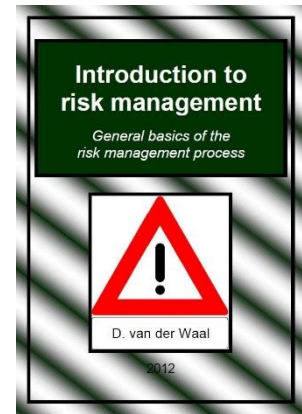




UNIVERSITY OF APPLIED SCIENCES

Introduction to Risk Management

exceed expectations



Programme

- ❑ What is risk management?
- ❑ Why do risk management
- ❑ What is a risk?
- ❑ What is a risk management process?
- ❑ Why use a risk management framework?

What is risk management?

- ❑ Focus on objectives of individuals, projects, processes and organisations
- ❑ Conscious / subconscious?
- ❑ Formal / informal?

- ❑ Subconscious + informal: daily life
- ❑ Conscious + formal: organisations
 - ❑ Costs time and money
 - ❑ Consider costs and benefits

- ❑ **Enterprise Risk Management**
- ❑ Project Risk Management

Why do risk management?

- ❑ Corporate Governance (development)
- ❑ Increasing complexity
- ❑ Development of risk management

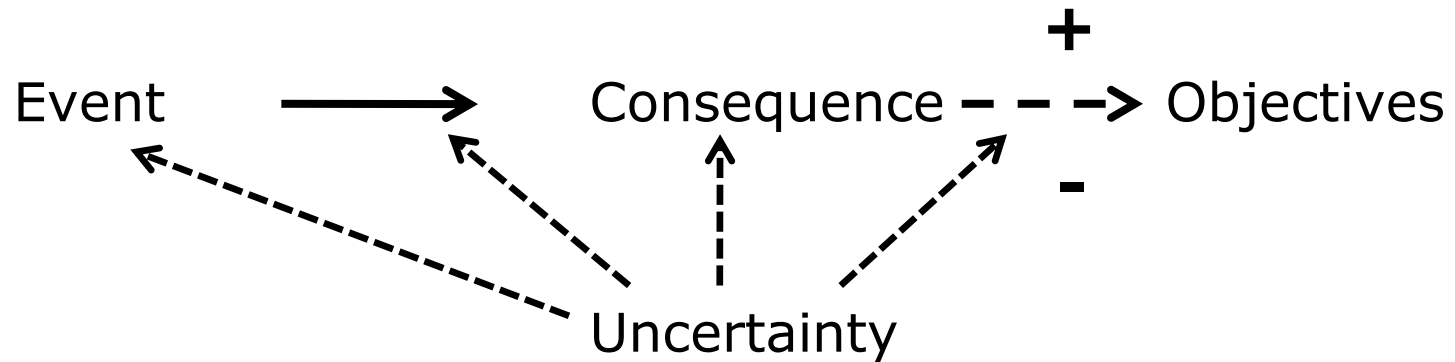
What is a risk?

- ❑ Definition of risk
 - ❑ *An uncertain event with consequences for an objective*

Key words:

- Uncertain (or possible)
- Event
- Consequences
- Objective

Risk definition



Inherent & residual

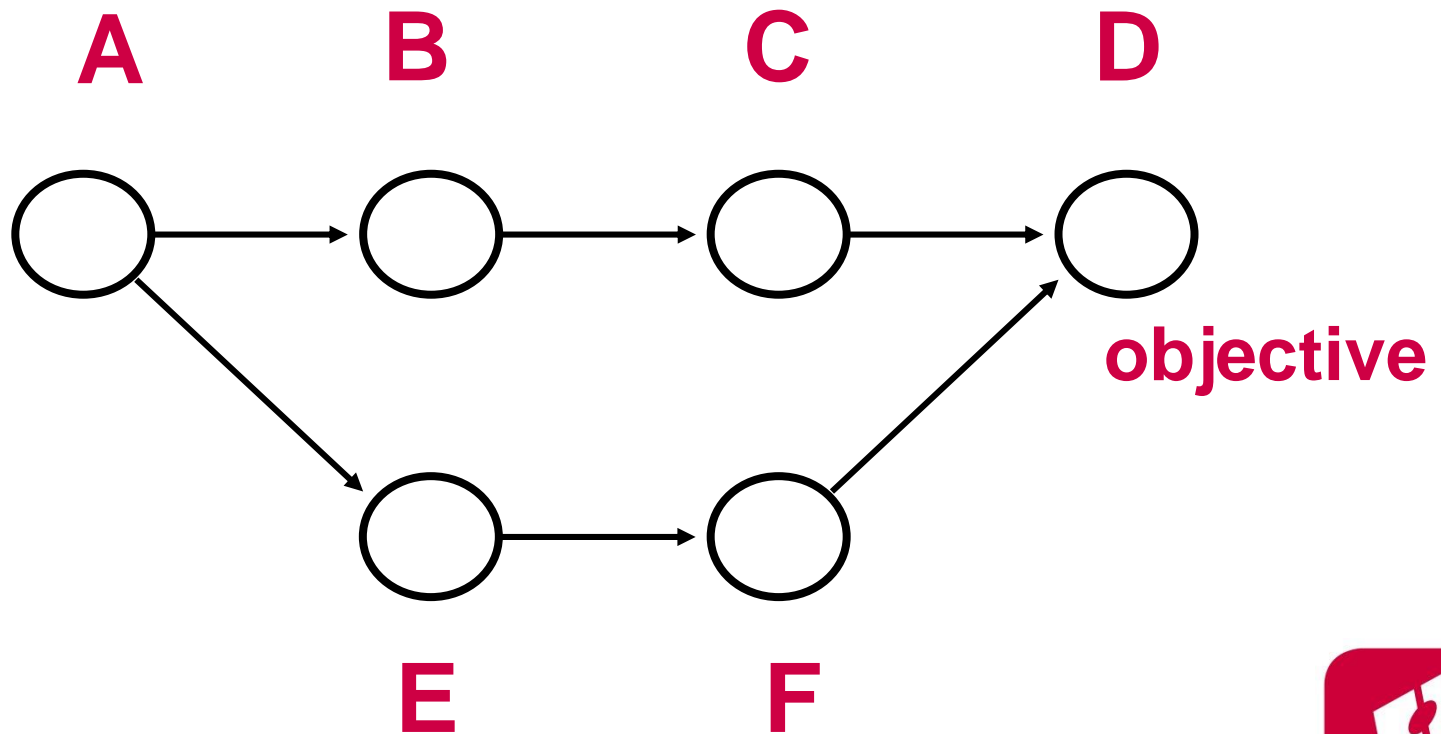
- ❑ Inherent risk
 - ❑ Without control measures
- ❑ Residual risk
 - ❑ With control measures



Static and dynamic risk

- ❑ Static risk (also: pure risk)
 - ❑ A static risk only has negative consequences
- ❑ Dynamic risk (also: speculative)
 - ❑ A dynamic risk can have negative and positive consequences

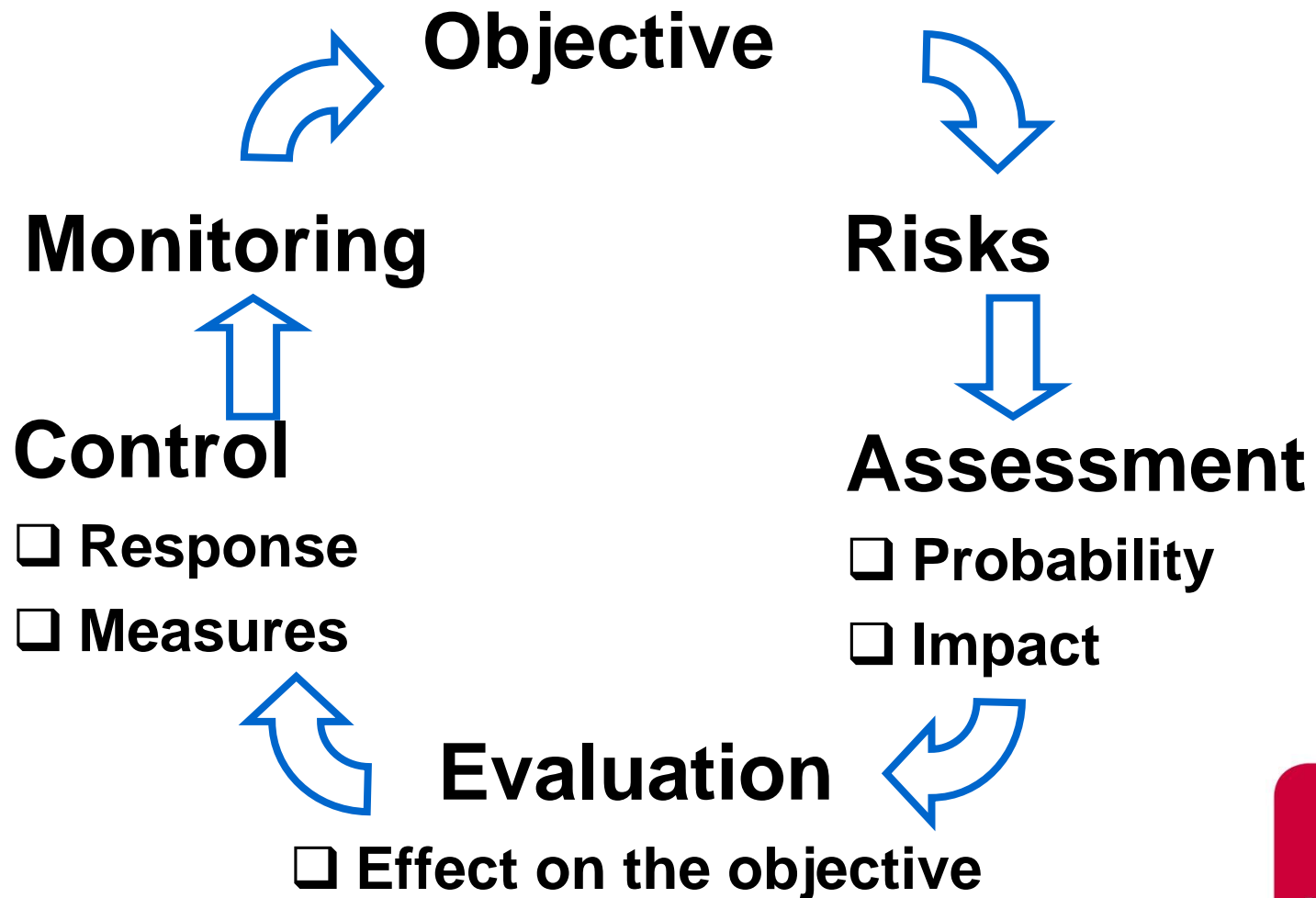
Event tree



SMART

- ❑ Not meeting an objective because of one or more events
- ❑ Objective is SMART
 - ❑ S: Specific
 - ❑ M: Measurable
 - ❑ A: Acceptable (or attainable)
 - ❑ R: Reasonable
 - ❑ T: Time-bound
- ❑ Threats are also SMART

Risk management process

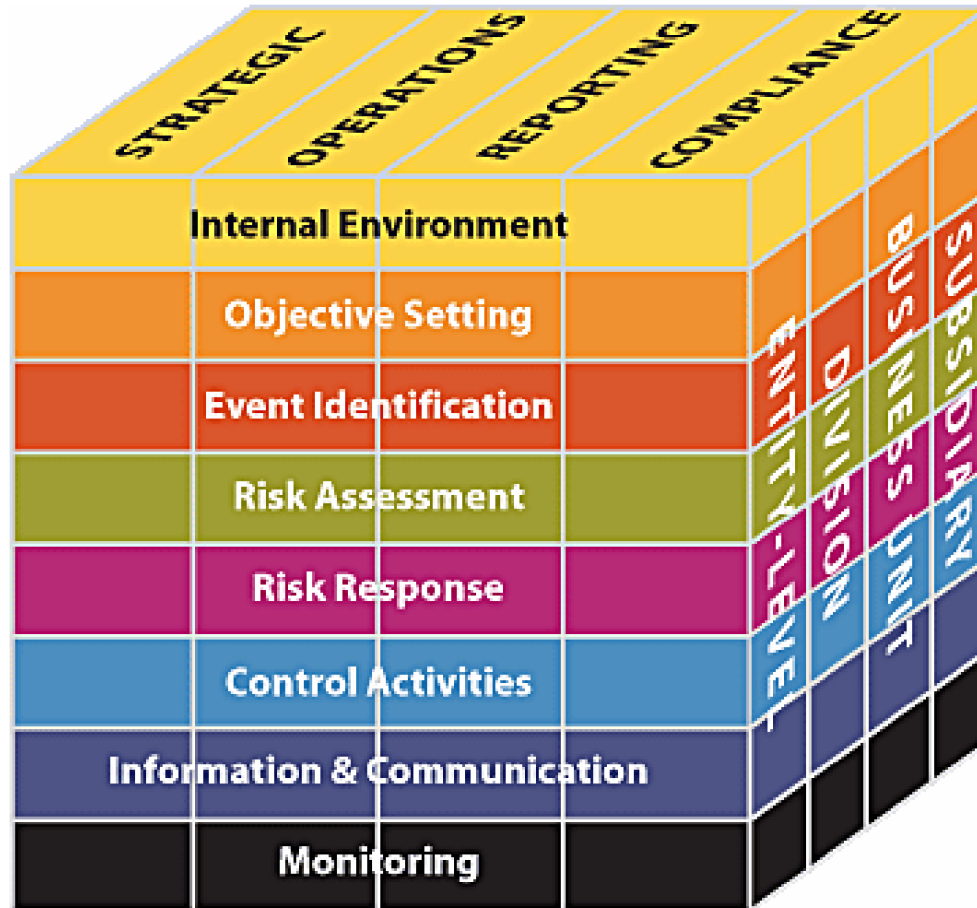


Entreprise risk management



- *"Enterprise risk management is a **process**, effected by an **entity's board of directors, management and other personnel**, applied in **strategy setting and across the enterprise**, designed to identify potential events that may affect the entity, and manage risk to be **within its risk appetite**, to provide **reasonable assurance** regarding the **achievement of entity objectives**."*

