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Title Page

A Case Study of Six Sigma to improve Blood Bag Wastage in Ampang Hospital

By

Diyanna Hassan

Thesis submitted in partial fulfillment for the degree of

Master of Science

By the
Women and Child Care
Women and Child Health Centre
University Putra
Malaysia

In collaboration with
Ampang Putri Medical Centre
Ampang Hilir
Selangor
Malaysia

Submitted on
02/28/2013

Abstract

Increased diversity representations in higher education create both opportunities and challenges for diversity management. challenge has been to achieve equal access and opportunity for diverse groups because of differences in standardized mea GPA) used in admissions decisions and in personnel selection. This study examined race-based differences in academic m college GPA to better understand the influence of these factors on diversity management in higher education. The implicati future research.

Keywords: diversity, higher education, race, adverse impact

Approval Sheet

This dissertation entitled

A Case Study of Six Sigma to improve Blood Bag Wastage in Ampang Hospital

was prepared By

Diyanna Hassan

and submitted as partial fulfillment for the requirements of

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with the collaboration of

Ampang Putri Medical Centre
Ampang Hilir
Selangor
Malaysia

Approved by
Prof. Goh Sing Weng
Department of Herbal Medicines
Medical Sciences
University of Malaya
Malaysia

Permissions

Women and Child Health Centre
University Putra
Dated : 01/24/2013

It is here by certified that

Diyanna Hassan (123456)

has completed the dissertation entitled

A Case Study of Six Sigma to improve Blood Bag Wastage in Ampang Hospi

under the supervision of

Rohana Ismail
Women and Child Care,
Women and Child Health Centre

and co-supervisor

Goh Chwin Chee
Women and Child Care,
Women and Child Health Centre

I hereby give permission to my supervisors to write and prepare manuscript of these research findings for publishing in any form, if I did not prepare it within six (6) months time from this date provided that my name is included as one of the author for this article. Arrangement of the name depends on my supervisors.

Signature _____

Date	**01/24/2013**
Name	**Diyanna Hassan**
Registration No.	**123456**

Declaration

This thesis contains no material that has been accepted for the award of any othe degree or diploma in any educational institution. And, to the best of my knowledg and belief, it contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

Signature _____

Date	**01/24/2013**
Name	**Diyanna Hassan**
Registration No.	**123456**

Acknowledgement

I am forever grateful to Jane McKintosh for enabling all the research to evaluated in Polaroid. He has been a great source of strength during my program. Without his guidance, I could not have accomplished this thesis.

I am indebted to Allan Croughton for helping conduct the research in a suitable manner. He has been most helpful in all the detailed analytical help. With His direction, I could not have sailed through the tough times.

Dedication

This work is dedicated to my mother Mariamme McCane.

Proof of Need

Edit

Proof of Need

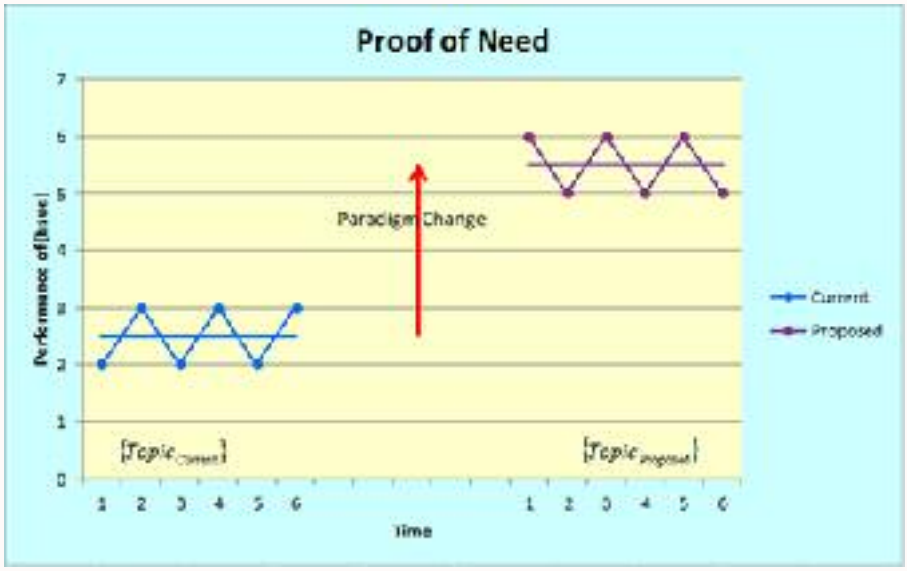
1. Topics

1.1 Design the circuit

One of the first questions asked about a thesis is: Why is this Research necessary? This section of the thesis puts forward your argument why your thesis is necessary. It is related to the current sta One of the first questions asked about a thesis is: Why is this Research necessary? This section of the thesis puts forward your argument why your thesis is necessary. It is related to the current staThermal control of electronic components has been one of the primary areas of application of advanced heat transfer techniques. One significant area where thermal management has played a crucial rolThermal control of electronic components has been one of the primary areas of application of advanced heat transfer techniques. One significant area where thermal management has played a crucial rol

1.2 Causes of Waste

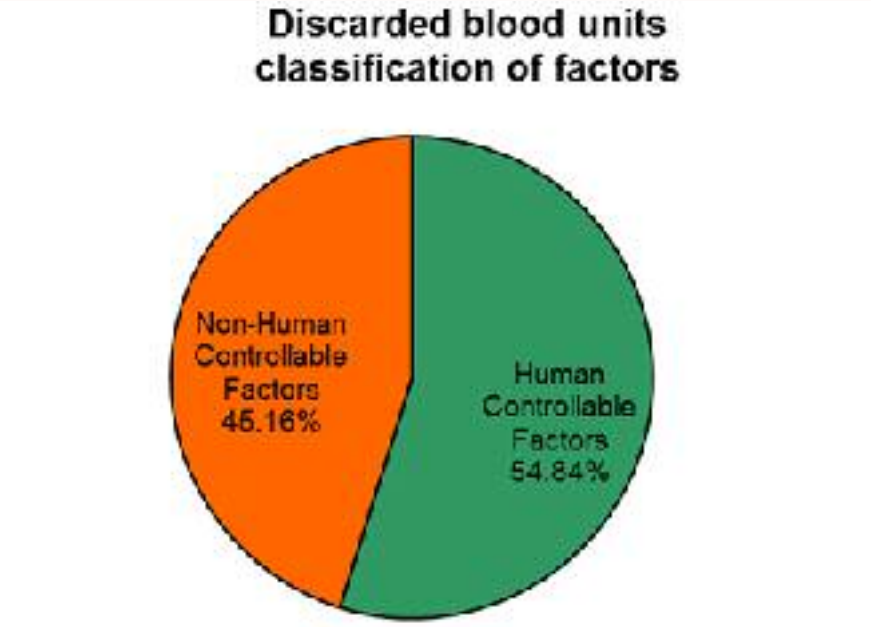
Since blood units are precious, it is understandable that such wastage should not be tolerated. And the reader is likely to agree that some action may be taken to reduce this Blood Units loss.



The trend in a hospital processing Blood Units has high wastage. Blood is donated by people and is a precious commodity. It should not be wasted purely on controllable aspects such as shelf life, brok

1.3 Six Sigma Implementation

Much of the Discarded blood units classification of factors can be traced to Human Controllable Factors. This accounts for over 54% so it is an important area to be addressed.



2. Issue

2.1 Blood is precious

The table below shows the trend for the last few years.

Item	Brand description	Unit Costs USD	2005	2006	2007
Empty Bags	B.B Quadruple, trap WB	2.76			
	B.B Quadruple, trap WB	16.0			
Labels	ISBT-22	0.04			
	ISBT-11	0.36			
	ISBT 44	0.38			
Tube	Tube glass	7.5			
	Clot tube	7.4			
Employee	302		13.00USD	-	-
	512		-	12.00USD	-
	540		-	-	15.75 USD
Electricity			0.6	0.70	0.79
Total costs of bag for the years			63.64 USD	63.12 USD	61.3 USD

2.2 Wastage must be reduced

Once the reader is agreeable to the idea that some action may be taken to reduce blood bag loss, the researcOnce the reader is agreeable to the idea that some action may be taken to reduce blood bag l

3. Scope

3.1 Not to big

Once the reader is agreeable to the idea that some action may be taken to reduce blood bag loss, the researcher proposes a “methodology” by which this change can be made. The researcher might believe

3.2 Manageable

Once the reader is agreeable to the idea that some action may be taken to reduce blood bag loss, the researcher proposes a “methodology” by which this change can be made. The researcher might believe

Thesis Statement

While there are many methods for improvement, Six Sigma is the best way to reduce Blood Bag Wastage in Ampang Hospital

Explanation to the Problem Statement

“Essay mills”—companies that sell pre-written and/or custom works for students to purchase and turn in as their own work—have been an increasing problem for universities across the nation since the advent of the Internet. Some researchers believe that over 10% of papers turned in come from one of these services (or from similar plagiarism, like buying from friends).

In order to combat this, stronger analytical tools are needed to compare the student’s past body of work to the existing work being turned in. Professors, overworked as they can be, need also turn a sharper eye toward the work they’re given.

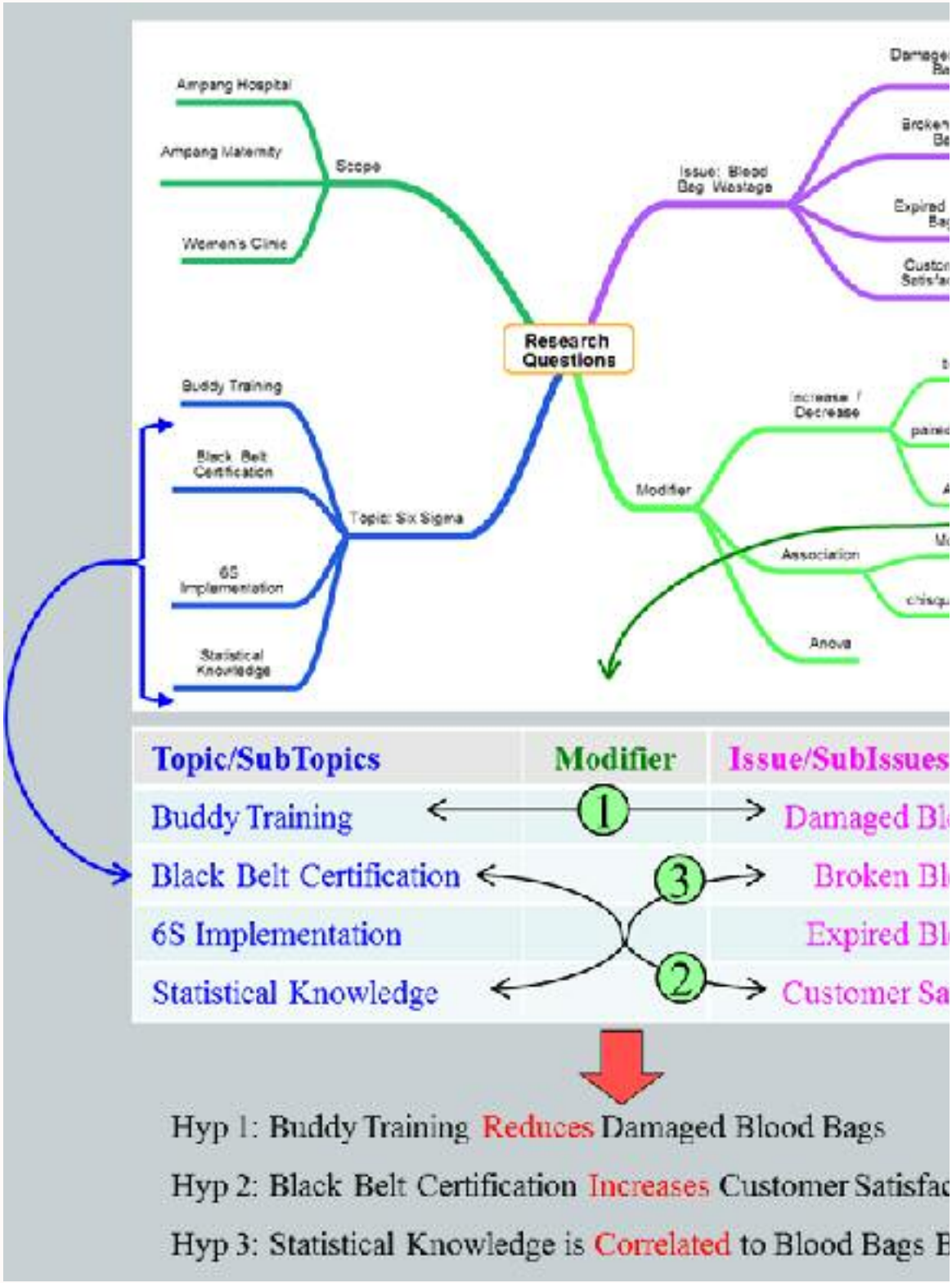
Students turning in work improperly labeled as their own are a serious problem to every school that wants to be taken seriously. We must take more steps in analyzing the work to mitigate the practice’s impact on education and society.

Mindmap

Text Editor

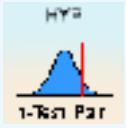
AsterWrite can help the student to create the Hypotheses and Research Question requires a brainstorming process together with a mind map. Possible Sub-Topics, Scopes are generated by the student. This can be individually or with the supervis

Once the Sub-items are formed, the student can pair Sub-Topics with the Sub-Issu Modifier. Modifiers are related to the statistical analysis relevant to hypothesis. It is the Sub-Scopes for the Sub-Research Question although this can be done as well below.

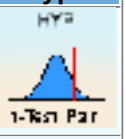
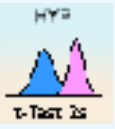
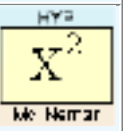
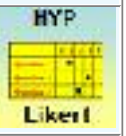
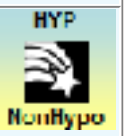


Once the Hypothesis is established, the Hypothesis can be reworded into a questi
Research Question or into a Research Aim. Each Hypothesis will have its own Re
Research Aim.

Research Questions

No.	Questions	Test Name	Test Type	Applet Added	Edit
1	**Is Statistical Knowledge associate to Broken Blood Bags in Blood Preservation** Topic: Gap; Issue: Gap; Scope: Gap; The research question rating: Original	**Assoc**		✔	
2	**Can Integrated Thermal Design be Optimization for Integrated Power Electronics Module in Computers** Topic: No Gap; Issue: No Gap; Scope: No Gap; The research question rating: Weak	**NonHyp**		✔	
3	**Does Black Belt Certification increases Customer Satisfaction Mobile Blood Unit** Topic: No Gap; Issue: No Gap; Scope: No Gap; The research question rating: Weak	**DiffMean**		✔	
4	**Can Statistical Knowledge reduce Broken Blood Bags in Blood Preservation** Topic: Gap; Issue: Gap; Scope: Gap; The research question rating: Original	**Paired**		✔	
5	**Can Client Perspective equal Customer Satisfaction Blood Preservation** Topic: No Gap; Issue: No Gap; Scope: Gap; The research question rating: Moderate	**Likert**		✔	

Research Hypotheses

No.	Hypotheses	Test Name	Test Type
1	**Statistical Knowledge reduce Broken Blood Bags** Ho : The mean value of Broken Blood Bags-Aft greater than or equal to Broken Blood Bags-Bfr Ha : The mean value of Broken Blood Bags-Aft less than Broken Blood Bags-Bfr	**Paired**	
2	**Black Belt Certification increases Customer Satisfaction** Ho : The mean difference of Customer Satisfaction-Aft less than or equal to Customer Satisfaction-Bfr Ha : The mean difference of Customer Satisfaction-Aft greater than Customer Satisfaction-Bfr	**DiffMean**	
3	**Statistical Knowledge associate Broken Blood Bags** Ho : Statistical Knowledge is independent of Broken Blood Bags Ha : Statistical Knowledge is not independent of Broken Blood Bags	**Assoc**	
4	**Client Perspective equal Customer Satisfaction** Ho : Customer Satisfaction-Aft equal to {Constant} Ha : Customer Satisfaction-Aft not equal to {Constant}	**Likert**	
5	**Integrated Thermal Design Optimization Integrated Power Electronics Module** Ho : Optimization Not successful Ha : Optimization Is successful	**NonHyp**	
6	**SELECT TOPIC SELECT MODIFIER SELECT ISSUE**		

