

4.4.2 Non-functional Requirements Assessment

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Assessing the Alternatives

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Non-Functional requirements are by nature, hard to measure and hard to assess for compliance. The complexity of the assessment problem is compounded because products or systems as well as the environment they operate within are not static. Therefore, an assessment that is done today, may no longer be accurate in the future. When assessing [Commercial Off-The-Shelf \(COTS\)](#), [Government Off-The-Shelf \(GOTS\)](#), [Modified Off-The-Shelf \(MOTS\)](#) or [NATO Off-The-Shelf \(NOTS\)](#) or the inclusion of [Open Source Software \(OSS\)](#) the potential for changes (particularly enhancements) needs to be assessed also.

One way to accomplish this is to provide an assessment which is weighted for the “ease of implementation” for new features. For example, a system or product may not have done much to support [4.3.4.1 Confidentiality](#), but the vendor of the product must determine that it is an easy upgrade to add it to the product. On the other hand, the support for **Confidentiality** might be extremely difficult. Sometimes, the feature may be easy to solve but requires time and money to accomplish. As a potential stakeholder, they can direct resources to help overcome this shortfall.

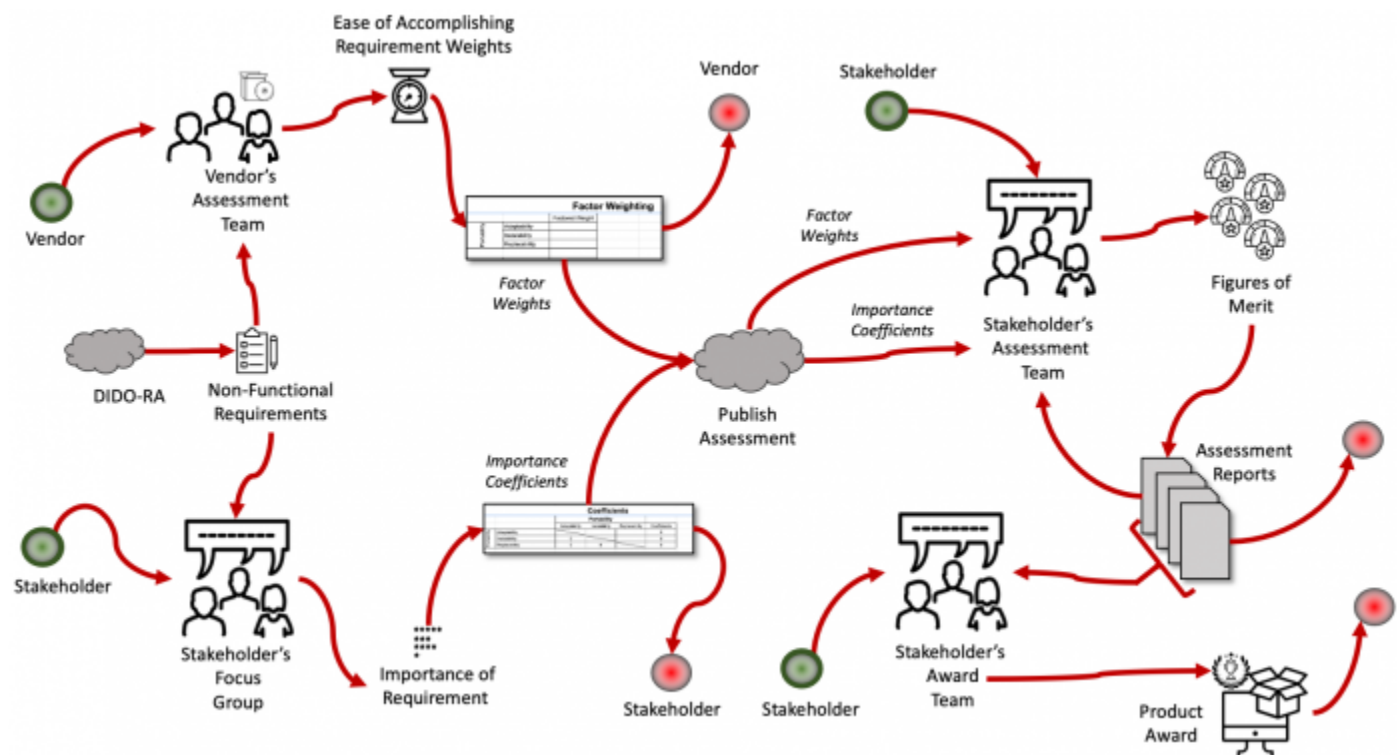


Figure 1: An overview of the Assessment Process

The Vendor's Assessment

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The Vendor's assessment team must discuss with each other and use the DIDO-RA workbook to determine the weight of the requirement.

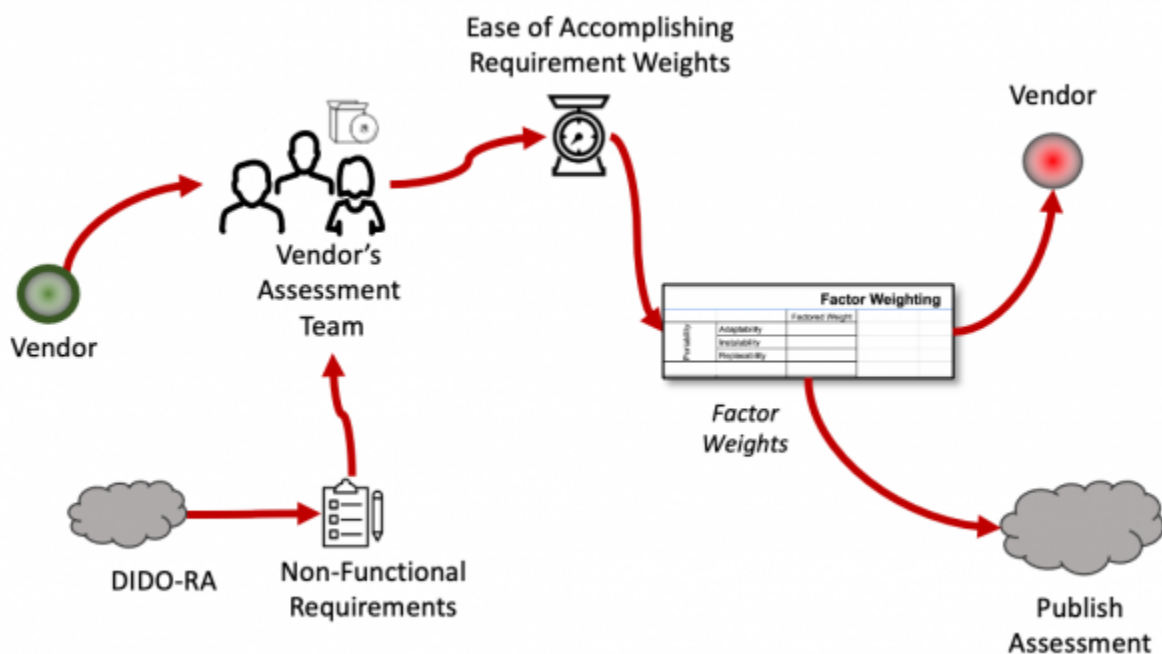


Figure 2: The Vendor's Assessment Team Activities

This is done by weighing each property, related to the Requirement, by giving a score between 1-100. 1 representing an easy development process, and 100 being impossible now, merely very difficult in a couple years.

