RiskSpotlight

Risk Aggregation

23Mar2018

Schools of Thought on Risk Aggregation

S1

Risk information can never be aggregated into any meaningful and useful way due to the complex and multi-dimensional nature of risks.

S2

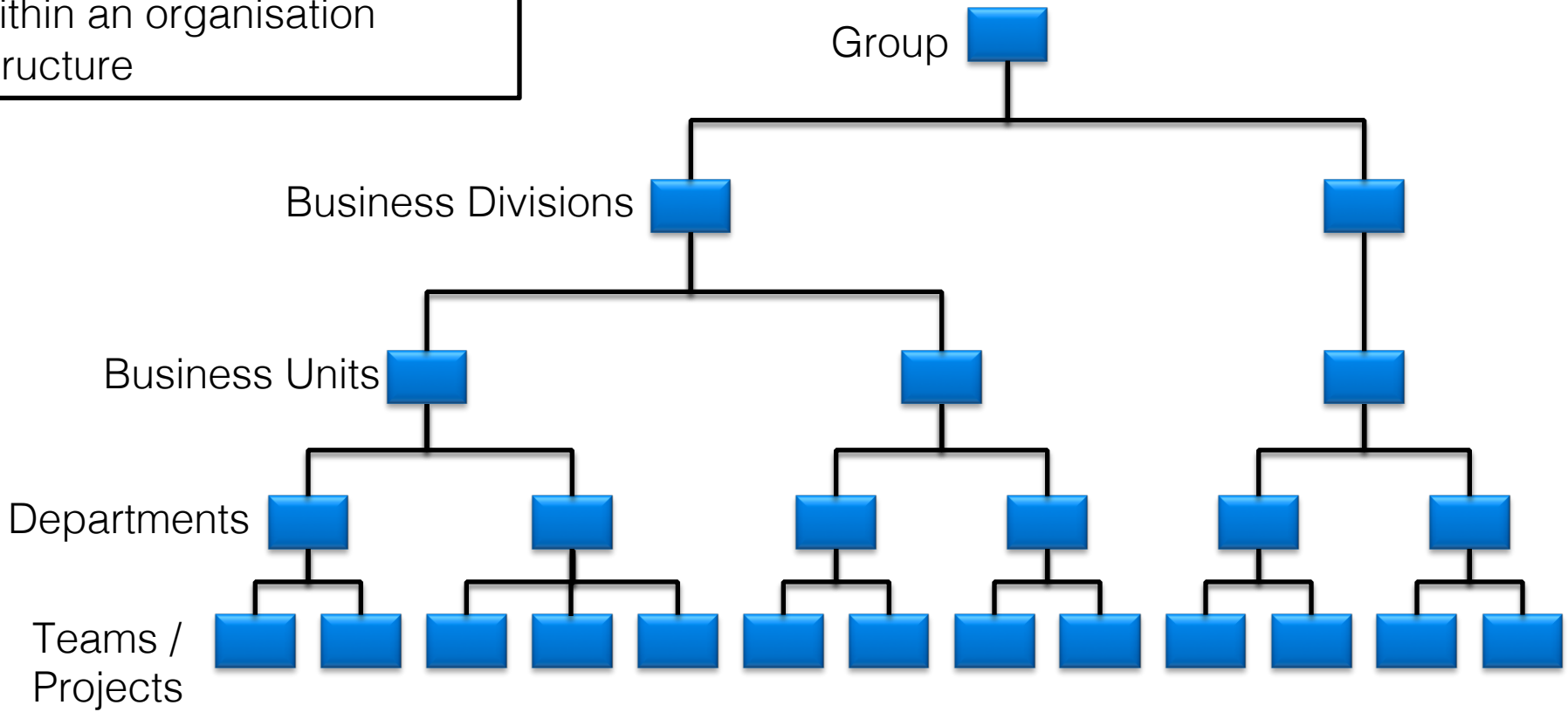
Some risk information can be aggregated but accept that all the information about a risk cannot be aggregated into one number. Also accept that all aggregation methods will have pros and cons.

S3

All risk information can be aggregated into meaningful and useful way. Aggregation can also be automated without requiring any manual intervention.

Why aggregate?

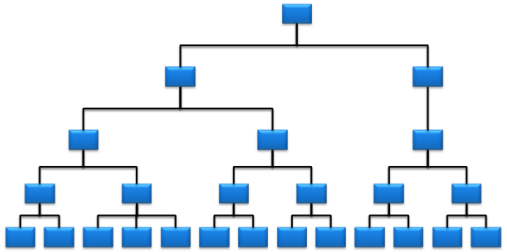
Risks exist at multiple levels within an organisation structure



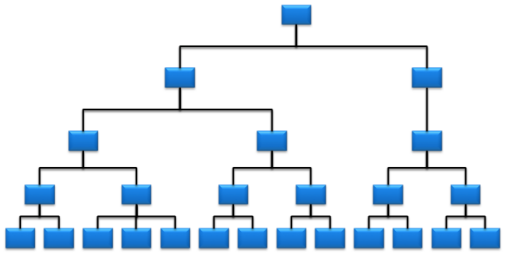
Why aggregate?

Risks also exist at different levels of other hierarchies (some highlighted below).

