

BUSINESS CASE ANALYSIS

1.1 BUSINESS CASE

In order to determine the value of an alternative implementation for biometric enterprise architecture, Team Biometrics resolved to assess the relative cost of implementing and maintaining the software that comprises each implementation of biometrics enterprise architecture; the “As-Is” (or current implementation) and the “To-Be” (prospective implementation). The Team has created a Biometrics enterprise architecture using the CORE modeling tool, incorporating the requirements from our requirements document in Appendix D. Using that architecture an assessment of the function points was conducted and recorded as depicted in the Function Point Basis Tables below. These function points were fed along with other factors as specified in Appendix C into a cost modeling tool called the Constructive Cost Model II (COCOMO II) to arrive at a cost level of effort to produce and maintain both the As-Is and To-Be implementations of the biometrics enterprise architecture.

Nominal	ILF/EIF	EO/EI	EIP		
Data Elements	20-50	6-19	5-15		
RecordElements/File Types	6+	4+	3+		
				Value	
		As-Is	To-Be	As-Is	To-Be
Internal Logic File	ILF	Nominal	Higher	High	High
External Interface File	ELF	Nominal	Lower	High	Average
External Input	EIP	Nominal	Higher	High	High
External Output	EO	Nominal	Higher	High	High
External Inquiry	EI	Nominal	Higher	High	High

Figure 1 Function Point Table Basis I

				Number of Function Points (As-Is Nominal)					
Complexity Wt				As Is			To Be		
As-Is	To-Be	As Is	To Be	L	A	H	L	A	H
Nominal	Higher	10	15	2	4	6	4	8	12
Nominal	Lower	7	5	2	4	6	1	2	3
Nominal	Lower	4	3	2	4	6	4	8	12
Nominal	Higher	5	7	2	4	6	4	8	12
Nominal	Higher	4	6	2	4	6	4	8	12

Figure 2 Function Point Table Basis II

The Function Point Table Bases (Basis I and Basis II) were used to produce COCOMO II generated cost figures as described in the “Sales and Pricing Table” and a “Cash Flow Table” for both the As-Is model and the “To-Be” model as shown below.

The Sales and Pricing Table for both As-Is and To-Be depict the quantity sales over the study timeframe of 5 years. In the As-Is case, since there are existing implementations the assumption is made that there is a steady revenue generation occurring based on adding 5 new installations of As-Is capabilities per year. IN the To-Be case, there are similar sales, but the To-Be sales are offset, in the first two years, by sales of the existing To-Be products.

BUSINESS CASE ANALYSIS

The Cash Flow tables for the To-Be case only depicts cash flows for the As-Is infrastructure, where the To-Be Cash Flow Table shows cash flows occurring for both systems sales. While the To-Be does start out with selling both As-Is and To-Be capabilities, the To-Be case, ends up just accounting for only To-Be sales, as sales for the As-Is product ceases after the second year.

		AS-IS Sales and Pricing Table				
Inputs		Yr0	Yr1	Yr2	Yr3	Yr4
Sales		Current				
As Is		5	5	5	5	5
Total		5	5	5	5	5
Pricing		Current	Price Change			
As Is		106072	1.1			
As Is			Yr1	Yr2	Yr3	Yr4
Costs		Dev	Maint			
As Is	Expected	324846	282929	443051	693792	1086436
As-Is	Low (Optimal)	201841	175796	275287	431083	675050
As-Is	High (Pessimistic)	315377	274682	430136	673569	1054767
Discount Rate			10.00%			
Output						
NPV			\$10.18			

Figure 3 As-Is Sales and Pricing Table

		As-Is Cash Flow				
Units		Period 0	Period 1	Period 2	Period 3	Period 4
As Is		5	5	5	5	5
Total		5	5	5	5	5
Revenue						
As Is		530360	530360	530360	530360	530360
Total		530360	530360	530360	530360	530360
Costs						
Exp Dev As Is		324846				
Exp Yr 1 As Is			282929			
Exp Yr 2 As Is				443051		
Exp Yr 3 As Is					693792	
Exp Yr 4 As Is						1086436
Total		324846	282929	443051	693792	1086436
Net Profit		205514	247431	87309	-163432	-556076
NPV		\$10.18				