Factor Weighting		
Portability	Adaptability	
	Instalability	
	Replacability	
Reliability	Maturity	
	Availability	
	Fault Tolerance	
	Recoverability	
Maintainability	Modularity	
	Reusability	
	Analasability	
	Modifiability	
	Testability	
Securability	Confidentiality	
	Data Integrity	
	Non-Repudiation	
	Authenticity	
	Accountability	
Manageability	Type of Manageability Functions	
	Manageability Cost	
	System Manageability Issues	
	Software Manageability Issues	
Usability	Effectiveness Metrics	
	Efficiency Metrics	
	Satisfaction Metrics	
Performance	Platform Performance	
	Application Performance	
	Network Performance	

		Factored Weight
Portability	Adaptability	
	Instalability	
	Replacability	

1. In these cells input a number between 1 and 100

2. Do this for each cell next to a requirement.

		Factored Weight
Portability	Adaptability	25
	Instalability	10
	Replacability	30

1. These are the factor weightings

Publish the assessment, and notify the vendor..

The Stakeholder's Focus Group

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The Vendor's stakeholder assessment team must create a focus group of stakeholder's. This group is used in conjunction with the stakeholder assessment team to determine the importance of the Requirement and potentially direct more or less resources to this area.

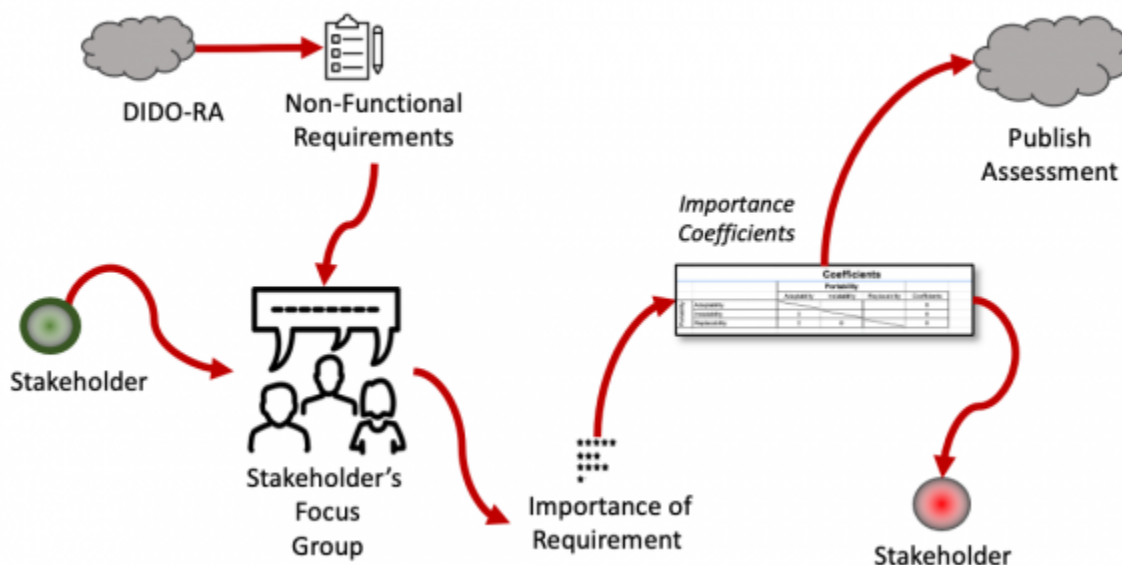


Figure 5: The Stakeholder's Focus Group Activities

This is done by rating each property related to the requirement with either a '+' option representing a 'more important' status, or a '-' option representing a 'less important' status. On the Coefficient sheet choosing a '+' will cause a '-' to be put in the opposite cell in the table. EX: cell(1,2)='+' means cell(2,1)='-'. Also properties can't be compared to themselves, these cells have lines drawn through them to represent this.

