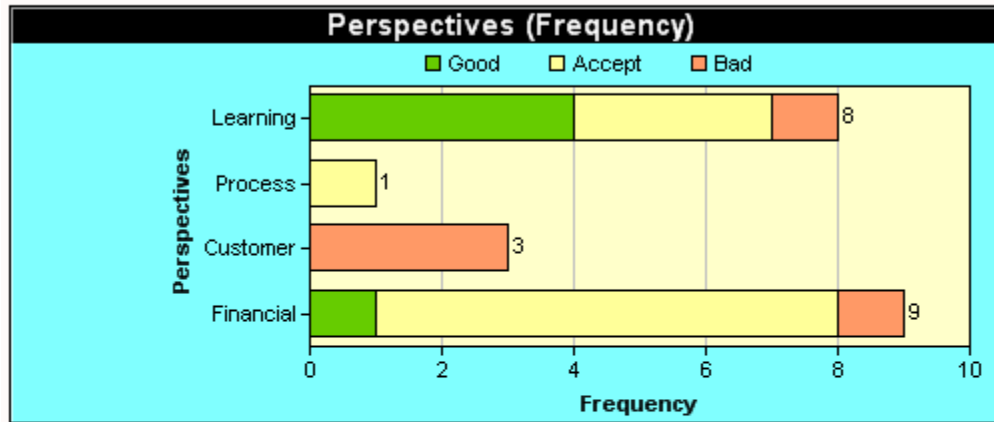
# Perspective Frequency Charts



## Perspective Frequency Charts

Time Periods : 2007 Dec

Time Frame : 01-Dec-2007 To 31-Dec-2007





# Department Score Dials

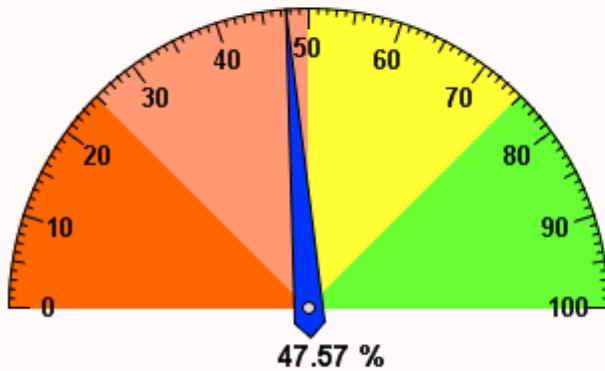


## Department Score Dials

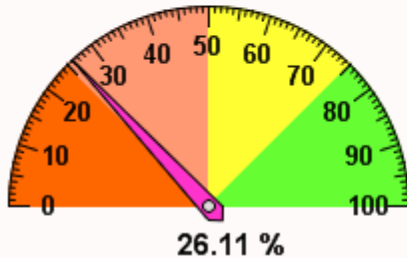
Time Periods :  Departments :  Total Records :

Time Frame : 01-Jan-2008 To 31-Jan-2008

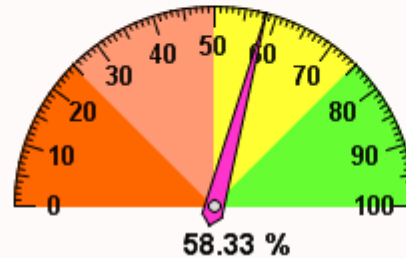
Overall Performance



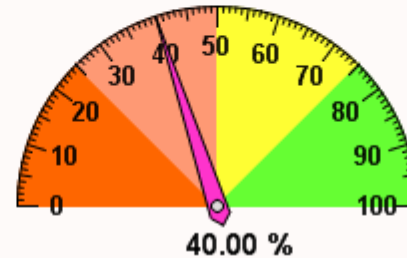
Financial



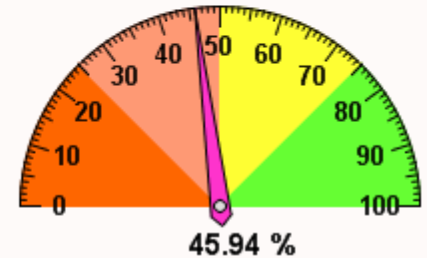
Customer



Process



Learning





# Department Score Graphs



## Department Score Graphs

Time Periods :  Departments :  Total Records :

Time Frame : 01-Jan-2008 To 31-Jan-2008

Graphs	
<b>1 Financial</b>	26.11
1 Kg per Ringgit	26.11
<b>2 Customer</b>	58.33
1 Timely Delivery	68.75
2 Driver presentable	56.25
3 Customer care	50
<b>3 Process</b>	40
1 Many choices	40
<b>4 Learning</b>	45.94
1 Service orientation	16.88
2 Attain minimum hours	75
<b>Overall Performance</b>	47.57



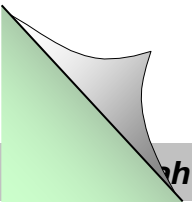
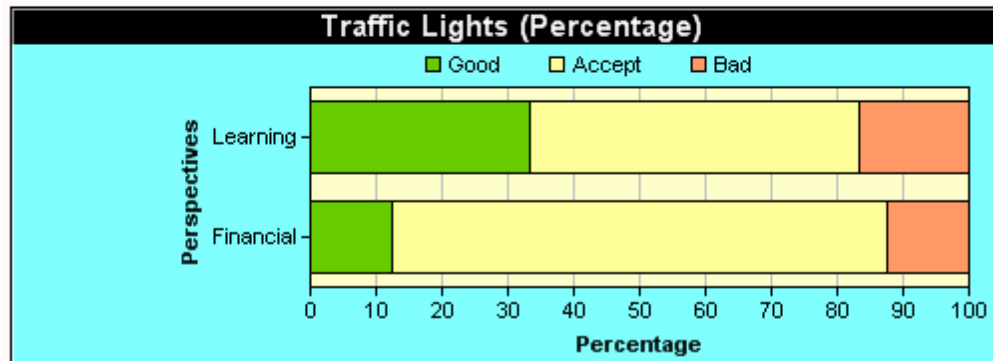
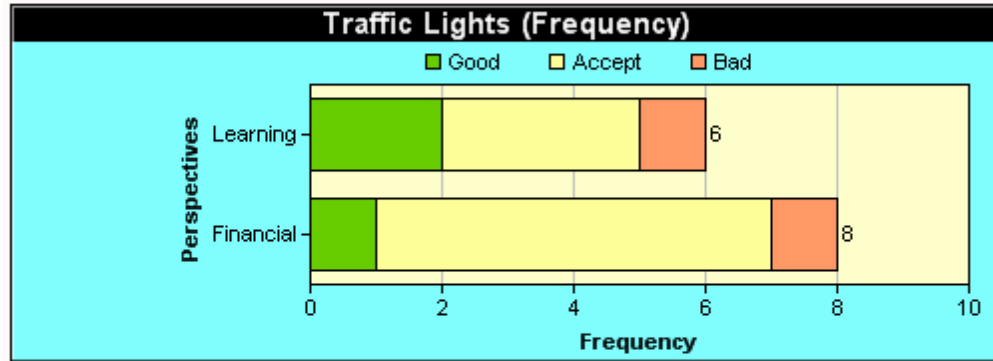
# Department Traffic Lights