Research Aims

No.	Aims to be Achieved
1	To demonstrate that Statistical Knowledge can reduce Broken Blood Bags in Blood Preservation
2	To demonstrate that Black Belt Certification increases Customer Satisfaction in Mobile Blood Unit
3	To show that Statistical Knowledge is associate to Blood Preservation in Broken Blood Bags
4	To conduct a survey of Client Perspective equal Customer Satisfaction Blood Preservation
5	To demonstrate Integrated Thermal Design Optimization of Integrated Power Electronics Module Computers
6	SELECT TOPIC SELECT MODIFIER SELECT ISSUE SELECT SCOPE

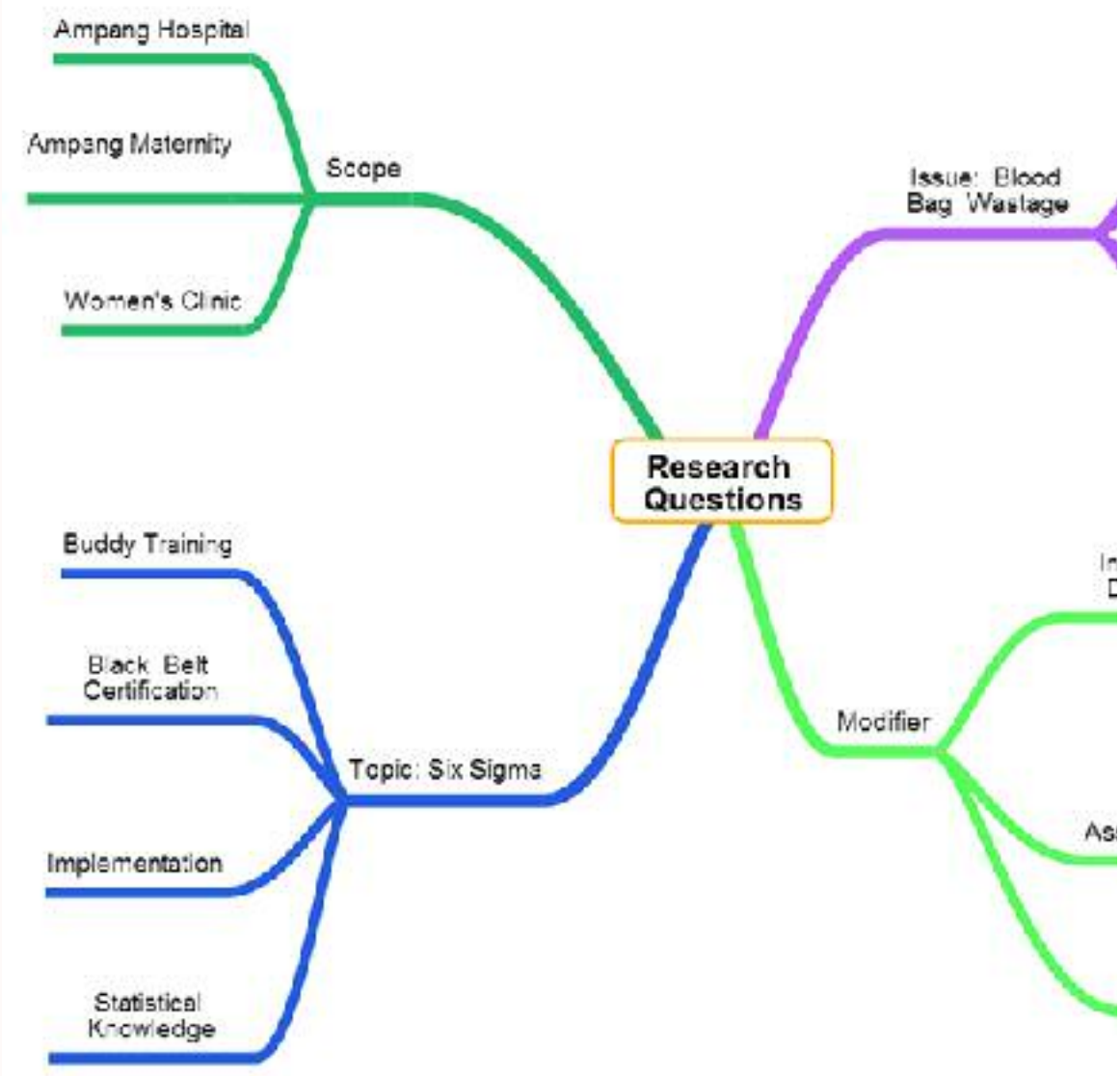
Simple Gantt Chart

		Time In Months																			
No.	Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Thesis Start Date																					
2	Bibliographic Searches																					
3	Draft preparation																					
4	Submission of proposal																					
5	Research Design																					
6	Formulation of Strategies																					
7	Pre-Test																					
8	Data collection																					
9	Data Analysis																					
10	Writing up of thesis																					
11	Revision and editing																					
12	Submission of thesis																					
13	Thesis defense																					

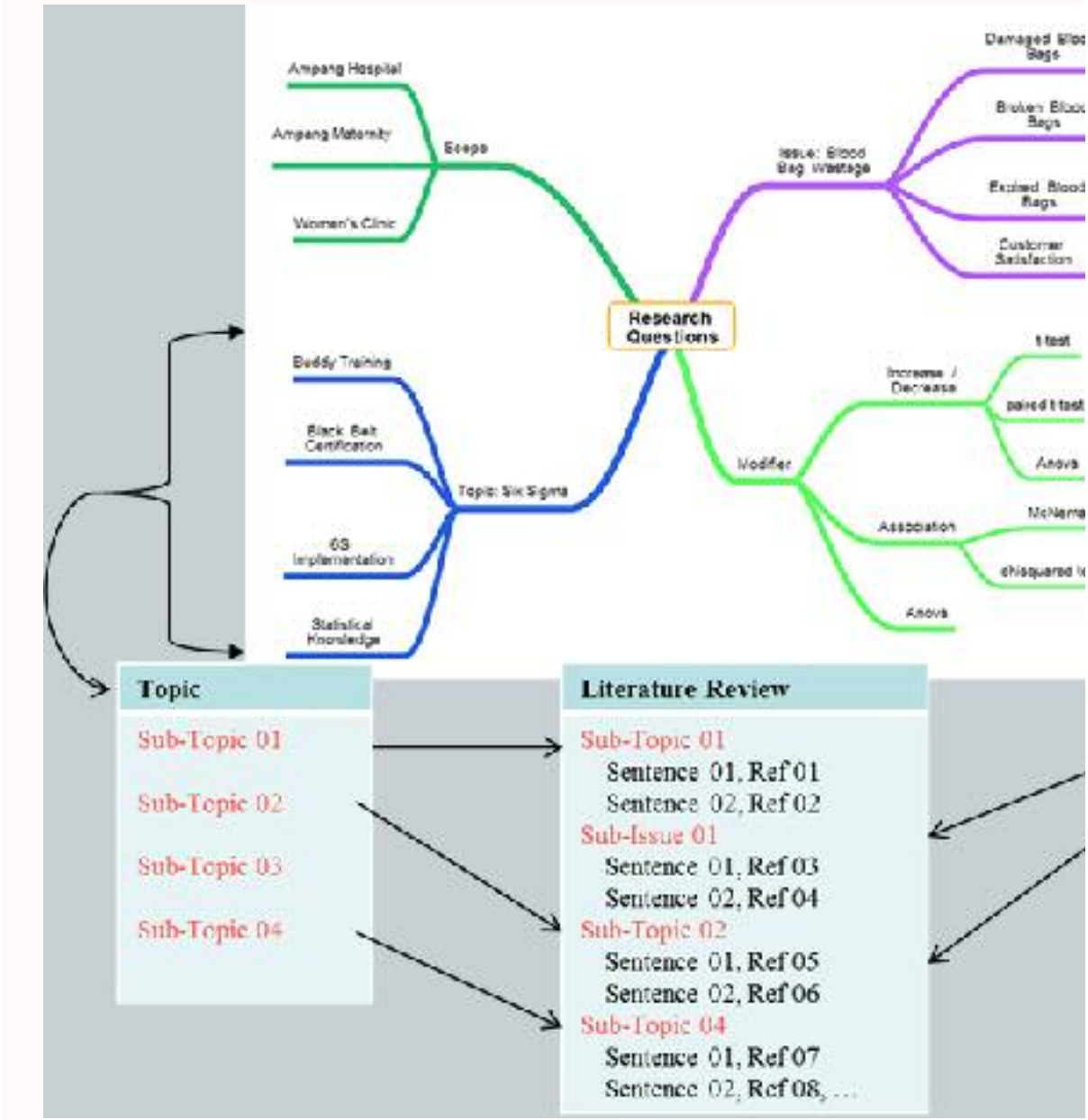
Mindmap

Text Editor

The Literature Review is approached from a mind map. In fact, the mind map nee
already created in the Research Hypothesis.



Although the student can create any section under the Literature Review, AsterWr
prompting Sub-Items already pertinent to the thesis. The student should then inco
Literature Review that can search out the literature for content that is contemporar


Ampang Hospital
Ampang Maternity
Women's Clinic
Scope
Damaged Blood Bags
Broken Blood Bags
Expired Blood Bags
Customer Satisfaction
Issue: Blood Bag Wastage
Research Questions
Buddy Training
Black Belt Certification
6S Implementation
Statistical Knowledge
Topic: Six Sigma
t test
Increase / Decrease
paired t test
Anova
Modifier
Association
McNema
chisquared
Anova
Topic
Sub-Topic 01
Sub-Topic 02
Sub-Topic 03
Sub-Topic 04
Literature Review
Sub-Topic 01
Sentence 01, Ref 01
Sentence 02, Ref 02
Sub-Issue 01
Sentence 01, Ref 03
Sentence 02, Ref 04
Sub-Topic 02
Sentence 01, Ref 05
Sentence 02, Ref 06
Sub-Topic 04
Sentence 01, Ref 07
Sentence 02, Ref 08, ...

Outline

Edit

1. Six Sigma
   - 1.1 Buddy Training
   - 1.2 Black Belt Certification
   - 1.3 Six Sigma Implementation
   - 1.4 Statistical Knowledge
2. Black Belt Certification
   - 2.1 Customer Satisfaction
   - 2.2 Expired Blood Bags
   - 2.3 Broken Blood Bags
   - 2.4 Damaged Blood Bags
3. Blood Bad Wastage
   - 3.1 Blood Storage
   - 3.2 Blood Department
   - 3.3 Blood Preservation
   - 3.4 Mobile Blood Unit

Literature Review

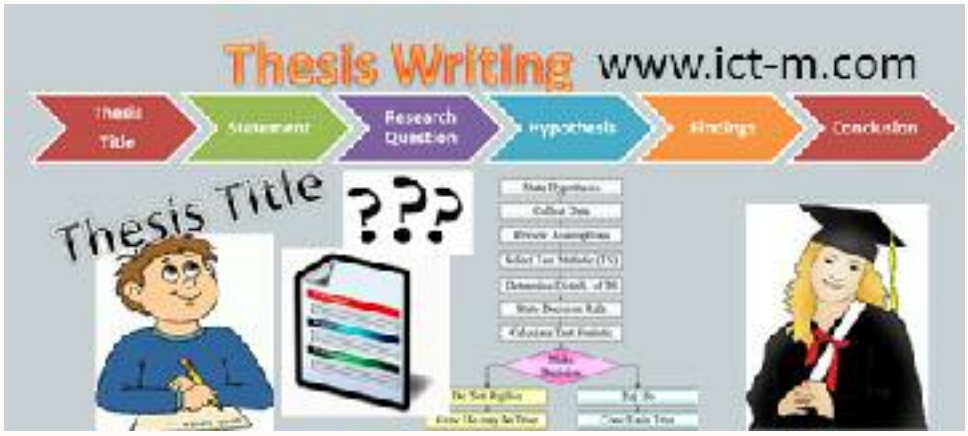
1. Six Sigma

1.1 Buddy Training

It is important to note that there were a few criticisms, especially from Buttle (1996), citing that the 5 dimensions of service quality by PZB are not universal, and the model fails to draw on established.Rowkins, J. , (2010) (Rowkins, J. , 2010 In a previous paper we provided guidelines for scholars on optimizing research articles for academic search engines such as Google Scholar. Feedback in the academic

1.2 Black Belt Certification

Text can be added here easily Khan, J. F., (2005)(Rowkins, J. , 2010 UMNO is now at its lowest ebb - ever. While its inner core is decaying and rotting because none of its leaders are d It is important to note that there were a few criticisms, especially from Buttle (1996), citing that the 5 dimensions of service quality by PZB are not universal, sss and the model fails to draw on establ



1.3 Six Sigma Implementation

Service quality as defined in the introduction part has become the pinnacle of importance in companies. yes it works. Service quality as defined in the introduction part has become the pinnacle of importance in companies. yes it works. Service quality as defined in the introduction part has become the pinnacle of importance in companies. yes it works. As service quality cannot be easily measured and quantified, the true value of how it is perceived varies from organisation to organisation.

1.4 Statistical Knowledge

Other disbelievers of the PZB SERVQUAL framework are Luis & Joana (2005) who claimed similarly to the SERVQUAL scale, the Service Personal Values (SERPVAL) with its 3 dimensions of service value to pe

2. Black Belt Certification

2.1 Customer Satisfaction

As this is the first unique study in seeking to develop a design framework for a multicultural authentic e-learning program, it is important to adopt an epistemology that is supportive of multiple per All relevant learning theories and instructional design principles were reviewed and critically analyzed for their relevance, flexibility and adaptation to a new e-learning framework. It is always more desirable to use primary sources whenever possible. Primary sources in science are usually in the form of articles published in reputable journals. Secondary sources include textbook(Khan, J. F., 2005)

2.2 Expired Blood Bags

It is always more desirable to use primary sources whenever possible. Primary sources in science are usually in the form of articles published in reputable journals. Secondary sources include textbook Grey literature is a term used to describe such things as government reports, reports from short-term consultancies, internal planning documents etc. Conference proceedings and theses also come into t

2.3 Broken Blood Bags

All relevant learning theories and instructional design principles were reviewed and critically analyzed for their relevance, flexibility and adaptation to a new e-learning framework. As this is the first unique study in seeking to develop a design framework for a multicultural authentic e-learning program, it is important to adopt an epistemology that is supportive of multiple per

2.4 Damaged Blood Bags

Thermal control of electronic components has been one of the primary areas of application of advanced heat transfer techniques. One significant area where thermal management has played a crucial role is in the area of power electronics. Devices of this type are usually used on a large scale where the heat flux levels are much greater than microelectronics. In many cases, catastrophic failure is a result of steep temperature gradient in the localized temperature distribution. The local heat transfer characteristics are complex, as the heat dissipated in the chip is conducted into the substrate and then transferred by some combination of thermal conduction, convection and radiation to the outer surface through numerous components. This detailed distribution is commonly simplified by identifying a junction to case resistance; however, the variation over the complex surface could yield surface heat flux values ranging from 0.1 to 0.3 W/m2 or more.

3. Blood Bad Wastage

3.1 Blood Storage

One of the more famous tools to measure service quality was mentioned by Parasuraman, Zeithaml, & Berry, (1985) (otherwise known as PZB), called the SERVQUAL model which can be broken down into 10 det This was then reduced in 1988 into 5 dimensions and both this model will be further explained in the following subcategory.

3.2 Blood Department

As mentioned earlier, the SERVQUAL model was reduced to 5 dimensions in the early 90¿s. This model will be explained with Table 2.2 below: As shown in the both Table 2.1 and Table 2.2, the 10 determinants and 5 dimensions are overlapping at a certain sectors. PZB decided at 1988 that they should reduce the determinants, as it was called

3.3 Blood Preservation

It is important to note that there were a few criticisms, especially from Buttle (1996), citing that the 5 dimensions of service quality by PZB are not universal, and the model fails to draw on establ

3.4 Mobile Blood Unit

This areas has not been studied enought although, Khan, J. F., (2005) has done some work in this area.

Research Gap

Topic/Sub-Topics

TOPIC	Six Sigma	GAP
1	Buddy Training	No Gap
2	Black Belt Certification	No Gap
3	Six Sigma Implementation	Gap
4	Statistical Knowledge	Gap
5	Client Perspective	No Gap
6	Integrated Thermal Design	No Gap

Issue/Sub-Issues

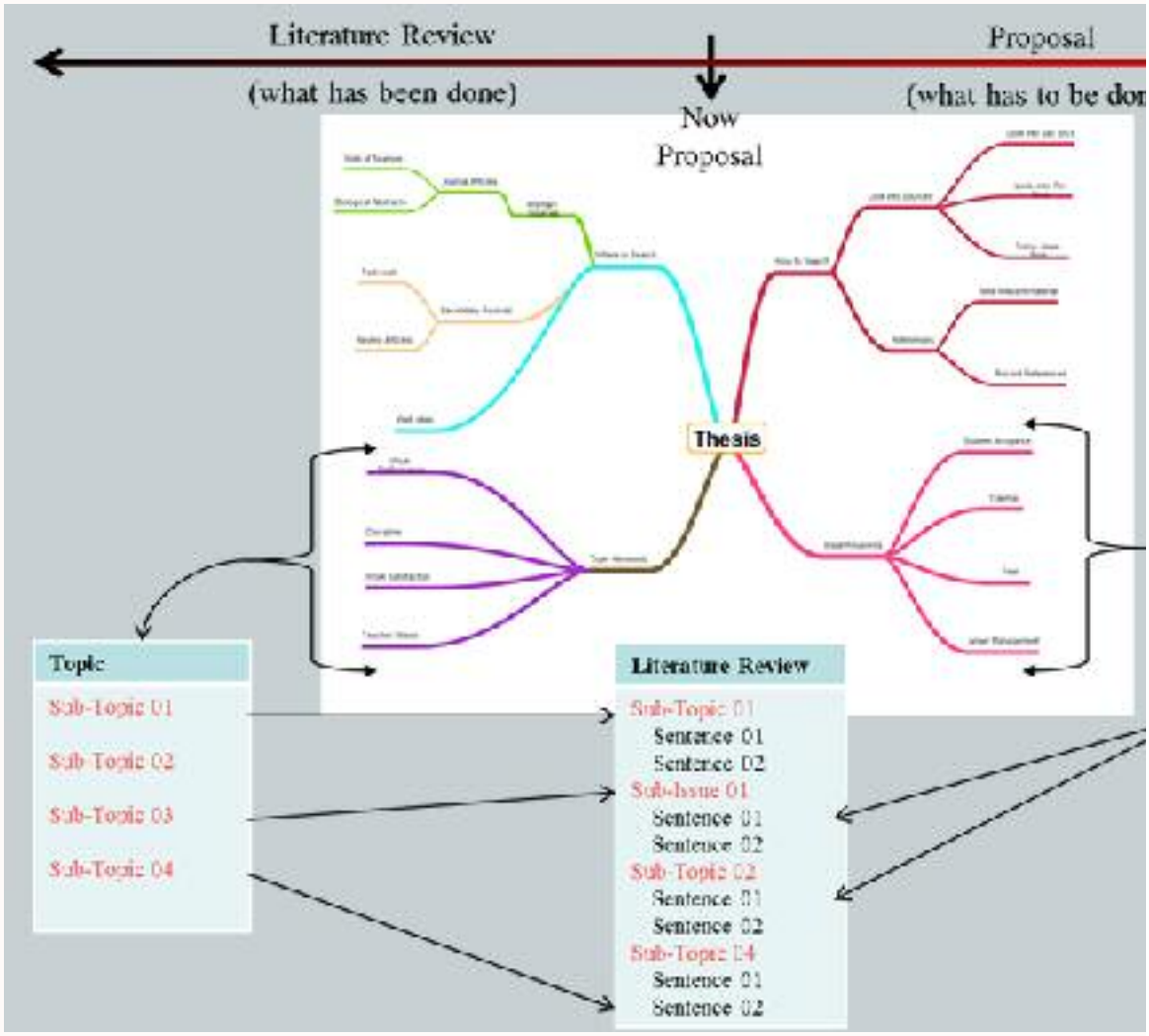
ISSUE	Blood Bag Wastage	GAP
1	Damaged Blood Bags	No Gap
2	Broken Blood Bags	Gap
3	Expired Blood Bags	Gap
4	Customer Satisfaction	No Gap
5	Integrated Power Electronics Module	No Gap

Scope/Sub-Scopes

SCOPE	Ampang Hospital	GAP
1	Blood Department	No Gap
2	Blood Preservation	No Gap
3	Mobile Blood Unit	No Gap
4	Blood Storage	Gap
5	Computers	No Gap

Research Strategy

Research Strategy



Sample Size Calculation

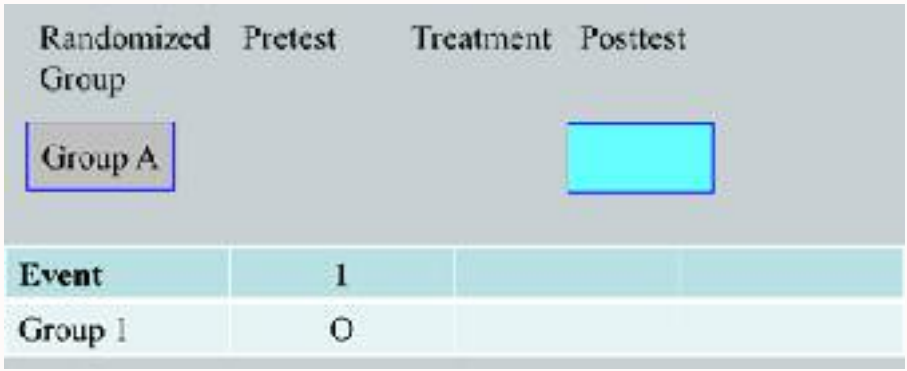
No.	Sample Type	Sample Parameters	Sample Size
1	1 Sample Means	s1=1.5; Δ=-0.2; CL=0.9; Sides=2; Ho : p2 = p1; Ha : p2 <> p1; α=0.050; Zα=1.645;	n=152
2	1 Sample Proportions	s1=0; Δ=-0.2; CL=0.95; Sides=2; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960;	n=20
3	2 Sample Means	s1=1; Δ=0.2; CL=0.95; Sides=2; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960; 1-β=0.8; β=0.2; Zβ=0.842;	n=392
4	2 Sample Proportions	P1=0.4; P2=0.9; Δ=0.1; CL=0.95; Sides=2; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960; 1-β=0.8; β=0.2; Zβ=0.842;	n=10
5	2 Sample Prevalence	P1=0.3; P2=0.5; Δ=0.2; CL=0.95; Sides=2; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960; 1-β=0.8; β=0.2; Zβ=0.842;	n=34
6	Difference between 2 Sample proportions (Kelsey, equal sample sizes)	P1=0.3; P2=0.5; Δ=0.2; CL=0.99; Sides=2; P=0.5; Ho : p2 = p1; Ha : p2 <> p1; α=0.005; Zα=2.576; 1-β=0.8; β=0.2; Zβ=0.842;	nk1=140 nk2=140 nF1=139 nF2=139 nFC1=149 nFC2=149
7	Difference between 2 Sample proportions (Kelsey, unequal sample sizes)	P1=0.4; P2=0; Δ=0.2; CL=0.9; Sides=2; P=0.5; Ho : p2 = p1; Ha : p2 <> p1; α=0.050; Zα=1.645; 1-β=0.8; β=0.2; Zβ=0.842;	nk1=14 nk2=29 nF1=13 nF2=25 nFC1=16 nFC2=32
8	Case-Control Study (Relative Difference)	P1=0.3; P2=0; Δ=0.2; CL=0.95; Sides=2; P=0.5; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960; 1-β=0.8; β=0.2; Zβ=0.842;	nk1=44 nk2=44 nF1=35 nF2=35 nFC1=41 nFC2=41
9	Case-Control Study (Relative Risk)	P1=0.4; P2=0; Δ=1.5; CL=0.95; Sides=1; P=0.5; Ho : p2 <= p1; Ha : p2 > p1; α=0.050; Zα=1.645; 1-β=0.8; β=0.2; Zβ=0.842;	nk1=19 nk2=19 nF1=16 nF2=16 nFC1=20 nFC2=20
10	Case-Control Study (Odds Ratio)	P1=0.4; P2=0.584; Δ=2.11; CL=0.95; Sides=2; P=0.492; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960; 1-β=0.8; β=0.2; Zβ=0.842;	nk1=116 nk2=116 nF1=115 nF2=115 nFC1=125 nFC2=125
11	Pearson's Correlation	r_ref=0.4; r_obs=0.8; CL=0.95; Sides=2; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960; 1-β=0.9; β=0.1; Zβ=1.282;	n=26
12	Difference of Two Pearson's Correlations	r_c1=0.2; r_c2=0.25; CL=0.95; Sides=2; Ho : p2 = p1; Ha : p2 <> p1; α=0.025; Zα=1.960; 1-β=0.9; β=0.1; Zβ=1.282;	n=3789
13	1 Sample Means	s1=2; Δ=0.5; CL=0.95; Sides=1; Ho : p2 <= p1; Ha : p2 > p1; α=0.050; Zα=1.645;	n=43

14	1 Sample Means	s1=0; Δ=0; CL=0; Sides=0; Ho : p2 = p1; Ha : p2 <> p1; α=0.500; Zα=0.000;	nk1=0 nk2=0 nF1=0 nF2=0 nFC1=0 nFC2=0

Research Design

Design 01

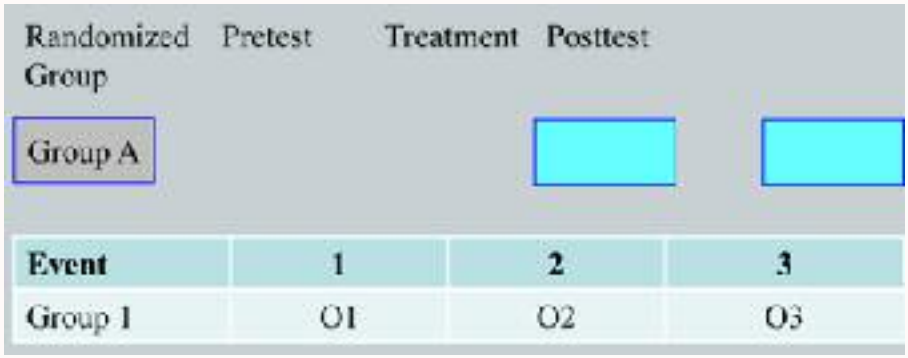
Observation Design



Event	1		
Group 1	O		

Design 02

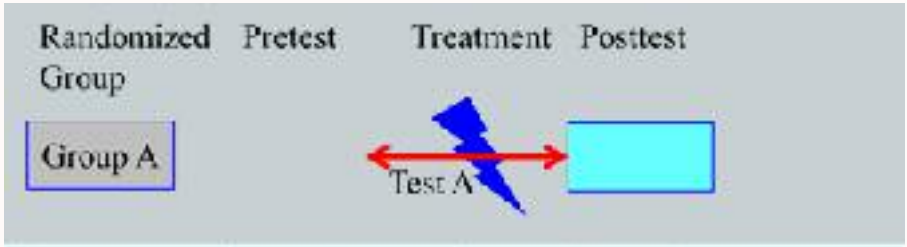
Observation Design Over Time



Event	1	2	3
Group 1	O1	O2	O3

Design 03

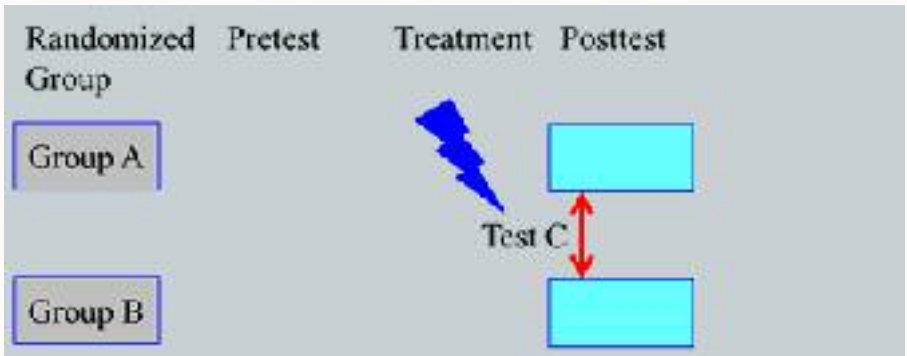
One-group Posttest Experiment



Event	1	2
Group 1	X	O

Design 04

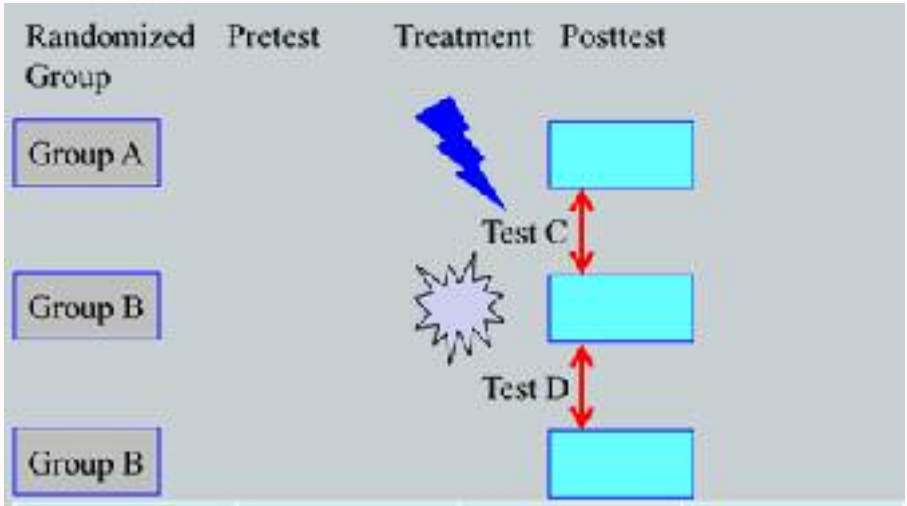
Two-group Posttest-only Experiment



Event	1	2
Group 1	X	O
Group 2		O

Design 05

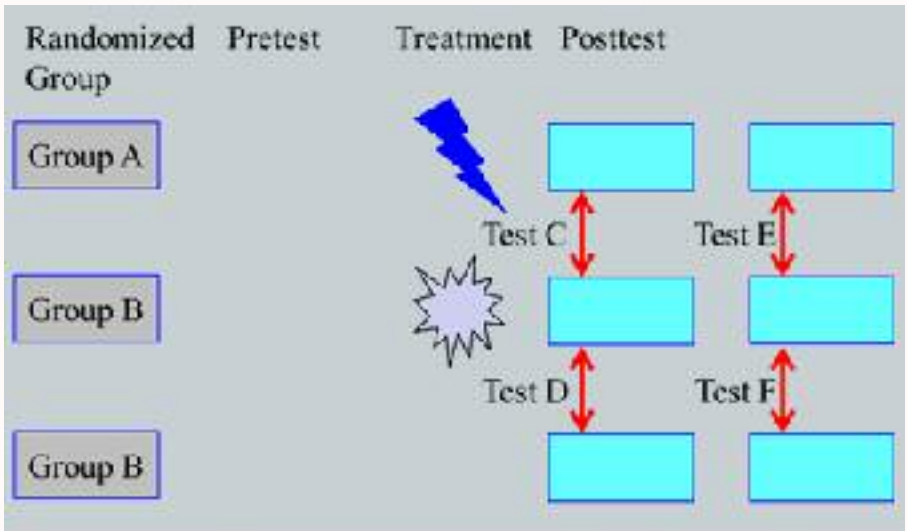
Multiple Treatment Posttest-only Experiment



Event	1	2
Group 1	X1	O
Group 2	X2	O
Group 3		O

Design 06

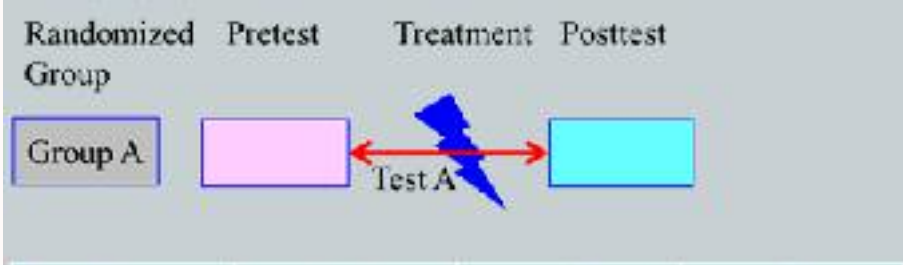
Multiple Treatment Posttest over Time Experiment