Figure 4 As-Is Cash Flow Table

BUSINESS CASE ANALYSIS

		To-Be Sales and Pricing Table					
Inputs		Yr0	Yr1	Yr2	Yr3	Yr4	Total
Sales	Current						
As Is		5	3	0	0	0	8
To Be		0	2	5	5	5	17
Total		5	5	5	5	5	25
		Current	Price Change				
As Is		106072	1.1				
To Be		106072	1.1				
			Yr1	Yr2	Yr3	Yr4	
Costs		Dev	Maint				
As Is	Expected	324846	282929	443051	693792	1086436	
To Be	Expected	252302	100540	122075	148220	179973	
As-Is	Low (Opt)	201841	175796	275287	431083	675050	
To Be	Low (Opt)	201841	80432	97660	118576	143978	
As-Is	High (Pess)	315377	274682	430136	673569	1054767	
To Be	High (Pess)	315377	125675	152594	185275	224966	
Discount Rate							
Expected			10.00%				
Output							
NPV			\$1,093,548.51				

Figure 5 To-Be Sales and Pricing Table

		To-Be Cash Flow Table					
Units	Period 0	Period 1	Period 2	Period 3	Period 4	Total	
As Is	5	3	0	0	0	8	
To Be	0	2	5	5	5	17	
Total	5	5	5	5	5	25	
Revenue							
As Is	530360	318216	0	0	0	848576	
To Be	0	212144	530360	530360	530360		
Total	530360	530360	530360	530360	530360		
Costs							
Exp Dev As Is	324846					324846	
Exp Dev To Be	0						
Exp Yr 1 As Is		282929					
Exp Yr 1 To Be		100540					
Exp Yr 2 As Is			0				
Exp Yr 2 To Be			122075				
Exp Yr 3 As Is				0			
Exp Yr 3 To Be				148220			
Exp Yr 4 As Is					0		
Exp Yr 4 To Be					179973		
Total	324846	383469	122075	148220	179973		
Net Profit	205514	146891	408285	382140	350387		
NPV		\$1,093,548.51					

Figure 6 To-Be Cash Flow Table

BUSINESS CASE ANALYSIS

These cash flow values were obtained from using COCOMO to derive the values that are contained in the Sales and Pricing Tables for both the As-Is and the To-Be case.

Using a hourly labor rate of \$200 per person (a \$115,000 yearly salary) and a nominal schedule, COCOMO II calculated that the expected cost of software development and maintenance for the As-Is case to be \$324,846 to develop and maintain existing Biometric software. Corresponding pessimistic and optimistic values were recorded as well and are found in Appendix C.

Likewise for the To-Be situation, COCOMO II calculated the expected cost of software development and maintenance to be \$252,302. Corresponding pessimistic and optimistic values were recorded as well and are found in Appendix C.

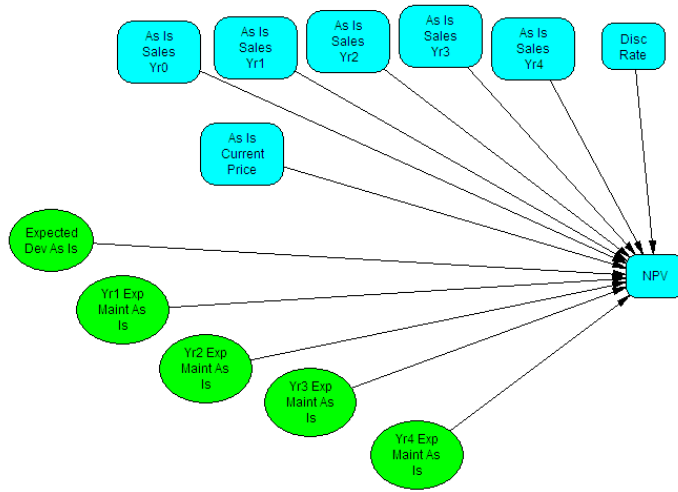
1.1.1 ASSUMPTIONS AND NPV COMPARISON OF BASE CASE (AS-IS) TO ALTERNATIVE (TO-BE)

