PROF.DR.IR. J.I.M. (JOOP) HALMAN 19 AUGUST 2019



MANAGING RISKS IN (INNOVATION) PROJECTS

AGENDA FOR THIS AFTERNOON

- Risks: different contexts, different views
- Group case as first rehearsal
- Attention points for a risk analysis
- The Risk Diagnosing Methodology: RDM

THE RISK-PARADOX IN NEW BUSINESS DEVELOPMENT AND INNOVATION:

- Entrepreneurship and the introduction of new products, processes and services requires risk taking behavior
- Many innovations and start ups fail: innovation and entrepreneurship is a risky business
- Stressing the importance for risk management may not lead to reinforcement of risk avoidance behavior
- Apply risk management as a tool to foresee the risks and take the manageable risks actively and consciously

Discovery: Find out something that exists but that is not known yet

Invention:

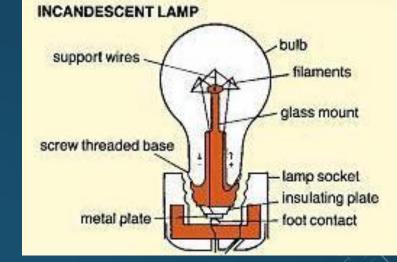
Thinking out and/or putting together, based upon specific knowledge, skills and experience, something new by which human possibilities could be enlarged

Innovation:

Developing and implementing a new product, process and/or service successfully into the market

Edison's light bulb (example)

Edison as an inventor:



In 1879 Edison invented a practical solution by constructing a carbon filment suitable to be applied for light bulbs

In that same period there were at least 10 inventors competing with comparable technical solutions for light bulbs

Edison's light bulb (example continued)

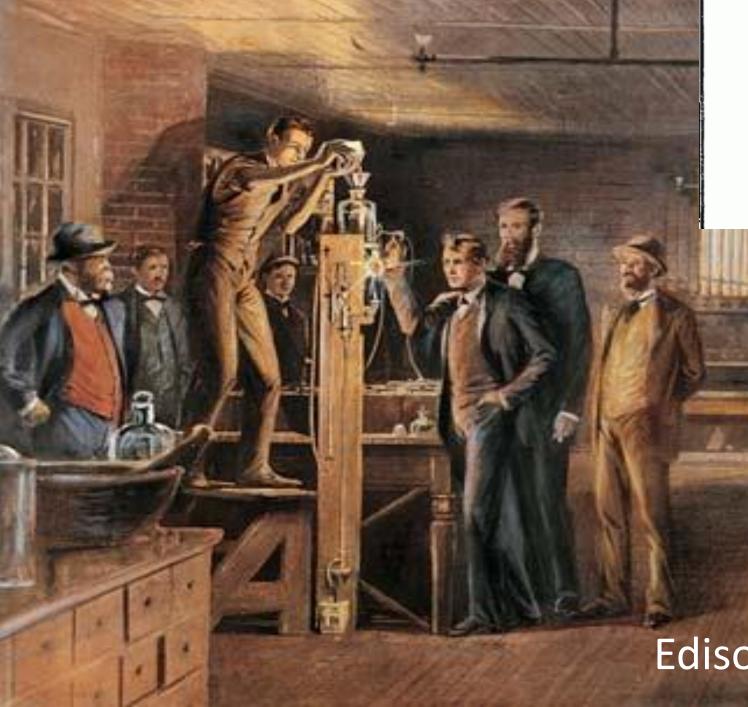
Edison as an innovator:

First:

- developed dynamo's supplying power for at least 1000 light bulbs
- designed cables, safety fuses, sockets and gauges to measure electricity consumption
- carries out experiments with home lighting in small villages

Publicity, selling and large scale production only after having acquired successful development results:

- street lighting in a major city in the UK
- a proposition is worked out for licensees
- in 1881 he participates at the world exhibition in Paris





Do not attempt to light with match. Simply turn key on wall by the door.

Edison: inventor and innovator

"When the Paris Exhibition closes, electric light will be closed with it and no more will be heard of it"

LACK OF IMAGINATION

(Erasmus Wilson, professor at Oxford University, 1878)

RISK DUE TO LACK OF IMAGINATION

"The Americans have need of the telephone, but we do not. We have plenty of messenger boys."
-- Sir William Preece, chief engineer of the British Post Office, 1876.

"Who the hell wants to hear actors talk?" -- H. M. Warner, Warner Brothers, 1927.

- "I think there is a world market for maybe five computers."
- -- Thomas Watson, chairman of IBM, 1943.





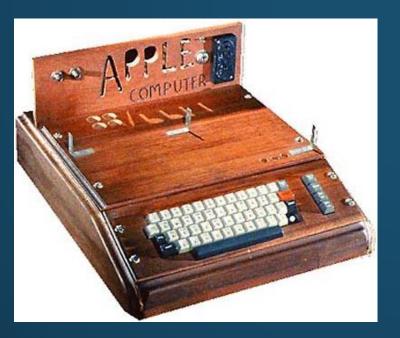


"There is no reason anyone would want a computer in their home."

-- Ken Olson, president, chairman and founder of Digital Equipment Corp., 1977.







Martin Cooper First mobile from 1973 1 kilo in weight

Steve Wozniak First Apple 1976 Introduced on the market by friend Steve Jobs \$ 699,99 4 KB RAM, extendable from 8 KB or 48 KB (external card)

TECHNOLOGY PUSH VS MARKET PULL

Don't talk to your consumers



If I'd asked my customers what they wanted, they would have said a faster horse

Henry Ford

TECHNOLOGY PUSHVS MARKET PULL

What happens when you don't listen to consumers



When we were creating Bailey's Irish Cream, the concept bombed in consumer research. So we lied to the board to push the concept through.

Project Leader

Source: Maria Tornell Arla Foods

THE IMPORTANCE OF PRODUCT INNOVATION & BUSINESS DEVELOPMENT RISK MANAGEMENT :

- We have centuries of experience in conducting innovative projects (Pyramids, Expeditions, Panama-canal etc.)
- Nevertheless a substantial subset of innovative projects can be considered as failures:

Innovation projects: 1/3 are market failures, ½ of the money spent goes to the failures Software projects: ¼ stops preliminary, average 1 year delay in time and budgets exceeding with factor 2

New Business Start ups: ½ fail within 5 year of existence

AUGMENTING INSIGHT AMONG PROFESSIONALS THAT:

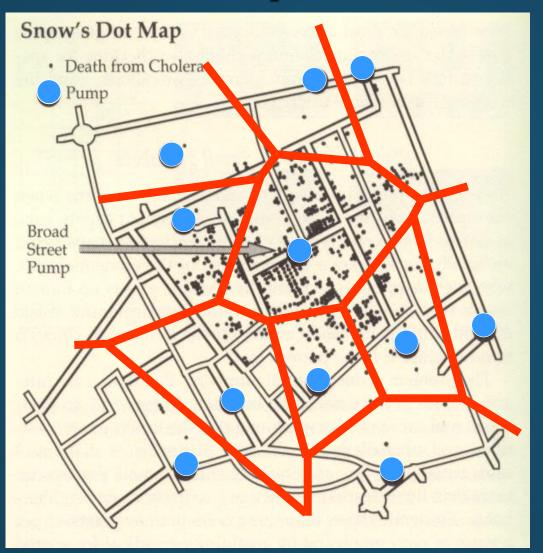
Risk management is essential to realize innovative activities successfully

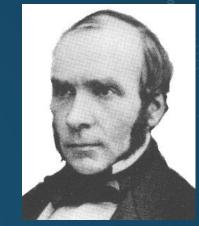
RISK AS A CONCEPT:

The concept of risk is used in different disciplines:

- *Health sciences:* epidemic research to identify health risks
- Social psychology: objective versus cognitive risks
- *Economy:* investment questions
- Safety sciences: acceptable risk in production
- *Insurance:* to determine insurance premium
- *Statistics:* methods to quatify risks
- Business sciences: short vs long term success of companies

Gis – spatial analysis





WHAT IS MORE RISKY: FLYING OR DRIVING A CAR?



PERCEIVED VERSUS ACTUAL RISKS

According to the National Highway Traffic Safety Administration:

- 35.000 deaths were registered in 2015 in the USA due to car accidents.
- *Zero (0) deaths* were registered in 2015 due to flight accidents in the USA
- You have a chance of 1:114 to die in a car accident while the chance to die due to a flight accident is 1:9821

PERCEIVED VERSUS ACTUAL RISKS



Perceived versus Actual risks

Dying in a bathtub

- In Japan, bath-related deaths have assumed proportions of a national tragedy with 19,000 deaths occurring annually.
- In the US, federal mortality data in 2006 stated at least one American dies in a bathtub, hot tub or spa a day.

Chances to die:

Heart attack: 1 : 23 Choke: 1 : 370.000 In bath tub: 1 : 685.000 Terroristic attack: 1 : 9.300.000

SMALL SPACE, BIG DANGER

CELEBRITIES WHO DIED IN BATHTUBS

> Jim Morrison of The Doors (28) was found dead in a bathtub in Paris in 1971. No autopsy was done but it is said he died of drug overdose



face down in bathtub in a hotel suite in 2012. Items used to sniff drugs discovered

Bobbi Kristina Brown, famous as daughter of singers Bobby Brown and Whitney Houston, was found unconscious with her face down in a bathtub in 2015. Autopsy records revealed alcohol, prescription meds

Actor-singer Judy Garland was 47 when found dead in a bathroom in 1969; cause was overdose of barbiturates



Indian actress Sridevi dies in bathtub 24 Feb 2018

PLEASE READ THIS CAREFULLY

A father and his son walk on the street when suddenly they witness a terrible drive-by shooting. The father gets hit by a stray bullet and dies. The son survives and is brought to the police-station as an eyewitness. Just as the police officer is about to interview him, the officer says "I can't interview him, that boy is my son!"



TRY TO UNDERSTAND THIS:

A father and his son walk on the street when suddenly they witness a terrible drive-by shooting. The father gets hit by a stray bullet and dies. The son survives and is brought to the police-station as an eyewitness. Just as the police officer is about to interview him, the officer says "I can't interview him, that boy is my son!"



SO, WHAT'S THE CLUE?

A father and his son walk on the street when suddenly they witness a terrible drive-by shooting. The father gets hit by a stray bullet and dies. The son survives and is brought to the police-station as an eyewitness. Just as the police officer is about to interview him, the officer says "I can't interview him, that boy is my son!"



A QUARANTINED VILLAGE



Consider the following situation: A terrible disease has hit a village with 975 people There are two possible courses of action:

a. Save 325 people by giving all the patients an experimental drug costing € 1 million.

b. Quarantine the village at a cost of \$300k and let 650 people die, which will leave a
 € 700k clean-up Bill.

Which option is better?

A QUARANTINED VILLAGE



Answer:

In both situations the result will be the same: 325 people live and 650 people die and the to € 1 million

Option 1 was framed as an optimistic view while Option 2 was framed with a pessimistic view

YOU MIGHT WIN SOME MONEY.... WHICH OPTION DO YOU CHOOSE A OR B?

Option A:

- 80% chance to win € 4000,-
- 20% chance to win nothing

Option B: - 100% chance to win € 3000,-

YOU MIGHT LOOSE MONEY... WHICH OPTION DO YOU CHOOSE A OR B?

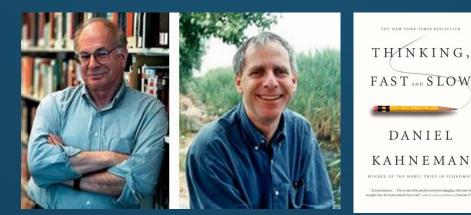
Option A:

- 80% chance to loose € 4000,-
- 20% chance to loose nothing

Option B: - 100% chance to loose € 3000,-

KAHNEMAN & TVERSKY: PROSPECT THEORY

- Kahneman and Tversky demonstrated the "Loss aversion effect": the tendency that people prefer avoiding losses to acquiring gains: it's better to not lose \$5 than to win \$5.
- They demonstrated the effect of *Framing* something as a loss or as a gain: would you rather get a \$5 discount or avoid a \$5 surcharge? The same change in price framed differently has a significant effect on consumer behavior
- Kahneman was awarded in 2002 with a Nobel Laurate

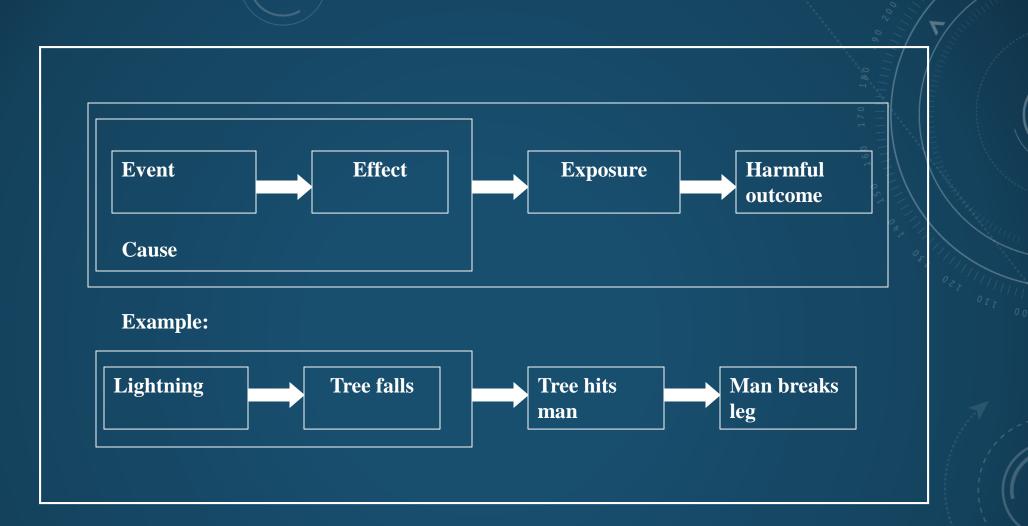


US Airways flight 1549, lands on 15 January 2007 in the Hudson Bay

What do you notice?

ISAIRWAIS

List Statist



Risk seen as a chain of cause, exposure and harmful outcome (Rowe, 1977)

A seat in the woods



The risk event? The risk chance? The impact? The influencibility?

A Typology of Risk

	Frequent	Not frequent
Outcome cannot be influenced	Objective measurable: frequency of failures Example: weather delays in contractor's estimate	Subjective assessment: degree of (reasoned) belief in chance of failure Example: Buying a share
Outcome can be Influenced	Objective measurable: frequency of failure due to uncontrolled process Example: Statistic process control	Subjective assessment: degree of (reasoned) belief in uncontrolled process Example: NBD and innovation

New Business risk framework:

The level of uncertainty

NBD risks:

- Technological
- Organizational
- Financial
- Market & Business

Ability to influence Impact on new business success

RISK ANALYSIS (FINGER EXERCISE)

As a team you get the assignment to organise and manage a big international health conference. To make this project a success you decide as a team to execute a risk analysis. You perform this risk analysis by answering the following questions:

- Q I: Determine (individually) when you will consider the conference as a success
- Q II: Make (also indivually) an inventarisation of all the important potential risks that may jeopardize a successful conference
- Q III: Compare your own list with those of your team members and make 2 categories
 1: risks identified by most of the team members
 2: risks identified by just one team member

RISK ANALYSIS (FINGER EXERCISE)

- Q IV: Make a matrix as a team in which you plot the potential risks according to two dimensions: *certainty of occuring* (the chance of occuring)' and *severity in case of occurence*'
- Q V: Determine to what extent the potential risk are influenceable'
- Q VI: Determine what the measures will be that your team will take for the diagnozed risks (who is going to do what and when)

DILLEMAS IN RISK MANAGEMENT:

Risk identification and risk assessment:

- How do you know that you have identified <u>all</u> the important project risks?
- How reliable are your data?

How to decide on identified project risks?

- By a democratic majority point of view?
- By hierarchical or functional position?
- How to handle point of views of minorities?

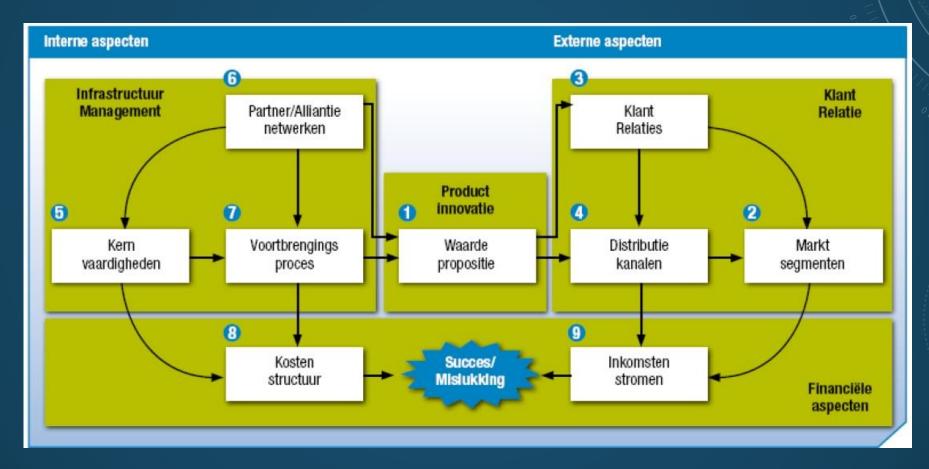
DIAGNOSING RISKS IN PRODUCT INNOVATION AND NEW BUSINESS PROJECTS:

- Ensure a systematic identification process: do not trust only on brain storming!
- Take everyone's view point serious!
- Relate your project to experiences from the past

EXAMPLE OF PRODUCT INNOVATION RISK CATEGORIES:

- Strategic positioning: fit with project portfolio
- Technology risks
 - product
 - production process
 - patents en licencies
- Client acceptance & Marketing
- Suppliers
- Distribution channels
- Competitors
- Commercial viability
- Organisation and project management risks
- External risks: acceptance by external parties
- Safety

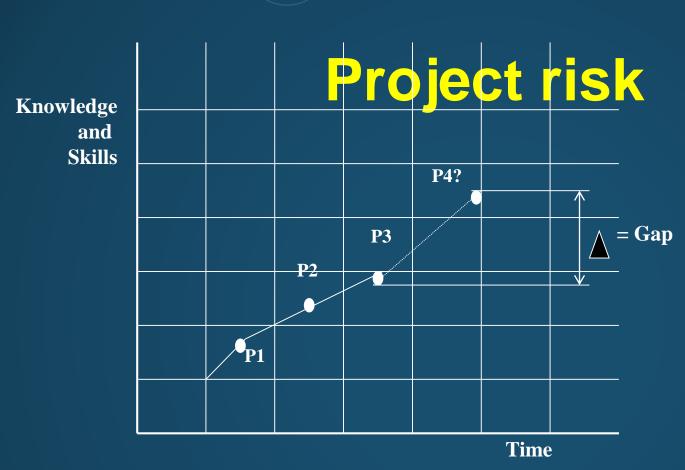
Identifying risks in new business development



Osterwalder Model from a presentation by Gerben Blaauw

The Challenger case

The Risk Diagnosing Methodology RDM



Be conscious of the gap between:

- the available knowledge and skills of the team
- the required knowledge and skills of a particular project

Main characteristics of RDM (1)

Project risks

detection of the gaps between acquired and required knowledge & skills

Systematic description of the project

- project charter and project planning
- category technology checklist
- systematic overview by using a list with trigger questions

Main characteristics of RDM (2)

- Maximise the contribution of individuals and groups
 - individual interviewing
 - homework for participants
 - cross-fertilisation through group session
- Role of the project consultant
 - process
 - content

RDM: Process steps

- 1. Initial briefing and kick off
- 2. Identification of project risks
- 3. Evaluation of project risks
- 4. Decision making about the diagnosed project risks
- Drawing up and execution of a Risk Management Plan

Step 1: Initial briefing & Kick Off

Initial briefing

- between project manager & risk facilitator
- build a full understanding of the conditions to be met and make the necessary appointments

• Kick Off

- risk team, project manager & risk facilitator
- ensure that all concerned parties are aware of what is expected from them and are willing to contribute

Step 2: Identification of project risks

- Get an overview of all *critical aspects* that may jeopardise the successful realisation of the project
- Risk team members are *interviewed individually* by the risk facilitator
- **Preparation** of risk team members for interview
 - studying the project charter and project planning
 - going through the risk reference list
 - reflect on potential risk areas

Structure of an interview

Personal: let's begin with your position
Project: what is this project about?
What are the main critical issues?
Let's look at the risk reference list
Did we forget something?
Next steps in the RDM process

Identification of potential risk factors

Project Environment

	parent org	anisation	supplier	S	influential bodies					
	mar	ket	trade custo	mers	competitors					
	formulate	specify	organise	realise						
Project										

Step 3: Evaluation of project risks

- All identified risk factors are transformed into 'risk' statements' and included in a Risk Questionnaire by the facilitator
- Risk team members are asked to *rank the potential risk factors* by giving their judgement on the riskiness of the different risk statements in the questionnaire
- The responses of the risk team members are processed and compiled by the risk facilitator in a *Risk Topography*

Risk Questionnaire

Selected items with a clear gap between current and required knowledge, skills or experience	Certainty		Ability to team to influence course of action within time & resource limits				Relative importance to project success								
		LOW		HIGH		LOW			HIGH		HIGH			LOW	
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1. An appropriate solution to guarantee stability will be available in time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. With the trade customer clear after sales arrangements have been agreed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. For localised dye damage we have an appropriate solution	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Risk Topography

Internal aspects of the project		Certainty			Ability to team to influence course of action within time & resource limits				Relative importance to project success				risk score	risk class				
		LOV	LOW HIGH			LOW HIGH			HIGH LOW					~ <u>7</u>				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5		
1. An appropriate solution to guarantee stability	n resp	0	0	1	3	5	0	0	1	3	5	0	2	5	2	0	00m	L
will be available in time	cum%	0	0	11	44	100	0	0	11	44	100	0	28	78	100	100		
	50%SC																	/
2. With the trade customer clear after sales	n resp	3	2	4	0	0	0	2	5	2/	0	3	5	/1	0	0	m	Н
arrangements have been	cum%	33	56	100	100	100	0	22	78	/100	100	33	89 /	100	100	100		
agreed	50%SC		•															
3. For localised dye	n resp	1	3	2	0	2	2	2	/ 0	4	0	4	/ 0	1	1	2	?*?	L-F
damage we have an appropriate solution	cum% 50%SC	13	50 •	75	75	100	25	50 / •/	50	100	100	50	50	63	88	100		

Step 4: Decision making about diagnosed project risks

- Risk process: decide about the approach to tackle the diagnosed project risks
 - individual preparation
 - preparation by subgroups
 - plenary session
- Risk content: decide about the approach to deal with the diagnosed project risks
 - accept
 - reject
 - reduce
 - transfer

Risk session: rules of engagement

everyone's viewpoint is valid

- no holding back, say what is worrying you !
- no management hierarchy
- the things we don't want to hear are probably the key issues !
- explain from your area of expertise

Agenda Risk Management Session (1)

- 10.00 h. Opening, objectives, rules of engagement
- 10.15h. Presentation of risk topography for project RRR
- 10.45h. Plenary discussion about scenario's:
 - worries
 - possible solutions
 - selection between scenario's
 - Plenary discussion on other potential
 - worries
 - possible solutions

How to handle remaining issues

Agenda Risk Management Session (2)

12.30h. Lunch14.00h. Subgroups

Cluster 1: Consumer acceptance & commercial viability Cluster 2: Packaging and supply Cluster 3: Formulation Cluster 4: Patents

15.30h. Plenary feedback and discussion17.00h. Plenary discussion on organisational issues17.30h. Conclusions

Risk issues to be addressed

Key issues (items labelled as H-F)

- Critical to project success
- do we agree and what do we do

Key discussion issues (labelled potentially H-F)

- Potentially critical to project success
- Discuss/resolve points of difference
- Do we agree and what do we do
- Remaining issues (items labelled <H)
 - (potentially) important to project success
 - to be delegated
 - do we agree and what do we do

Proposed method of operation

Introduction of the topic

what is the problem

Free discussion

what are our worries

Agree risk issues

what do we need to solve?

Free discussion

what are possible options for solutions?

- pro's and con's
- Agree action plan

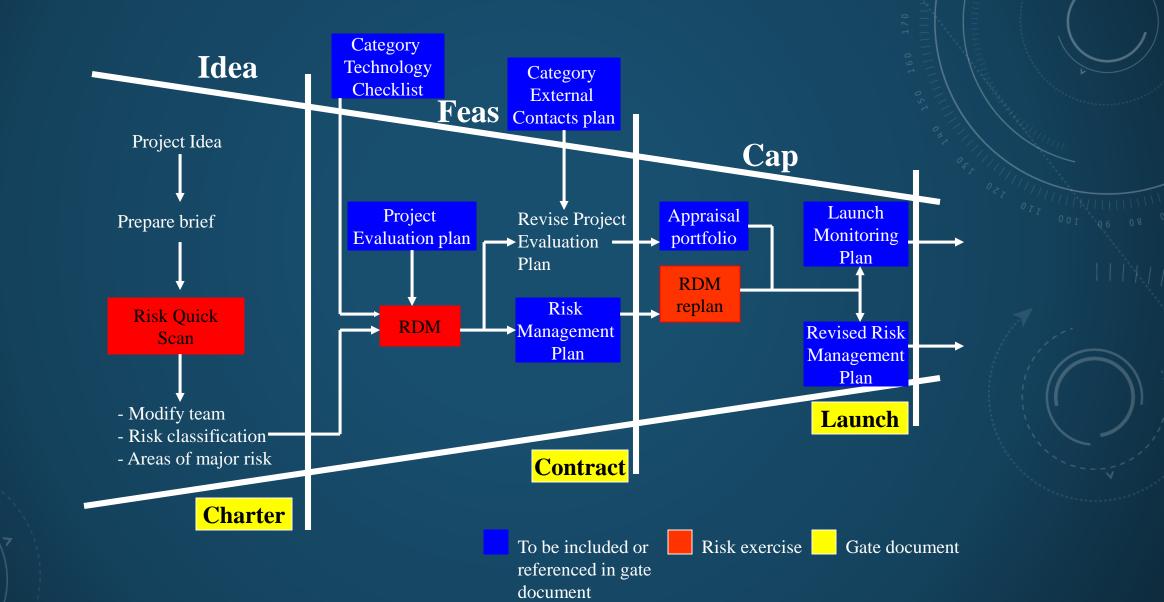
Step 5: Risk Management Plan

 Planning of the risk measures in a coherent Risk Management Plan, to be built into the overall project plan

Monitoring and control of the risk measures

 Reassessment of project risks at key milestones to be considered

Managing risk in the innovation funnel



RDM activities and required time

Process steps	Time				
	Project manager	Risk facilitator	Team member		
0. Initial briefing	2 h.	2 h.	*		
1. Informing the members of the risk team	1 h.	1 h.	1 h.		
2. Homework before interview	*	*	1 h.		
3. Individual interviewing by risk facilitator	*	1,5 h. per interviewee	1,5 h.		
4. Processing the interviews	*	1 h. per interviewee	*		
5. Feed back to rpoject manager and writing interim report	1,5 h.	1,5 h. 4 h.	*		
6. Designing and answering the Risk Questionnaire	*	8 h.	1.h		

RDM activities and required time

Process steps	Time		
	Project manager	Risk facilitator	Team member
7. Constructing the Risk Topography	*	4 h.	*
8. Preparing a risk session	2 h.	5 h.	*
9. Risk session	1 day	1 day	1 day
10. Drawing up a Risk Management Plan	4 h.	*	*

Total investment in time for a 10 persons risk team session:

- Project Manager:20+ hour
- Risk facilitator: 60+ hour
- Risk Team Member: 13+ hour

The RDM process and the project manager

Project managers' perceptions and evaluations:

- at the start often reluctant, hesitating: are my problems not yet big enough
- at the end of the whole process: positive
- Factors causing satisfaction
 - limited time required from project team
 - limited throughput time for whole process (1-2 weeks)
 - opportunity for individual professionals to express their worries
 - appeal on team to think cross functionally
 - application of 'rules of engagement' in plenary meeting

RDM provides the project team with:

List of classified risks identified while there is still time

Risk evaluation on scenario's that can be followed

- Plan on how the major risks will be tackled between feasibility & launch: basis for updated planning
- Basis for communication with senior management about the project planning and required resources

CONCLUSION:

- Risk management is essential for realizing product innovation and new business success
- Identify and evaluate the risks systematically: risk reference list
- Take everyone's view seriously
- Generate risk solutions from a multi disciplinary perspective

DIFFUSION OF RDM IN PRACTICE

- Since the '90s at industrial firms (e.g. Philips, Unilever, Vredestein, Lips, Fokker etc.)
- Later also in service oriented and (re)organization projects and in hospitals
- New Business ventures from the Kauffman foundation, USA
- Since 2002 adopted by several building companies
- Since 2006 in medical research projects (e.g. at University of Maastricht)
- Since 2011 for cases of prosecution of criminals
- 2013: Shaanxi China Heavy weight trucks





Application of RDM at Shaanxi, a developer of heavy weight trucks in China (2013/2014)



RDM at public prosecution projects in The Netherlands





risico's

met partners

Ontbreken

stuurploeg

Application of RDM for public prosecutions



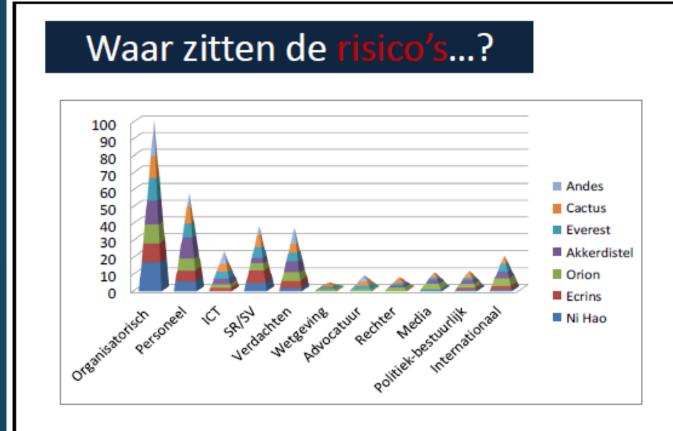
Risico's m.b.t. internationale samenwerking Mate van afhankelijkheid van

medewerking buitenlandse justitiële autoriteiten Afwijkende belangen buitenlandse autoriteiten Verschillen in rechtssysteem (tussen land dat RHV uitvoert en Nederland)

 Ontbreken van verdragen met bepaalde landen Internationaalrechtelijke aspecten



APPLICATION OF RDM AT PUBLIC PROSECUTION PROJECTS IN THE NETHERLANDS



...50% organisatorische & personele risico's!

ESCALATION OF COMMITMENT THEORY

Escalation of commitment: persisting while information indicates that the outcome is unlikely to be successful

Symptoms:

- Disappointing intermediate results have no or only marginal
- Increasing costs to solve problems while chances on success are decreasing
- Also when project is officially stopped, it returns with another name

ESCALATION OF COMMITMENT "DRIVERS"

- Person:

 - personal stake in the project
 the will to earn back 'sunk costs'
 interpreting information in a selective way
 "project champions" and "technology freaks" always continue to be optimistic
- Organisation:

 - external staff hired to fulfil a specific job are not inclined to kill the project
 development of specific knowledge and the importance for the organization are used as excuse to continue
 - greater tendency to be persistant if one also has taken the initial decison to start the project
- Social:
 - persistance against external critique
 loss of leadership face

Factors that could infuence the 'pulling the plug' (Boulding et al. '97)

100% 100% - Recognized External Experts 90%			
 80% 70% 66% - Control 60% 55% - Decision decoupling 50% 43% - Precommitment to a predetermined rule 40% 20% 21% - Opportunity cost 3% - Risk analysis 0% - Base/no decision aid; Precommitment to self-specified rule 	100%	100% - Recognized External Experts	0 18 11/11/1
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0% - Base/no decision aid; Precommitment to self-specified rule	20%	21% - Opportunity cost	
0% - Base/no decision aid; Precommitment to self-specified rule	10%	 3% - Risk analysis 	
	0%	0% - Base/no decision aid; Precommitment to self-specified rule	

INSIGHTS FROM THE STUDIES OF FLYVBJERG

Explanations for cost overruns are:

- Economic: contractors' offerings are too tightly costed, just to to get the order
- Psychological: overoptimistic behavior about ones own competences and the denial of project complexity
- *Political*: deliberately providing incorrect or incomplete information
- *Technical*: the data and models have their shortcomings causing a false representation of reality

INSIGHTS FROM THE STUDIES BY FLYVBJERG

Possible solutions:

- Flyvbjerg suggests to use his *Reference Class Forecasting (RFC)* method
- Use of the *RFC* in Denemark and the UK resulted in a reduction of cost overruns
- National Audit Office should not only control afterwards but also on beforehand
- Use the insights and recommentations from *Escalation of commitment* theory

RISKS & ENTREPREURSHIP

TOPICS:

- What are high-tech start-ups?
- Why are high-tech start-ups important?
- Characteristics of technopreneurs
- Factors influencing the performance of HTSUps
- Science parks & high-tech start-ups

DEFINITION OF ENTREPRENEURSHIP

"Entrepreneurship is an activity that involves the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of organizing markets, processes and raw materials through organizing efforts that previously had not existed" (Venkatamaran, 1997)

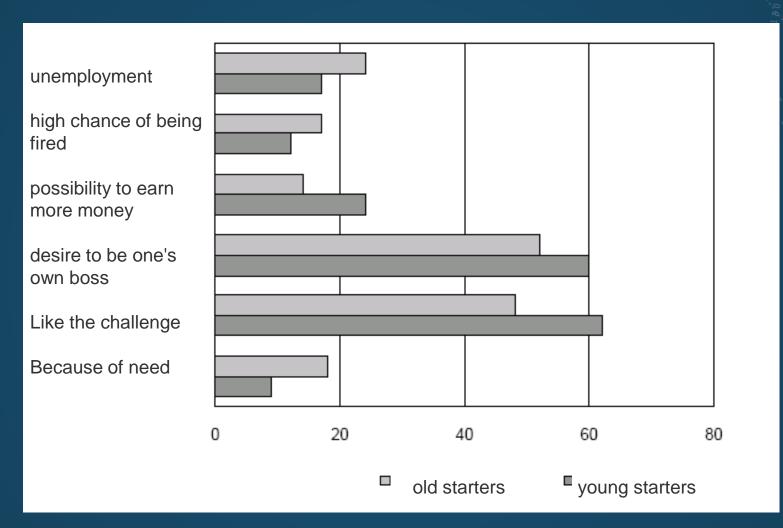
REQUISITES FOR ENTREPRENEURSHIP

Entrepreneurship involves the nexus of two phenomena:

- The presence of lucrative opportunities
- The presence of enterprising individuals

(Venkataraman, 1997)

Motives to start up



Research EIM (2003)

HIGH-TECH START-UPS ARE

- New Firms (0-5/8 years)
- Technology focused, with a high proportion of activities devoted to research & development
- Run by entrepreneurs with higher education qualifications (MSc, PhD)

WHY ARE HIGH-TECH START-UPS IMPORTANT?

- Developers of knowledge intensive products and processes
- Commercialize knowledge developed at universities and knowledge institutes
- Ability to develop themselves into specialized and innovative suppliers
- As suppliers HTSUps have the potential to reinforce the competitive position of existing firms
- Ability to break through conventional boundaries between markets and different disciplines faster
- Employment growth among techno starters four times as high as among other new businesses

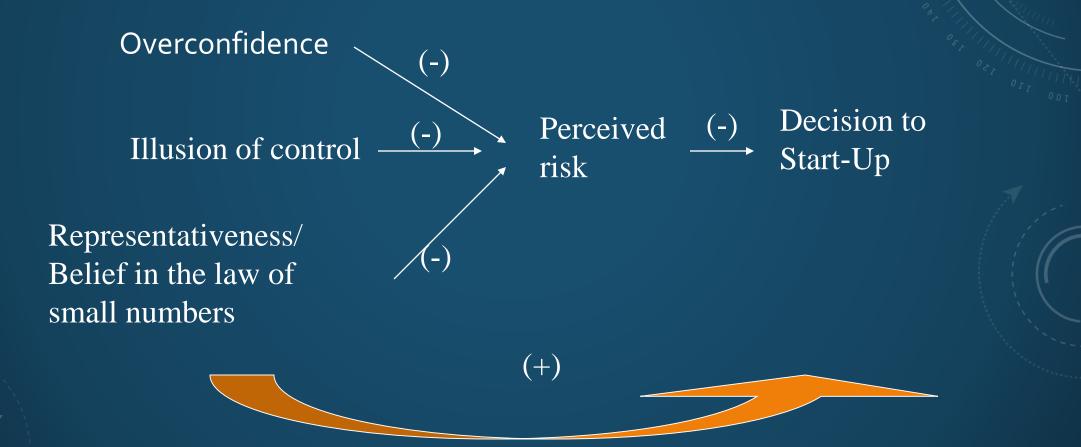
• Entrepreneurs do NOT have a higher *propensity to take risks*, actually most techno starters assert that they are not taking any risk (Simon, Houghton & Aquino, 1999)

BUT

 Entrepreneurs have a lower risk perception, and tend to be predisposed to cognitively categorize business situations more positively, using specific biases and heuristics to filter their decisions (Busenitz, 1999)

Studies of Simon Houghton & Aquino (1999) and Busenitz (1999) have shown that entrepreneurial activities are often dominated by:

- Overconfidence: tendency to be overly optimistic in their estimation and slow to revise their initial judgment as additional information comes available (Busenitz, 1999; Simon Houghton & Aquino, 1999)
- An *illusion of control*: overestimation of one's skills to cope with and predict future events (Simon Houghton & Aquino, 1999)
- A *belief in small numbers*: a limited number of informational inputs is used to draw firm conclusions (Simon Houghton & Aquino, 1999)



- Propensity toward innovation: able to do something differently or to do something other than intended (Sapienza & Grim, 1997)
- Desire for control, High ambition to succeed, Perseverance, Decisiveness combined with core skills and serendipity (Hatch & Zweig, 2000)
- Often come from entrepreneurial families
- Many achieve their start through the help from friends and family

HIGH-TECH START-UPS: A 50% SURVIVAL RATE AFTER 5 YEARS OF EXISTENCE.

Likelihood of entrepreneurial exit influenced by:

(Gimeno, Folta, Cooper & Woo, 1997; Sapienza & Grim, 1997)

- Economic performance:
 - Education, familiarity with the industry and previous relations with key customers positively influence economic performance
- Threshold level of performance:
 - Costs of switching to alternative occupations
 - Psychic income from entrepreneurship: personal satisfaction derived from self-employment (intrinsic motivation; entrepreneurial families)
 - Number of employees
 - Initial capital invested

FACTORS INFLUENCING PERFORMANCE OF HTSUPS

Environmental factors:	Organizational factors:	Product related factors:
 Network Market Economic Threshold 	 Structure Strategy Technical system Founding team Entrepreneurial Characteristics 	- representing additional value for customer if compared with competitive products

ENVIRONMENTAL FACTORS INFLUENCING THE PERFORMANCE OF HTSUPS:

Network factors: Market factors:

- + Linkages to Universities and Research institutes
- + Linkages to venture capital community
- + Linkages to financial institutions
- + Strategic Alliances
- + Marketing Alliances
- + Access to required knowledge
- + Outside buddy support

- + Knowing competitor's products
- + Targeting a mature market
- + Market related activities

Economic

performance:

- Being below an economic threshold

ORGANIZATIONAL FACTORS INFLUENCING THE PERFORMANCE OF HTSUPS

Structure: + Organic structure + Adhocracy Strategy: + Carefully planned technical plan + Product positioning + Investments in innovation	 <i>Entrepreneurial characteristics</i>: + Risk taking behavior + Psychic income + Initial (venture) capital + Employees (number & motivation) + Past experience + Education + Proactiveness, high ambition to succeed and perseverance
<i>Founding team</i> : + Having marketing skills + Being a multi founder team	<i>Learning</i> : + Having learned from failures

Successful entrepreneurship: is about taking acceptable risks!