Event	1	2	3
Group 1	X1	O1	O2
Group 2	X2	O1	O2
Group 3		O1	O2

Design 07

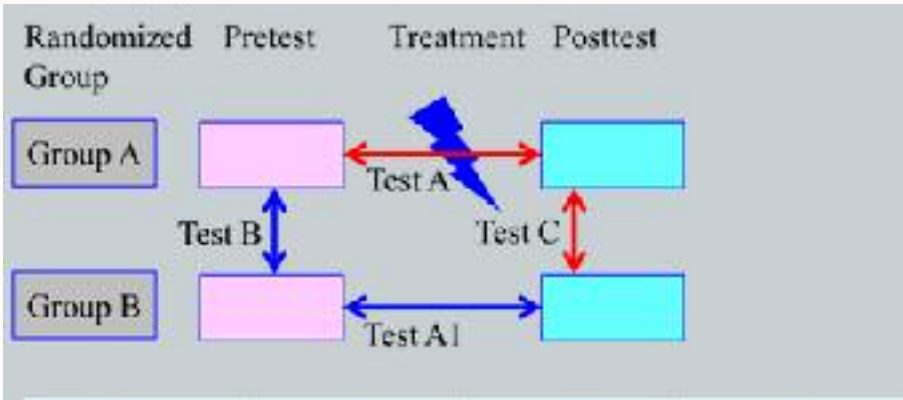
One-group Pretest-Posttest Experiment



Event	1	2	3
Group 1	O1	X	O2

Design 08

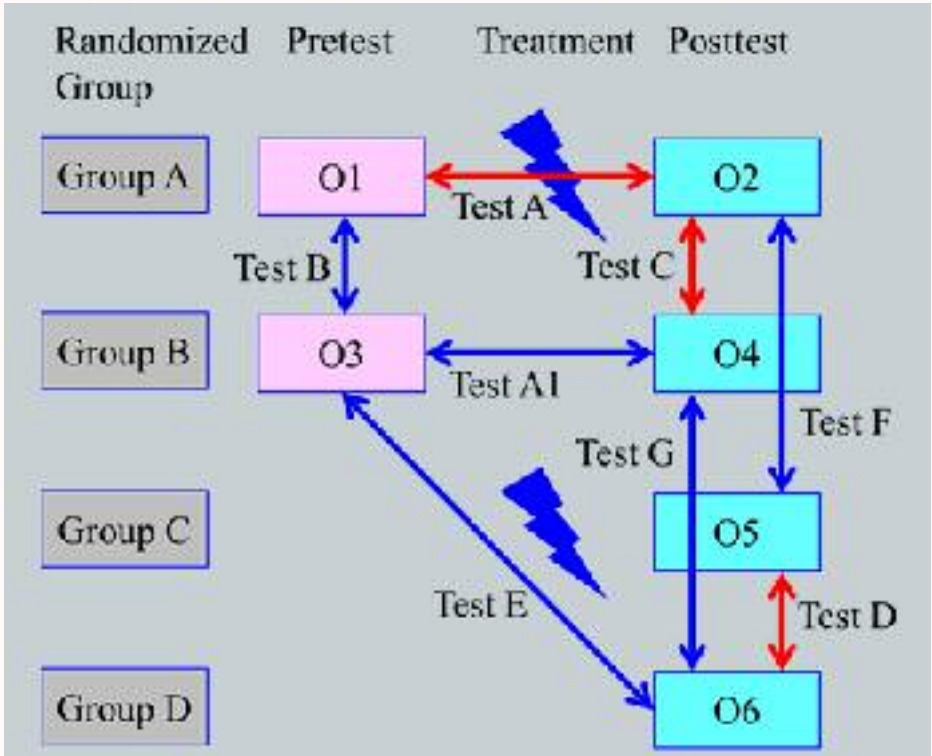
Two-group Pretest-Posttest Treatment-Control Experiment



Event	1	2	3
Group 1	O1	X	O2
Group 2	O1		O2

Design 09

Solomon Four Experiment



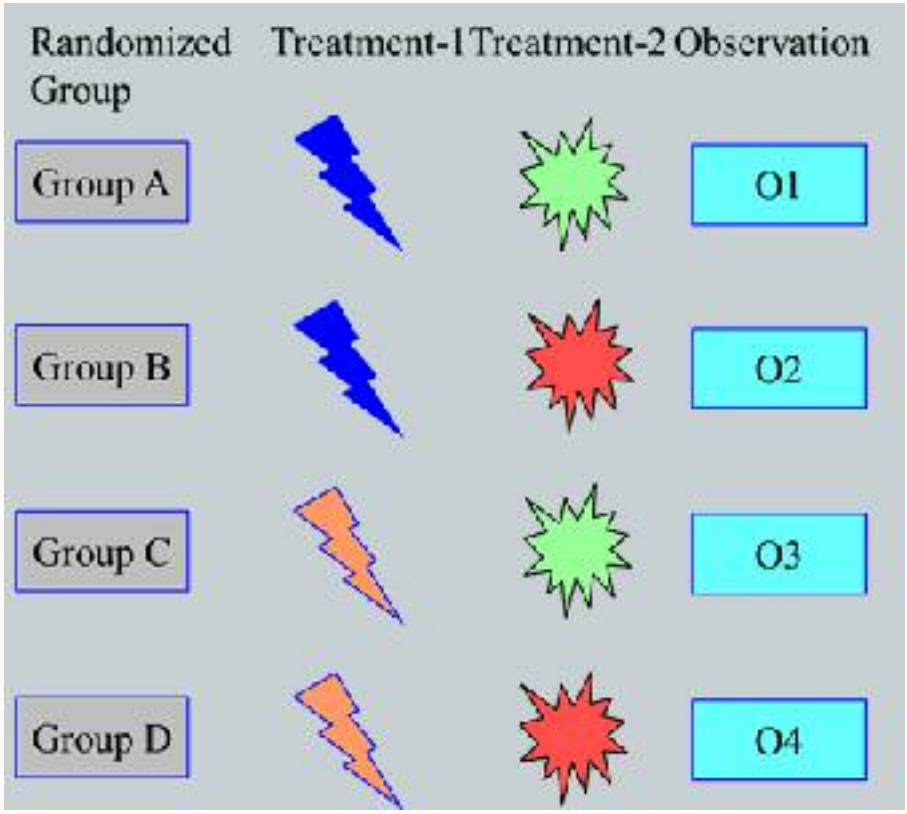
Randomized Group | Pretest | Treatment | Posttest

Event	1	2	3
Group 1	O	X	O
Group 2	O		O
Group 3		X	O
Group 4			O

Design 10

Factorial Experiment

Randomized Group	Pretest	Treatment	Posttest
Event	1	2	
Group 1	A1B1	O	
Group 2	A1B2	O	
Group 3	A2B1	O	
Group 4	A2B2	O	



Design 11

Time Series Design

Randomized Group	Pretest	Treatment	Posttest	
Event	1	2	3	4
Group 1	O1	X	O2	O3
	A		B	A

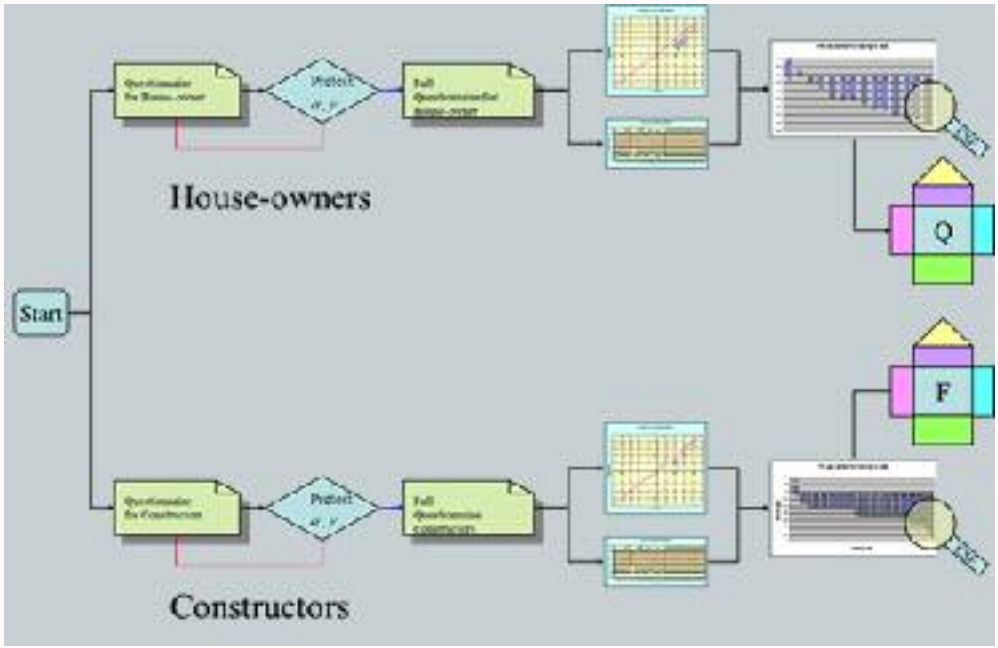
Research Methodology

Research Methodology

Introduction

The objective of this chapter is to provide a detailed description of the approach being taken by the researcher in this study methodology used, data collection, deployment approach of this study in the Ampang Central Blood Bank.

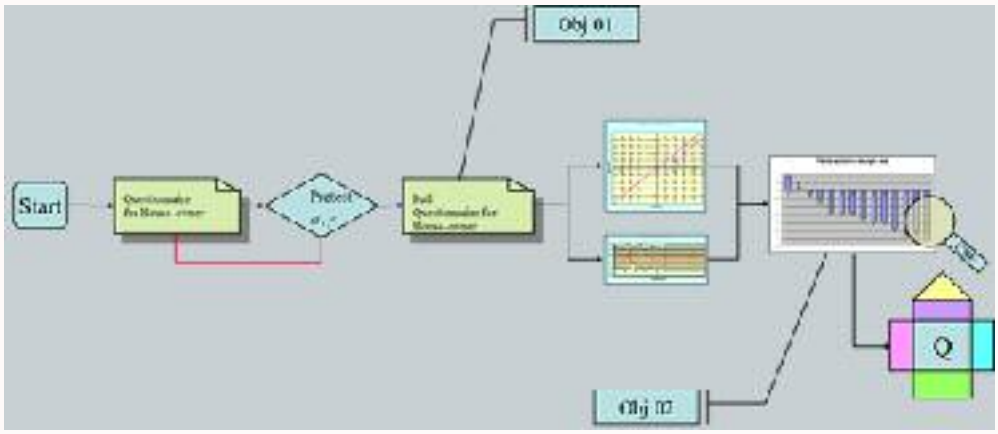
The researcher will use the Six Sigma concept as a primary driver for reducing the discarded blood units. Six Sigma derive Sigma is used in statistics to define the parametric statistic ?population standard deviation? (Pyzdek 1999). The relevant m DMAIC methodology. DMAIC stands for Define, Measure, Analyze, Improve and Control.



Six Sigma Application

Six Sigma programs are usually implemented by an organization from a top-down approach involving the entire organizatio implementation requires an extensive commitment from the collaborating organization in a top-down approach, in terms of t cultural implications among others. Such a massive program is not viable for this research and clearly not anticipated. Thus project application following the DMAIC methodology. Davison, L., & Al-Shaghana, K., (2007) discusses about the influence particular reference to a Six Sigma management program.

Healthcare industry is still in the early stages of evolution with regard to six-sigma. Therefore, healthcare personnel should implementation by the support of the top management. Successful execution of simple projects in hospitals can enable pra future and create clinical change on a broad scale. (Mehmet al et, 2007).



Responsiveness

Another problem which the researcher anticipates is if the blood bank can respond effectively and efficiently to new circums methodologies. The body of knowledge for implementing the scientific method is continually expanding as a result of advan increasing complexities of businesses (Hahn and Hill, 1999). The blood bank has to go through Change Management in or the organization is to implement Six Sigma.

There may be a cultural shock to start with. The term ¿organizational culture¿ refers to a set of properties in the work envir the people who live and work there, and is assumed to influence motivation and behavior (Litwin & Stringer, 1968). Leaders seems to be an absolutely essential ingredient for cultural change, with the actions of lower and middle level managers act Heskett, 1992).

t - Test : Paired Data

Mode of selection : Sample Data

Summary Data

	Sample1	Sample2	Difference
Size	5	5	5
Mean	5.92	13.46	7.54
Stdev.	0.70	0.43	0.51
Variance	0.49	0.19	0.26
Difference			0.00
Alpha	0.05		

Data

No.	Sample1	Sample2	Difference
1	5.00	13.00	8.00
2	5.40	13.40	8.00
3	6.30	13.10	6.80
4	6.70	14.00	7.30
5	6.20	13.80	7.60

t - Test : Paired

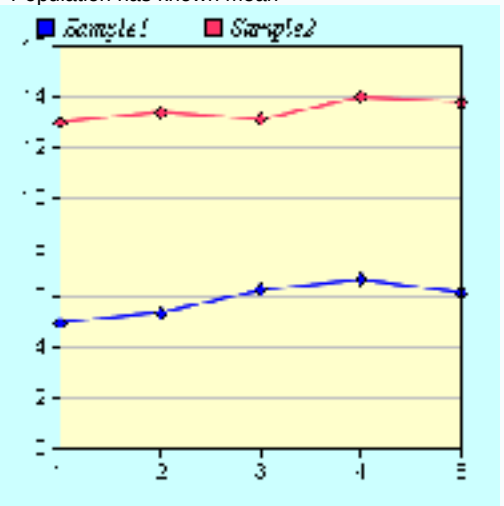
Summary Data

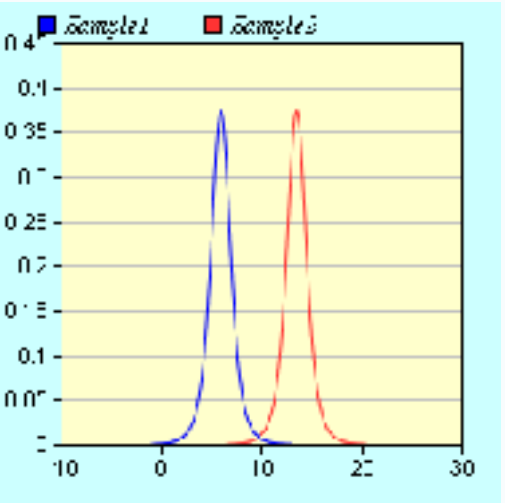
	Sample1	Sample2	Difference
Size	5	5	5
Mean	5.92	13.46	7.54
Variance	0.49	0.19	0.26
Difference			0.00
Alpha	0.05		

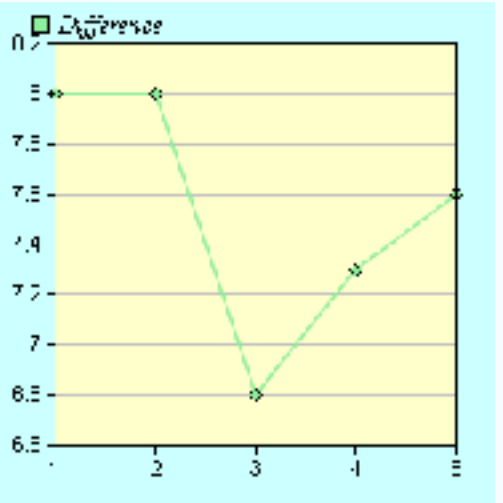
Normal Distribution

Assumption

Population is normally distributed
Population has known mean







Hypothesis

Left Tail

Ho : μ1 - μ2 >= 0.00 [Claim]
Ha : μ1 - μ x < 0.00 [Alternative]

Both Tails

Ho : μ1 - μ2 = 0.00 [Claim]
Ha : μ1 - μ x ≠ 0.00 [Alternative]

Right Tail

Ho : μ1 - μ2 <= 0.00 [Claim]
Ha : μ1 - μ x > 0.00 [Alternative]

Distribution of Test Statistic

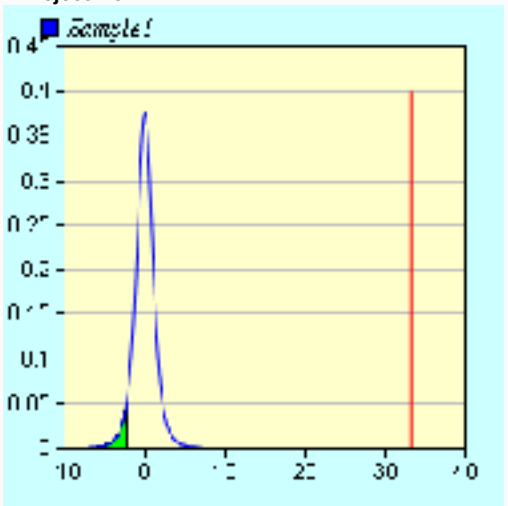
If Ho is true;
$t_{a, v}$ is t-distributed with v degrees of freedom