Coefficients						
Portability	Portability			Coefficients		
	Adaptability	Instability	Replacability			
	Adaptability					
	Instability	0				
Reliability	Reliability			Coefficients		
	Maturity	Availability	Fault Tolerance	Recoverability		
	Maturity					
	Availability	0				
Maintainability	Maintainability			Coefficients		
	Modularity	Reusability	Analsability	Modifiability	Testability	
	Modularity					
	Reusability	0				
Securability	Securability			Coefficients		
	Confidentiality	Data Integrity	Non-Repudiation	Authenticity	Accountability	
	Confidentiality					
	Data Integrity	0				
Manageability	Manageability			Coefficients		
	Type of Manageability Functions	Manageability Cost	System Manageability Issues	Software Manageability Issues		
	Type of Manageability Functions					
	Manageability Cost	0				
Usability	Usability			Coefficients		
	Effectiveness Metrics	Efficiency Metrics	Satisfaction Metrics			
	Effectiveness Metrics					
	Efficiency Metrics	0				
Performance	Performance			Coefficients		
	Platform Performance	Application Performance	Network Performance			
	Platform Performance					
	Application Performance	0				

1. Click on the arrow and choose one of the three options.

2. Do this for every requirement.

At the end of filling out each table. Each row is counted for '+', the number of '+' in a row is equal to the coefficient for that property.

Portability				
Portability	Adaptability	Instability	Replacability	Coefficients
	Adaptability	-	+	1
	Instability	+	+	2
	Replacability	-	-	0

2. Add the +’s in each row to find the coefficient for that requirement.

When completed publish the assessment and notify the stakeholder's.

The Stakeholder's Assessment Team

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Once the assessments and importance coefficients are set, the DIDO-RA is passed to the stakeholder's assessments team. Here they must take the factor weighting and the coefficients to create the [Figure of](#)

Merit (FoM). These figures are then published to assessment reports that are given to the Vendor, and/or given back to the stakeholder's assessment team for further review.