COSO ERM framework (2004)



Origin: COSO – Accountants Organisations

exceed expectations

Internal Environment



- ❑ Basis for the other components
- ❑ Influences risk awareness of employees
- ❑ Tone of the organisation
 - ❑ Risk management philosophy
 - ❑ Board oversight
 - ❑ Values and capabilities of employees
 - ❑ Internal organisation
 - ❑ **Risk appetite**

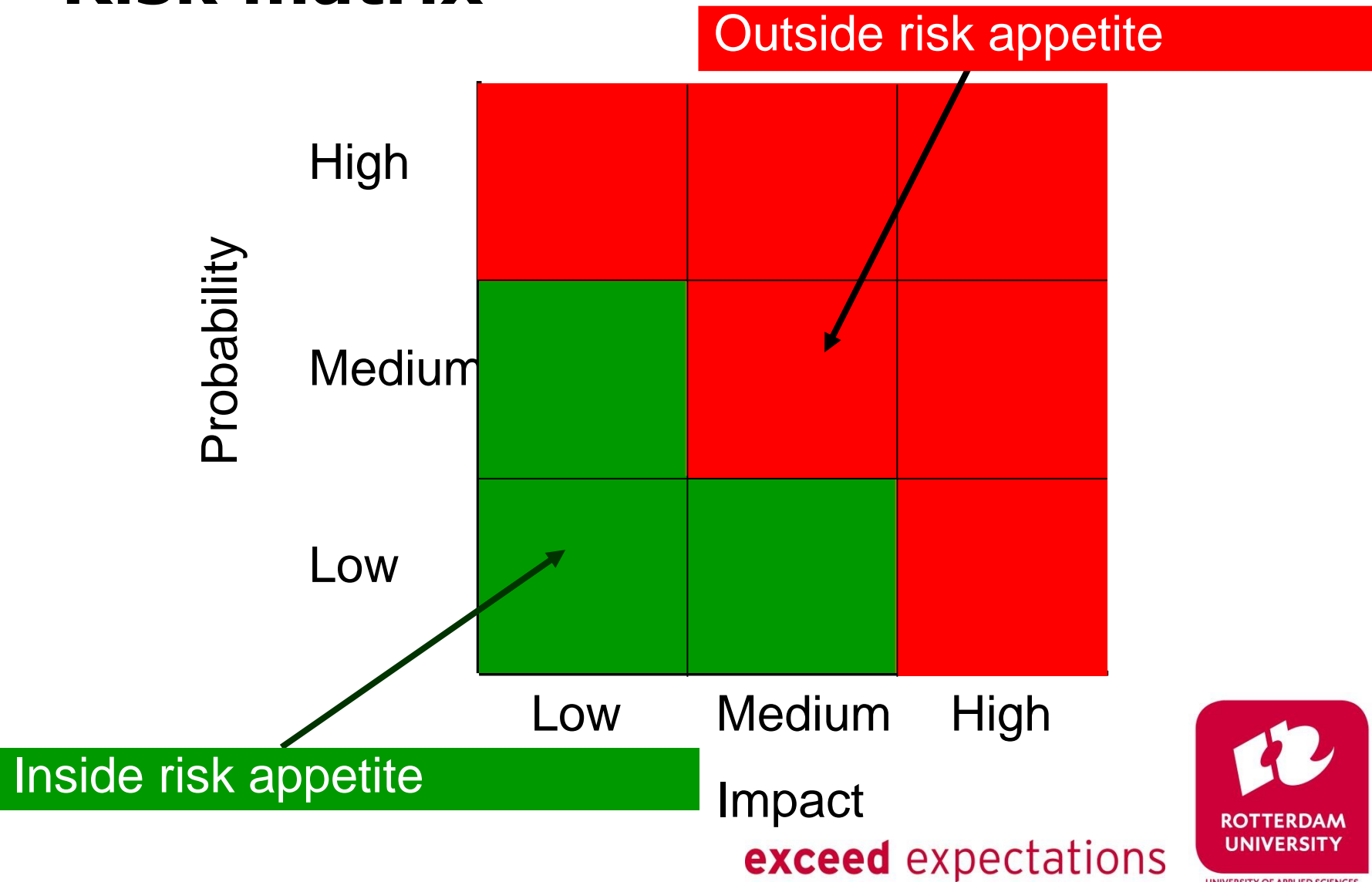
What is risk appetite?

- ❑ The degree of risk, on a broad level, that the organisation is prepared to accept in pursuit of value, its mission and its vision

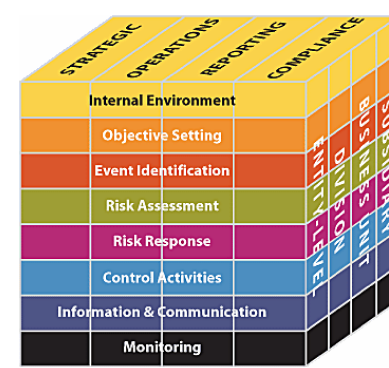


- ❑ How much risk you are willing to accept

Risk matrix

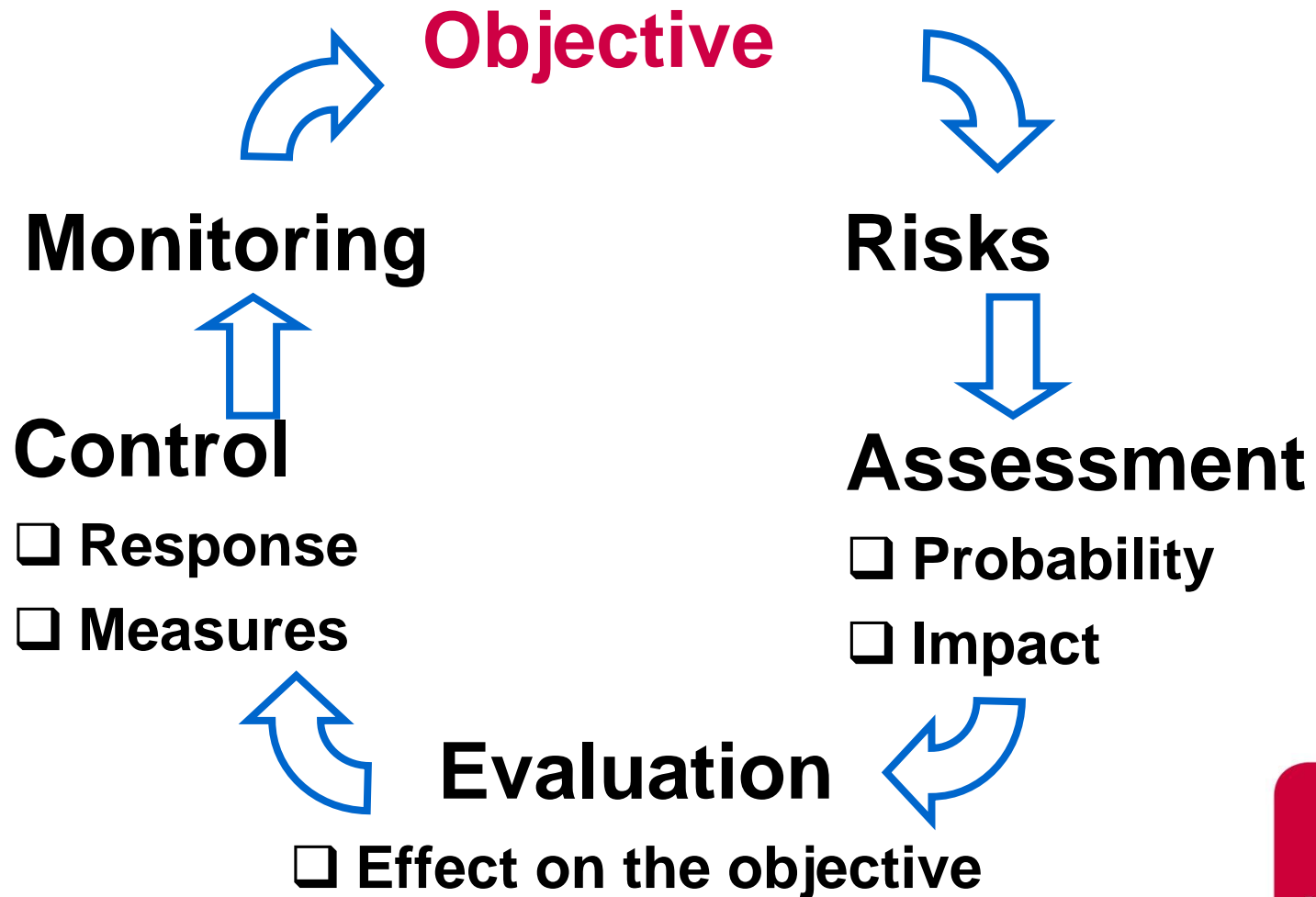


Objective Setting



- ❑ Strategic objectives
- ❑ Balanced Scorecard
 - ❑ Critical success factors (CSF)
 - ❑ Key performance indicators (KPI)
- ❑ SMART
 - ❑ Specific
 - ❑ Measurable
 - ❑ Acceptable
 - ❑ Reasonable
 - ❑ Time-bound

Risk management process



Example



MAFIN is a producer of notebooks








exceed expectations



FINANCIAL PERSPECTIVE

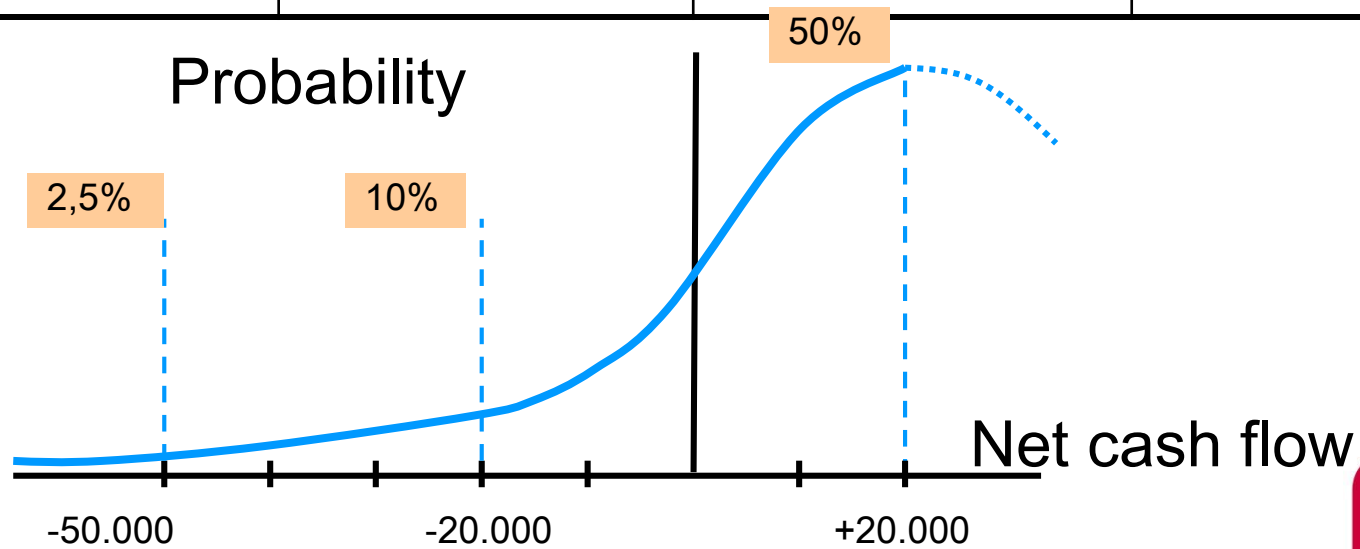
What do we look like to shareholders and other funders?

Critical success factor	Performance indicator
<input checked="" type="checkbox"/> Growth	Turnover growth  Net result growth 
<input checked="" type="checkbox"/> Survival	Cash flow   Turnover rate 

Event	Net cash flow	Acceptable probability
Meeting objective	$\geq + \text{€ } 20.000$	$\geq 50\%$
Taking loan out	$\leq - \text{€ } 20.000$	$\leq 10\%$
Bankruptcy	$\leq - \text{€ } 50.000$	$\leq 2,5\%$

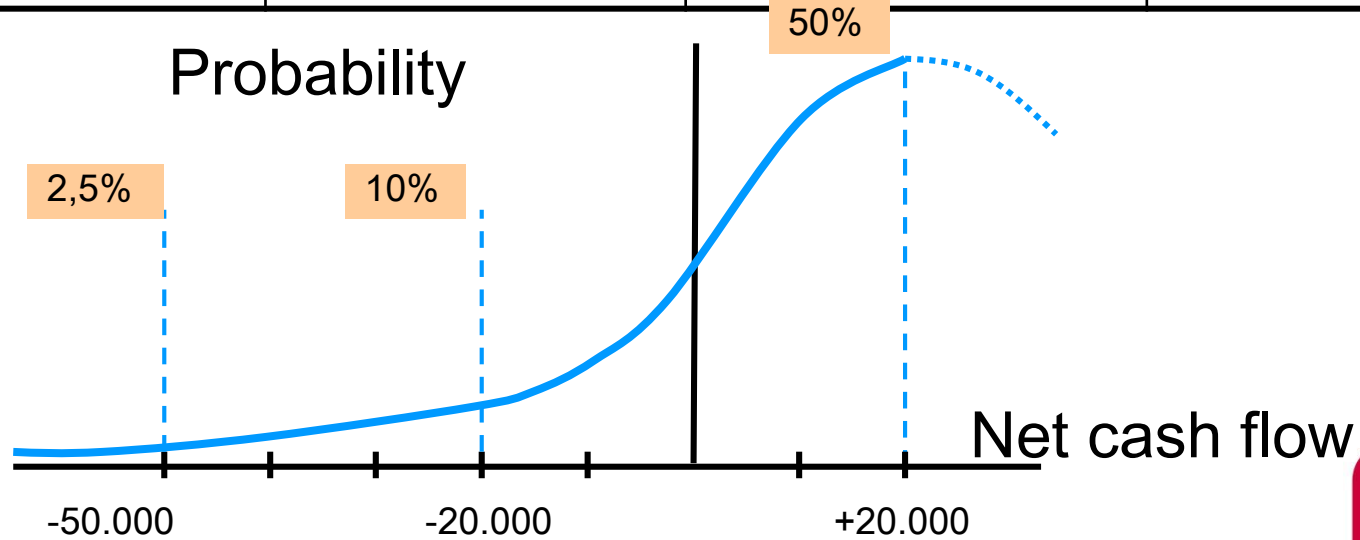
How often is it allowed to happen?

Event	Net cash flow	Once every ... years	Acceptable probability
Meeting objective	$\geq + \text{€ } 20.000$		$\geq 50\%$
Taking loan out	$\leq - \text{€ } 20.000$	10	$\leq 10\%$
Bankruptcy	$\leq - \text{€ } 50.000$	40	$\leq 2,5\%$



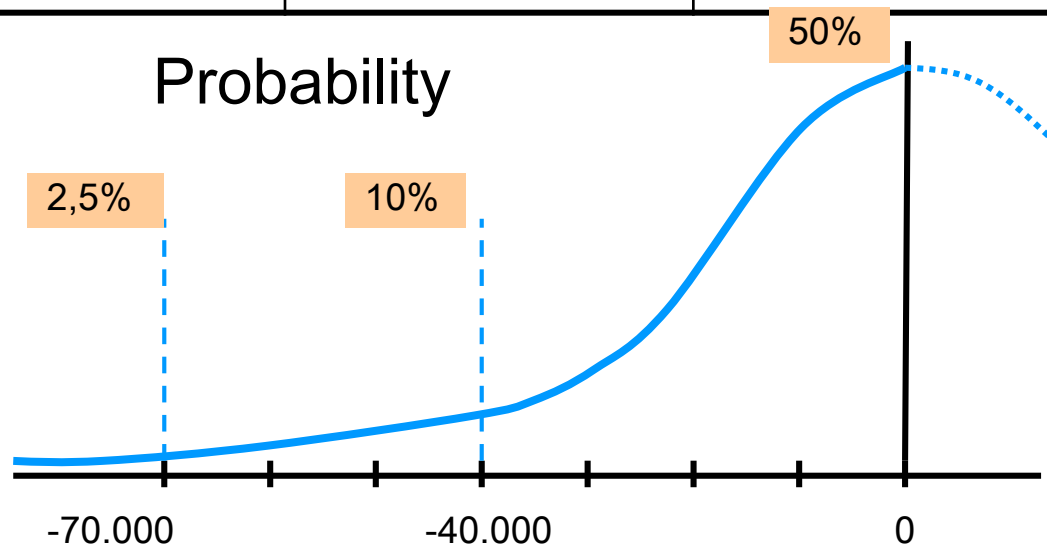
How often is it allowed to happen?

Event	Net cash flow	Deviation from objective	Acceptable probability
Meeting objective	$\geq + \text{€ } 20.000$	$\geq \text{€ } 0$	$\geq 50\%$
Taking loan out	$\leq - \text{€ } 20.000$	$\leq - \text{€ } 40.000$	$\leq 10\%$
Bankruptcy	$\leq - \text{€ } 50.000$	$\leq - \text{€ } 70.000$	$\leq 2,5\%$



How often is it allowed to happen?

Event	Net cash flow	Deviation from objective	Acceptable probability
Meeting objective	$\geq + \text{€ } 20.000$	$\geq \text{€ } 0$	$\geq 50\%$
Taking loan out	$\leq - \text{€ } 20.000$	$\leq - \text{€ } 40.000$	$\leq 10\%$
Bankruptcy	$\leq - \text{€ } 50.000$	$\leq - \text{€ } 70.000$	$\leq 2,5\%$

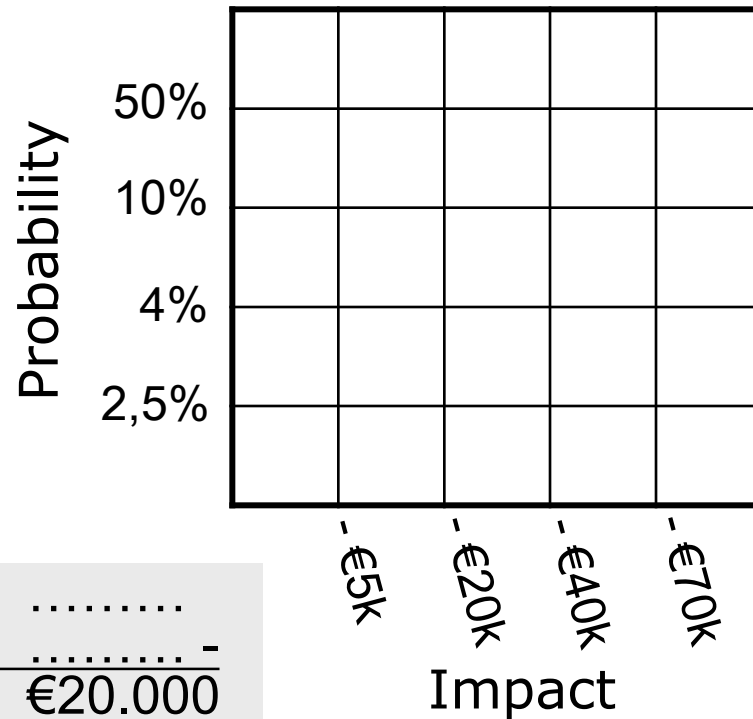


Risk Appetite expressed as Cash Flow at Risk (CFaR)

Deviation from objective
(in mutation of net cash flow)

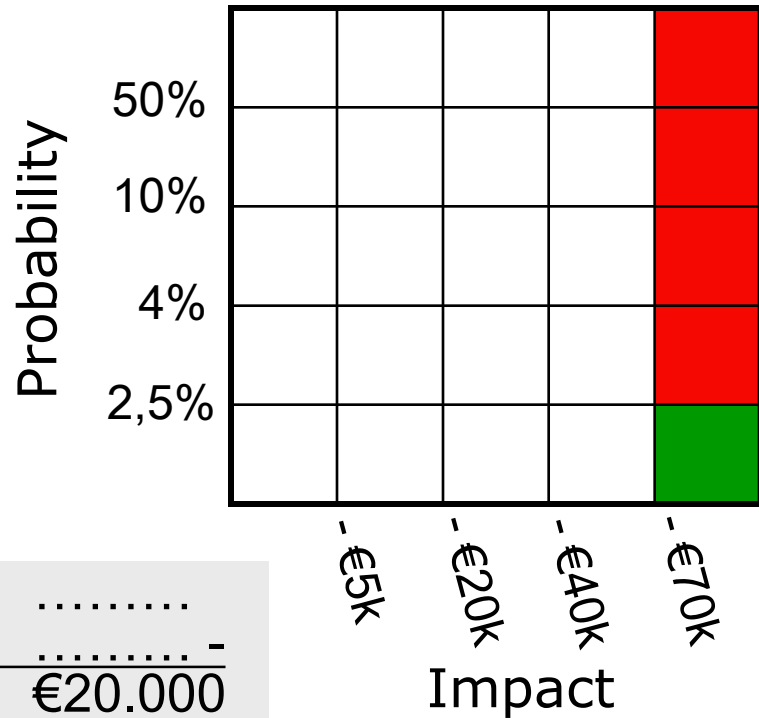
exceed expectations

Event	Deviation from objective	Once every ... years	Acceptable probability
Not meeting objective	< € 0		< 50%
Taking loan out	≤ - € 40.000	10 years	≤ 10%
Bankruptcy	≤ - € 70.000	40 years	≤ 2,5%



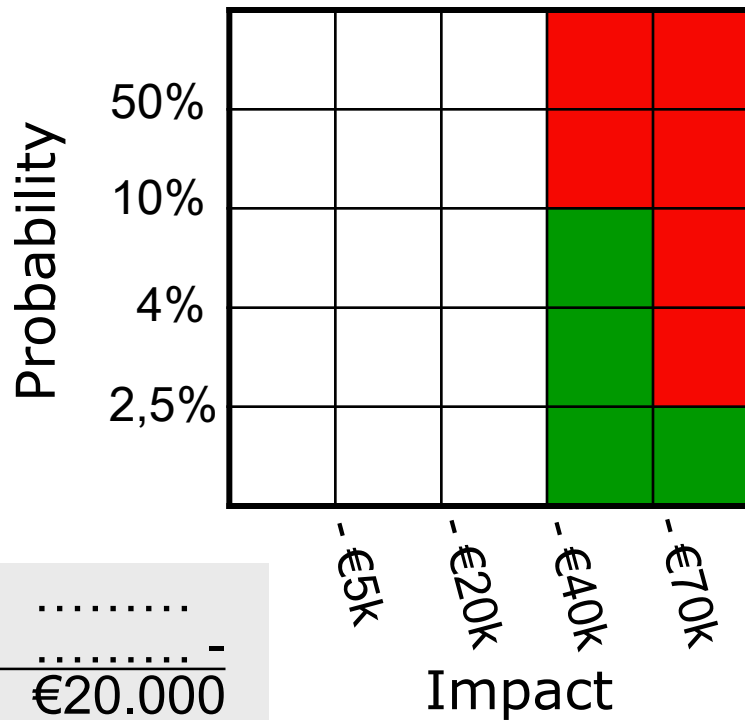
Budgeted income
Budgeted spending -
Net cash flow	€20.000

Event	Deviation from objective	Once every ... years	Acceptable probability
Not meeting objective	$\geq \text{€ } 0$		$\geq 50\%$
Taking loan out	$\leq - \text{€ } 40.000$	10 years	$\leq 10\%$
Bankruptcy	$\leq - \text{€ } 70.000$	40 years	$\leq 2,5\%$



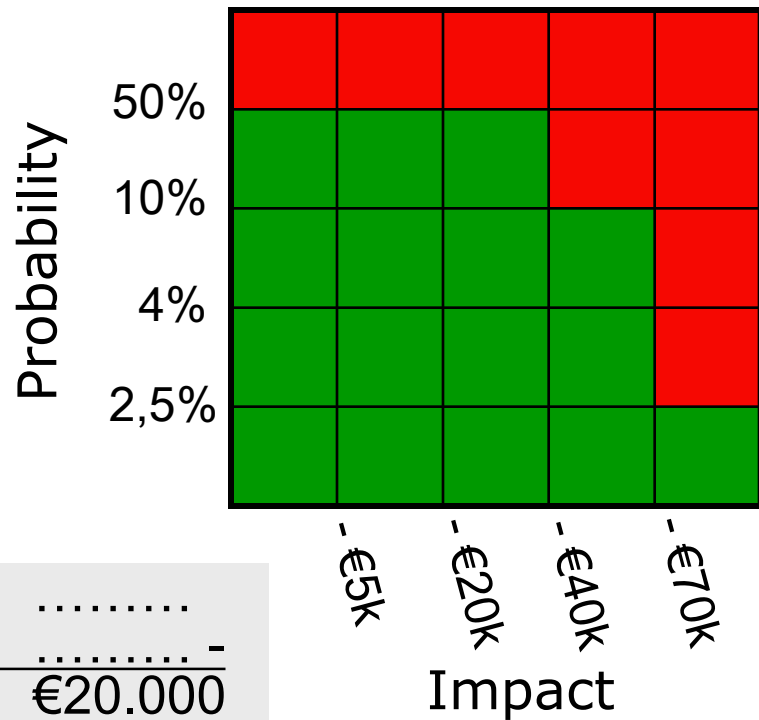
Budgeted income
Budgeted spending -
Net cash flow	€20.000

Event	Deviation from objective	Once every ... years	Acceptable probability
Not meeting objective	$\geq \text{€ } 0$		$\geq 50\%$
Taking loan out	$\leq - \text{€ } 40.000$	10 years	$\leq 10\%$
Bankruptcy	$\leq - \text{€ } 70.000$	40 years	$\leq 2,5\%$



Budgeted income
Budgeted spending -
Net cash flow	€20.000

Event	Deviation from objective	Once every ... years	Acceptable probability
Not meeting objective	$\geq \text{€ } 0$		$\geq 50\%$
Taking loan out	$\leq - \text{€ } 40.000$	10 years	$\leq 10\%$
Bankruptcy	$\leq - \text{€ } 70.000$	40 years	$\leq 2,5\%$

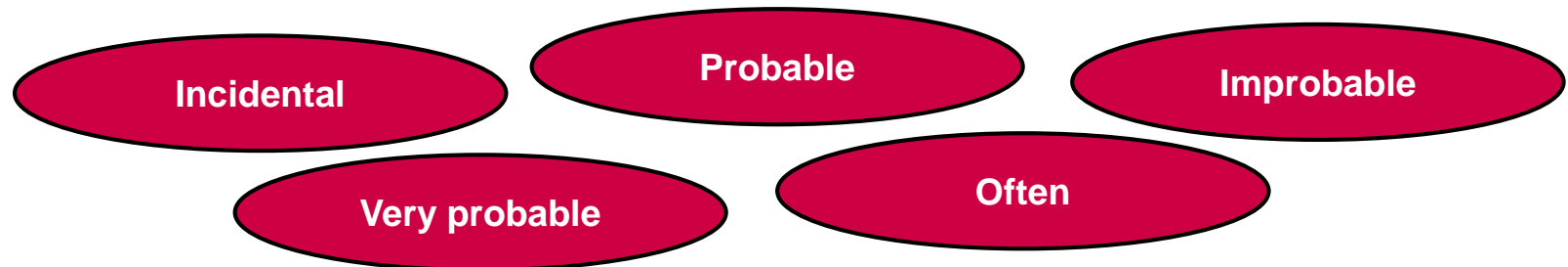


Risk Appetite expressed in Risk Map

Budgeted income
Budgeted spending -
Net cash flow	€20.000

Ranking words...

- Place the following words in the correct order

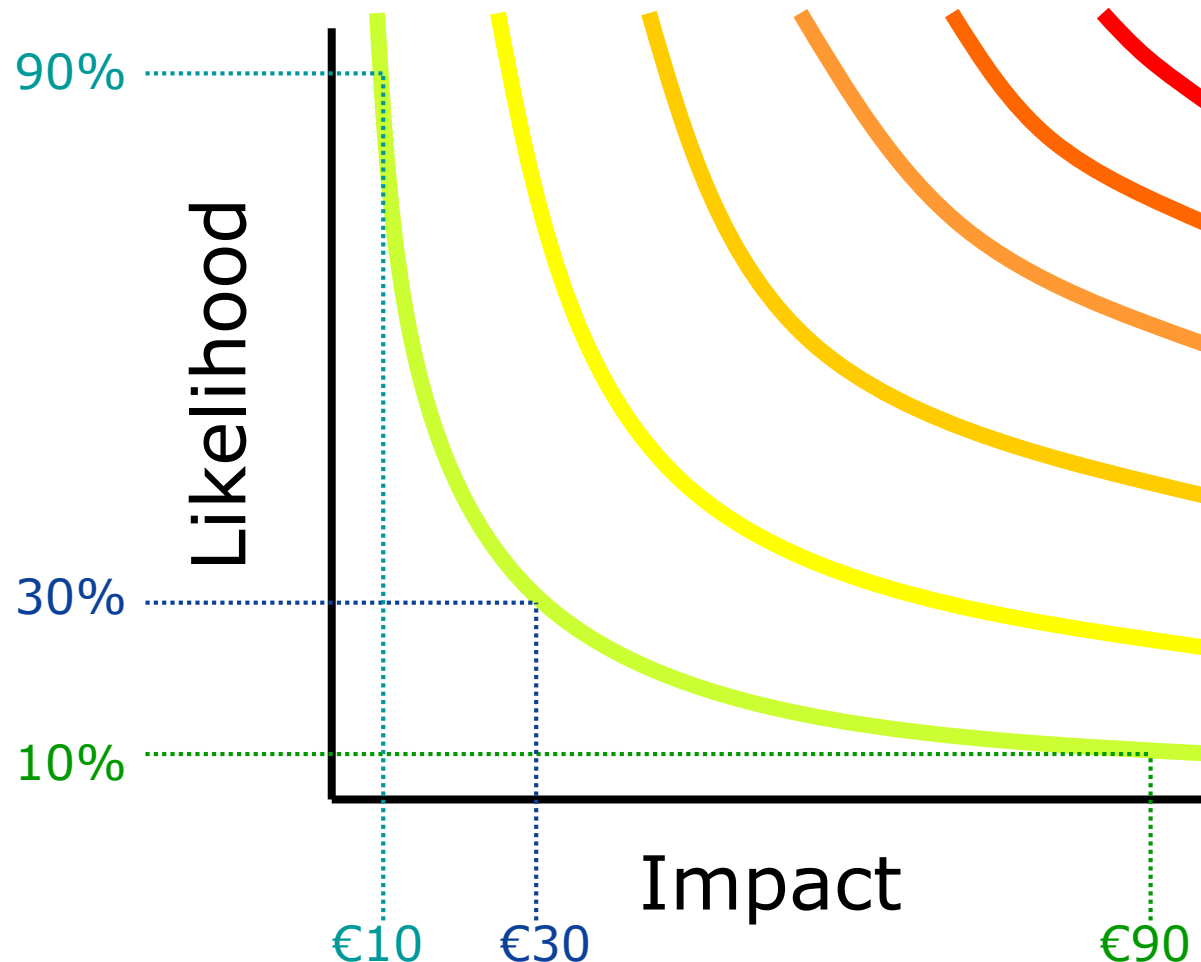


Version	I	II	III
Rank			
5	Very probable	Often	Very probable
4	Probable	Incidental	Often
3	Often	Very probable	Probable
2	Incidental	Probable	Incidental
1	Improbable	Improbable	Improbable

Expected value

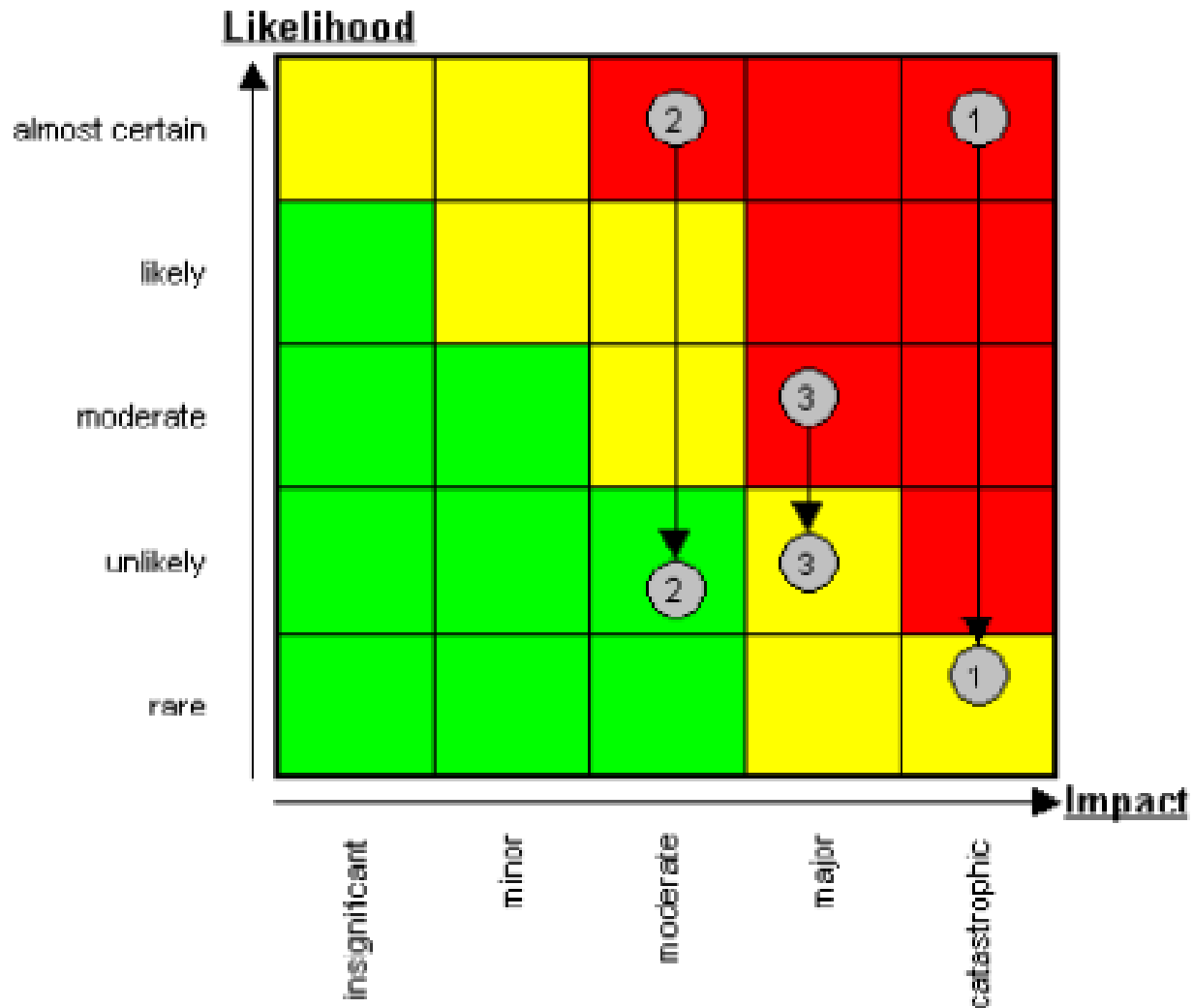
What can you say about this line?

□ Risk = Likelihood × Impact

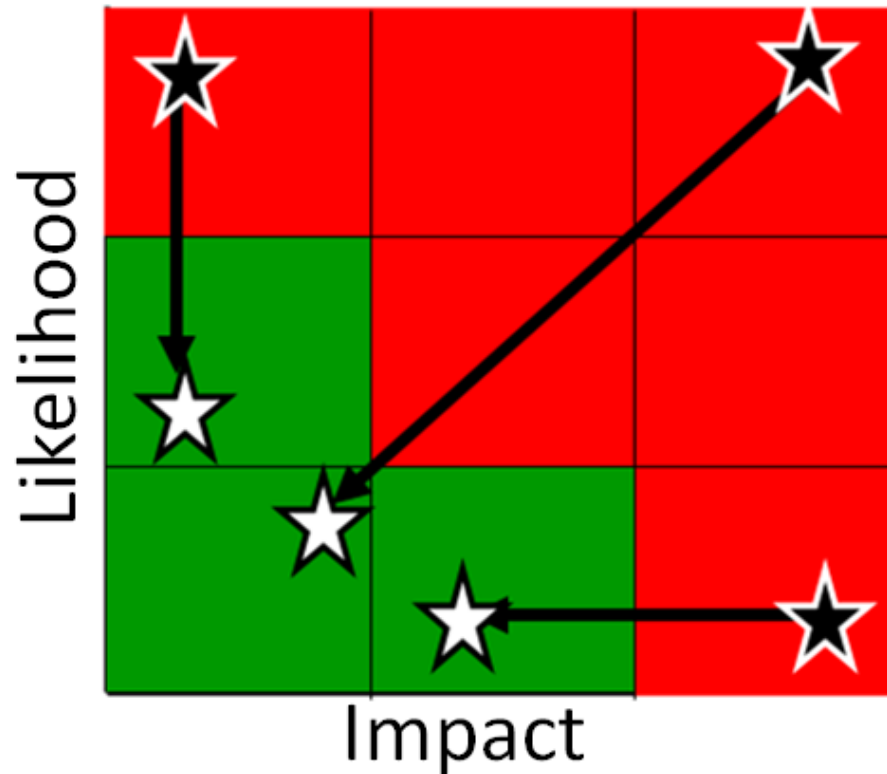


$$10\% \times \text{€}90 = 90\% \times \text{€}10 = 30\% \times \text{€}30 = \text{€}9$$

Example: IBM



From inherent to residual risk



★ Inherent risk ☆ Residual risk

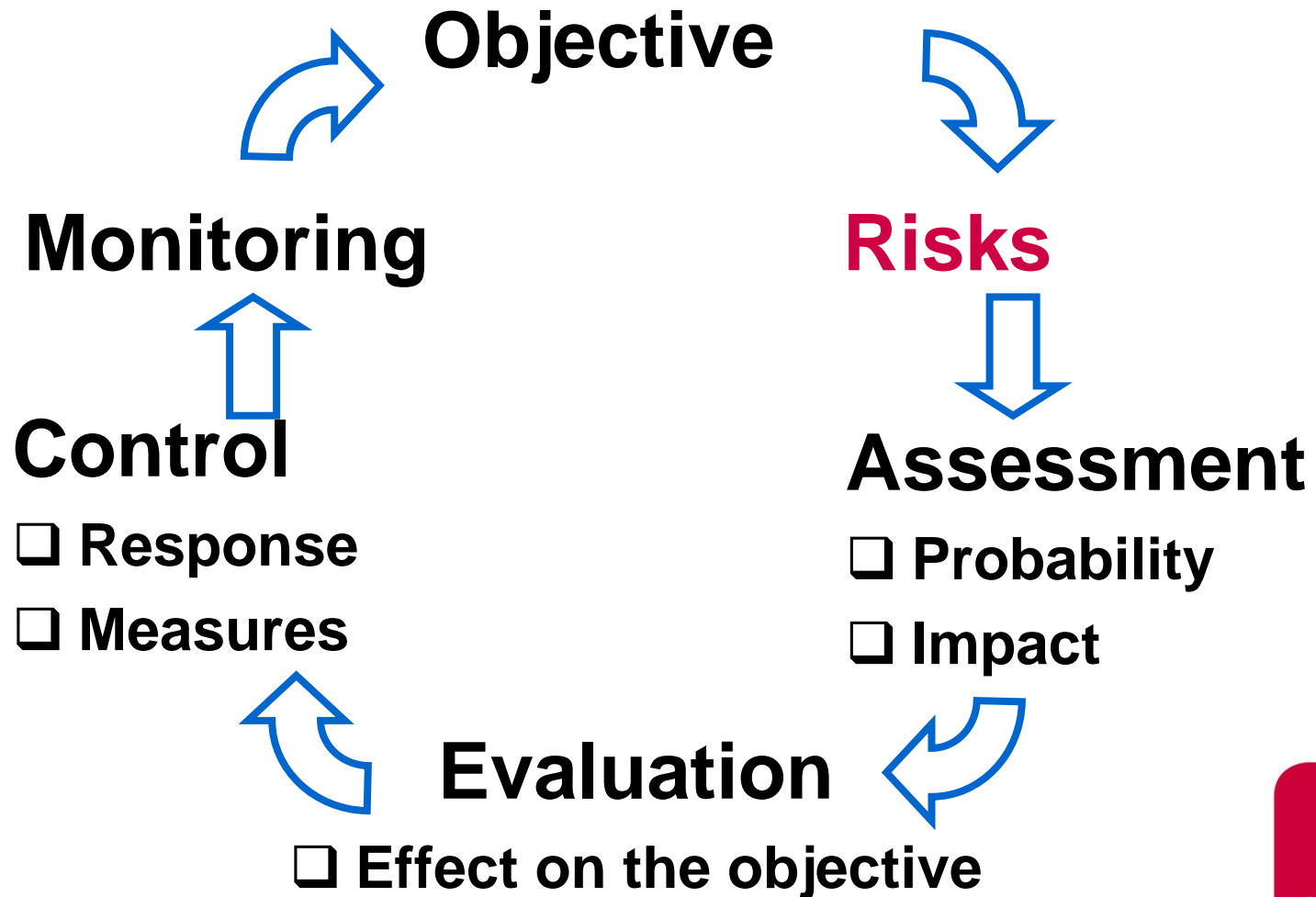
exceed expectations

Event Identification



- ❑ Events
- ❑ With positive consequences: opportunities
 - ❑ Objective setting
- ❑ With negative consequences: threat (or risk)
 - ❑ Risk assessment
 - ❑ Risk response
- ❑ Considering internal and external factors, like:
 - ❑ Internal Environment
 - ❑ Objective Setting

Risk management process

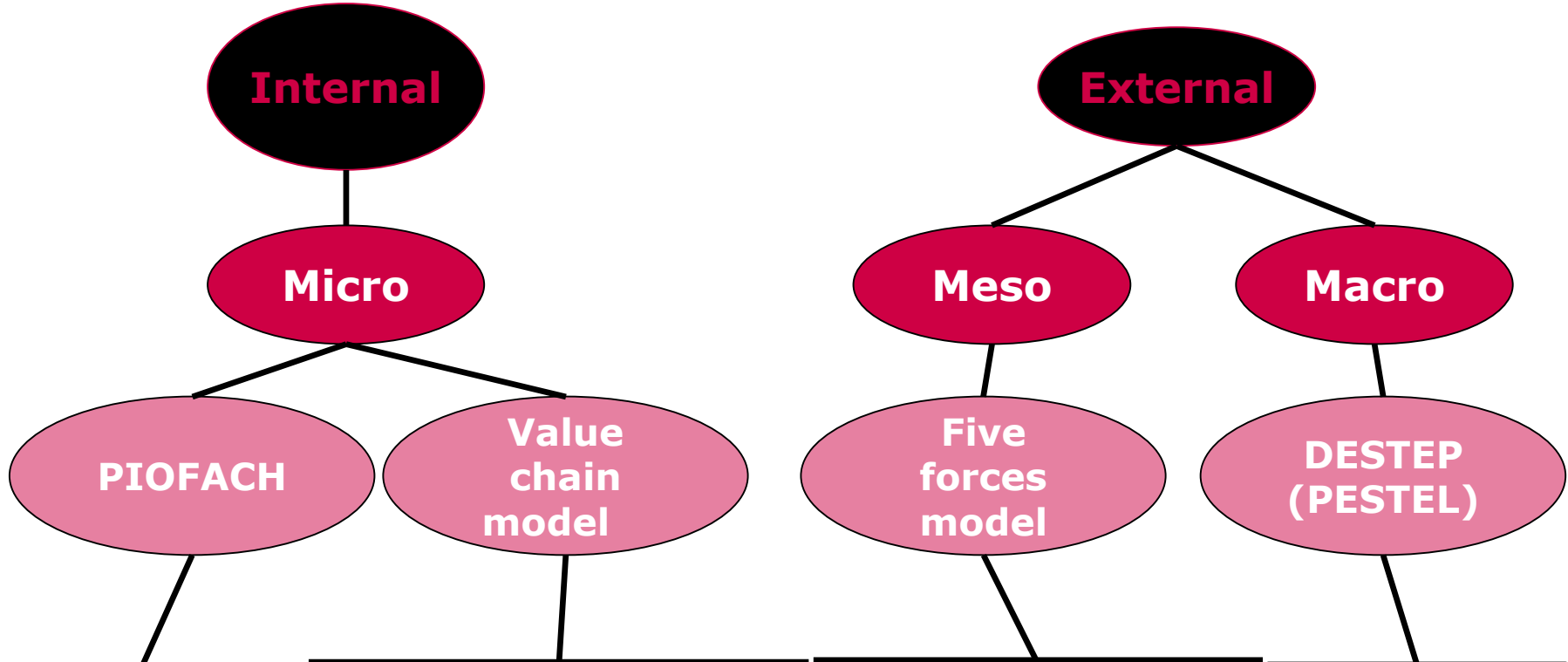


exceed expectations

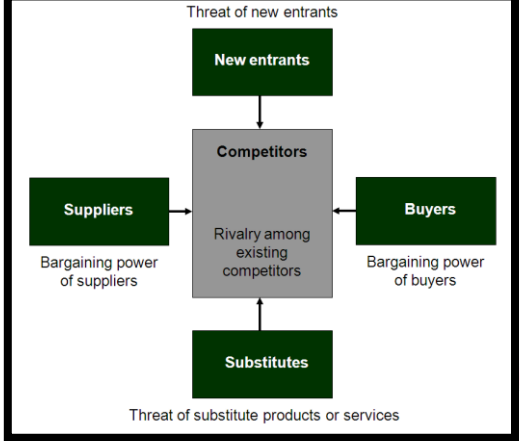
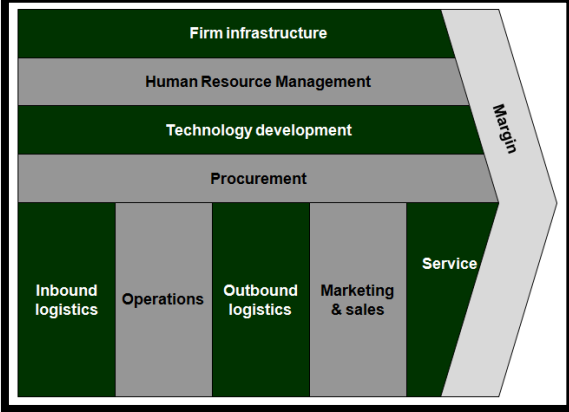
Risk as an event

Start your formulation with the word 'The'	<i>The</i>
Add a verb	<i>leaking</i>
Make use of words to clarify the risk	<i>of innovative ideas to the competitor</i>
If necessary indicate what the consequences are for the objective	<i>with the consequence that we lose our advantage</i>

Environments



Personal
Information
Organisation
Financial
Administration
Communication
Housing



Demographics
Economy
Society
Technology
Ecological
Political

Example



Considering the objective:

Net cash flow: + € 20.000

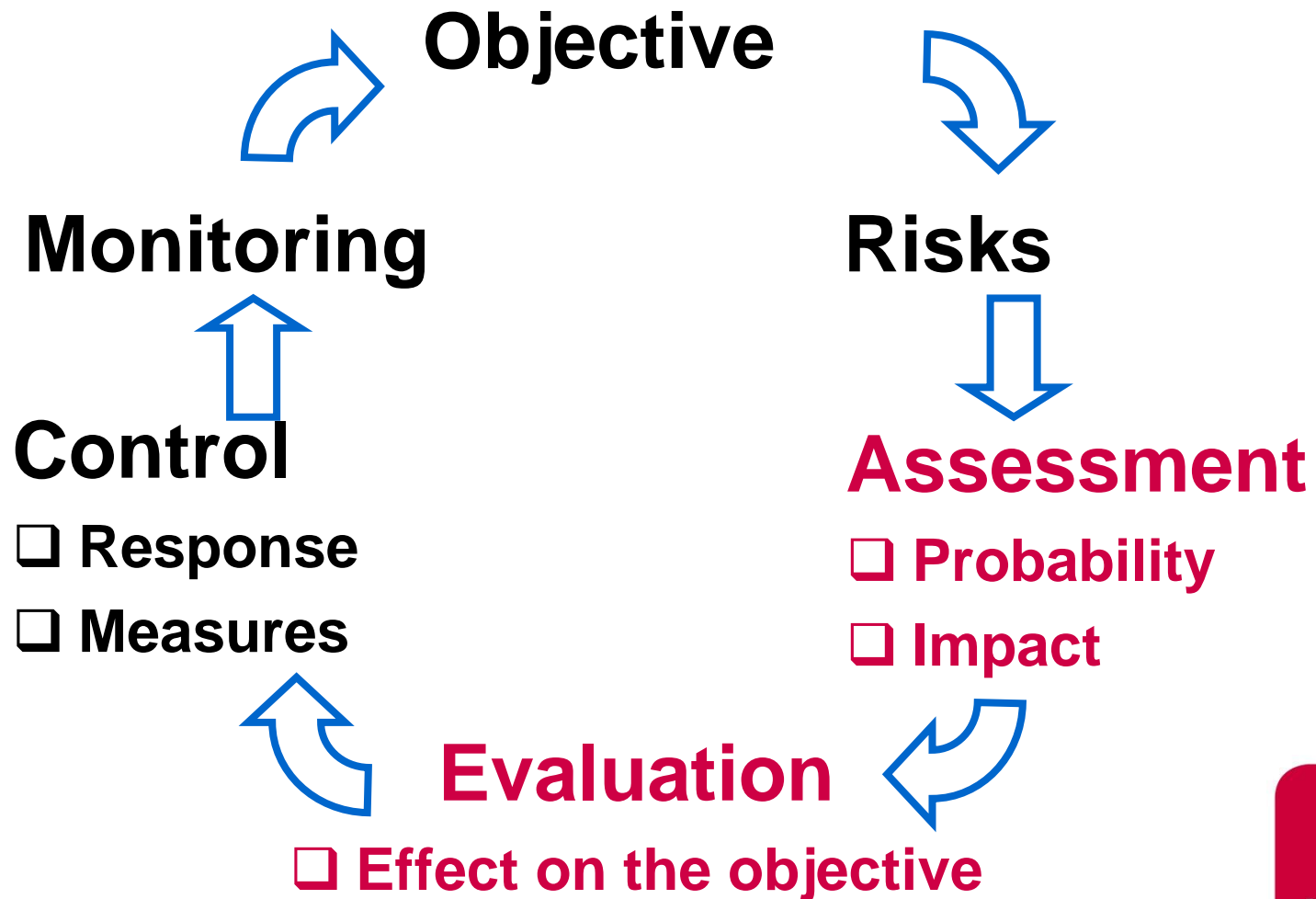
- ❑ MAFIN identifies the following risks
 - ❑ Bankruptcy of an important customer
 - ❑ Prolonged down time of a production machine
 - ❑ Prolonged illness of personnel

Risk Assessment



- Estimate per event
 - Probability
 - Impact
- Evaluation of events
 - Determine priorities
 - Top .. risks

Risk management process



exceed expectations

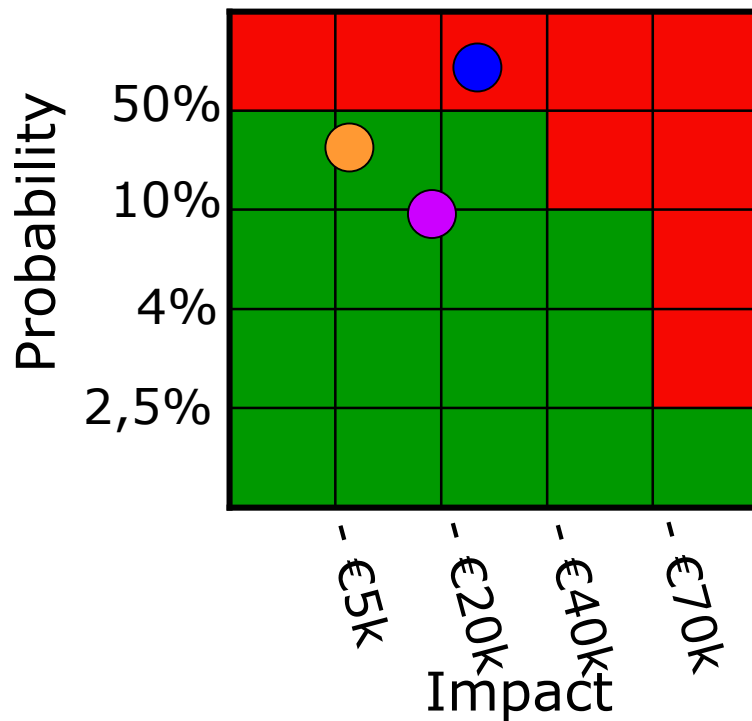
Example



MAFIN's estimate of the risks:

	Probability	Impact (effect on net cash flow)		
		Max	Mode	Min
Bankruptcy of an important customer	10%	— € 20.000	— € 12.000	— € 10.000
Prolonged down time of machine	33%	— € 8.000	— € 5.000	— € 2.000
Prolonged illness of personnel	67%	— € 25.000	— € 24.000	— € 15.000

	Probability	Max impact (on cash flow)
Bankruptcy of important customer	10%	– € 20.000
Prolonged down time of machine	33%	– € 8.000
Prolonged illness of personnel	67%	– € 25.000

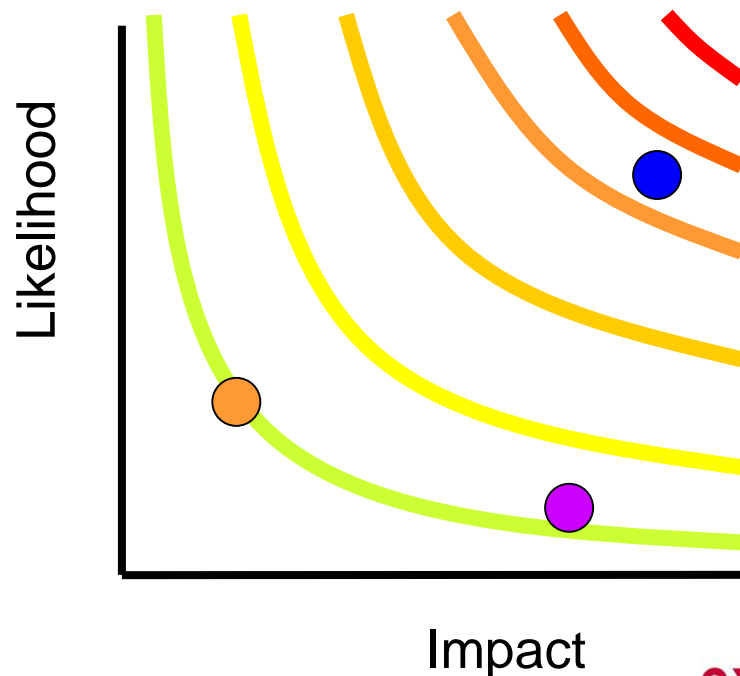


Risk Appetite
expressed in
Cash Flow

exceed expectations

	Probability	Max impact (on cash flow)
Bankruptcy of important customer	10%	– € 20.000
Prolonged down time of machine	33%	– € 8.000
Prolonged illness of personnel	67%	– € 25.000

□ Risk = Likelihood × Impact



Expected value

exceed expectations

Risk register (1.)

Risk #	Risk description	Prob. (in %)	Impact (in €)	Expected value
1	<i>The...</i>	<i>... %</i>	<i>€ ...</i>	<i>(% x €)</i>
2	<i>etc.</i>			

- ❑ Risk number
- ❑ Risk description (the – verb - ... - ...)
- ❑ Probability (%)
- ❑ Impact (€)
- ❑ Expected value

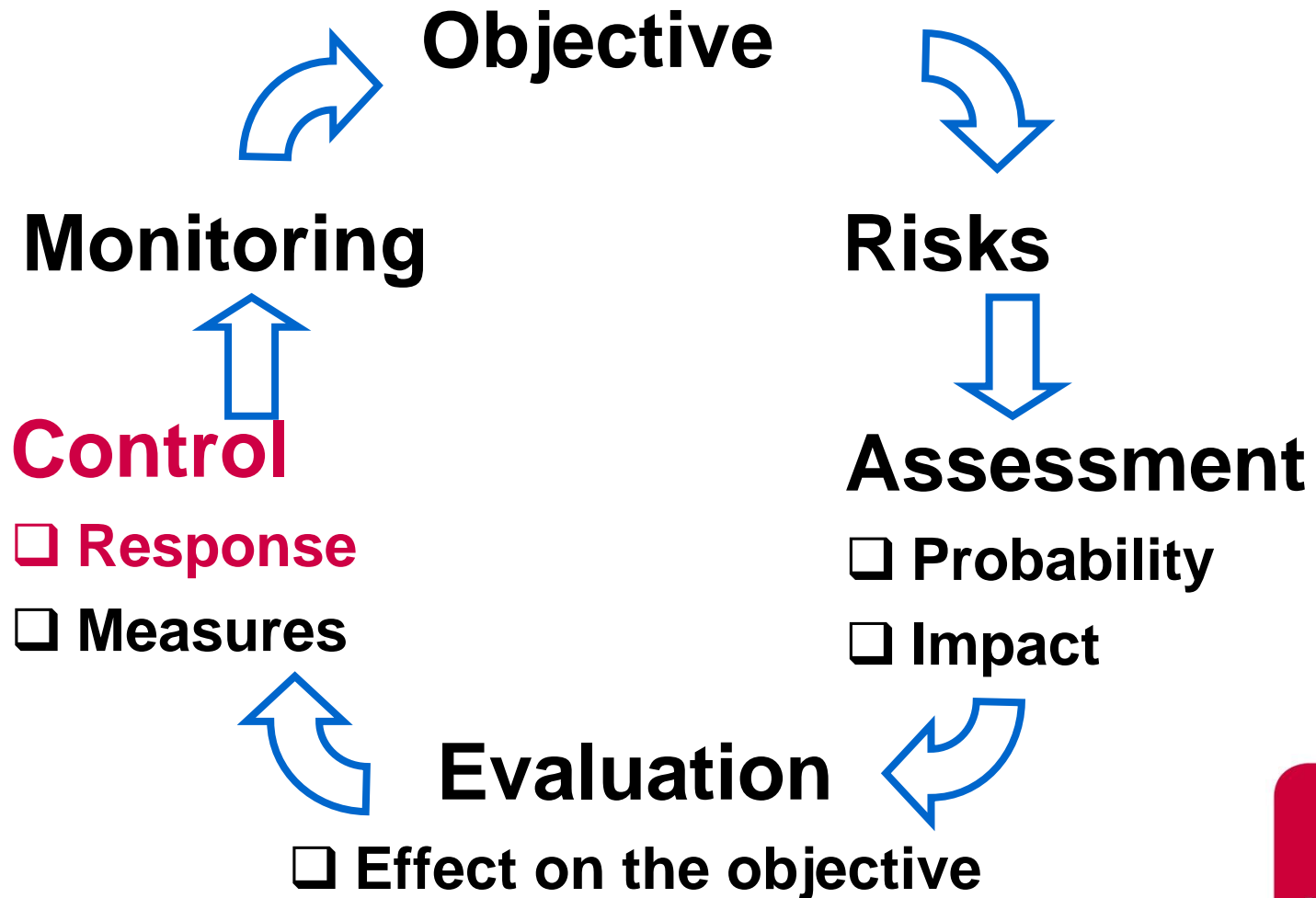
Risk Response



- ❑ Treat
- ❑ Transfer
- ❑ Take
- ❑ Terminate

- ❑ The choice of taking measures depends on:
 - ❑ Benefit
 - ❑ Effects on probability and impact
 - ❑ Cost
 - ❑ How much implementation costs

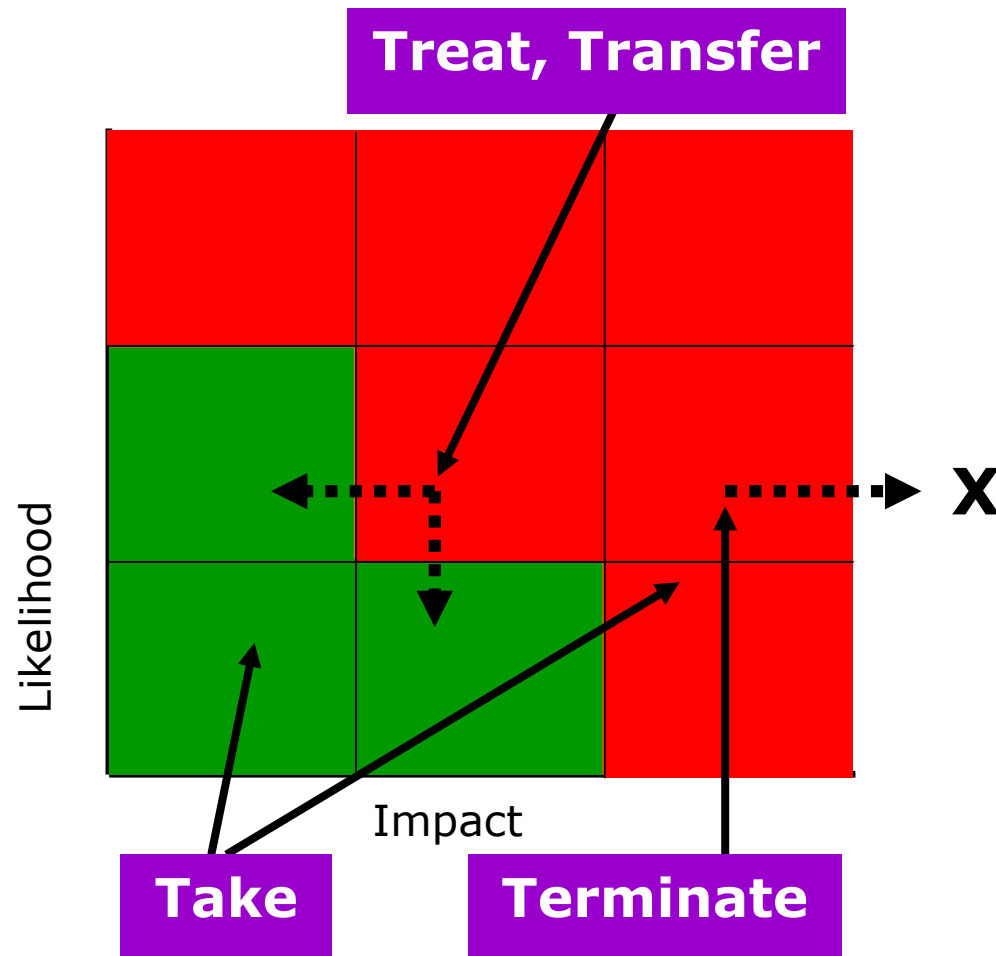
Risk management process



Risk response

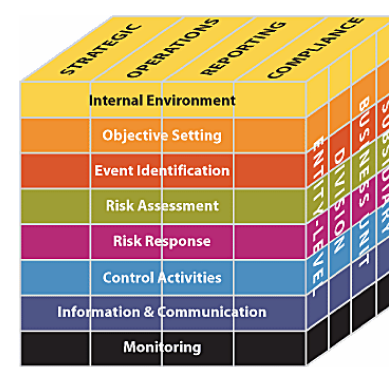
- ❑ Treat = Keep the risk yourself and take your own control measures
 - ❑ *Decrease either or both impact and probability*
- ❑ Transfer = Have others take the risk for you)
 - ❑ Such as insurance or outsourcing
- ❑ Terminate = Not taking any risk
 - ❑ For example closing an activity
- ❑ Take = Accept the risk and not take measures
 - ❑ Inside AND outside risk appetite

Risk response in risk map (1.)



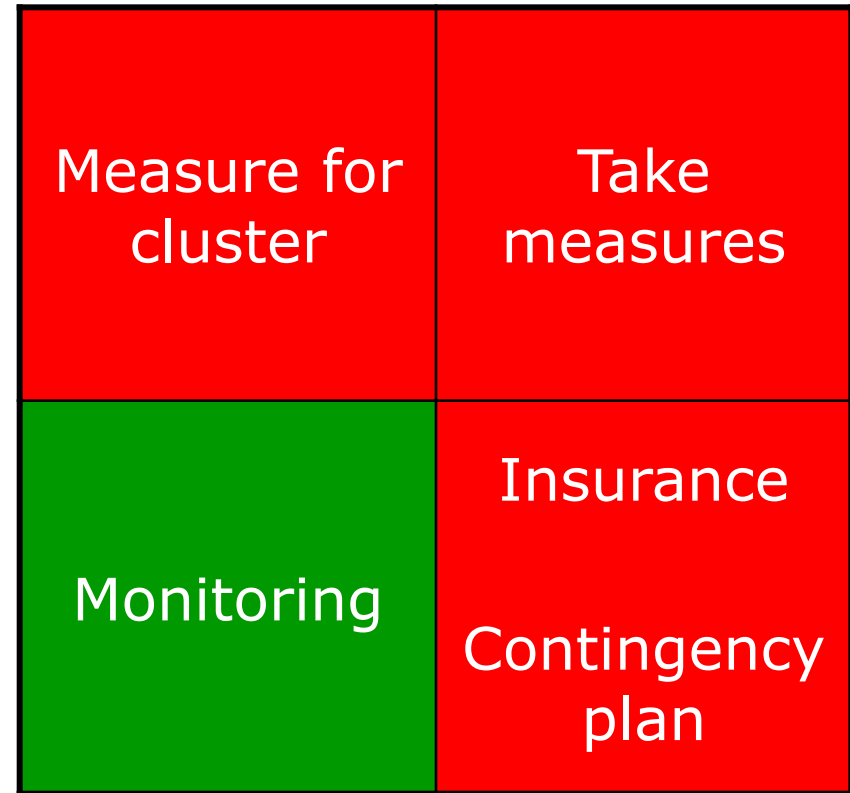
exceed expectations

Control Activities



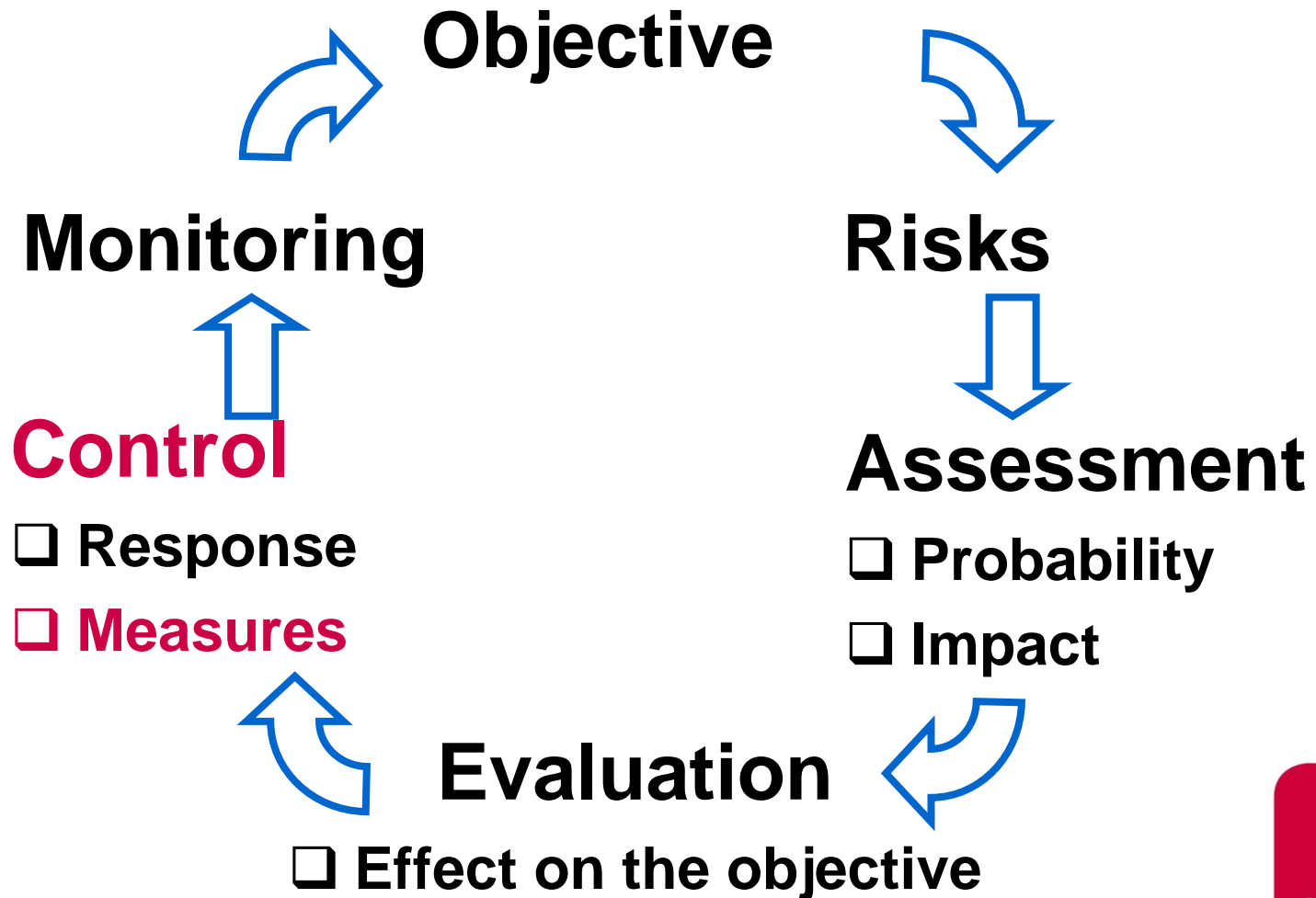
- Policy and procedures to implement a risk response

Likelihood

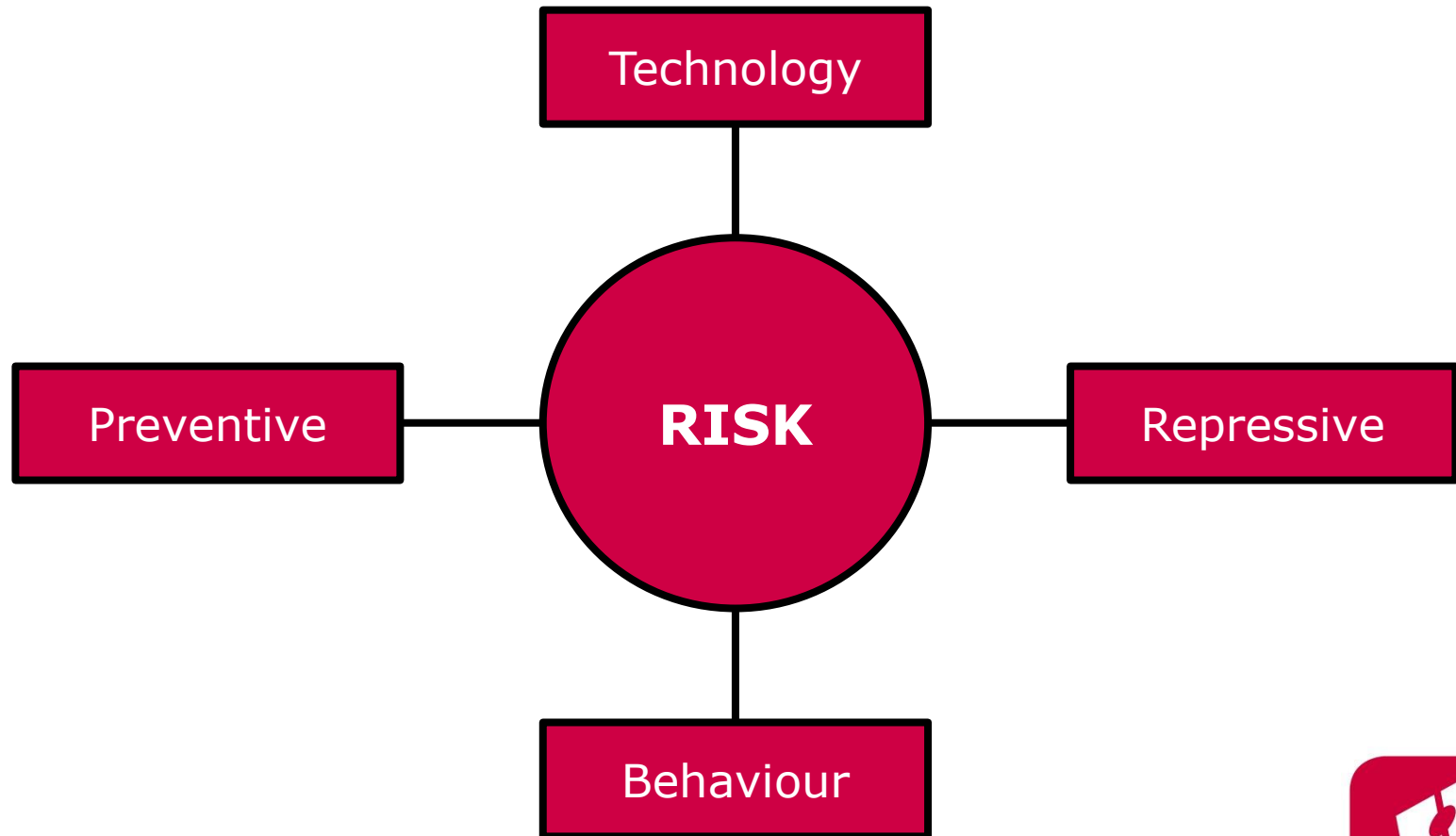


Impact

Risk management process



Types of measures



Types of measures (example)



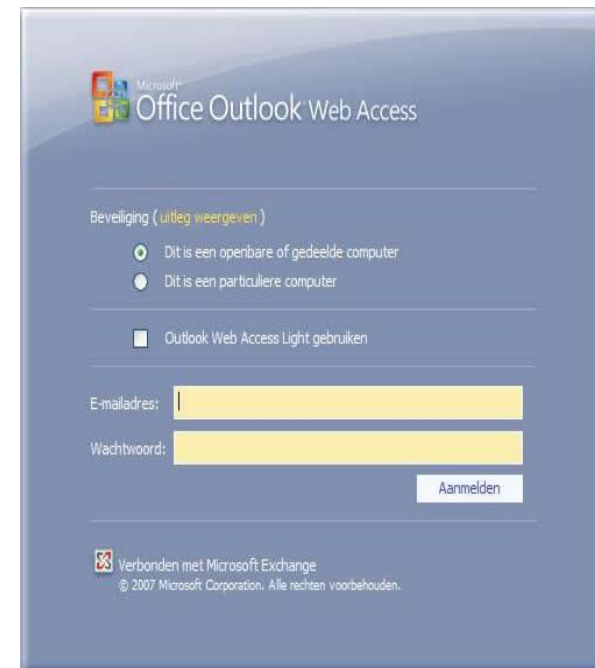
Hard & Soft Controls

Hard control:

- ❑ Measurable agreements and guidelines of which can be objectively determined if they have been followed
- ❑ Example: Passwords

Soft control:

- ❑ Measures related to personal performance and behaviour
- ❑ Example: Integrity



Microsoft Office Outlook Web Access

Beveiliging (uitleg weergeven)


Dit is een openbare of gedeelde computer

Dit is een particuliere computer

Outlook Web Access Light gebruiken

E-mailadres:

Wachtwoord:

 Verbonden met Microsoft Exchange
© 2007 Microsoft Corporation. Alle rechten voorbehouden.



Example



Considering the objective:

Net cash flow: + € 20.000

- ❑ MAFIN identifies the following risks
 - ❑ Bankruptcy of an important customer
 - ❑ Prolonged down time of a production machine
 - ❑ Prolonged illness of personnel

Example



MAFIN's risk assessment:

	Probability	Impact		
		Max	Mode	Min
Bankruptcy of an important customer	10%	— € 20.000	— € 12.000	— € 10.000
Prolonged down time of machine	33%	— € 8.000	— € 5.000	— € 2.000
Prolonged illness of personnel	67%	— € 25.000	— € 24.000	— € 15.000

Example



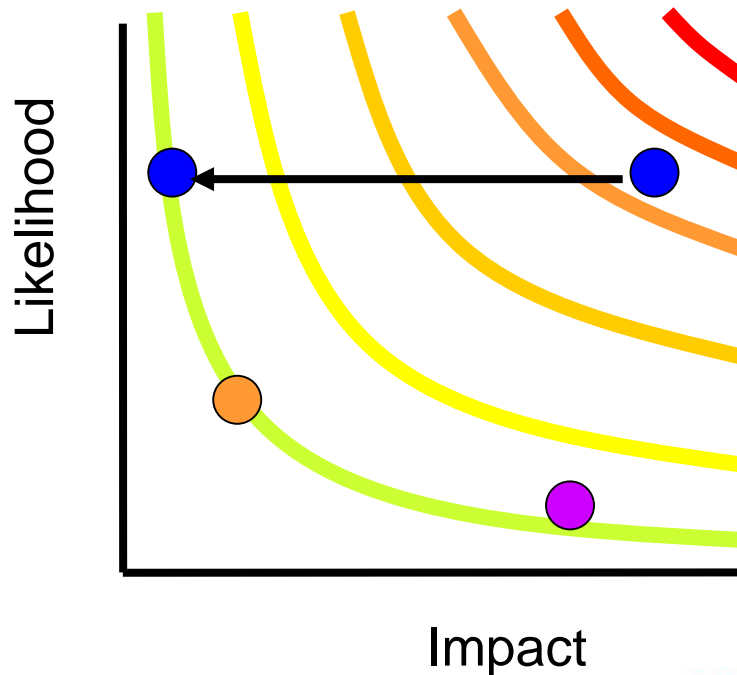
MAFIN decides to purchase insurance against prolonged illness of employees

- ❑ Own risk: € 2.000
- ❑ Premium: € 1.000

Prolonged illness of employees	Probability	Impact		
		Max	Mode	Min
Inherent	67%	— € 25.000	— € 24.000	— € 15.000
Residu	67%	— € 2.000		

	Probability	Max impact (on cash flow)
Bankruptcy of important customer	10%	– € 20.000
Prolonged down time of machine	33%	– € 8.000
Prolonged illness of personnel	67%	– € 2.000

□ Risk = Likelihood × Impact



Expected value

exceed expectations

Risk register (2.)

Risk #	Risk description	Prob. (in %)	Impact (in €)	Expected value	Risk response	Control measures
1	<i>The...</i>	<i>... %</i>	<i>€ ...</i>	<i>(% x €)</i>	<i>(4T's)</i>	<i>... + ...</i>
2	<i>etc.</i>					

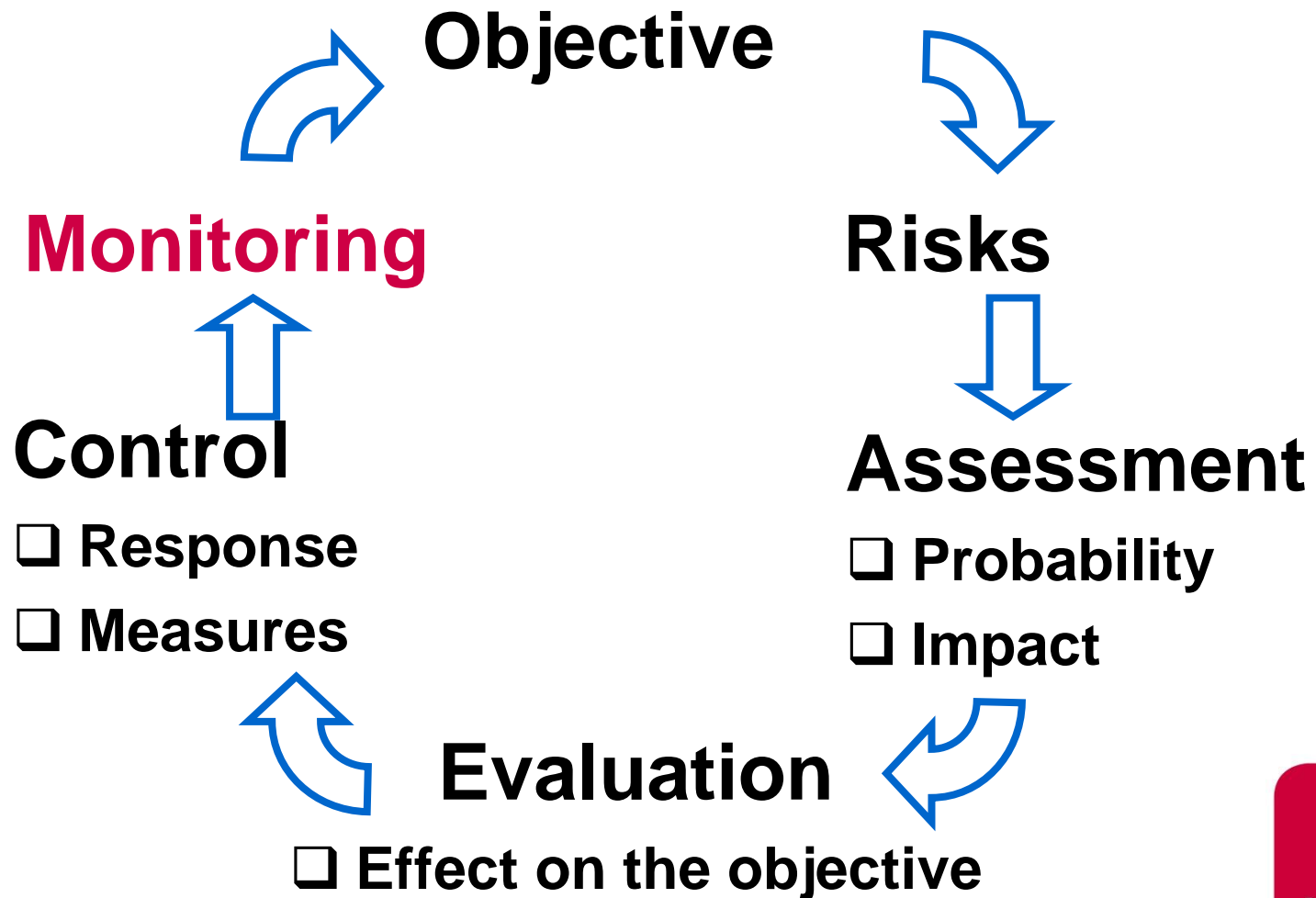
- ❑ Risk number
- ❑ Risk description (the – verb - ... - ...)
- ❑ Probability (%)
- ❑ Impact (€)
- ❑ Expected value
- ❑ **Risk response**
- ❑ **Control measures**

Risk register (3.)