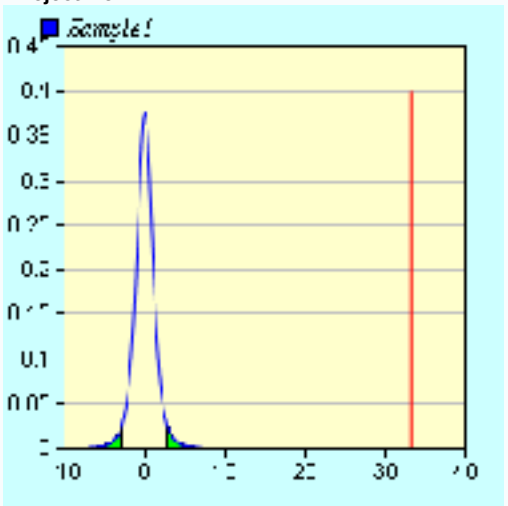
If Ho is true;
$t_{a/2, v}$ is t-distributed with v degrees of freedom

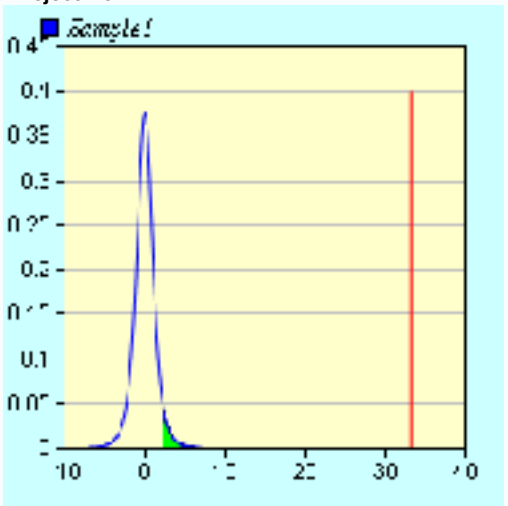
If Ho is true;
$t_{a, v}$ is t-distributed with v degrees of freedom

Decision Rule

	Left Tail	Both Tails	Right Tail
Alpha	= 0.05	= 0.05	= 0.05
$t_{a, v}$	= 2.13	= 2.78	= 2.13
Accept Ho if	$-t_{\alpha, (n1+n2-2)} < t_{sample}$	$-t_{\alpha/2, v} < t_{sample} < t_{\alpha/2, v}$	$t_{sample} < t_{\alpha, (n1+n2-2)}$
Reject Ho	otherwise	otherwise	otherwise







Calculate Test Statistic

$$t_{sample} = \frac{\bar{x}_{diff}}{\sqrt{\frac{s^2_{diff}}{n}}} =$$ 33.19

Ho Accept

Test Statistic is not significant at 0.05

$$t_{sample} = \frac{\bar{x}_{diff}}{\sqrt{\frac{s^2_{diff}}{n}}} =$$ 33.19

Ho Reject

Test Statistic is significant at 0.05

$$t_{sample} = \frac{\bar{x}_{diff}}{\sqrt{\frac{s^2_{diff}}{n}}} =$$ 33.19

Ho Reject

Test Statistic is significant at 0.05

Conclusion

Not enough statistical evidence that

Not enough statistical evidence that

Not enough statistical evidence that

m2 - m1 < 0.00	m2 - m1 # 0.00	m2 - m1 > 0.00

t - Test : 2 - Sample Data

Mode of selection : Sample Data

Summary Data

	Sample1	Sample2
Size	5	5
Mean	4.60	7.54
Stdev.	0.60	0.61
Variance	0.37	0.37
Alpha	0.05	

Sample 1 Data

No.	Sample1
1	4.00
2	4.20
3	5.30
4	5.20
5	4.30

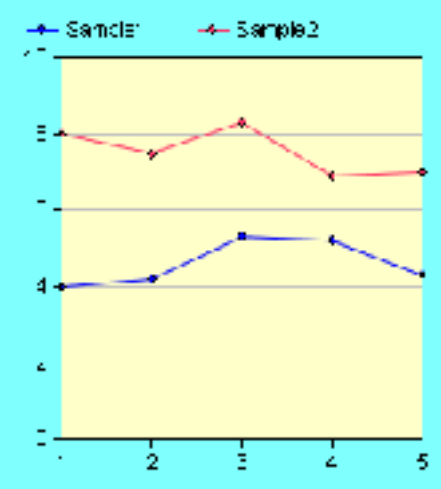
Sample 2 Data

No.	Sample2
1	8.00
2	7.50
3	8.30
4	6.90
5	7.00

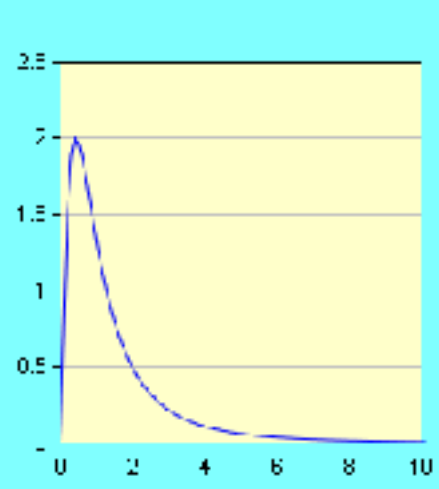
t Test : 2 Sample (Variance)

Assumption

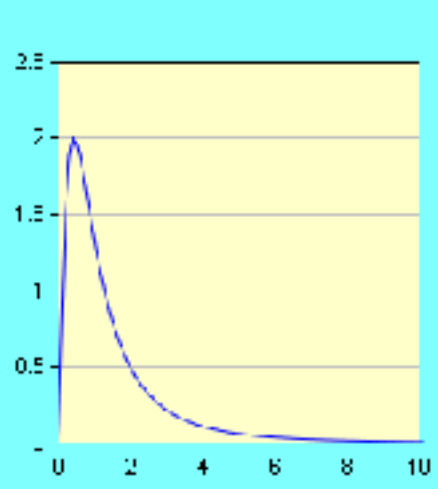
Population is normally distributed.
Population has known mean.
Sample is randomly selected.
Observations are independent.



Population is normally distributed.
Population has known mean.
Sample is randomly selected.
Observations are independent.



Population is normally distributed.
Population has known mean.
Sample is randomly selected.
Observations are independent.



Hypothesis

Left Tail
Ho : μ = 0.36 [Alternative]
Ha : μ < 0.36 [Claim]

Both Tails
Ho : μ = 0.36 [Claim]
Ha : μ ? 0.36 [Alternative]

Right Tail
Ho : μ = 0.36 [Alternative]
Ha : μ > 0.36 [Claim]

Distribution of Test Statistic

$F_{\alpha,n1,n2} = (s_{larger})^2 / (s_{smaller})^2$
If Ho is true
$F_{a,v1,v2}$ is F-distributed with v degrees of freedom

$F_{\alpha,n1,n2} = (s_{larger})^2 / (s_{smaller})^2$
If Ho is true
$F_{a/2,v1,v2}$ is F-distributed with v degrees of freedom

$F_{\alpha,n1,n2} = (s_{larger})^2 / (s_{smaller})^2$
If Ho is true
$F_{a,v1,v2}$ is F-distributed with v degrees of freedom

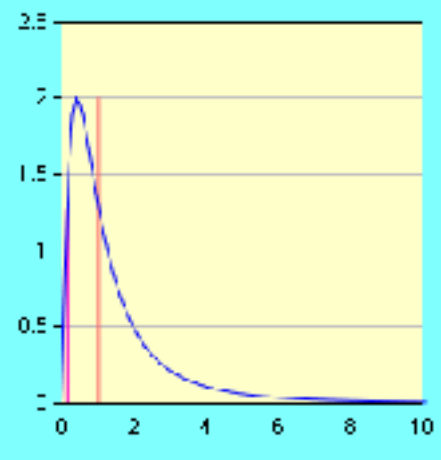
Decision Rule

Alpha = 0.95
$F_{1-a,n1,n2}$ = 0.16

Alpha = 0.975 0.025
$F_{1-a,n1,n2}$ = 0.10 9.60
Accept Ho if $F_{1-\alpha/2,v1,v2} < F_{sample} < F_{\alpha/2,v1,v2}$

Alpha = 0.05
$F_{a,n1,n2}$ = 6.39
Accept Ho if $F_{sample} < F_{\alpha,v1,v2}$

Accept Ho if $F_{1-\alpha,v1,v2} < F^2$ sample
Reject Ho otherwise



Calculate Test Statistic

$F_{sample} = \frac{s_1^2}{s_2^2} =$ 1.02

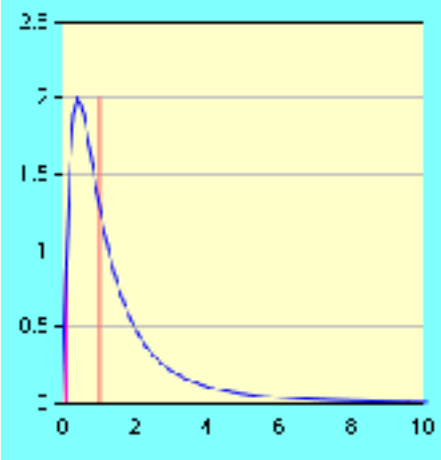
Statistical Decision

Ho Accept
Test Statistic is not significant at 0.05%

Conclusion

Not enough statistical evidence that the true variance is < than 0.36.

Reject Ho otherwise

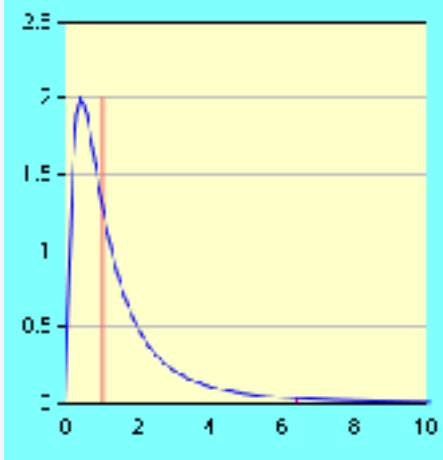


$F_{sample} = \frac{s_1^2}{s_2^2} =$ 1.02

Ho Accept
Test Statistic is not significant at 0.05%

Not enough statistical evidence that the true variance is not 0.36.

Reject Ho otherwise



$F_{sample} = \frac{s_1^2}{s_2^2} =$ 1.02

Ho Accept
Test Statistic is not significant at 0.05%

Not enough statistical evidence that the true variance is not 0.36.

t - Test : 2 - Sample

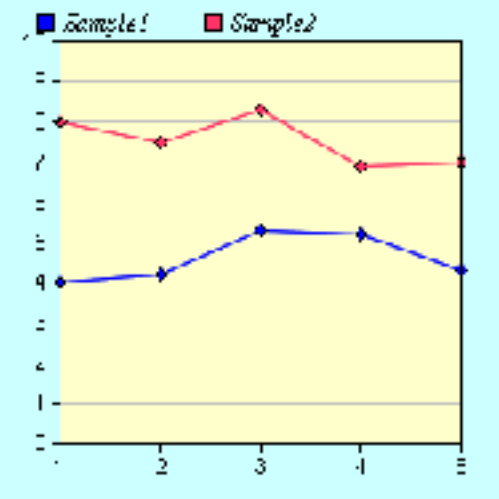
Summary Data (Equal Variance)

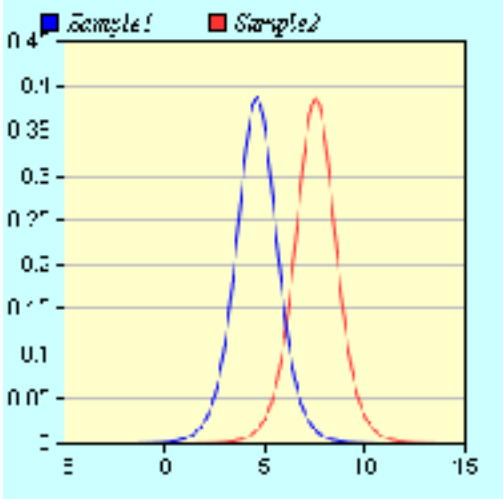
	Sample1	Sample2
Size	5	5
Mean	4.60	7.54
Variance	0.37	0.37
Alpha	0.05	

Alpha	0.05
v1	4
v2	4
F val	6.39
F-Ratio	1.02

Normal Distribution

Assumption
Population is normally distributed
Population has known mean





Hypothesis

Left Tail	Both Tails	Right Tail
Ho : μ >= 4.60 [Claim]	**Ho : μ =** 4.60 [Claim]	**Ho : μ <=** 4.60 [Claim]
Ha : μ < 4.60 [Alternative]	**Ha : μ ≠** 4.60 [Alternative]	**Ha : μ >** 4.60 [Alternative]

Distribution of Test Statistic

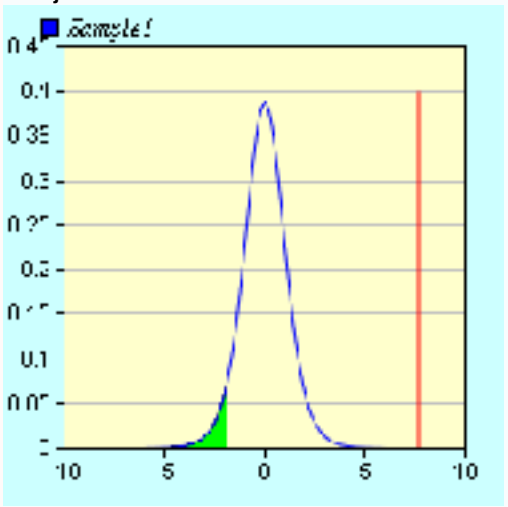
If Ho is true;
$t_{a, v}$ is t-distributed with v degrees of freedom

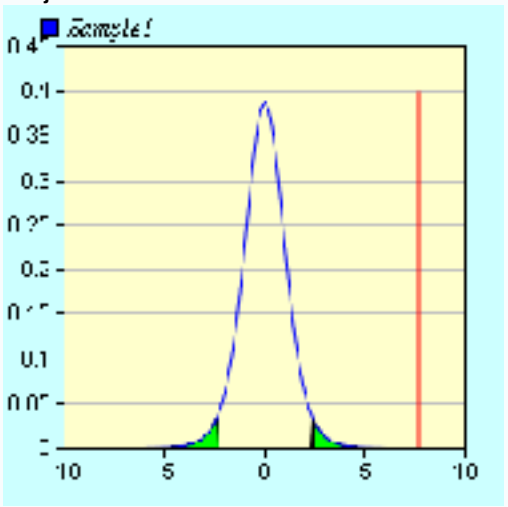
If Ho is true;
$t_{a/2, v}$ is t-distributed with v degrees of freedom

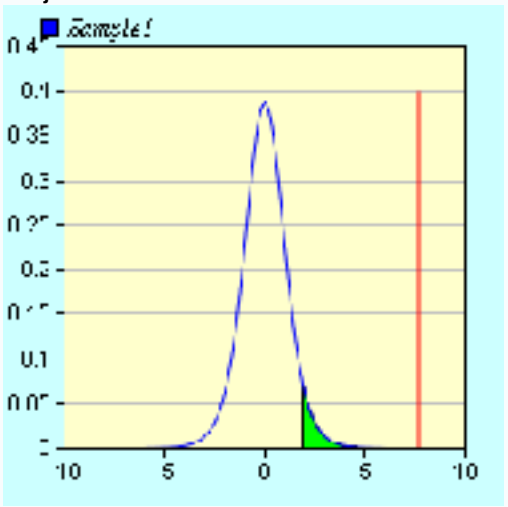
If Ho is true;
$t_{a, v}$ is t-distributed with v degrees of freedom

Decision Rule

	Left Tail	Both Tails	Right Tail
Alpha	= 0.05	= 0.05	= 0.05
$t_{a, v}$	= 1.86	= 2.31	= 1.86
Accept Ho if	$-t_{\alpha, (n1+n2-2)} < t_{sample}$	$-t_{\alpha/2, v} < t_{sample} < t_{\alpha/2, v}$	$t_{sample} < t_{\alpha, (n1+n2-2)}$
Reject Ho	otherwise	otherwise	otherwise







Calculate Test Statistic

$$t_{Sample} = \frac{(\bar{x}_2 - \bar{x}_1)}{\sqrt{s^2_{x_2-x_1}}} = 7.65$$

$$s_{x_2-x_1} = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}} \cdot \sqrt{\frac{n_1+n_2}{n_1 \times n_2}}$$

Ho Accept

Test Statistic is not significant at 0.05

$$t_{Sample} = \frac{(\bar{x}_2 - \bar{x}_1)}{\sqrt{s^2_{x_2-x_1}}} = 7.65$$

$$s_{x_2-x_1} = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}} \cdot \sqrt{\frac{n_1+n_2}{n_1 \times n_2}}$$

Ho Reject

Test Statistic is significant at 0.05

$$t_{Sample} = \frac{(\bar{x}_2 - \bar{x}_1)}{\sqrt{s^2_{x_2-x_1}}} = 7.65$$

$$s_{x_2-x_1} = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}} \cdot \sqrt{\frac{n_1+n_2}{n_1 \times n_2}}$$

Ho Reject

Test Statistic is significant at 0.05

Conclusion

Not enough statistical evidence that the true mean is < than 4.60 .	Enough statistical evidence that the true mean is not 4.60 .	Enough statistical evidence that the true mean is > than 4.60 .