In developing a Cost Analysis for the Biometric Enterprise architecture, we made several assumptions to determine our estimations. We assumed that Biometric Enterprise capabilities would sell, in the base case (As-Is) at a flat rate for “As-Is only” sales that As-Is sales would fall while introducing To-Be capabilities as shown in the tables. For value over time, to compare As-Is to To-Be we assume a nominal discount rate of 10% for the five year period. Using these as a basis we set the price for the As-Is situation so that Net Present Value (NPV) without considering other expectations, using the As-Is expected values, is nearly equal to zero.

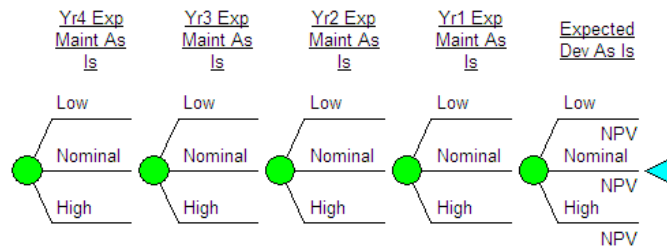
We then used that price to model the NPV of the To-Be case to ascertain the value of implementing the To-Be capabilities. We expect the NPV of the To-Be case to be higher than the NPV of the As-Is case and in fact, when the price is set at \$106,072, in the As-Is case, NPV is \$10.00 (nearly zero). Using this same price (\$106,072) in the To-Be case, the NPV is \$1,093,548. This is a significant difference. These figures, from the COCOMO II model, along with the expected, pessimistic and optimistic values for the As-Is and To-Be cases were introduced into Syncopation’s DPL7[®] decision and risk analysis tool to assess the true nature of the NPV and its relationship to the expected outcomes for both cases. The expectation is the same, that the NPV of the TO-Be case will be grater, by some measure as compared to the As-Is case and the resulting risk profile for the To-Be case will be less than that of the As-Is case. The results are shown below in the form of a DPL7 generated Tornado Diagram and a NPV Risk Profile both for each of the As-Is and the To-Be models:

BUSINESS CASE ANALYSIS

As-Is DPL-generated Influence Diagram with chance nodes assigned using the COCOMO II generated expectations:

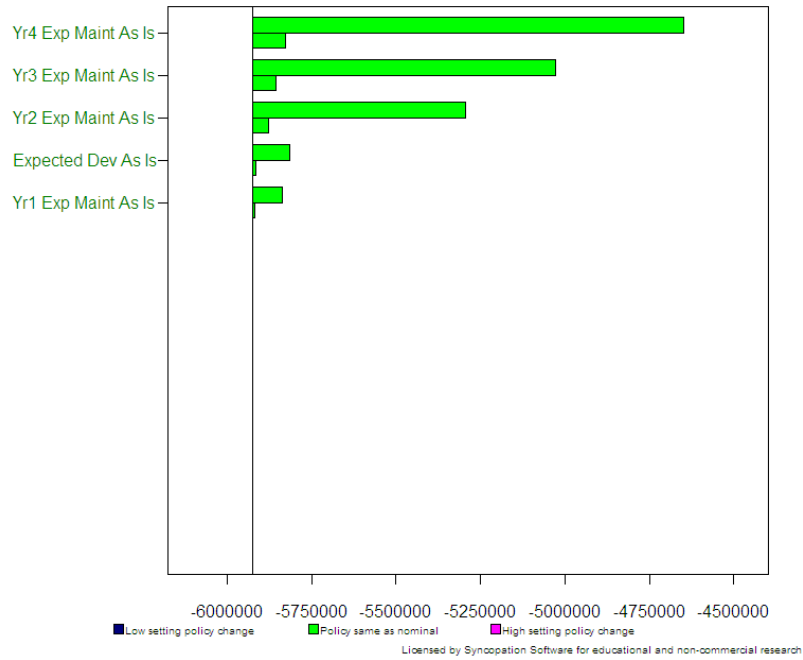


As-Is Chance Nodes:

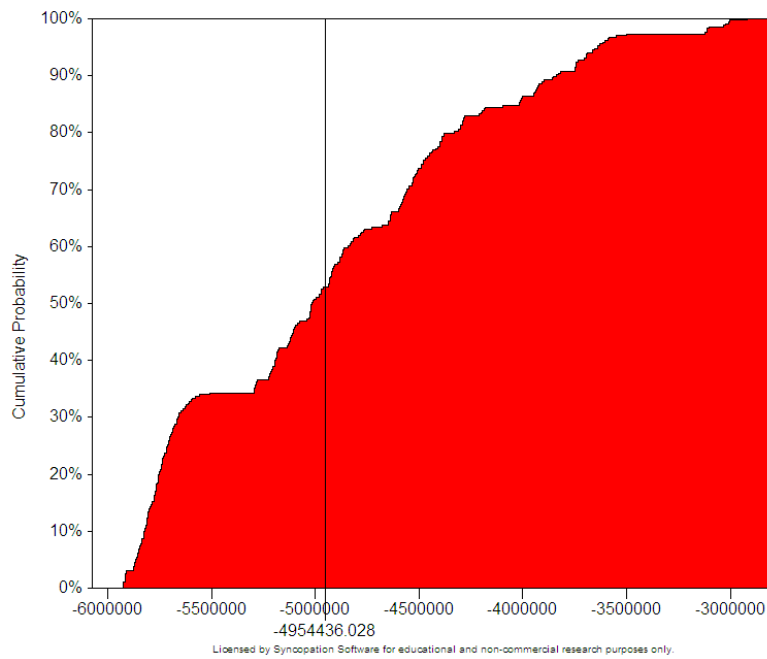


BUSINESS CASE ANALYSIS

As-Is Base Case Tornado Diagram:

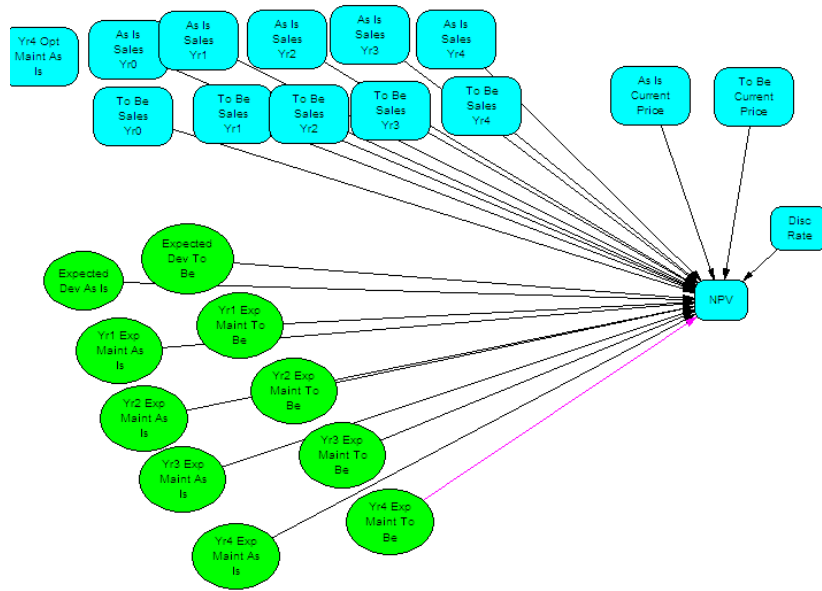


As-Is Risk Profile with Expected NPV:

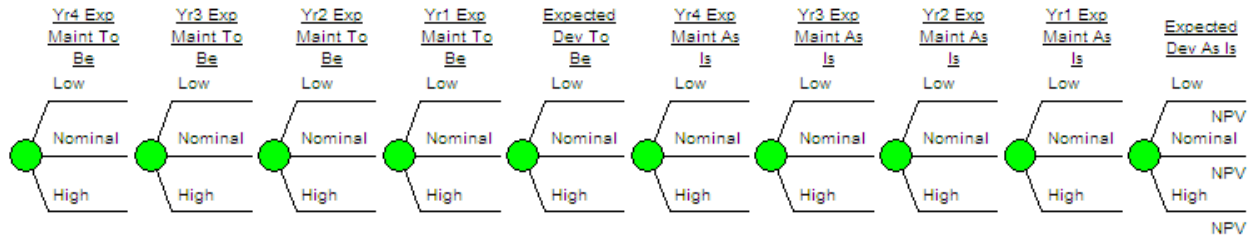


BUSINESS CASE ANALYSIS

To-Be DPL-generated Influence Diagram with chance nodes assigned using the COCOMO II generated expectations:

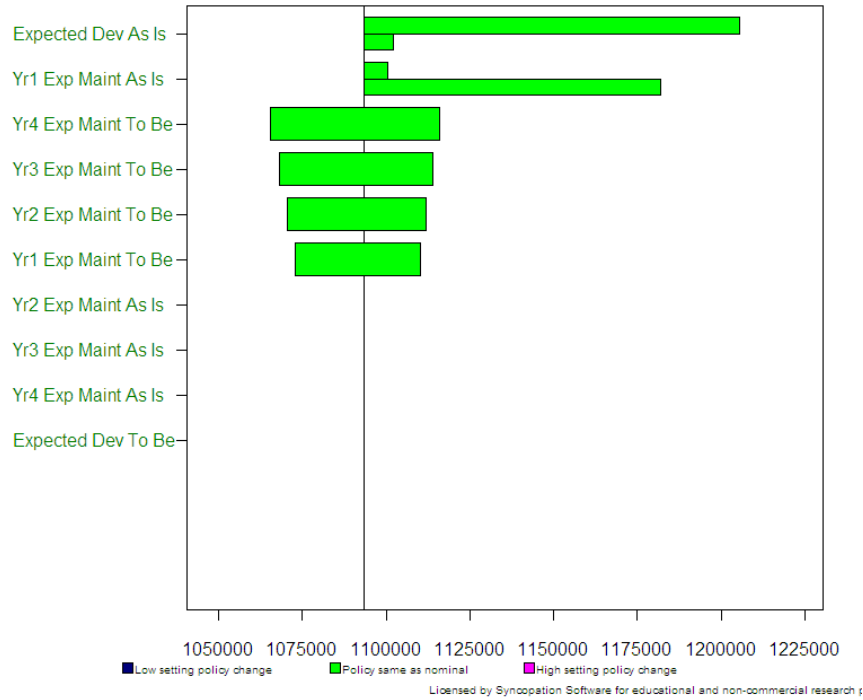


To-Be Chance Nodes:

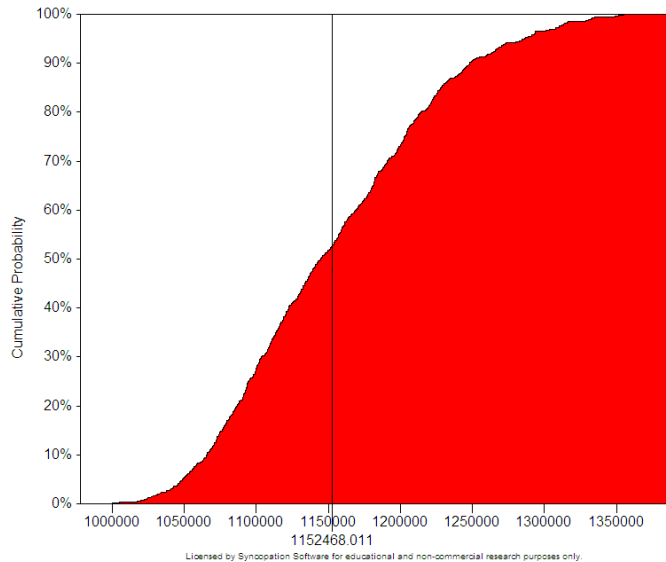


BUSINESS CASE ANALYSIS

To-Be Tornado Diagram:



To-Be NPV Risk Profile:



With these results it is very easy to see that the To-Be implementation has a positive NPV while the As-Is implementation is a negative overall expected NPV. There is risk to the To-Be implementation as there is some level of risk in not realizing the expected NPV.