ISO 27001 Implementer's Forum

Matrices for Asset Valuation and Risk Analysis

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Distribution List

Apex Committee	To approve and authorize
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Amendment History

Version No	Page No	Details of Amendment	Amendment Date	Approved By

1. Asset Valuation Matrix

Hypothesis

1. Confidentiality, Integrity and Availability of information will have minimum valuation as 1.
2. The value of levels for Confidentiality, Integrity and Availability are taken as follows:

Low	1
Medium	2
High	3

3. Asset value is determined by sum of all (attribute * its level).
4. Example

Confidentiality	Integrity	Availability	Asset Value
High	High	High	3 + 3 + 3 = 9
Medium	Medium	Medium	2 + 2 + 2 = 6
Low	Low	Low	1 + 1 + 1 = 3
High	Medium	Low	3 + 2 + 1 = 6

Asset Valuation Matrix [Table 1]

Table 1	CIA Matrix									
	Confidentiality	Low			Medium			High		
	Integrity	L	M	H	L	M	H	L	M	H
Availability	Low	3	4	5	4	5	6	5	6	7
	Medium	4	5	6	5	6	7	6	7	8
	High	5	6	7	6	7	8	7	8	9

2. Severity and Threat Vulnerability Matrix [Table 2]

Hypothesis:

The value of levels for severity of threat and vulnerability are taken as follows:

Low	1
Medium	2
High	3

The severity value matrix will be mathematical Asset Value * Severity of Threat Value * Severity of Vulnerability Value.

Example

Asset Value	Severity of Threat	Severity of Vulnerability	Severity Matrix Value
3	Low = 1	Medium = 2	3 * 1 * 2 = 6
4	High = 3	High = 3	4 * 3 * 3 = 36
5	High = 3	High = 3	5 * 3 * 3 = 45
9	High = 3	High = 3	9 * 3 * 3 = 81

Table 2	Severity of Threat and Vulnerability									
Severity of Threat		Low			Medium			High		
Severity of Vulnerability		L	M	H	L	M	H	L	M	H
Asset Value	3	3	6	9	6	12	18	9	18	27
	4	4	8	12	8	16	24	12	24	36
	5	5	10	15	10	20	30	15	30	45
	6	6	12	18	12	24	36	18	36	54
	7	7	14	21	14	28	42	21	42	63
	8	8	16	24	16	32	48	24	48	72
	9	9	18	27	18	36	54	27	54	81

3. Risk Impact Matrix [Table 3]

While determining the risk impact matrix probability values are taken as follows:

Probability		
Value	**Explanation**	**Example**
1	Never happened	Not happened in last 3 years
2	Rare	Once in Year
3	Periodic	Once in a Quarter
4	Regular	Once in a fortnight
5	Frequent	Once in a week

Risk Impact is calculated as per following formula:

Risk Impact = Asset Value * Severity Of threat * Severity of Vulnerability * Probability

= Unique Value from Table 2 * Probability

Example

Asset Value	Severity of Threat	Severity of Vulnerability	Probability		Risk Impact Matrix Value
5	High = 3	Low = 1	Periodic = 3	5*3*1*3	45
7	Medium = 2	High = 3	Regular = 4	7*2*3*4	168
9	Medium = 2	High = 3	Regular = 4	9*2*3*4	216
9	High = 3	High = 3	Frequent = 5	9*3*3*5	405

The derived Risk impact table is as follows:

Table 3	Probability	Risk Impact				
		1	2	3	4	5
Table2 values	**3**	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25
	6	6	12	18	24	30
	7	7	14	21	28	35
	8	8	16	24	32	40
	9	9	18	27	36	45
	10	10	20	30	40	50
	12	12	24	36	48	60
	14	14	28	42	56	70
	15	15	30	45	60	75
	16	16	32	48	64	80
	18	18	36	54	72	90
	20	20	40	60	80	100
	21	21	42	63	84	105
	24	24	48	72	96	120
	27	27	54	81	108	135
	28	28	56	84	112	140
	30	30	60	90	120	150
	32	32	64	96	128	160
	36	36	72	108	144	180
	42	42	84	126	168	210
	45	45	90	135	180	225
	48	48	96	144	192	240
	54	54	108	162	216	270
	63	63	126	189	252	315
	72	72	144	216	288	360
	81	81	162	243	324	405

4. Acceptable Risk Level

The Management has decided the business impact as follows;

Value	Business Impact	Lower Limit	Upper Limit
1	Not Considered	0	
2	Negligible		
3	Very Low		
4	Low		
5	Low Medium		
6	High Medium		
7	High		
8	Very High		
9	Destructive		Total Loss

After the analysis, the management has decided following rules for acceptable risk level.

1. A risk impact score Less than multiplication of Highest asset value 9, Very Low Business Impact 3 and Rare Probability 2 is acceptable i.e., less than equal to 9 * 3 * 2 = 54

2. A risk impact score greater than 54 and multiplication of highest asset value 9, low business impact 4 and periodic Probability 3 has to be treated i.e., greater than 54 and less than or equal to 9 * 4 * 3 = 108 has to treated with proper control and brought down below 54.

3. Management will not accept any value greater than 108 and on priority basis such values shall be brought down to acceptable risk level or at least between the range of 55 to 108 and constantly monitored till they reach acceptable risk level.