Mc Nemar Test

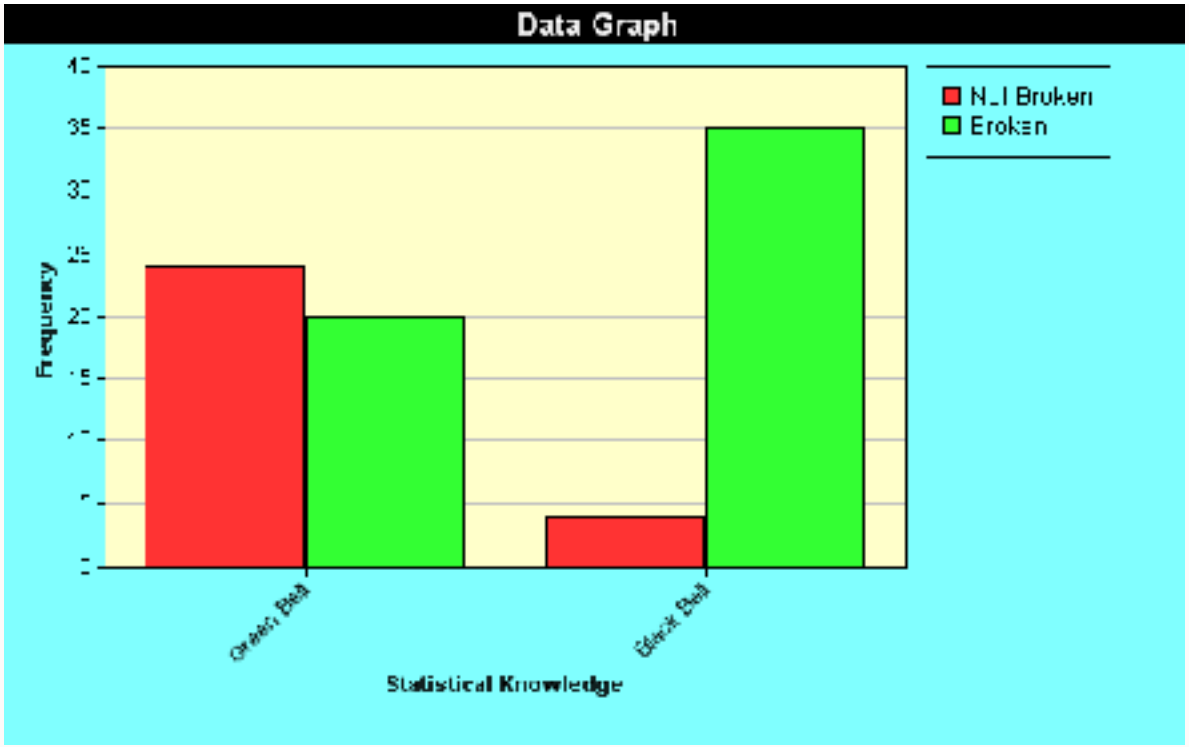
Alpha	0.05

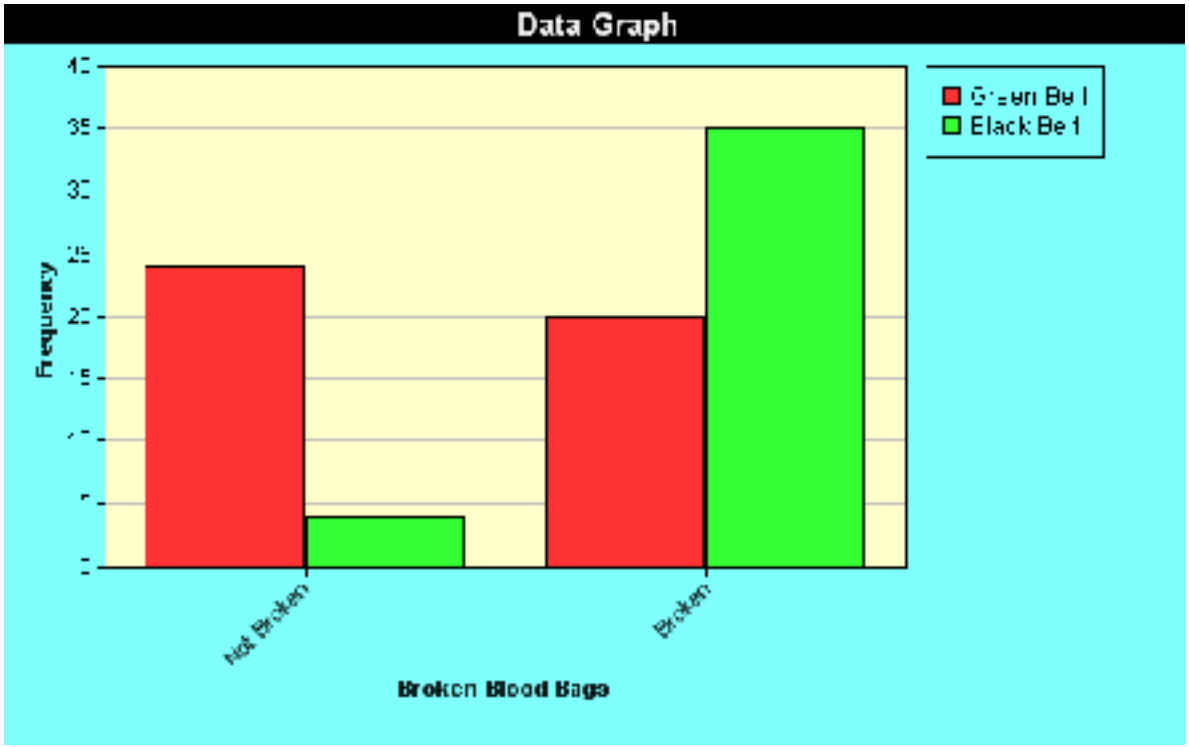
Observed Values

			Broken Blood Bags		
			Not Broken	Broken	
Statistical Knowledge	1	Green Belt	24.00	20.00	**44.00**
	2	Black Belt	4.00	35.00	**39.00**
			28.00	**55.00**	**83.00**

Expected Values

			Broken Blood Bags		
			Not Broken	Broken	
Statistical Knowledge	1	Green Belt	14.84	29.16	**44.00**
	2	Black Belt	13.16	25.84	**39.00**
			28.00	**55.00**	**83.00**


Data Graph
N_I Broken
Broken
Frequency
Statistical Knowledge


Data Graph
Green Belt
Black Belt
Frequency
Not Broken
Broken
Broken Blood Bags

Mc Nemar Test

Assumption
A key assumption of the chi square test of independence is that each subject contributes data to only one cell. Therefore the sum of all cell frequencies in the table must be the same as the number of subjects in the experiment. Use of the chi-square tests is inappropriate if any expected frequency is below 1 or if the expected frequency is less than 5 in more than 20% of cells.

Hypothesis
Right tail (only)
Ho : Statistical Knowledge and Broken Blood Bags are independent. [Claim]
Ha : Statistical Knowledge and Broken Blood Bags are not independent. [Alternative]

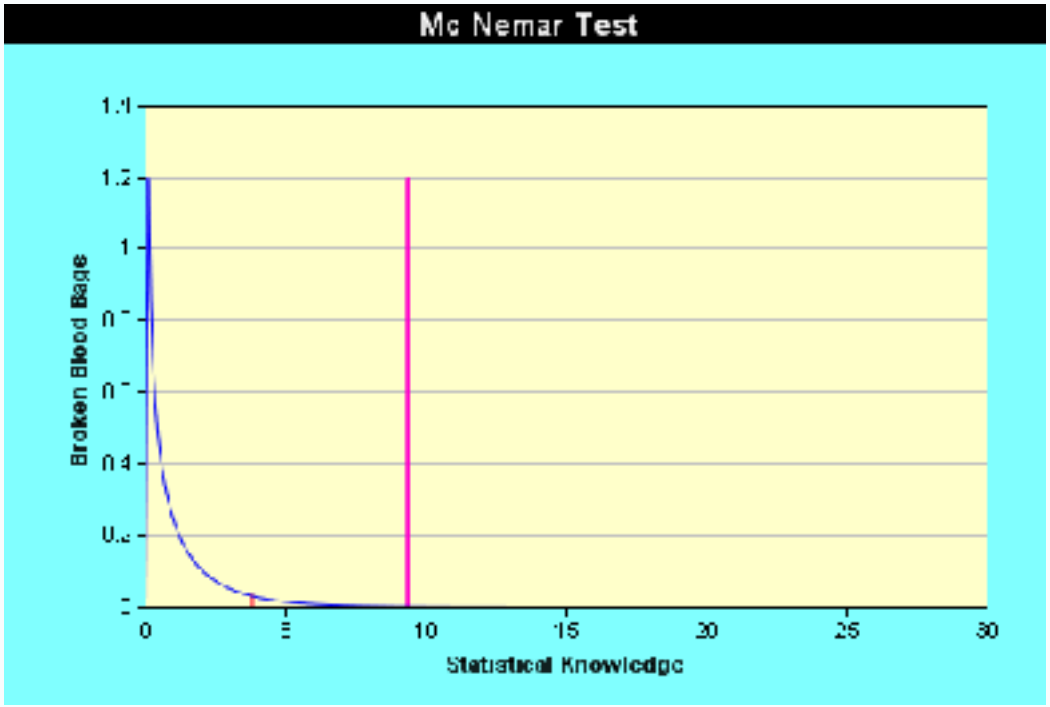
Distribution of Test Statistic
If Ho is true;
X^2_v is Chi-square -distributed with v degrees of freedom

Decision Rule

Alpha	=	0.05
Degree Of Freedom	=	1
X^2_v	=	3.84
Accept Ho if	=	$X^2_{sample} < X^2_{\alpha,v}$
Reject Ho	=	Otherwise

Calculate Test Statistic

			Broken Blood Bags		
			Not Broken	**Broken**	
Statistical Knowledge	**1**	**Green Belt**	5.65	2.88	**8.52**
	2	**Black Belt**	6.37	3.24	**9.62**
			12.02	**6.12**	**9.38**



Statistical Decision
Ho : Reject
Test Statistic is significant at 0.05.

Conclusion
Statistical Knowledge and Broken Blood Bags are not independent.

Sub-Hypothesis

Save

Statement	Client Perspective Survey
Ho	Customer Satisfaction is unimportant
Ha	Customer Satisfaction is not unimportant
Alpha	0.05

H1 Perception
Ho : Perception is unimportant
Ha : Perception is not unimportant

H2 Interactivity
Ho : Interactivity is unimportant
Ha : Interactivity is not unimportant

H3 Access
Ho : Access is unimportant
Ha : Access is not unimportant

H4 Efficacy
Ho : Efficacy is unimportant
Ha : Efficacy is not unimportant

H5 Convenience
Ho : Convenience is unimportant
Ha : Convenience is not unimportant

H6 Availability
Ho : Availability is unimportant
Ha : Availability is not unimportant

H7 Financial
Ho : Financial is unimportant
Ha : Financial is not unimportant

H8 Continuity
Ho : Continuity is unimportant
Ha : Continuity is not unimportant

H9 Environment
Ho : Environment is unimportant
Ha : Environment is not unimportant

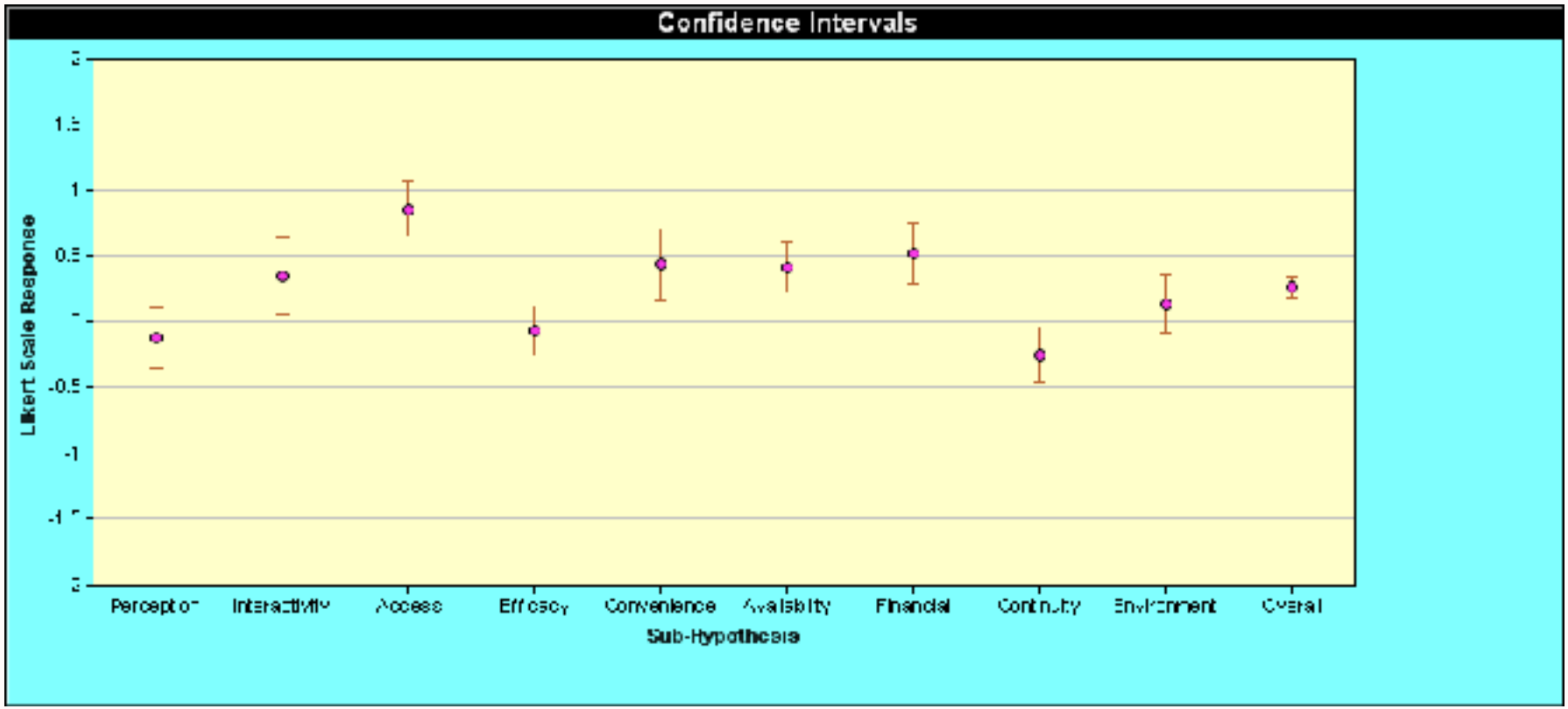
Client Perspective Survey

Ho : Customer Satisfaction is unimportant
Ha : Customer Satisfaction is not unimportant

Data

Edit Scale -n to n+

No.	Item	Poor	Fair	Good	Better	Excellent	Total	Mean	Variance	T-Val	Tcrit	M+CI	M-CI
1	Perception	4	14	42	0	7	67	-0.119	0.864	-1.043	1.997	0.10	-0.34
2	Interactivity	5	15	5	31	8	64	0.344	1.436	2.277	1.998	0.64	0.05
3	Access	2	8	24	34	32	100	0.860	1.051	8.347	1.984	1.06	0.66
4	Efficacy	8	22	43	23	4	100	-0.070	0.934	-0.721	1.984	0.12	-0.26
5	Convenience	1	25	10	20	20	76	0.434	1.529	3.041	1.992	0.71	0.16
6	Availability	3	12	40	30	15	100	0.420	0.973	4.236	1.984	0.61	0.23
7	Financial	2	50	10	25	50	137	0.518	1.810	4.492	1.978	0.74	0.29
8	Continuity	15	22	40	19	4	100	-0.250	1.119	-2.352	1.984	-0.04	-0.46
9	Environment	9	15	41	23	12	100	0.140	1.213	1.265	1.984	0.36	-0.08
10	**Overall**	**49**	**183**	**255**	**205**	**152**	**844**	**0.270**	**1.341**	**6.773**	**1.963**	**0.348**	**0.192**

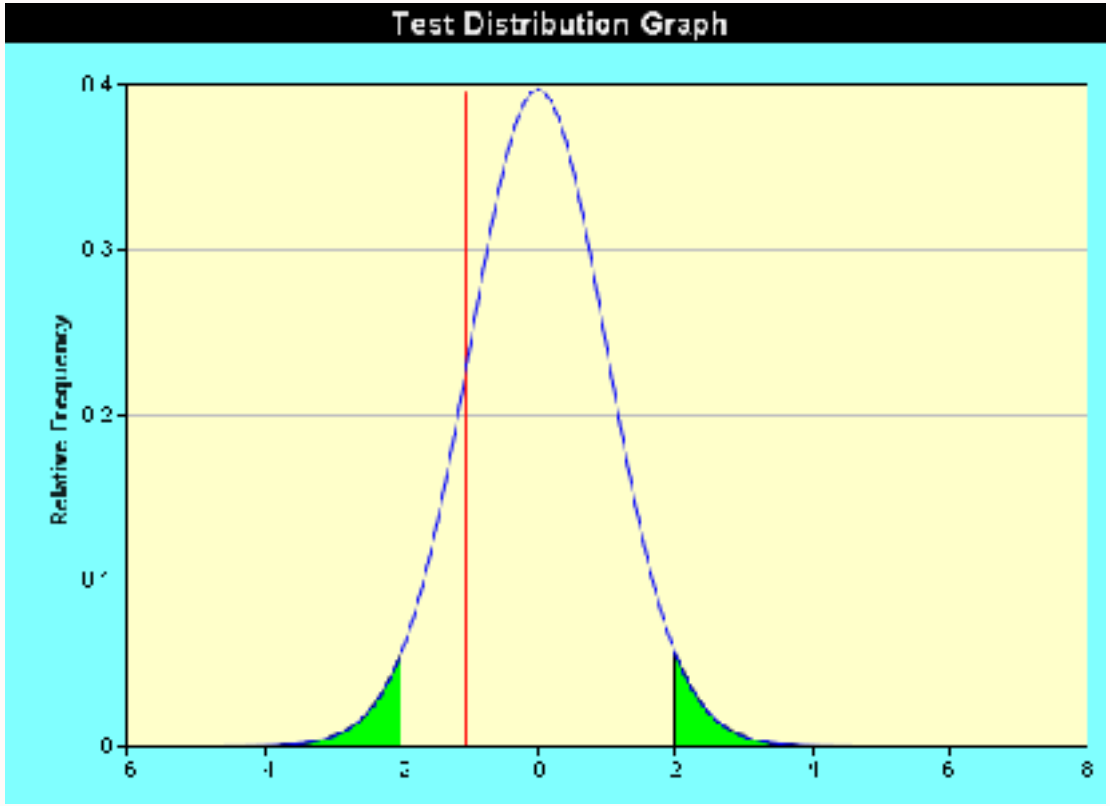

Confidence Intervals
Likert Scale Response
1
0.5
-0.5
-1
Interactivity
Access
Efficacy
Convenience
Availability
Financial
Environment
Sub-Hypothesis

Item Test

Likert Scale -n to n+

No.	Item Test	Poor	Fair	Good	Better	Excellent	Total	Mean	Variance	T-Val	Tcrit	M+CI	M-CI
1	Perception	4	14	42	0	7	67	-0.119	0.864	-1.043	1.997	0.10	-0.34
2	Interactivity	5	15	5	31	8	64	0.344	1.436	2.277	1.998	0.64	0.05
3	Access	2	8	24	34	32	100	0.860	1.051	8.347	1.984	1.06	0.66
4	Efficacy	8	22	43	23	4	100	-0.070	0.934	-0.721	1.984	0.12	-0.26
5	Convenience	1	25	10	20	20	76	0.434	1.529	3.041	1.992	0.71	0.16
6	Availability	3	12	40	30	15	100	0.420	0.973	4.236	1.984	0.61	0.23
7	Financial	2	50	10	25	50	137	0.518	1.810	4.492	1.978	0.74	0.29
8	Continuity	15	22	40	19	4	100	-0.250	1.119	-2.352	1.984	-0.04	-0.46
9	Environment	9	15	41	23	12	100	0.140	1.213	1.265	1.984	0.36	-0.08
10	Overall	49	183	255	205	152	844	0.270	1.341	6.773	1.963	0.348	0.192

Item Perception


Test Distribution Graph
Relative Frequency
0.4
0.3
0.2
0
6
4
2
0
2
4
6
8

Conclusion

No.	Groups	Test	True/False	Conclusion
1	Perception	insignificant	Ho is not rejected	Perception is unimportant
2	Interactivity	significant	Ho is rejected	Interactivity is not unimportant
3	Access	significant	Ho is rejected	Access is not unimportant
4	Efficacy	insignificant	Ho is not rejected	Efficacy is unimportant
5	Convenience	significant	Ho is rejected	Convenience is not unimportant
6	Availability	significant	Ho is rejected	Availability is not unimportant
7	Financial	significant	Ho is rejected	Financial is not unimportant
8	Continuity	significant	Ho is rejected	Continuity is not unimportant
9	Environment	insignificant	Ho is not rejected	Environment is unimportant
10	**Overall**	**significant**	**Ho is rejected**	**Customer Satisfaction is not unimportant**

Non-Hypothesis Test

Edit

1. Validation of Modeling Technique

1.1 General Modeling Characteristics

1.2 Computational Modeling of MOSFETs

1.3 Sensitivity and Uncertainty Analysis

1.4 Experimental Setup

1.5 Experimental Procedures

1.6 Results and Discussions

2. Thermal Design of Active

2.1 Electrical and Packaging Constraints

2.2 Design Strategy

2.3 Thermal Modeling of Active IPEM

2.4 Parametric Analysis

2.5 Sensitivity and Uncertainty Analysis

3. Results and Discussions

3.1 Parametric Study

3.2 Sensitivity and Uncertainty Analysis

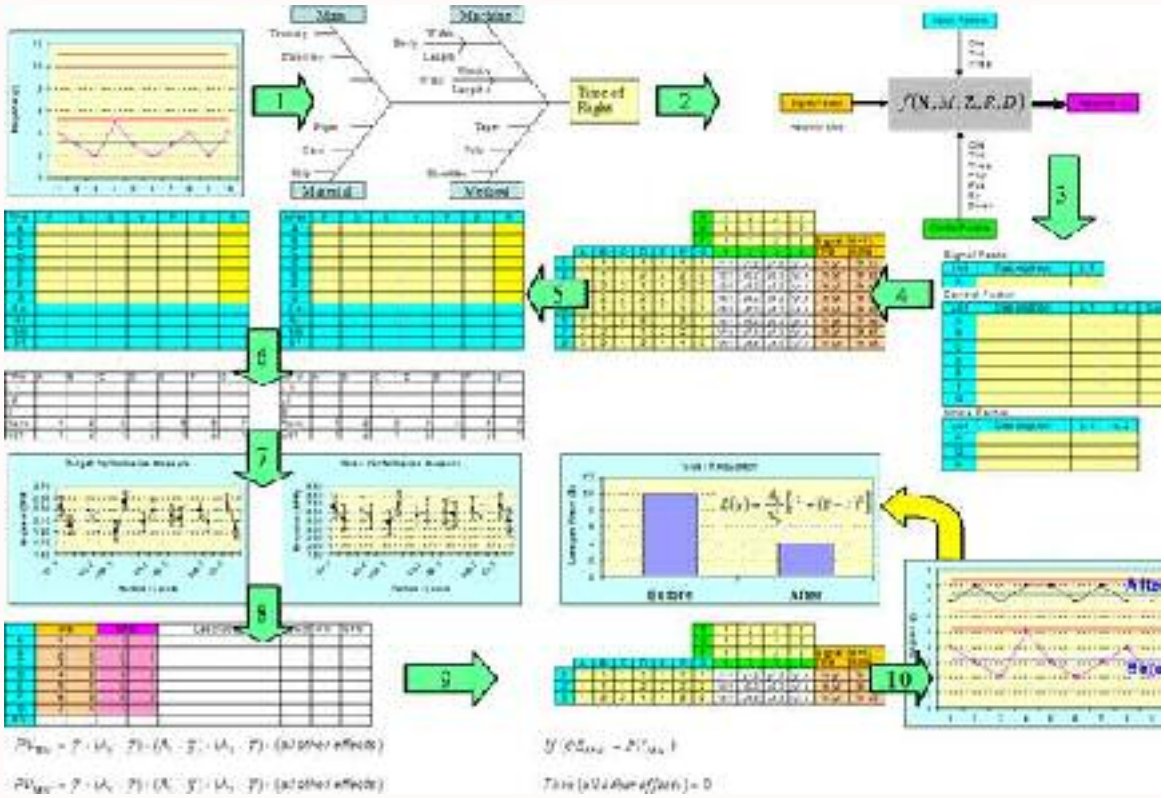
3.3 Solution and Results Convergence

Non-Hypothesis Test

1. Validation of Modeling Technique

1.1 General Modeling Characteristics

To develop and implement an integrated electro-thermal design strategy for the next generation of the Gen-II IPEM, 11 2. T optimize thermal performance of the active IPEM with the considerations of electrical and packaging limitations, and 3. To reduce the geometric footprint while maintaining all other design specifications.



Heat removal from the chips now ranks among the major technical problems that need to be solved to achieve higher powe density. For years, the chip industry has trying to maintain the pace of Moore Heat removal from the chips now ranks amon the major technical problems that need to be solved to achieve higher power density. For years, the chip industry has trying maintain the pace of Moore Heat removal from the chips now ranks among the major technical problems that need to be so to achieve higher power density. For years, the chip industry has trying to maintain the pace of Moore Heat removal from th chips now ranks among the major technical problems that need to be solved to achieve higher power density. For years, th chip industry has trying to maintain the pace of Moore New text, new text

1.2 Computational Modeling of MOSFETs

1.3 Sensitivity and Uncertainty Analysis

1.4 Experimental Setup

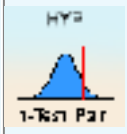
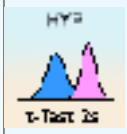
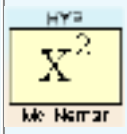
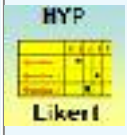
1.5 Experimental Procedures

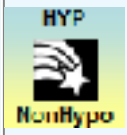
1.6 Results and Discussions

TEXT

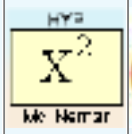
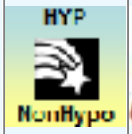
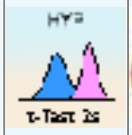
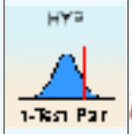
2. Thermal Design of Active

Research Findings

No.	Hypotheses	Test Name	Test Type
1	**Statistical Knowledge reduce Broken Blood Bags** Ho : The mean value of Broken Blood Bags-Aft greater than or equal to Broken Blood Bags-Bfr Ha : The mean value of Broken Blood Bags-Aft less than Broken Blood Bags-Bfr **Statistical Decision** Ho : Accept Test Statistic is not significant at 0.05 **Conclusion** Not enough statistical evidence that m2 - m1 < 0.00	Paired	
2	**Black Belt Certification increases Customer Satisfaction** Ho : The mean difference of Customer Satisfaction-Aft less than or equal to Customer Satisfaction-Bfr Ha : The mean difference of Customer Satisfaction-Aft greater than Customer Satisfaction-Bfr **Statistical Decision** Ho : Reject Test Statistic is significant at 0.05 **Conclusion** Enough statistical evidence that the true mean is > than 4.60 .	DiffMean	
3	**Statistical Knowledge associate Broken Blood Bags** Ho : Statistical Knowledge is independent of Broken Blood Bags Ha : Statistical Knowledge is not independent of Broken Blood Bags **Statistical Decision** Ho : Reject Test Statistic is significant at 0.05. **Conclusion** Statistical Knowledge and Broken Blood Bags are not independent.	Assoc	
4	**Client Perspective equal Customer Satisfaction** Ho : Customer Satisfaction-Aft equal to {Constant} Ha : Customer Satisfaction-Aft not equal to {Constant} **Statistical Decision** Ho : Reject Test statistics is significant at 0.05 **Conclusion** Customer Satisfaction is not unimportant	Likert	

5	**Integrated Thermal Design Optimization Integrated Power Electronics Module** Ho : Optimization Not successful Ha : Optimization Is successful	NonHyp	
6	**SELECT TOPIC SELECT MODIFIER SELECT ISSUE**		

Research Conclusion

No.	Aims and Test Status	Test Type	Test Icon	Status
1	Aim : To show that Statistical Knowledge is associate to Blood Preservation in Broken Blood Bags Result : Enough statistical evidence To show that Statistical Knowledge is associate to Blood Preservation in Broken Blood Bags	McNemar		
2	Aim : To demonstrate Integrated Thermal Design Optimization of Integrated Power Electronics Module Computers Result : Not enough evidence To demonstrate Integrated Thermal Design Optimization of Integrated Power Electronics Module Computers	NonHyp		
3	Aim : To demonstrate that Black Belt Certification increases Customer Satisfaction in Mobile Blood Unit Result : Enough statistical evidence To demonstrate that Black Belt Certification increases Customer Satisfaction in Mobile Blood Unit	T-Test_2S		
4	Aim : To demonstrate that Statistical Knowledge can reduce Broken Blood Bags in Blood Preservation Result : Not enough statistical evidence To demonstrate that Statistical Knowledge can reduce Broken Blood Bags in Blood Preservation	T-Test_Paired		
5	Aim : To conduct a survey of Client Perspective equal Customer Satisfaction Blood Preservation Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction Blood Preservation	Likert		

While there are many methods for improvement, Six Sigma is the best way to reduce Blood Bag Wastage in Ampang Hospital

Text Editor

Discussion

Discussion of Findings

Discussion of the findings with respect to Ampang

Technology advancement

The researcher believes the current state of technology available in Kuwait must benefit of the general public. This improve accessibility to the data in KCBB. With the advancement of technology the general public should be able to have a better sy public sectors.

Costs

The deployment of Six Sigma helps ACBB to reduce the financial wastage due to the systematic reduction of the discarded ACBB does not require capital investment but only investment in human capital development. With the investment in huma productive and contribute better towards the GDP of Ampang.

Globalization

Countries in the GCC region can now enjoy better service and blood product from ACBB as it becomes a Six Sigma organi of a better service and product. Communications and waiting time can also be reduced in view of the technology advancem

Recommendations

Result : Enough statistical evidence To show that Statistical Knowledge is associate to Blood Preservation in Broken Blood Bags

Action 1: Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood Preservation

Action 2: Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood Preservation

On this occasion the researcher only conducted the general HFMEA. The researcher recommends that the Revised HFMEA must be done to ascertain and monitor that the recommendations and implementations are checked and balanced for improvement as intended.

Result : Not enough evidence To demonstrate Integrated Thermal Design Optimization of Integrated Power Electronics Module Computers

Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood Preservation

Before the Revised HFMEA can be implemented the team needs to determine the recommendations to reduce RPN. Following are the activities need to be carried out in deploying the Revised HFMEA: Assigned each cause to a responsible person in the organization, Allow a reasonable time frame for the recommended corrective actions to be implemented,

Result : Enough statistical evidence To demonstrate that Black Belt Certification increases Customer Satisfaction in Mobile Blood Unit

The researcher recommends that Statistical Knowledge cannot be overlooked in the quest for improving, that is, reducing the amount of Broken Blood Bag.

Implement the recommendations and put in place the control as per the recommendation, Recalculate all the RPN¿s, And continue doing this until the process in place is reduced from all potential failures.

Result : Not enough statistical evidence To demonstrate that Statistical Knowledge can reduce Broken Blood Bags in Blood Preservation

Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood Preservation

Implement the recommendations and put in place the control as per the recommendation, Recalculate all the RPN¿s, And continue doing this until the process in place is reduced from all potential failures.

Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction Blood Preservation

Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood Preservation

Implement the recommendations and put in place the control as per the recommendation, Recalculate all the RPN¿s, And continue doing this until the process in place is reduced from all potential failures.

Future Work

Result : Enough statistical evidence To show that Statistical Knowledge is associate to Blood Preservation in Broken Blood Bags

Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood Preservation

To incorporate the Improve and Control phase measures in the Six Sigma initiative. To incorporate the Customer Satisfaction survey perhaps using the ServQual model to study the customer satisfaction level. The customer satisfaction level could be monitored to measure the index on an ongoing basis.

Result : Not enough evidence To demonstrate Integrated Thermal Design Optimization of Integrated Power Electronics Module Computers

Result : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood PreservationResult : Enough statistical evidence To conduct a survey of Client Perspective equal Customer Satisfaction in the Blood Preservation

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Result : Enough statistical evidence To demonstrate that Black Belt Certification increases Customer Satisfaction in Mobile Blood Unit

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Result : Not enough statistical evidence To demonstrate that Statistical Knowledge can reduce Broken Blood Bags in Blood Preservation

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To incorporate the Improve and Control phase measures in the Six Sigma initiative. To incorporate the Customer Satisfaction survey perhaps using the ServQual model to study the customer satisfaction level. The customer satisfaction level could be monitored to measure the index on an ongoing basis.

Limitations

Scope

The study covers the discarded blood bags. The study will be focused on improving the number of discarded blood units wi
be approximately 6 months.

Limitation of Study

This study is limited to the Six Sigma DMAIC methodology. The study is further limited to the wastage reduction of blood ur
these questions as a starting point, the research will identify a scope of work that will significantly reduce the discarded bloc

The researcher will deploy relevant tools and techniques in the Define, Measure and Analyze phase only. The Improve and
methodology can not be conducted as part of this study. This is due to the fact that Six Sigma methodology requires a form
included as part of this study.

Consequently the likely outcome of the study is highlighted in the recommendation of this study. Likewise the Change Mana
implementation in an organization is excluded from this study as it is not viable to do it because of the resources and time c

Contribution

Contribution of the Study

This study has contributed a valuable experience for the aspiring researcher in terms of learning and conducting a Six Sigma project deployment in an objective way. In terms of new and factual information, this six sigma project deployment has objectively evaluated the processes in the KCBB giving rise to the discarded units of blood bags. The study has enabled the team members to get new insights related to the major problem they are facing. These new information obtained from this study will be used more objectively in developing, designing and managing the Kuwait Central Blood Bank in future.

Appendices

References

Khan, J. F. (2005). *Methods for Literature Review* (Vol. 2). (Teng, A., Eds.,)LA: Prentice

Hemmingway, F. J. (2012). *An introduction to Genetic Algorithms*Kuala Lumpur: Kancil Publications

Rowkins, J. (2010). *An evolution of genetic algorithms method.* (3 ed. Vol. 4).: Longmans

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Khan, J. F. *Methods for Literature Review* (Vol. 2). (Teng, A., Eds.,)LA: Prentice (2005).

Hemmingway, F. J. *An introduction to Genetic Algorithms*Kuala Lumpur: Kancil Publications (2012).

Rowkins, J. *An evolution of genetic algorithms method.* (3 ed. Vol. 4).: Longmans (2010).

Thesis Progress

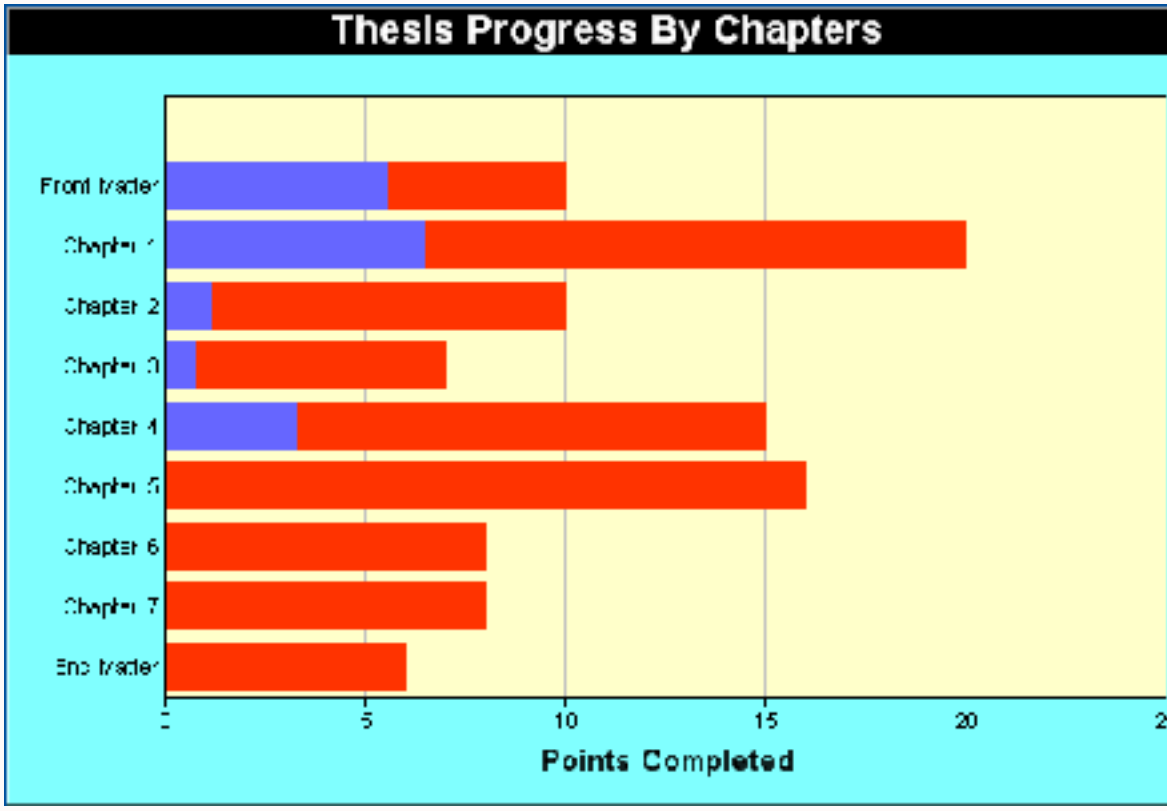
Thesis Progress Data			Completed	Not Completed	Points
−	1	**Front Matter**	**5.60**	**4.40**	**10.00**
	1	Cover	0.50	0.50	1.00
	2	Abstract	2.50	2.50	5.00
	3	TOC	0.80	0.20	1.00
	4	Declaration	0.30	0.70	1.00
	5	Acknowledgment	0.80	0.20	1.00
	6	Dedication	0.70	0.30	1.00
−	2	**Chapter 1**	**6.50**	**13.50**	**20.00**
	1	Proof of Need	1.20	1.80	3.00
	2	Thesis Statement	0.80	1.20	2.00
	3	Main Research Questions	1.20	2.80	4.00
	4	Sub Research Questions	0.90	2.10	3.00
	5	Hypothesis	1.50	3.50	5.00
	6	Aims	0.60	1.40	2.00
	7	Objectives	0.30	0.70	1.00
−	3	**Chapter 2**	**1.20**	**8.80**	**10.00**
	1	Literature Review	1.20	4.80	6.00
	2	Desktop Research	0.00	2.00	2.00
	3	Collaborative Research	0.00	2.00	2.00
−	4	**Chapter 3**	**0.80**	**6.20**	**7.00**
	1	Research Strategy	0.80	3.20	4.00
	2	Research Design	0.00	3.00	3.00
−	5	**Chapter 4**	**3.30**	**11.70**	**15.00**
	1	Research Methodology	2.00	3.00	5.00
	2	Questionnaire Design	1.00	4.00	5.00
	3	Sample Size	0.20	1.80	2.00
	4	Etiquette	0.10	0.90	1.00
	5	Pretest	0.00	2.00	2.00
−	6	**Chapter 5**	**0.00**	**16.00**	**16.00**
	1	Data Collection	0.00	8.00	8.00
	2	Data Analysis	0.00	8.00	8.00
−	7	**Chapter 6**	**0.00**	**8.00**	**8.00**
	1	Data Findings	0.00	4.00	4.00
	2	Verification	0.00	2.00	2.00
	3	Validation	0.00	2.00	2.00
−	8	**Chapter 7**	**0.00**	**8.00**	**8.00**
	1	Conclusion	0.00	3.00	3.00
	2	Limitation	0.00	1.00	1.00
	3	Recommendation	0.00	2.00	2.00
	4	Contribution	0.00	1.00	1.00
	5	Future Work	0.00	1.00	1.00
−	9	**End Matter**	**0.00**	**0.00**	**6.00**

1	Appendix	0.00	2.00	2.00
2	References	0.00	2.00	2.00
3	Bibliography	0.00	2.00	2.00
Progress Data Total		**17.40**	**82.60**	**100.00**

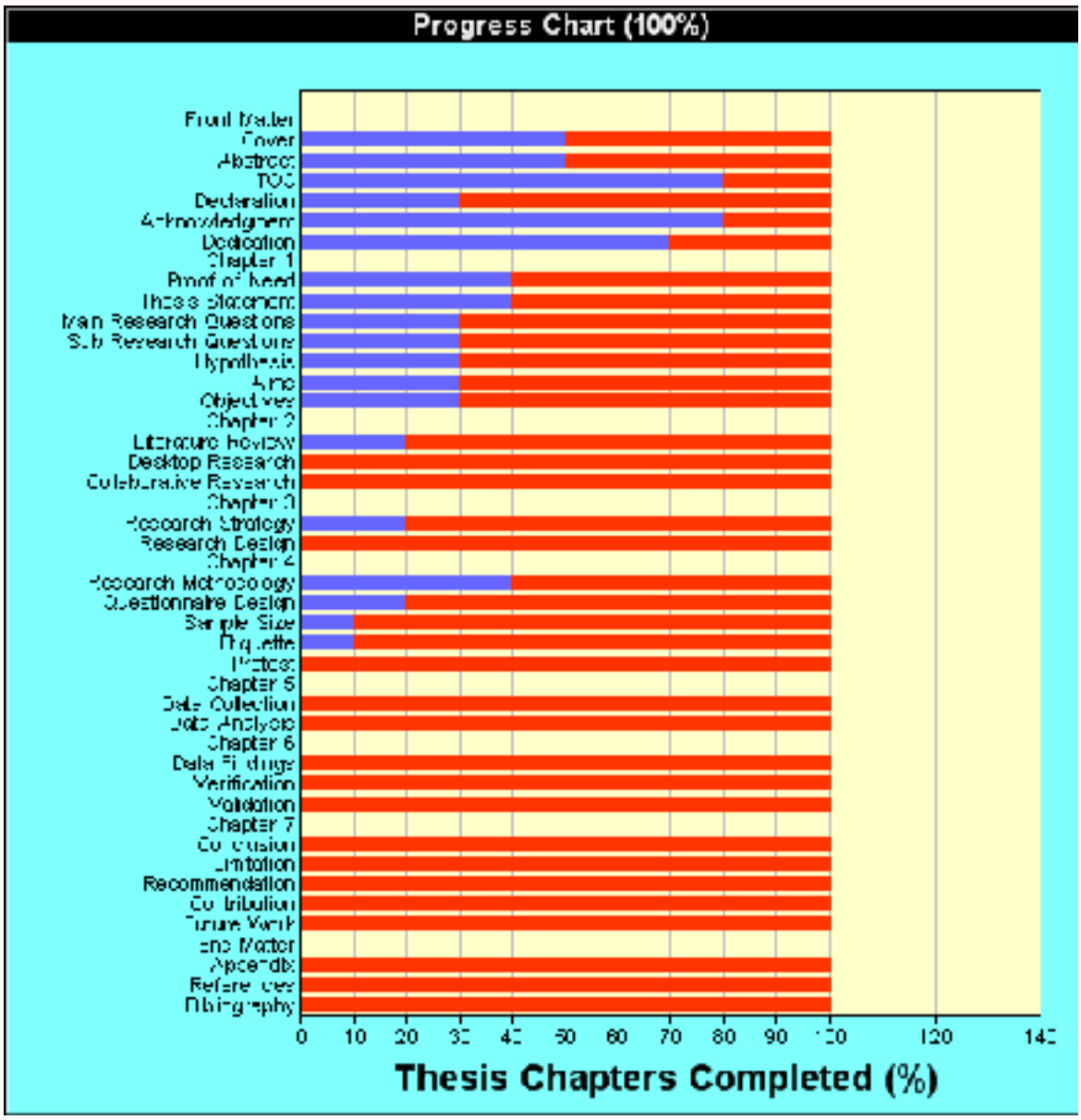
Thesis progress

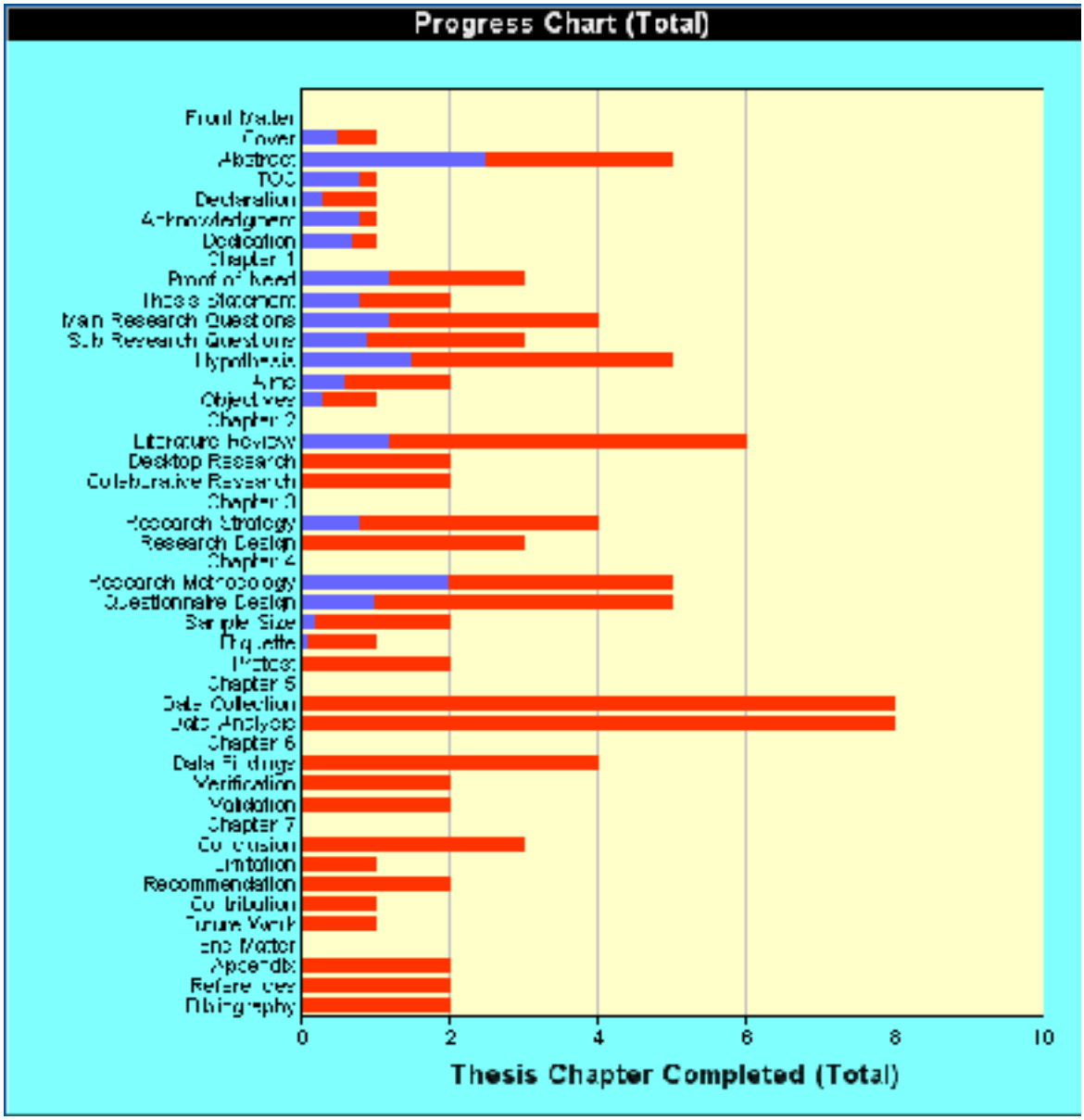
There has been good progress in this thesis. Thesis Progress allows you to track your progress. As you continue to work on your thesis, you need to update Thesis Progress. Thesis Progress then allows you to visualize how much work has been completed and how much work more work needs to be completed.

Progress Chart



Detail Chart




Progress Chart (Total)
Thesis Chapter Completed (Total)
0
2
4
6
8
10