## Department Traffic Lights

Time Periods : 2007 Dec Departments : Human Resources

Time Frame : 01-Dec-2007 To 31-Dec-2007



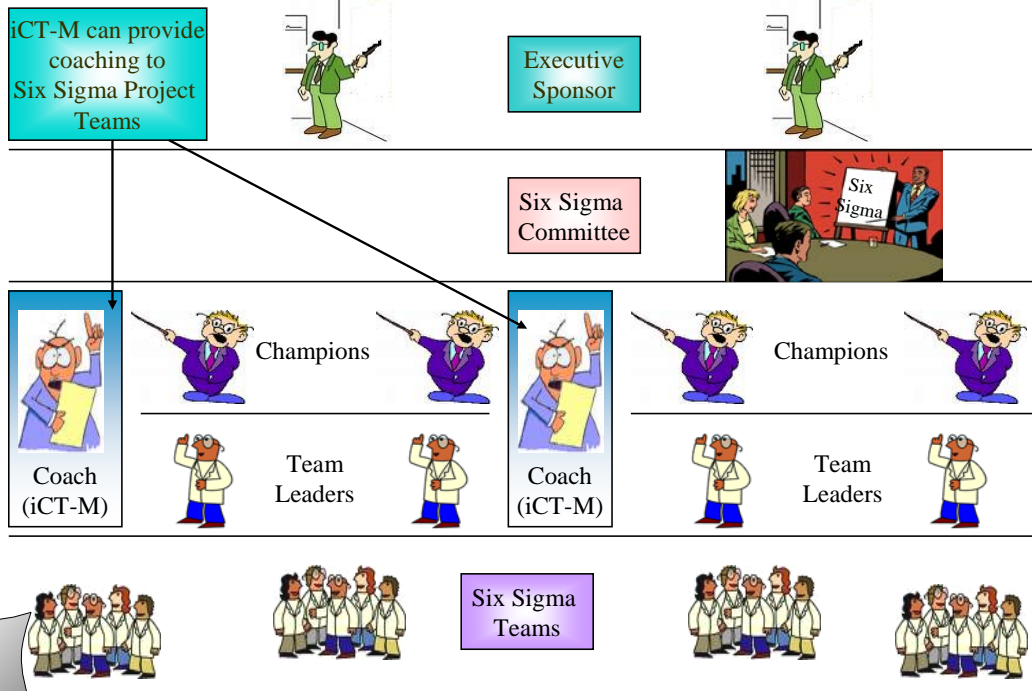




# Six Sigma Implementation



- Define important business case
- Measure current performances
- Analyze root causes and gaps
- Improve performances
- Control the gains



All tools are supported by iCT-M® software

Easy to report

Print to pdf

Save to thumb drive

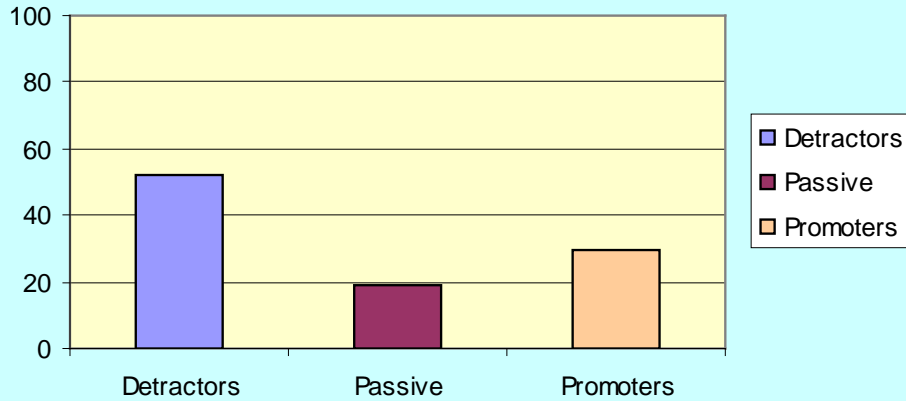
Send via email



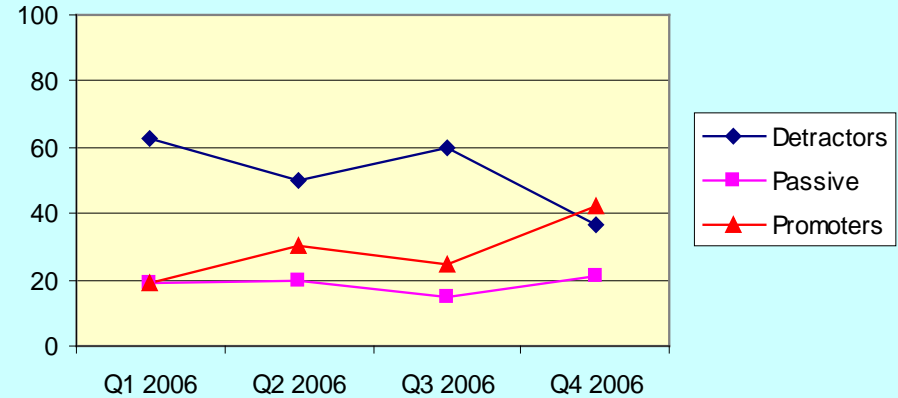
# Net Promoter Score (NPS)