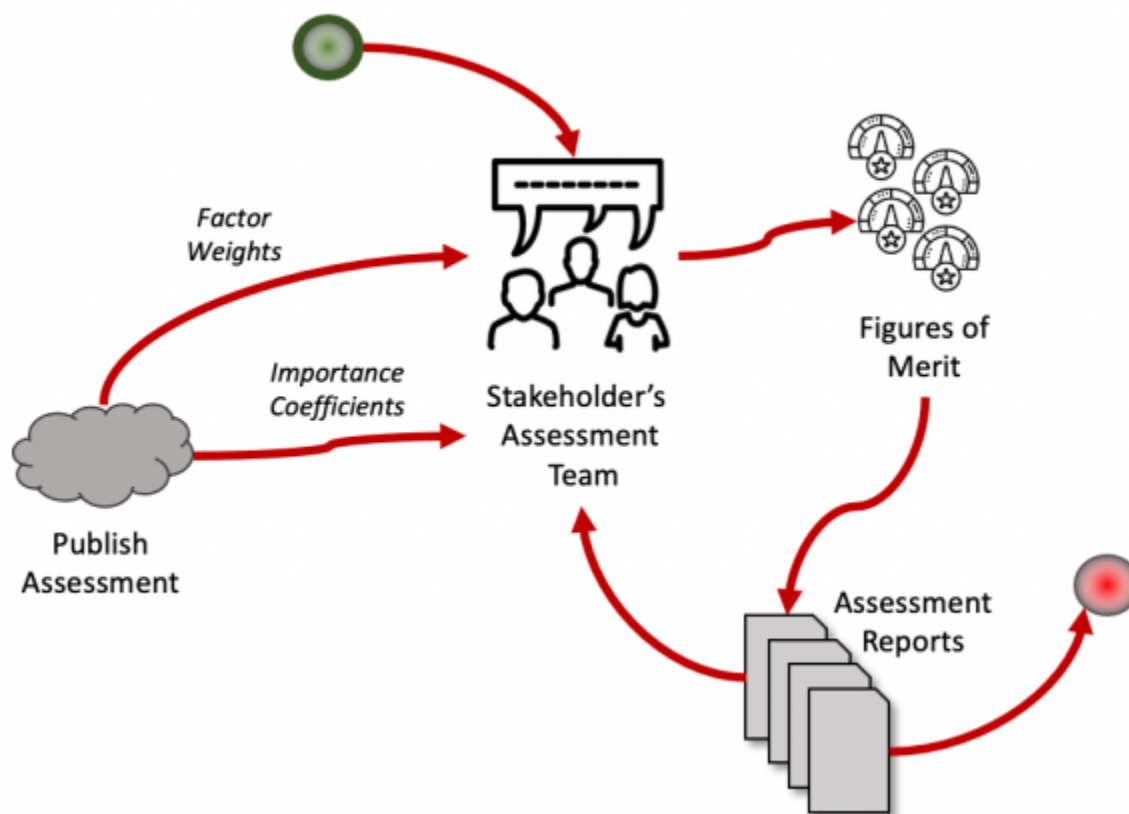


Figure 8: The Stakeholder's Assessment Team Activities

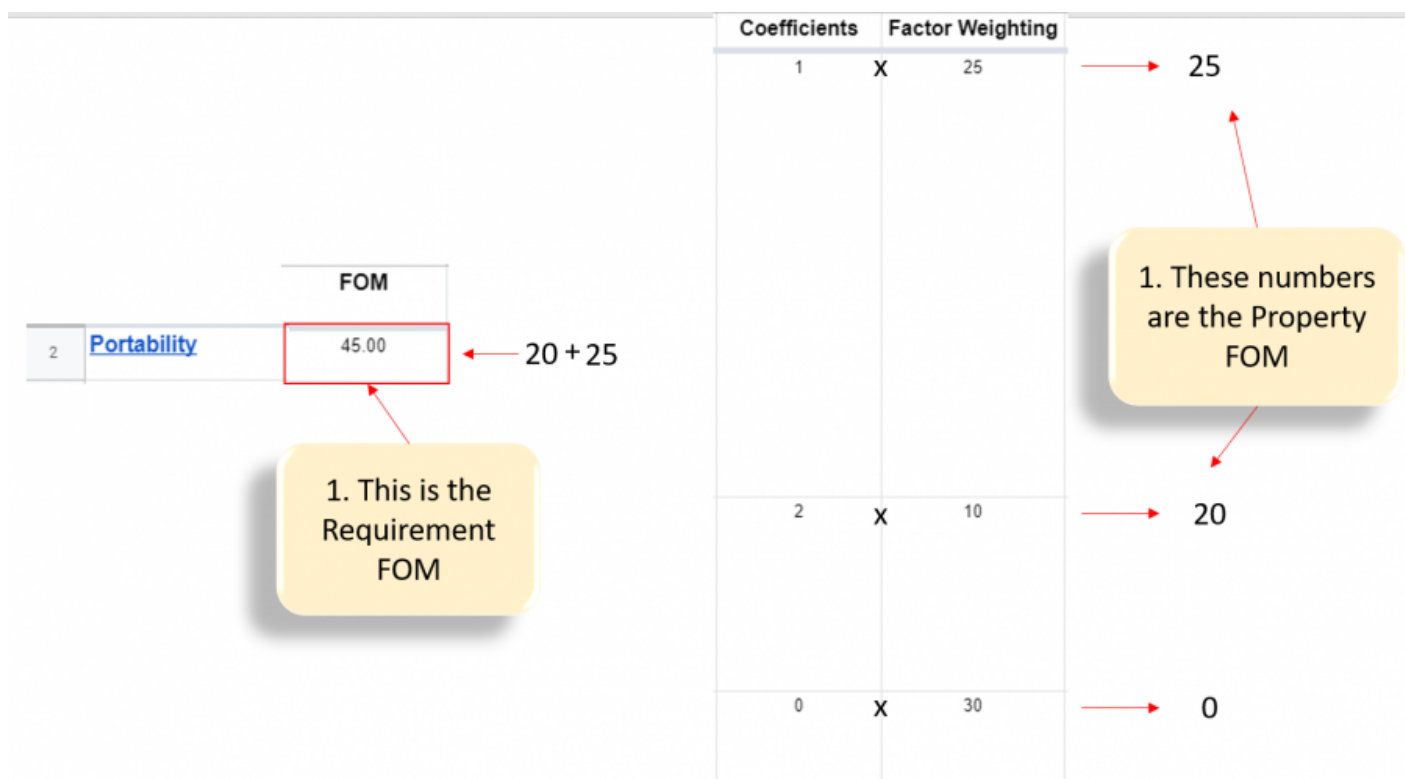
In the DIDO-RA workbook after the Coefficient/Factor Weight sheets are filled out, those values associated with the requirement, are then sent to the corresponding Requirement Sheets in the workbook.

Coefficients	Factor Weighting
1	25
2	10
0	30

1. This column has data from the Coefficient sheet

2. This column has data from the Factor Weighting sheet

This data is then used to create the **FOM(Figures of Merit)**. The formula to calculate the $FOM = (C1)(FW1) + (C2)(FW2) + (Cn)(FWn)$ for each property. These Property FOMs are then added into a Requirement FOM.



NOTE: Comparing Requirement FOMs from one vendor to another will cause a skewed comparison. To compare between vendors you must break the Requirement FOMs into its components. The components of Requirement FOM are the Property FOMs.

The Stakeholder's Award Team

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The stakeholder's receive the Assessment Reports as well, if they deem the results satisfactory they will choose the product just reviewed.

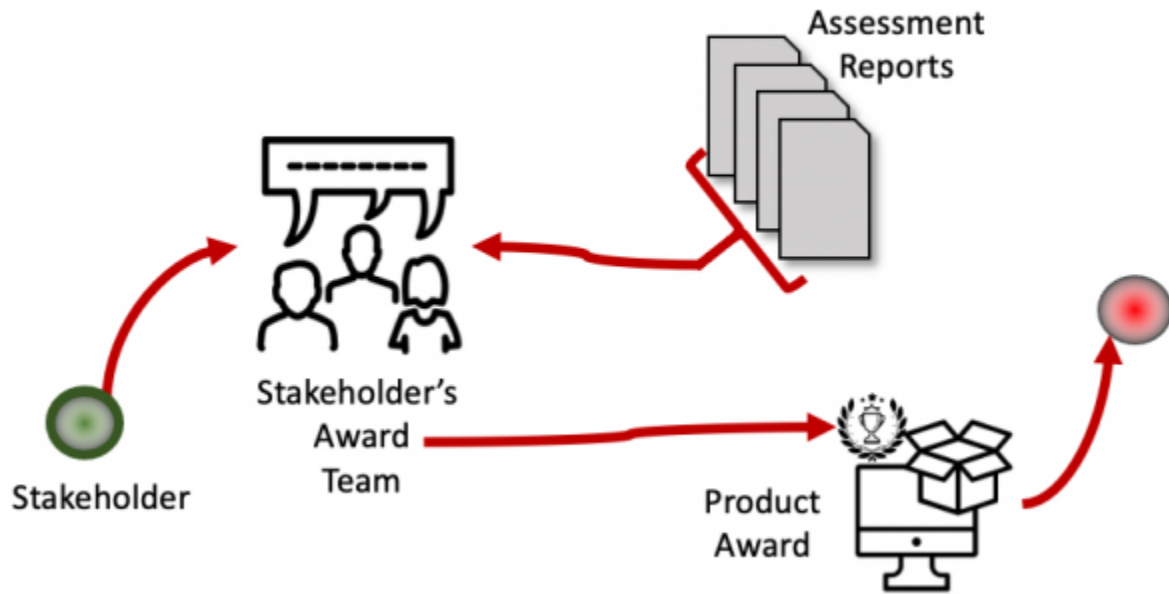


Figure 11: The award is usually your software is chosen to be used.

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Last update: 2021/03/24 19:15