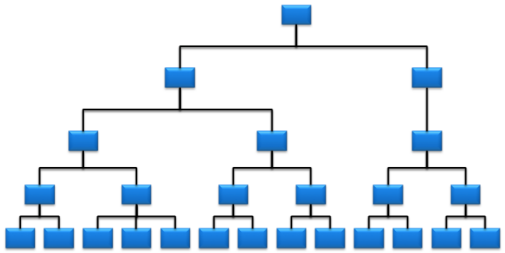
Organisation Structure



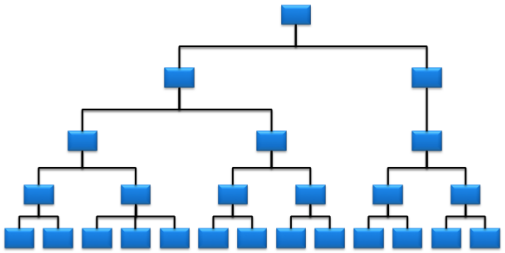
Legal Entity Structure



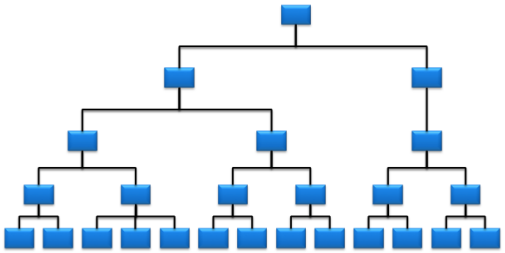
Geographical Structure



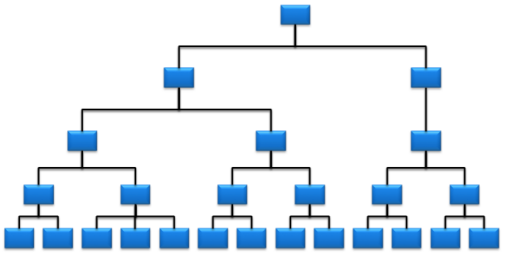
Process Structure



Product Structure

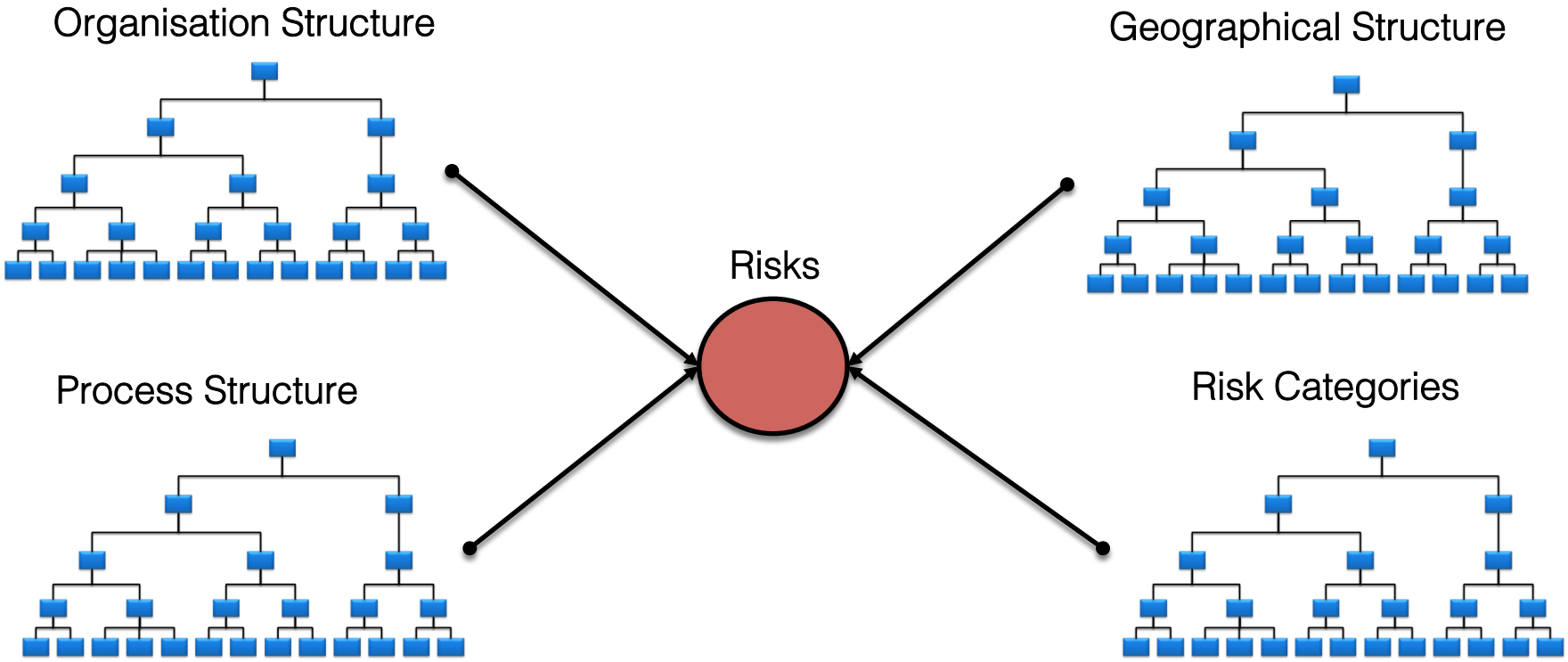


Risk Categories



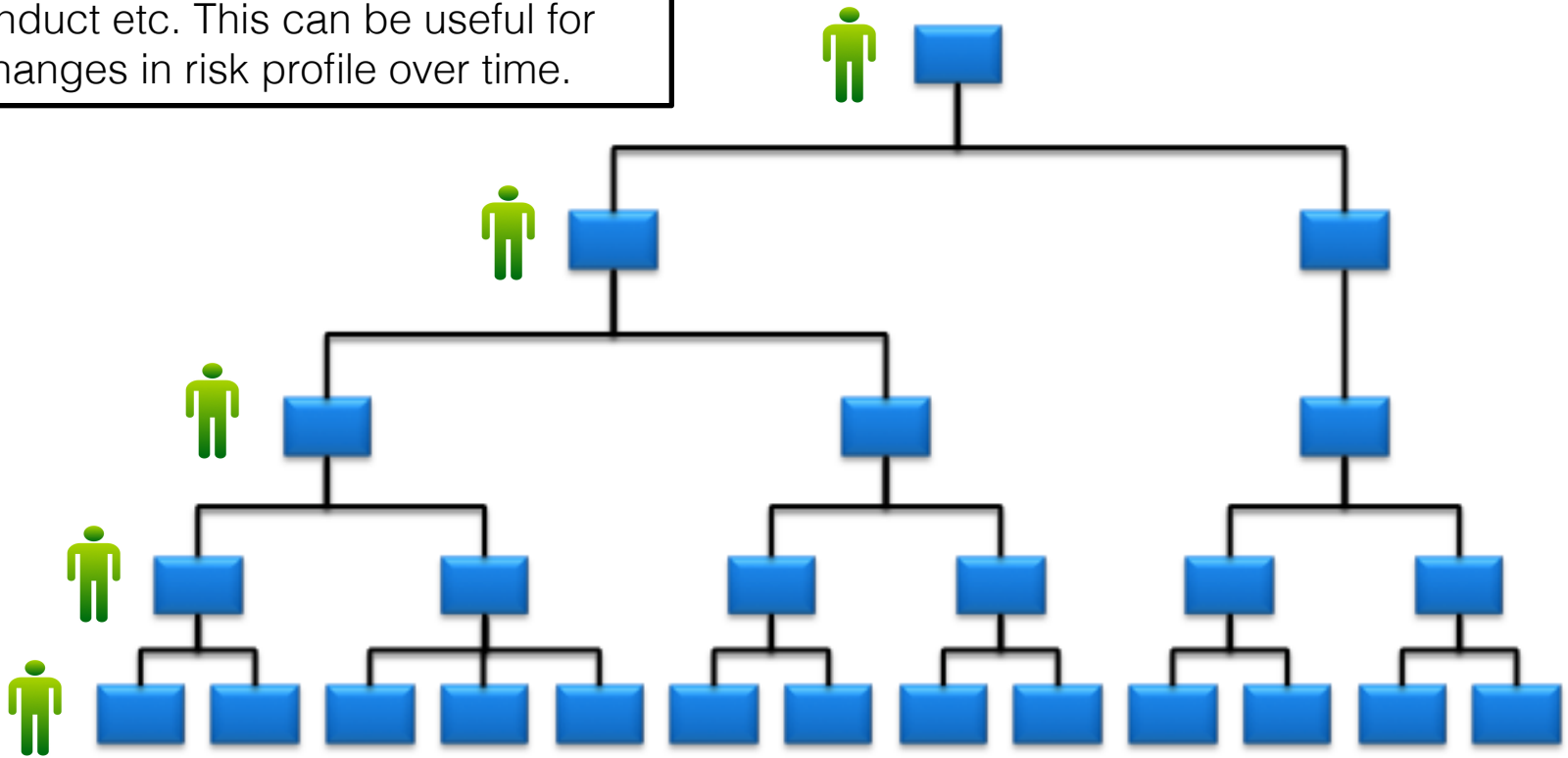
Why aggregate?

Risks typically exist at intersection of multiple hierarchies



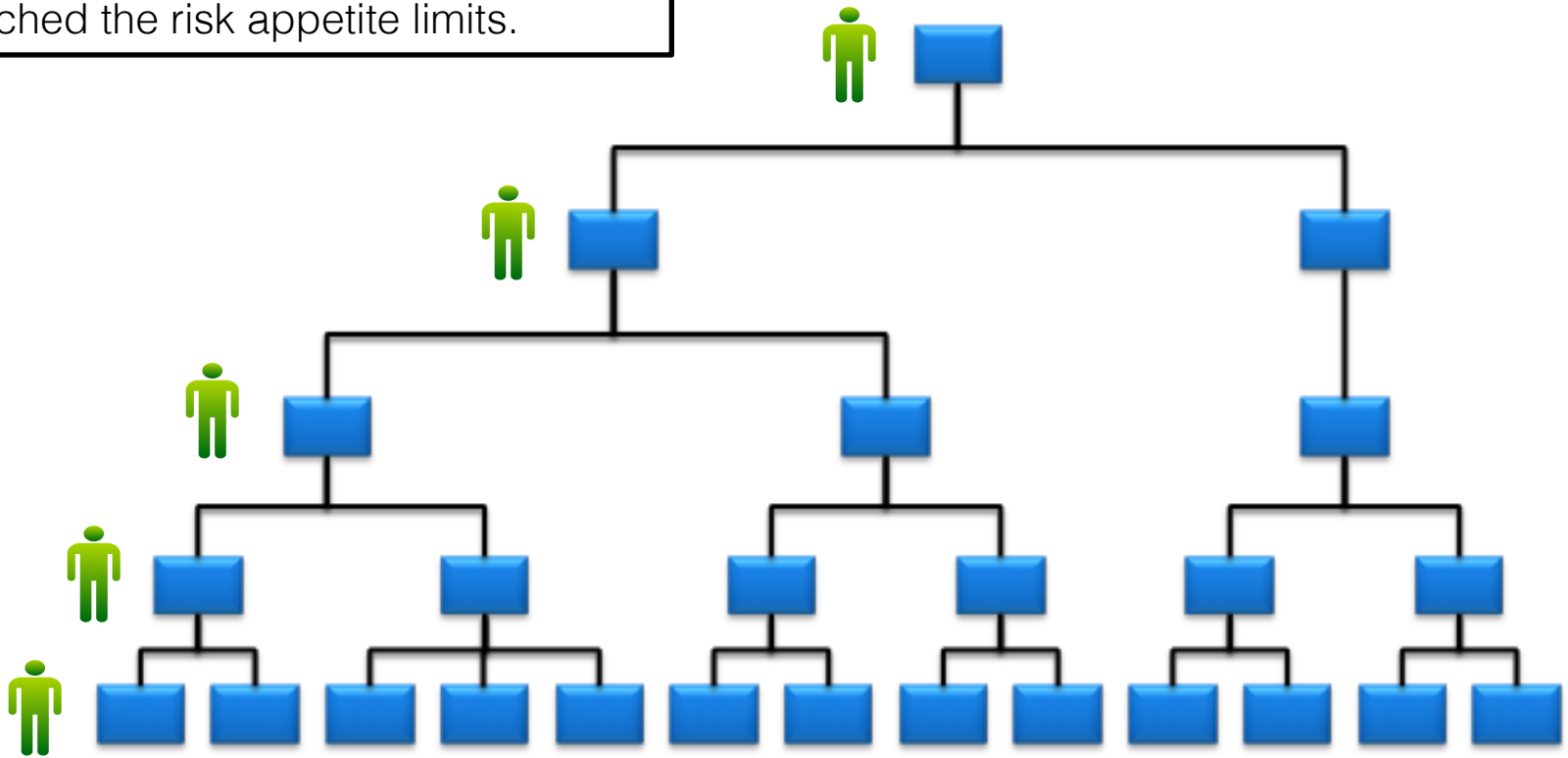
Why aggregate?

Stakeholders at each level want to view aggregated level of risk exposure for specific risks or categories e.g. External Fraud, Improper Conduct etc. This can be useful for monitoring changes in risk profile over time.



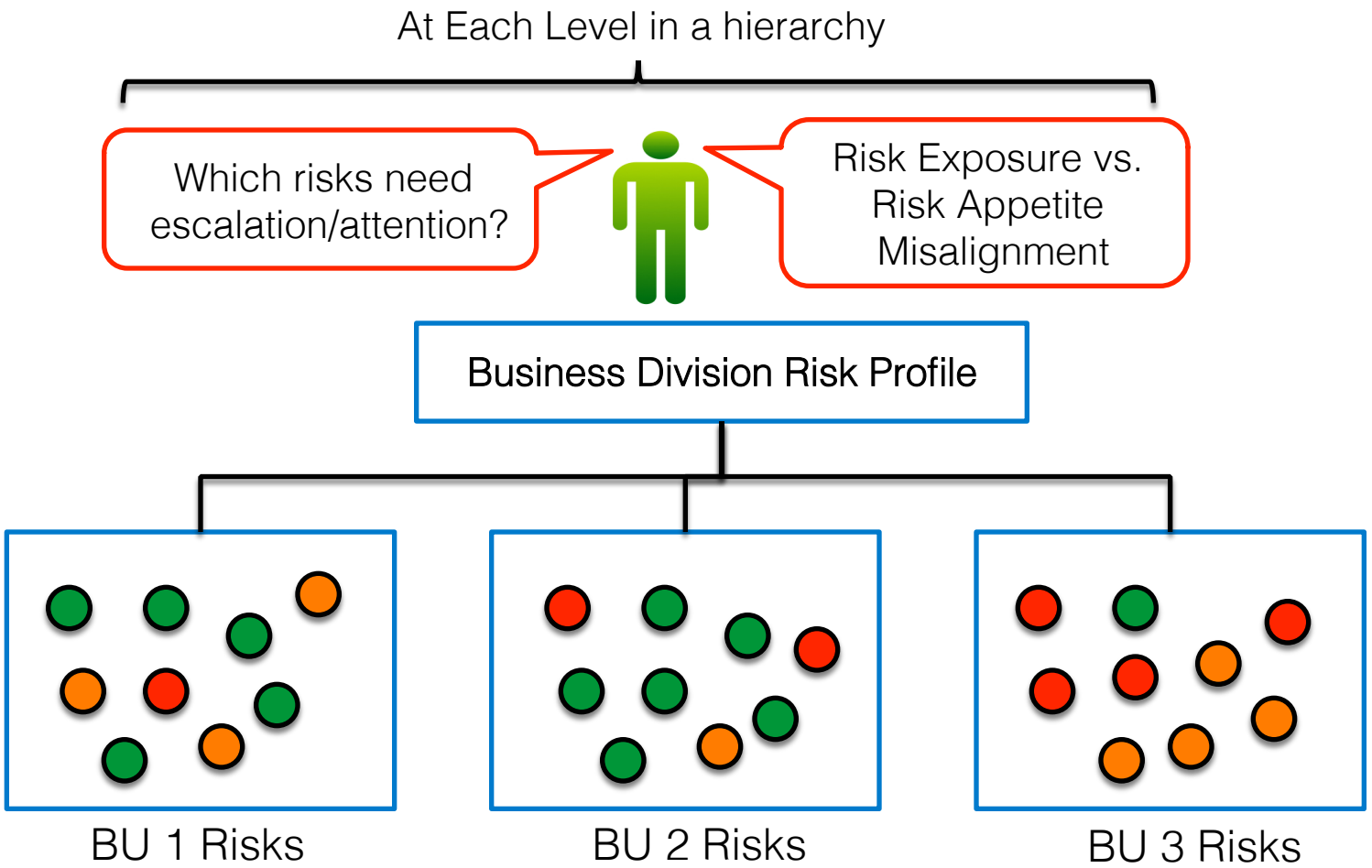
Why aggregate?

Stakeholders at each level want to easily identify whether any risks or portfolio of risks are approaching risk appetite limits or have already breached the risk appetite limits.



Why aggregate?

Summary



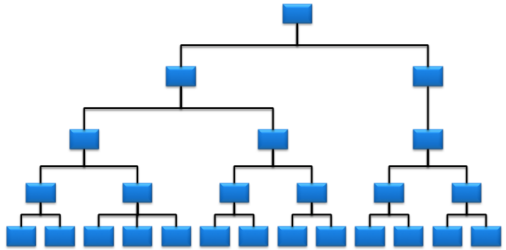
RiskSpotlight

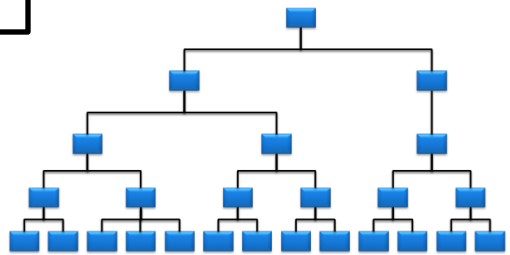
Challenges

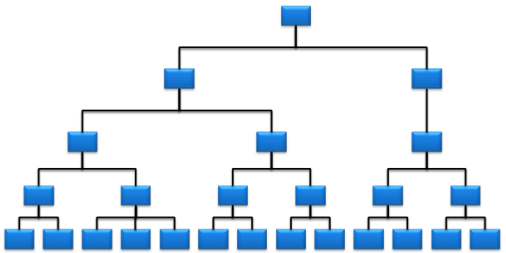
Challenge 1

Criticality threshold for each levels are typically different e.g. a £1mln exposure at the business unit level may be High but at the group level may be Low. Considering this across intersection of different hierarchies makes the challenge further complicated.

There may be multiple thresholds e.g. financial, reputational etc.







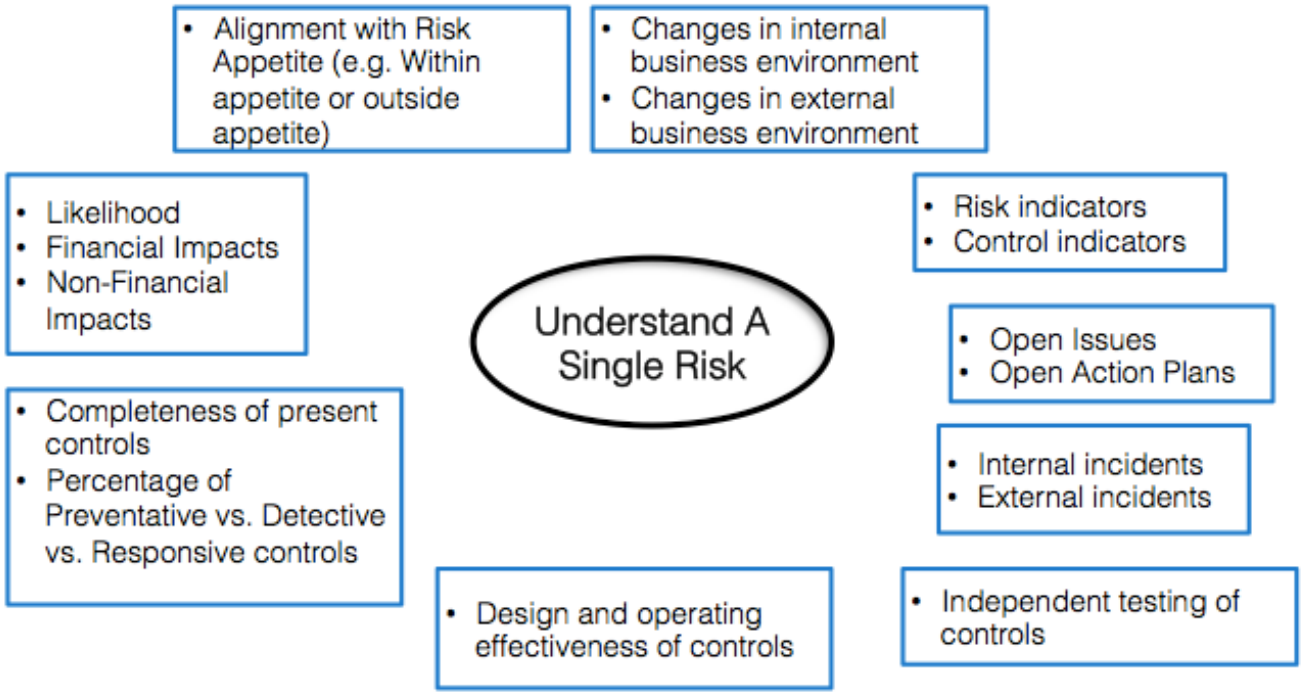
Challenge 2

Combining qualitative & quantitative information.

Majority information is qualitative.

Time horizon for information is typically different.

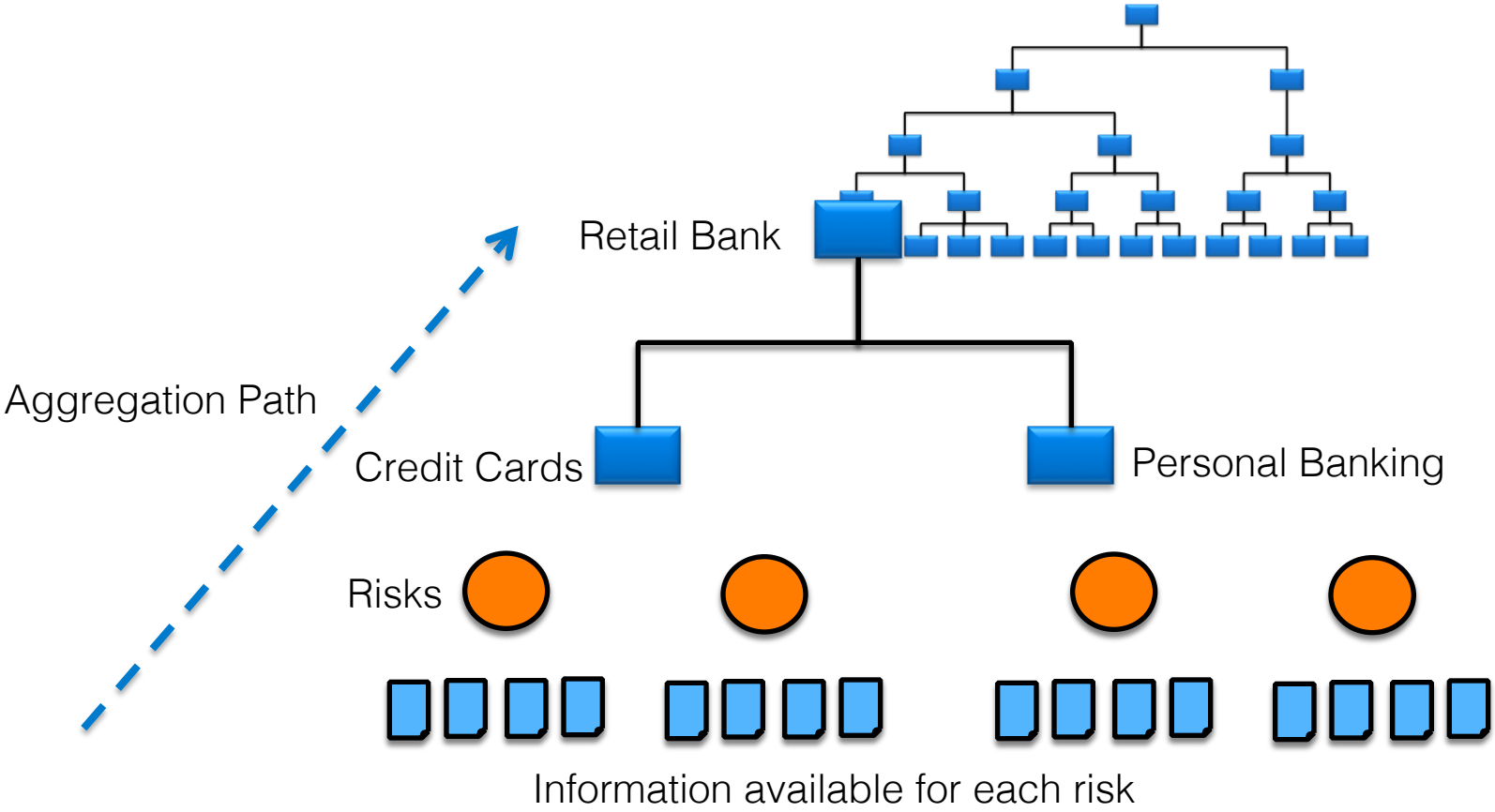
Statistical functions (e.g. SUM, AVERAGE) cannot be used for most quantitative information



RiskSpotlight

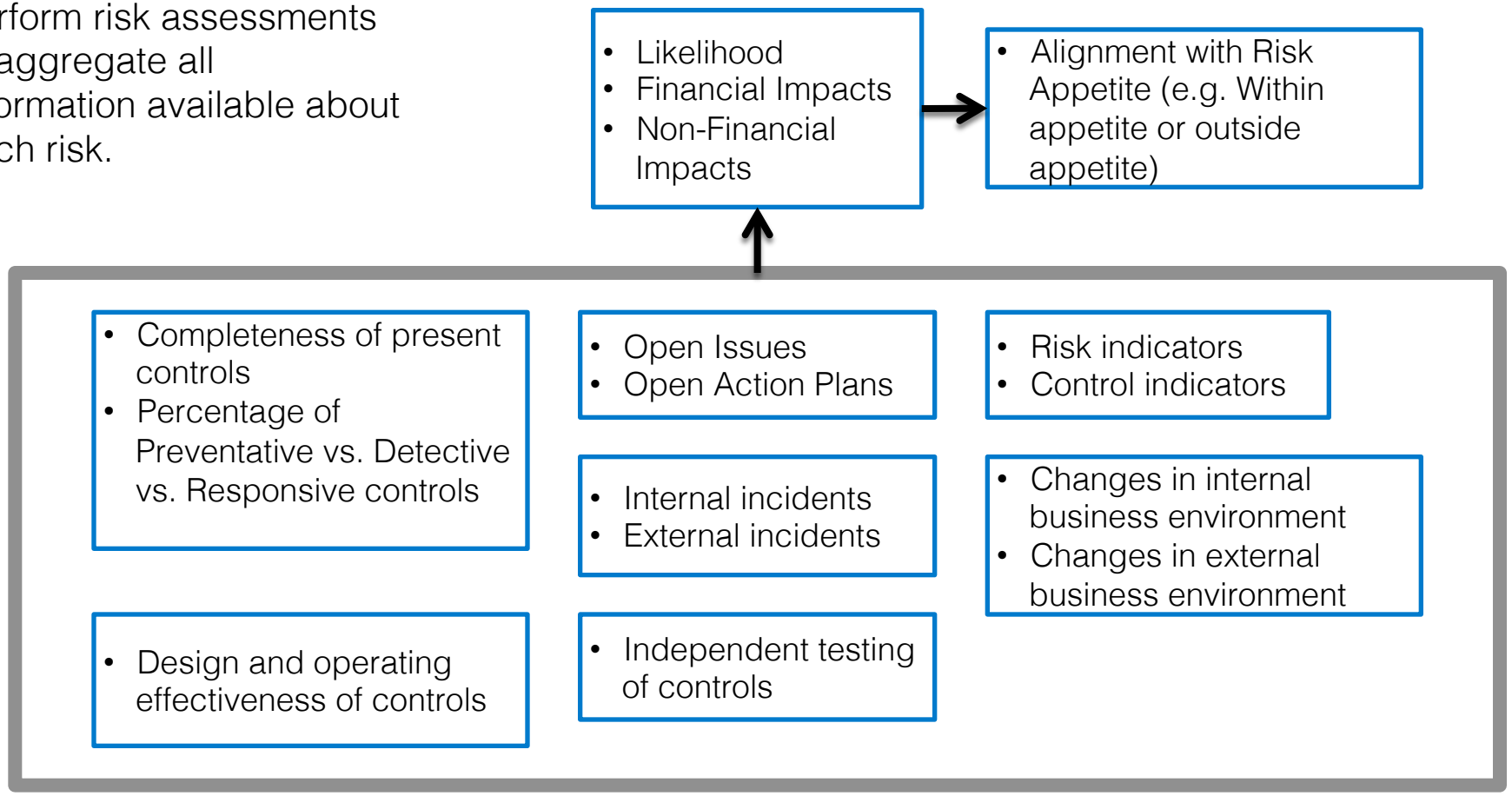
Aggregation Approaches

Aggregation Path



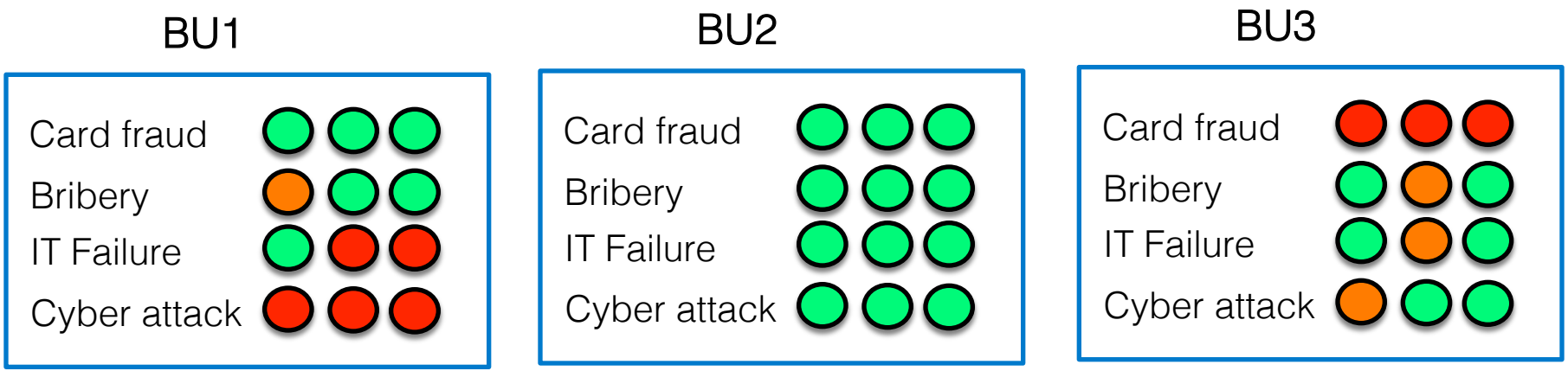
Risk Assessments

Perform risk assessments to aggregate all information available about each risk.



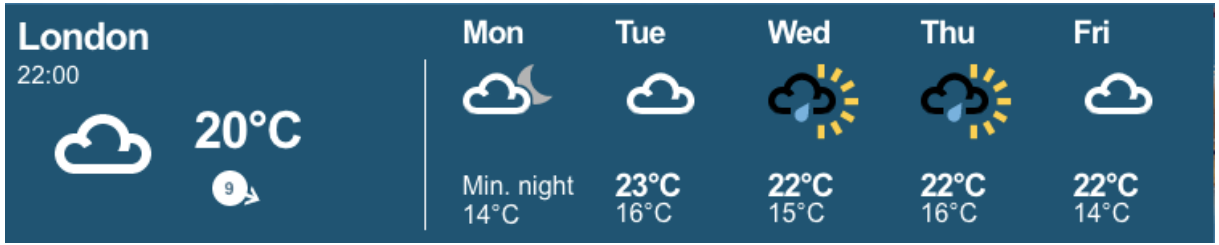
Risk Assessments

Risk assessments will provide an aggregated view of risk exposure at an individual risk level.



Switch to spreadsheet.

Weather Forecasts

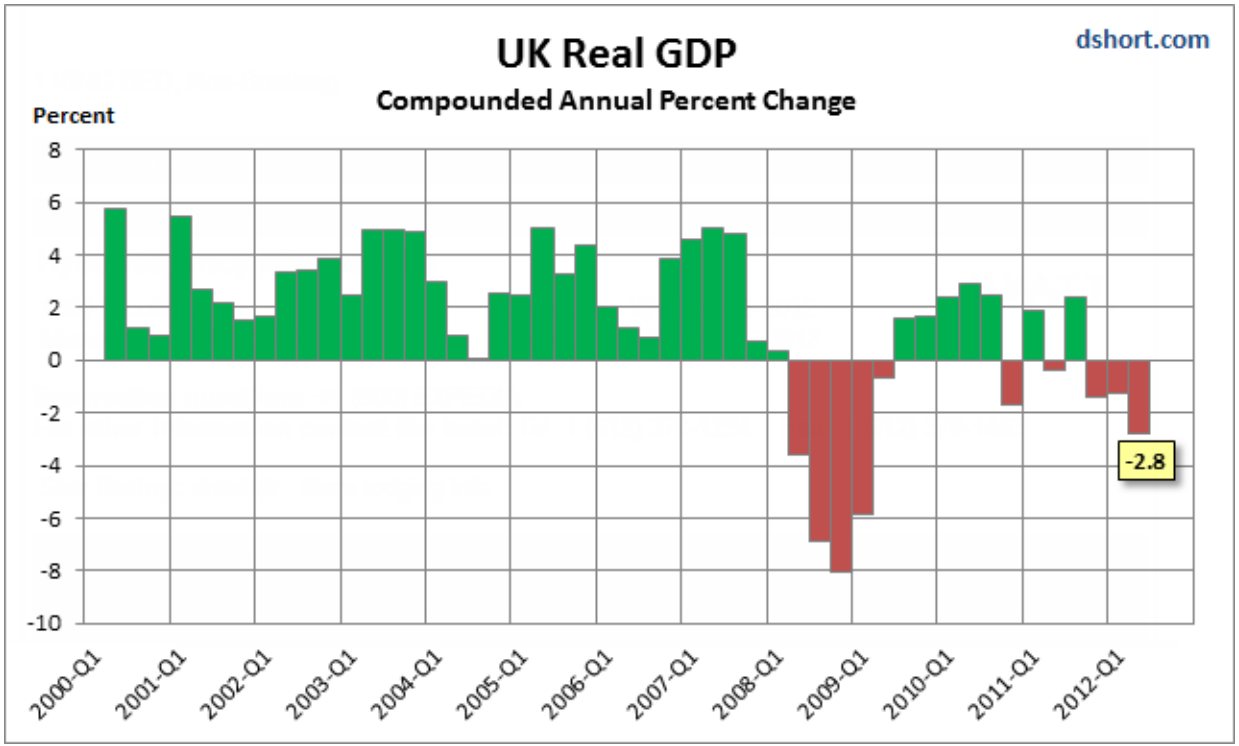


Credit Score

Corporate Credit Ratings

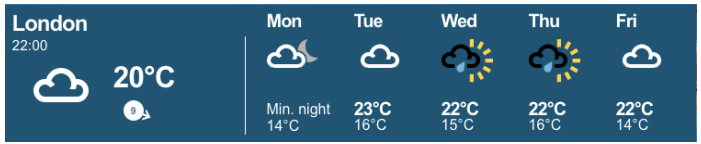
Long-Term Bond Ratings		Grade	Risk
Moody's	S&P/ Fitch		
Aaa	AAA	Investment	Highest Quality
Aa	AA	Investment	High Quality
A	A	Investment	Strong
Baa	BBB	Investment	Medium Grade
Ba, B	BB, B	Noninvestment	Speculative
Caa/Ca/C	CCC/CC/C	Noninvestment	Highly Speculative

Country GDP


UK Real GDP
dshort.com
Compounded Annual Percent Change
Percent
8
6
4
2
0
-2
-4
-6
-8
-10
-2.8
2000-Q1
2001-Q1
2002-Q1
2003-Q1
2004-Q1
2005-Q1
2006-Q1
2007-Q1
2008-Q1
2009-Q1
2010-Q1
2011-Q1
2012-Q1

Stock Market Index

Real-life Aggregation Examples



Long-Term Bond Ratings		Grade	Risk
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Aaa	AAA	Investment	Highest Quality
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A	A	Investment	Strong
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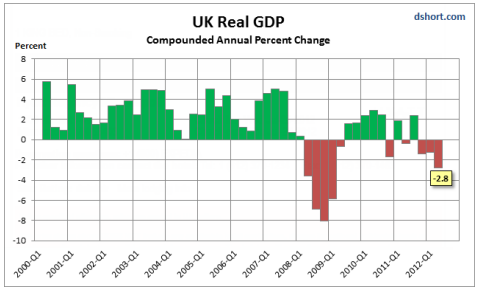


- Large amounts of detailed information is aggregated
- A distinct measure is defined for aggregated information, which can be different to the measurement units of detailed information
- Some aggregated measures typically update in real-time (e.g. stock index)

RiskSpotlight

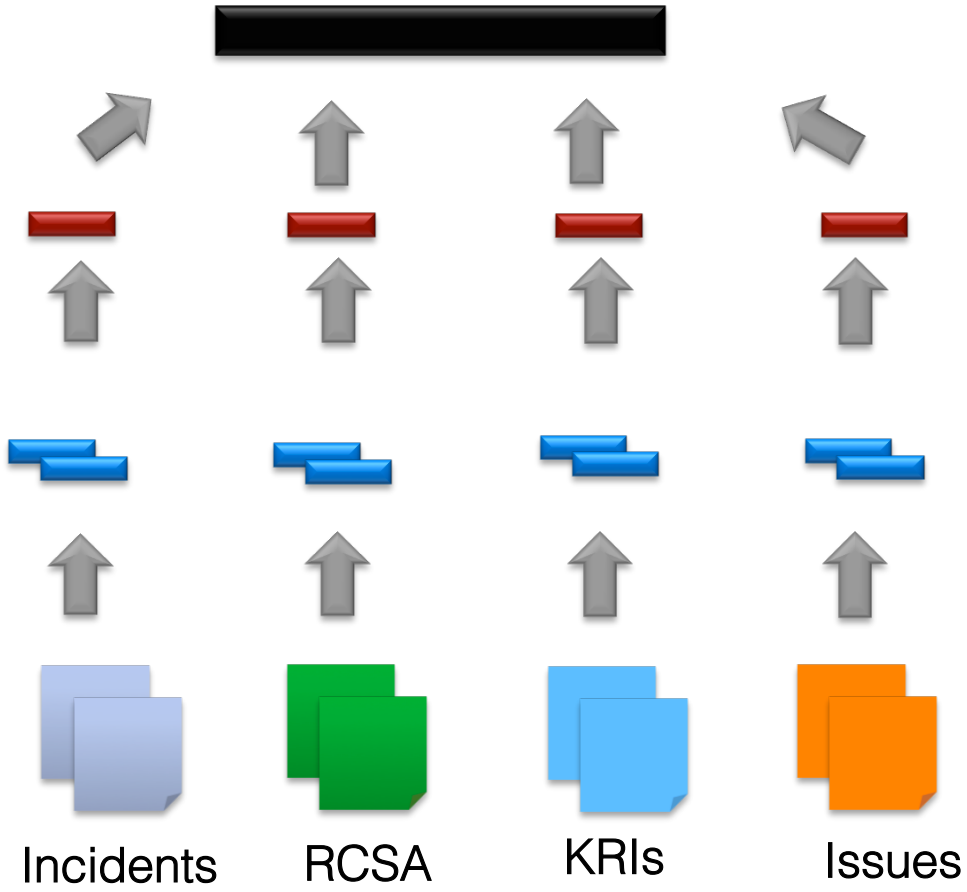
Risk Index Approach

Risk Index Approach

Step 3 – Aggregate the measures into a single risk measure

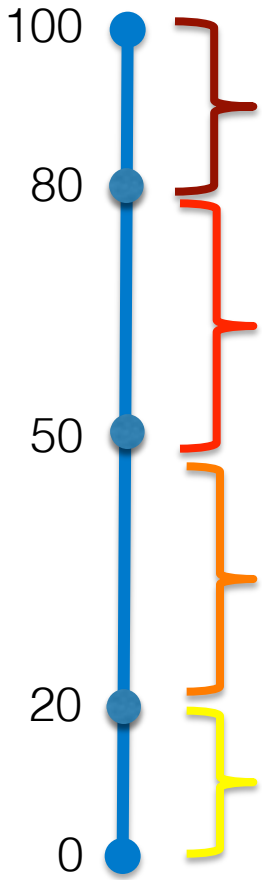
Step 2– Aggregate the measures for each type of information into a single aggregated measure

Step 1 – Convert different types of risk information into a single measure which can be aggregated (e.g. SUM, AVG)



Risk Index Approach

Define Aggregated Measurement Scale



State of risk management is deficient. Immediate responses required.

State of risk management is deteriorating. Preventative actions should be considered.

Early signs of problems. Review and respond appropriately.

Minor concerns

Risk Index Approach

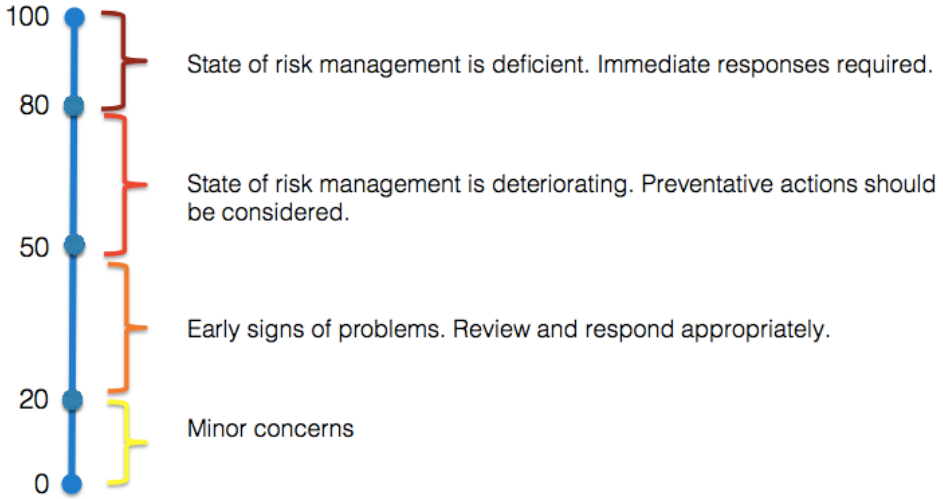
Develop rules to convert risk related information into aggregated measures

Rule Example 1: -

- If a risk is mapped to one or more high priority open issues, score = 100
- If a risk is mapped one or more medium priority open issues, score = 70
- If a risk is not mapped to any open issues, score = 0

Rule Example 2: -

- If 81% or more controls mapped to a risk are not effective, score = 100
- If 41% to 80% of controls mapped to a risk are not effective, score = 75
- If 1% to 40% of controls mapped to a risk are not effective, score = 45
- If all controls mapped to a risk are effective, score = 0



Risk Index Approach

Score at each rule level

Risk = Identity fraud

Risk Assessments

Rule 1 = 10

Rule 2 = 75

Rule 3 = 40

Control Assessments

Rule 4 = 80

Rule 5 = 90

Issues & Action Plans

Rule 6 = 0

Rule 7 = 10

Risk = Online banking fraud

Risk Assessments

Rule 1 = 10

Rule 2 = 10

Rule 3 = 0

Control Assessments

Rule 4 = 0

Rule 5 = 0

Issues & Action Plans

Rule 6 = 80

Rule 7 = 0

Risk Index Approach

Score at each rule category level

Risk = Identity fraud

Risk Assessments = 125

- Rule 1 = 10
- Rule 2 = 75
- Rule 3 = 40

Control Assessments = 170

- Rule 4 = 80
- Rule 5 = 90

Issues & Action Plans = 10

- Rule 6 = 0
- Rule 7 = 10

Risk = Online banking fraud

Risk Assessments = 10

- Rule 1 = 10
- Rule 2 = 10
- Rule 3 = 0

Control Assessments = 0

- Rule 4 = 0
- Rule 5 = 0

Issues & Action Plans = 80

- Rule 6 = 80
- Rule 7 = 0

Risk Index Approach

Score at risk level

Risk = Identity fraud — 305

Risk Assessments = 125

- Rule 1 = 10
- Rule 2 = 75
- Rule 3 = 40

Control Assessments = 170

- Rule 4 = 80
- Rule 5 = 90

Issues & Action Plans = 10

- Rule 6 = 0
- Rule 7 = 10

Risk = Online banking fraud — 90

Risk Assessments = 10

- Rule 1 = 10
- Rule 2 = 10
- Rule 3 = 0

Control Assessments = 0

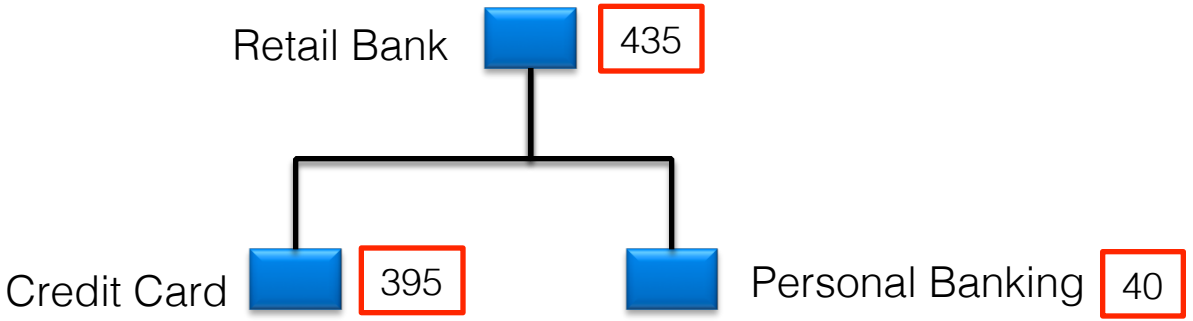
- Rule 4 = 0
- Rule 5 = 0

Issues & Action Plans = 80

- Rule 6 = 80
- Rule 7 = 0

Risk Index Approach

Score at each level of hierarchy

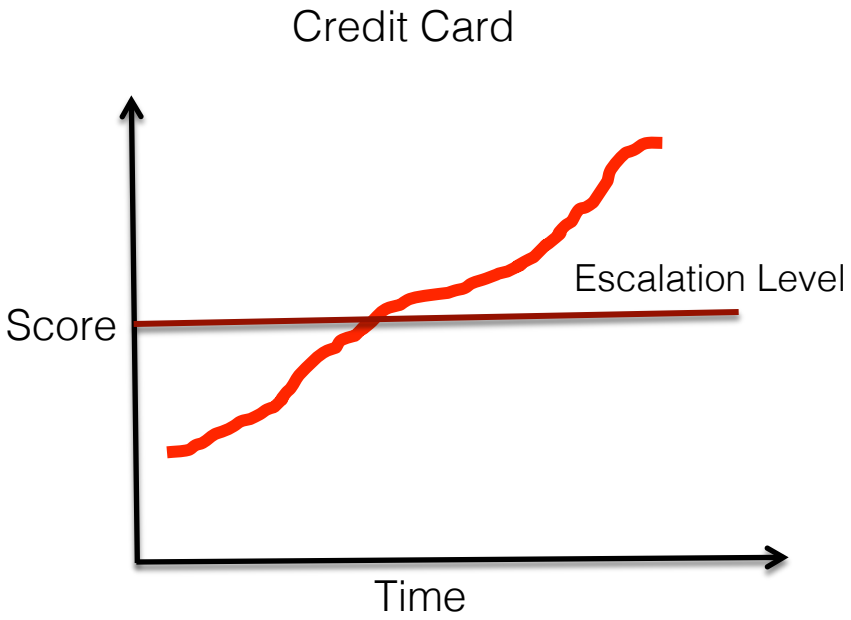


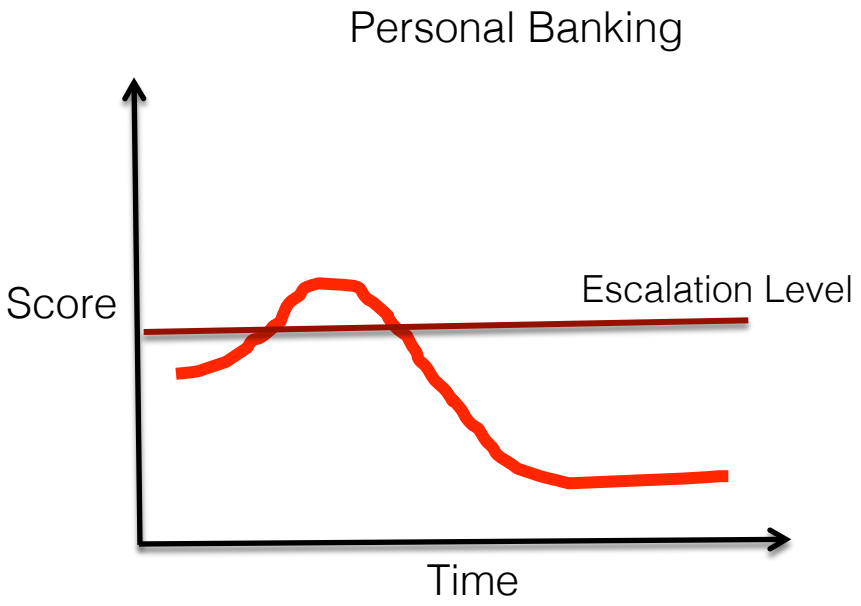
Risk = Identity fraud	305
Risk = Online banking fraud	90

Risk = Identity fraud	30
Risk = Online banking fraud	10

Risk Index Approach

Similar to stock prices or stock market index, aggregated scores can be tracked overtime to identify changes in the strength of the risk and control environment.

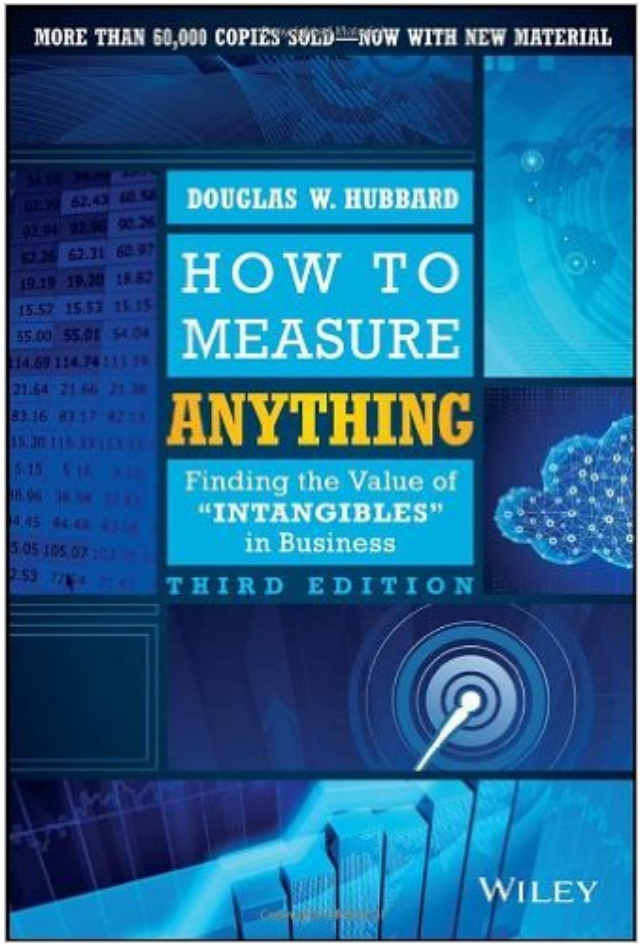




Risk Index Approach

- Overtime as the usage of this approach matures, escalation limits can be defined for the aggregated score at multiple levels.

- Implementing this approach in software can provide a real-time or near real-time update of scores. This can support continuous monitoring of risk and control environment between the qualitative aggregation assessments.



Thank you.

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