Risk #	Risk description	Control measures	Prob. (in %)	Impact (in €)	Expected value
1	<i>The...</i>	<i>... + ...</i>	<i>... %</i>	<i>€ ...</i>	<i>(% x €)</i>
2	<i>etc.</i>				

- ❑ Risk number
- ❑ Risk description (the – verb - ... - ...)
- ❑ **Probability after control measures (%)**
- ❑ **Impact after control measures (€)**
- ❑ **Expected value after control measures**

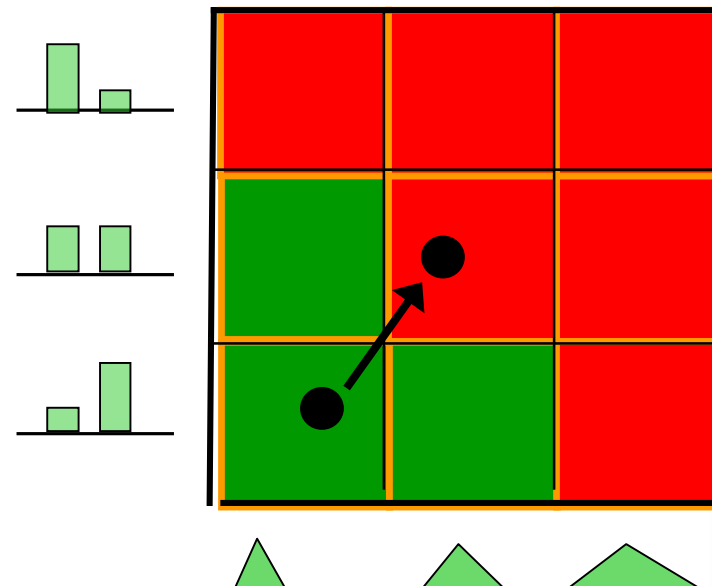
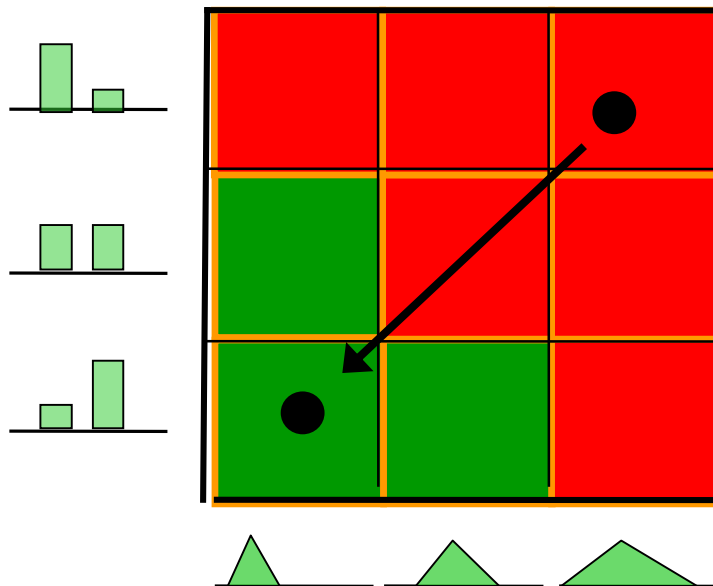
Risk management process



Monitoring after implementing (1.)

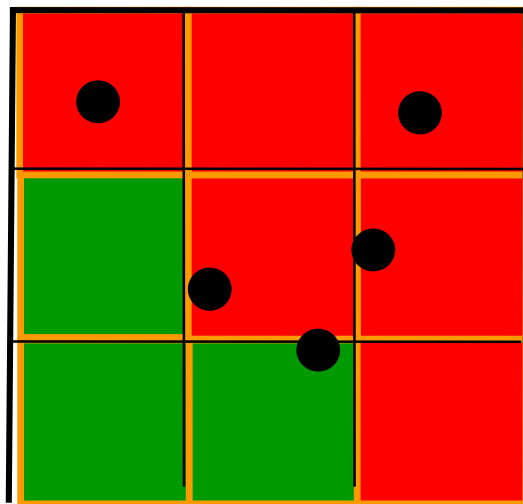
- ❑ Risk managing seems effective at first sight

- ❑ Size of risk increases
- OR
- ❑ Control measure is not very effective



exceed expectations

Monitoring after implementing (2.)

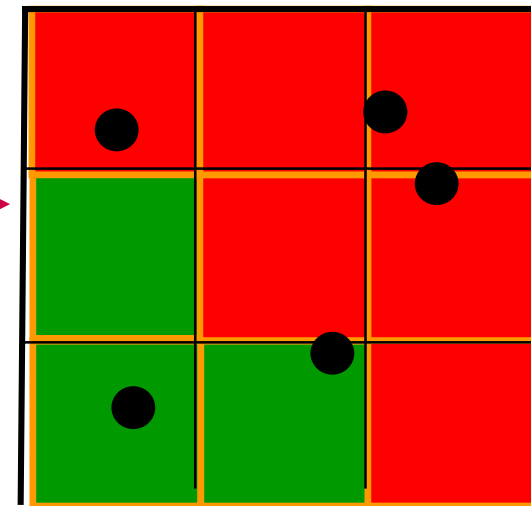


Current risk profile



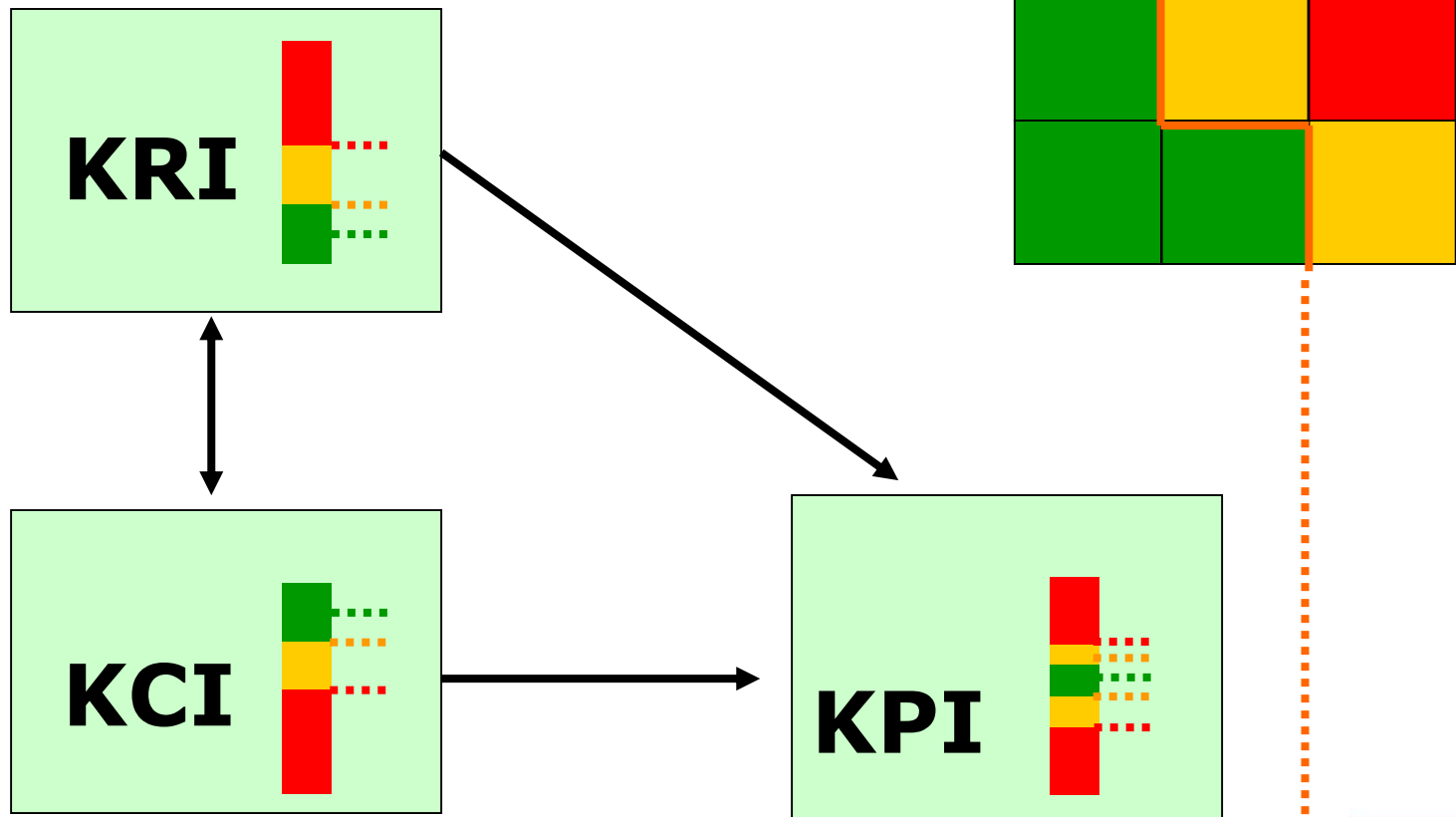
CAUSES:

- ❑ External developments
- ❑ Changing objectives
- ❑ Internal developments
- ❑ Information from risk profiles elsewhere in the organisation
- ❑ Control measures



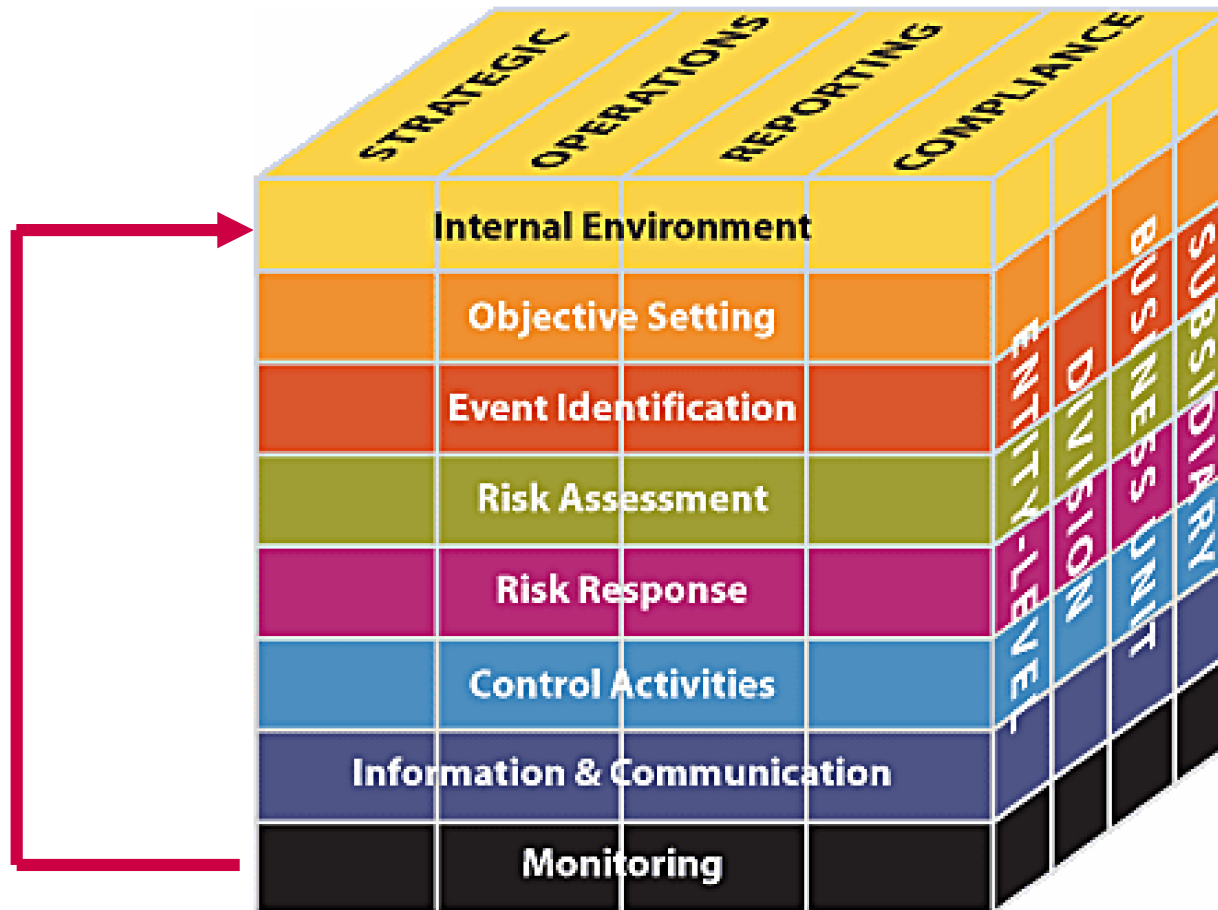
Updated risk profile

KPI, KRI and KCI



'Early Warning Indicators' give an early warning so preventive measures can be taken on time

End of the process?



Continuous process

exceed expectations

Risk management process