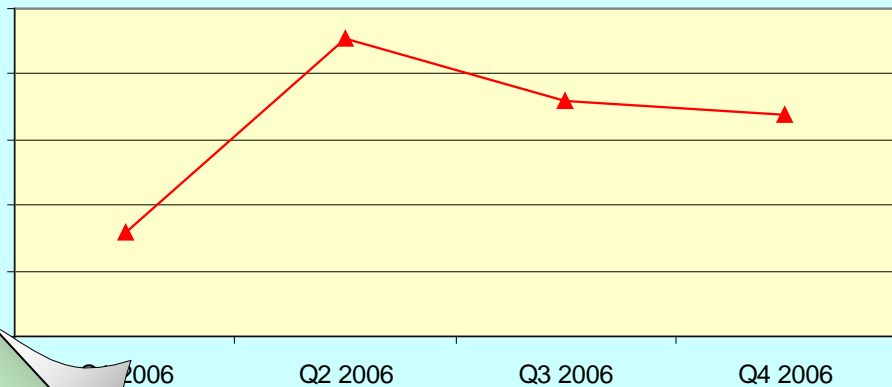
Q1 - Q4



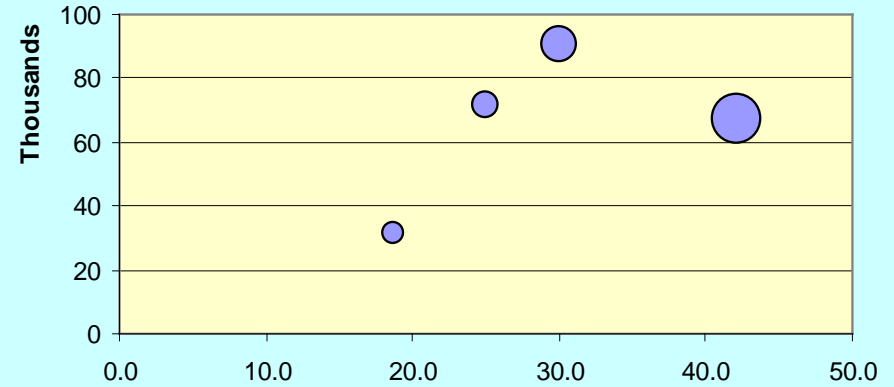
Q1 - Q4



Profits



NPS vs Profits





# Advanced Product Quality Planning



## APQP Focus Element Rating Checklist Status Report

[Edit](#)

<b>Date :</b>					
<b>Review No. :</b>					
<b>Diamond Point :</b>					
<b>Supplier</b>					<b>Program</b>
<b>Location</b>					<b>Model Year</b>
<b>Supplier Code</b>					<b>Lead Part No.</b>
<b>Risk Assessment</b>	New	Site	Technology	Process	<b>Part Name</b>
<b>Other Risks</b>					<b>Eng. Level</b>
					<b>User Plant(s)</b>

No.	Team Members	Company/Title	Phone/Fax
1			
1			

No.	Build Level	Material Required Date	Quantity	Concurred		P.I.S.T.%	P.I.P.C.%
				No. SC's	No. CC's		
1							

No	APQP Elements	GYR Status	Focus Element Rating	Program Need Date	Supplier Timing Date	Closed Date	Resp. Engineer Initials	Remarks or Assistance Required
1.	Sourcing Decision							
2.	Customer Input Requirements							
3.	Design FMEA		0					
4.	Design Review(s)							
5.	Design Verification Plan		0					
6.	Subcontractor APQP Status							
7.	Facilities, Tools and Gages							
8.	Prototype Build Control Plan		0					
9.	Prototype Builds							
10.	Drawings and Specifications							
11.	Team Feasibility Commitment							
12.	Manufacturing Process Flow Chart		0					
13.	Process FMEA		0					
14.	Measurement Systems Evaluation							
15.	Pre-Launch Control Plan		0					
16.	Operator Process Instructions		0					
17.	Packaging Specifications							
18.	Production Trial Run							
19.	Production Control Plan		0					
20.	Preliminary Process Capability Study							
21.	Production Validation Testing							
22.	Production Part Approval (PSW)							
23.	PSW Part Delivery at MRD							

## Checklist

- Consolidates
- Calculates



# Product Part Approval Process (PPAP)



No.	Requirement	Level 1	Level 2	Level 3	Level 4	Level 5
1	Design Records Of Saleable Product	S	S	*	*	*
	- for Proprietary components/details	S	*	*	S	S
	- for all other components/details	S	*	*	R	S
2	Engineering Change Documents, if any	R	*	S	S	S
3	Customer Engineering approval, if required	S	S	S	R	*
4	Design FMEA	R				
5	Process Flow Diagrams	R	R	R	R	S
6	Process FMEA	R	R	R	R	S
7	Dimensional Results	S	S	S	S	S
8	Material, Performance Test Results	R	S	S	S	*
9	Initial Process Study	R	R	S	S	S
10	Measurement System Analysis Studies	R	R	R	S	S
11	Qualified Laboratory Documentation					S
12	Control Plan	R	R	R	R	R
13	Part Submission Warrant (PSW)	S	S	S	S	S
14	Appearance Approval Report, (AAR) if applicable	S	S	S	S	*
15	Bulk Material Requirements Checklist (for bulk material PPAP only)	R	R	R	S	S
16	Sample Product	S	S	S	S	S
17	Master Sample	S	S	S	S	S
18	Checking Aids	R	R	R	R	R
19	Records Of Compliance With Customer-Specific Requirements	S	S	S	S	S

- S = The supplier shall submit to designated customer product approval activity and retain a copy of records or documentation items at appropriate locations, including manufacturing.
- R = The supplier shall retain at appropriate locations, including manufacturing, and make **readily** available to the customer representative upon request.
- \* = The supplier shall retain at appropriate locations, and submit to customer upon request.