

Interface Risk Work Sheet

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In [40]: #Interface Management Risk Calculation for depreciation of critical communication
#Meaning a loss of effectiveness of communication resulting in an increase of project costs

import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
```

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In [34]: #import data frame
df = pd.read_csv('Interface_Communication_Risk.csv')
```

Interface Communication Risks

Delays for materials, labour and equipment are in days.

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In [35]: df
```

```
Out[35]:
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	package_value	change_cost	schedule_delay_cost	direct	contractor_level	sub_contractor_level	communica
0	2500000	120000	14000	5	3	12	

```
In [89]: #Create communication pathways
#Communication Pathways
package_value = df.iloc[0,0]
change_cost = df.iloc[0,1]

# schedule delay is per day, includes equipment, and labour.
schedule_delay_cost = df.iloc[0,2]

direct = df.iloc[0,3]
contractor_level = df.iloc[0,4]
sub_contractor_level = df.iloc[0,5]
communication_effectiveness = df.iloc[0,6]

#Calculate communication channels  $N \times (N - 1) / 2$ 
comm_members = direct + contractor_level + sub_contractor_level
communication_channels = ((comm_members)*(comm_members-1))/2
communication_risk = communication_effectiveness * communication_channels

#Lead time in weeks
materials = df.iloc[0,7]
labour = df.iloc[0,8]
equipment_delay = df.iloc[0,9]

#Risk impact
material_delay_risk = (materials * (7 * schedule_delay_cost))
labour_delay_risk = (labour * (7 * schedule_delay_cost))
equipment_delay_risk = (equipment_delay * (7 * schedule_delay_cost))
average = ( material_delay_risk + labour_delay_risk + equipment_delay_risk)/3
impact_contingency_minimum = (communication_risk/communication_channels) * averag
e

#Risk of occurrence without controls
#Potential metrics and risk of communication failure
comm_risks = pd.DataFrame({
    'communication.channels' : [communication_channels],
    'communication.risk' : [communication_risk],
    'material.delay.risk' : [material_delay_risk],
    'labour.delay.risk' : [labour_delay_risk],
    'equipment.delay.risk' : [equipment_delay_risk],
    'impact.contingency.minimum' : [impact_contingency_minimum],
    'impact.to.schedule.minimum' : [impact_contingency_minimum / schedule_delay_c
ost]

})
comm_risks.rename(index={0:'Interface Risk'}, inplace=True)
comm_risks
#new data frame can be exported
```

Out[89]:

	communication.channels	communication.risk	material.delay.risk	labour.delay.risk	equipment.delay.risk
Interface Risk	190.0	76.0	1176000	98000	196000

Conclutions

Minimum schedule impact: 14 days

Forecasted minimum impact: \$196,000.00

Recommendations: Track critical communications to minimize impacts

Unknown Risk: communication pathways EPC, contractors and subcontractor teams may be larger than reported

In []: