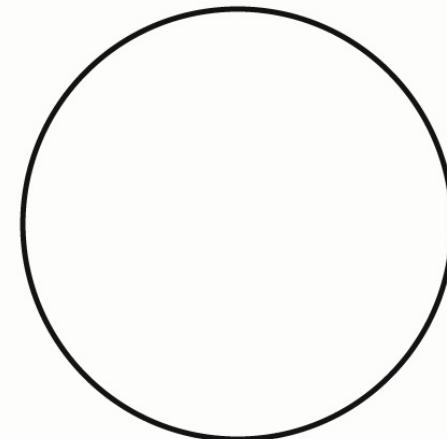


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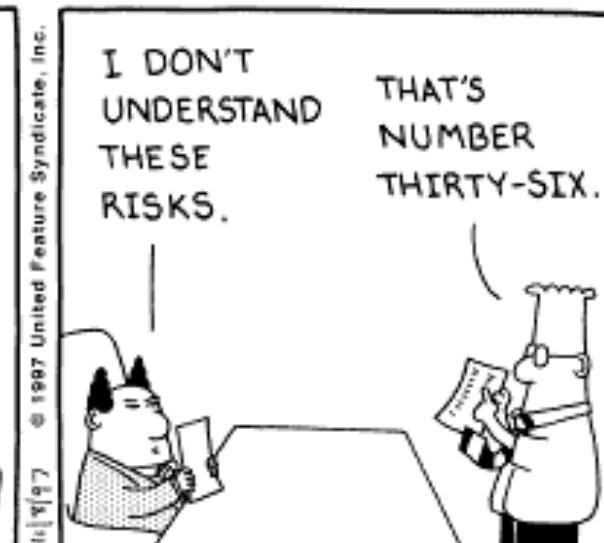
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LABORATÓRIO DE GESTÃO DE PROJETOS

2022/2023



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WHAT IS PROJECT MANAGEMENT? (RECAP)



Project management is the **application of knowledge, skills, tools, and techniques** to project activities to meet the project requirements.



Project management is accomplished through the appropriate application and integration of the **49** logically grouped **project management processes** comprising the **5 Process Groups**.

PMBOK KNOWLEDGE AREAS (I)



Integration Management – Think of this area as everything you need from project start to end. This knowledge area basically consists of the five process groups only closer monitoring and overseeing is required.



Cost Management – Are you over or under budget? Utilizing this knowledge area allows you to gain the upper hand on project costs and stop or intercede when overruns appear.



Scope Management – Scope creep and how to manage it is key in this knowledge area. You need to control and prevent scope creep and stick to the scope statement prepared or you'll find the project out of control.



Quality Management – As the PM, you can't have a sloppy, disorganized project. This knowledge area is all about ensuring quality and controlling missteps.



Time Management – You can't rely on the hope that milestones and goals will just appear. Time management requires paying close attention to schedules to ensure deliverables can be achieved.

PMBOK KNOWLEDGE AREAS (II)



Human Resource Management – tricky because it contains the “human” element. Not only must you deal with change management issues but also team conflict. From choosing to monitoring teams to managing external stakeholders, the PM must mix all these “human” elements to flow in tune to realize a successful outcome.



Procurement Management – This knowledge area is often a constant throughout the project. Everything from software to equipment to vendors to who will offer services and what type are included in procurement management. Think of this knowledge area as your purchasing department.



Risk Management – You are not playing the famous board game here. Risk management means you have to assess and prioritize risks, monitor and control risks, and create a risk register showing how risks will be and are dealt with.



Stakeholders Management – Project stakeholder management is the final knowledge area and considered very important. The success or failure of the product depends on timely and satisfactory project delivery to stakeholders.



Communications Management – You must have a communication plan accessible to everyone. This knowledge area also means holding status meetings and ensuring everyone is on the same page. In other words, if anything changes, everyone working on the project, every stakeholder must be aware of changes, additions or improvements.

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WHAT YOU DON'T KNOW CAN HURT YOU . . .
AND ALMOST CERTAINLY WILL!

Risk can be either negative or positive

- Negative risks (**threats**) potentially have a detrimental effect on one or more of the project objectives
(e.g. causing you to miss a deadline)
- Positive risks (**opportunities**) potentially have a beneficial effect on project objectives
(e.g. allowing you to complete a task with fewer personnel than you originally planned)

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PROJECT RISK MANAGEMENT

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and monitoring and control on a project. The objectives of Project Risk Management are to increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project.

Figure 11-1 provides an overview of Project Risk Management processes, which are as follows:

11.1 Plan Risk Management—The process of defining how to conduct risk management activities for a project.

11.2 Identify Risks—The process of determining which risks may affect the project and documenting their characteristics.

11.3 Perform Qualitative Risk Analysis—The process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.

11.4 Perform Quantitative Risk Analysis—The process of numerically analyzing the effect of identified risks on overall project objectives.

11.5 Plan Risk Responses—The process of developing options and actions to enhance opportunities and to reduce threats to project objectives.

11.6 Monitor and Control Risks—The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

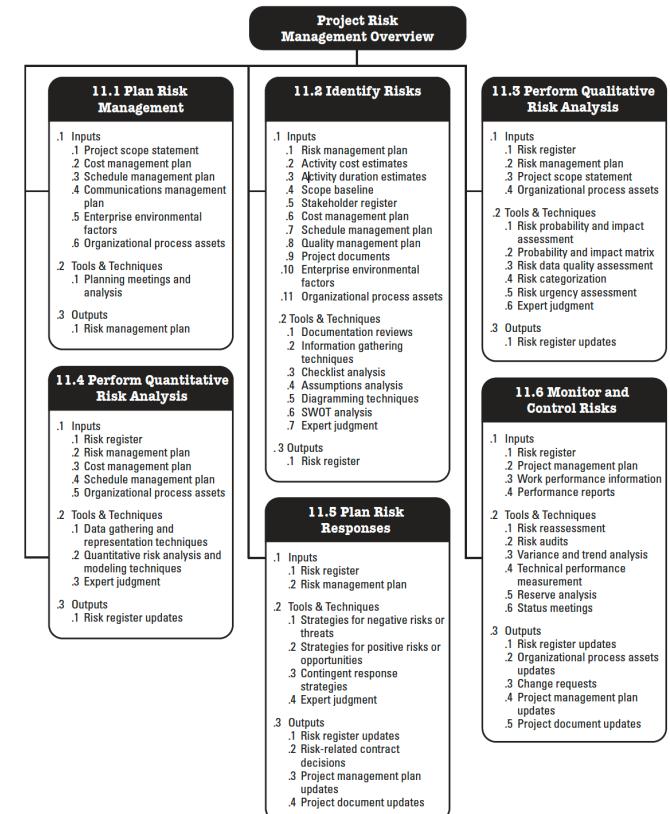


Figure 11-1. Project Risk Management Overview

Project risk is always in the future. Risk is an uncertain event or condition that, if it occurs, has an effect on at least one project objective. Objectives can include scope, schedule, cost, and quality. A risk may have one or more causes and, if it occurs, it may have one or more impacts. A cause may be a requirement, assumption, constraint, or condition that creates the possibility of negative or positive outcomes. For example, causes could

extracted from PMBOK



11 Project Risk Management

11.1 Plan Risk Management

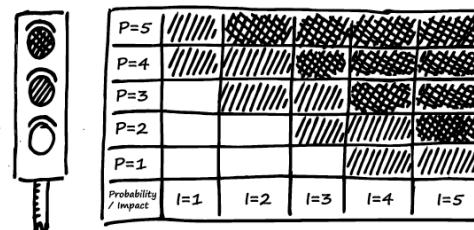


11.2 Identify Risks

Risk register

ID	Event	Impact	Owner
1	nnn	nnn	nnn
2	nnn	nnn	nnn

11.3 Perform Qualitative Risk Analysis

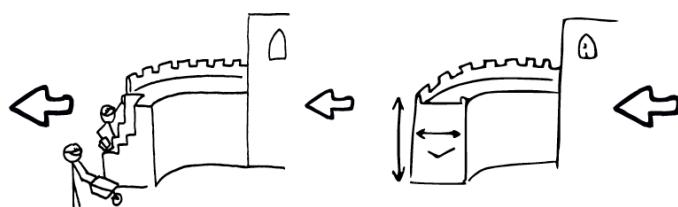


11.7 Monitor Risks

Risk register

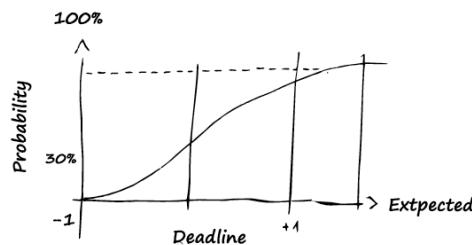
Event	Impact	Owner
nnn	nnn	nnn
nnn	nnn	nnn

11.6 Implement Risk Responses



11.5 Plan Risk Responses

11.4 Perform Quantitative Risk Analysis



Trend



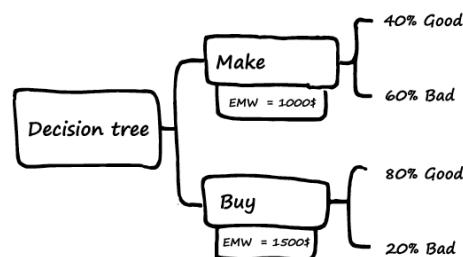
Strategies for Threats

- Avoid
- Transfer
- Mitigate
- Accept
- Escalate



Strategies for Opportunities

- Exploit
- Share
- Enhance
- Accept
- Escalate



ADDRESSING PROJECT RISKS

1. Identify risks

Determine which aspects of your plan or project environment may change.

2. Assess the potential effects of those risks on your project

Consider what can happen if those aspects don't work out the way you envision.

3. Develop plans for mitigating the effects of the risks

Decide how you can protect your project from the consequences of risks.

4. Monitor the status of your project's risks

Determine whether existing risks are still present, whether the likelihood of these risks is increasing or decreasing, and whether new risks are arising.

5. Inform key audiences of all risks involved with your project

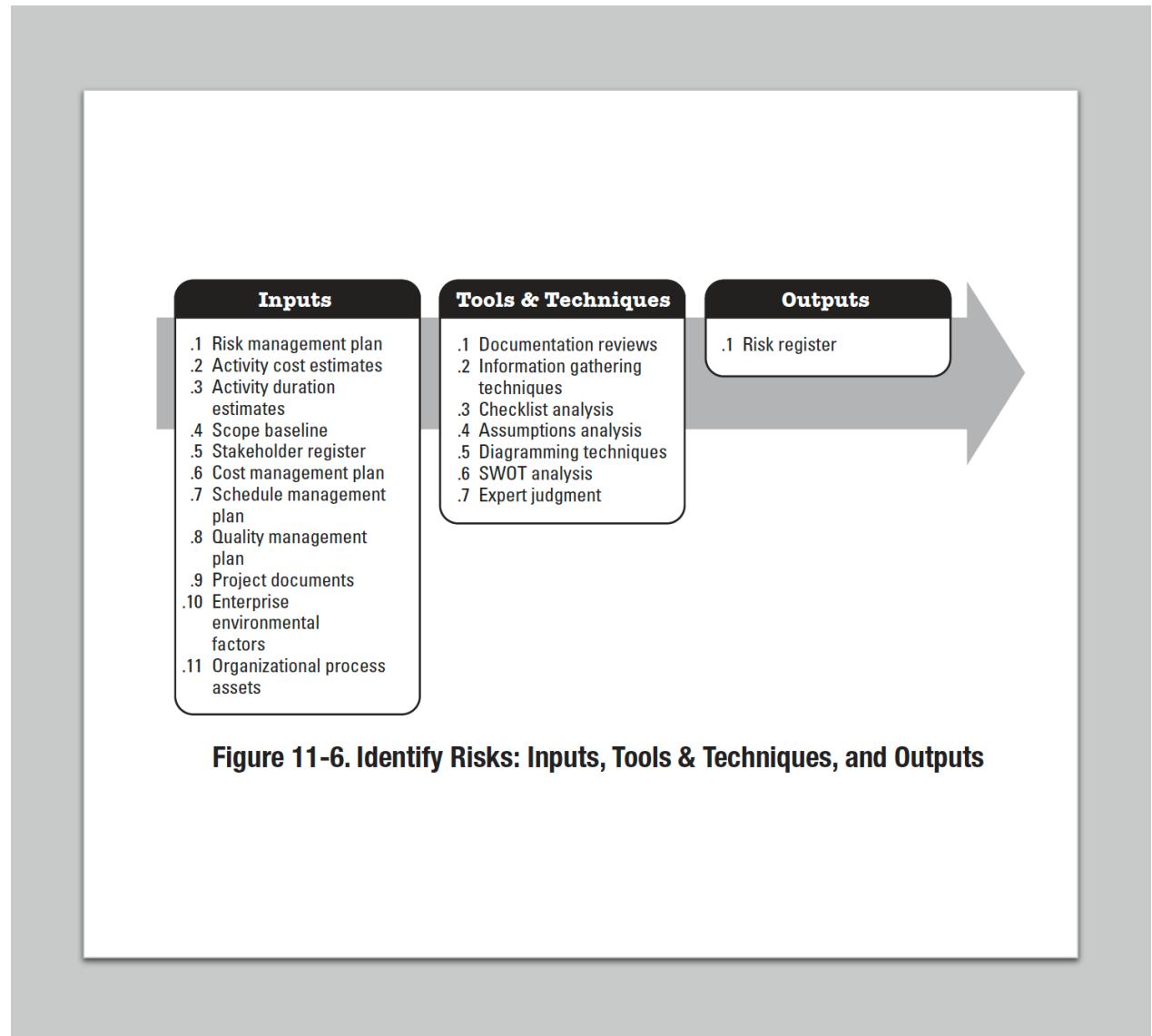
Explain the status and potential effect of all project risks — from the initial concept to the project's completion.

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RISK IDENTIFICATION

- Which risks are likely to affect the project and documenting the characteristics.
- It is not a onetime event
- Address both internal and external risks:
- internal - the project team can control or influence, such as staff assignments and cost estimates;
- external - beyond the control or influence of the project team, such as market shifts or government action;
- also concerned with opportunities as well as threats.

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RISK ASSESSMENT

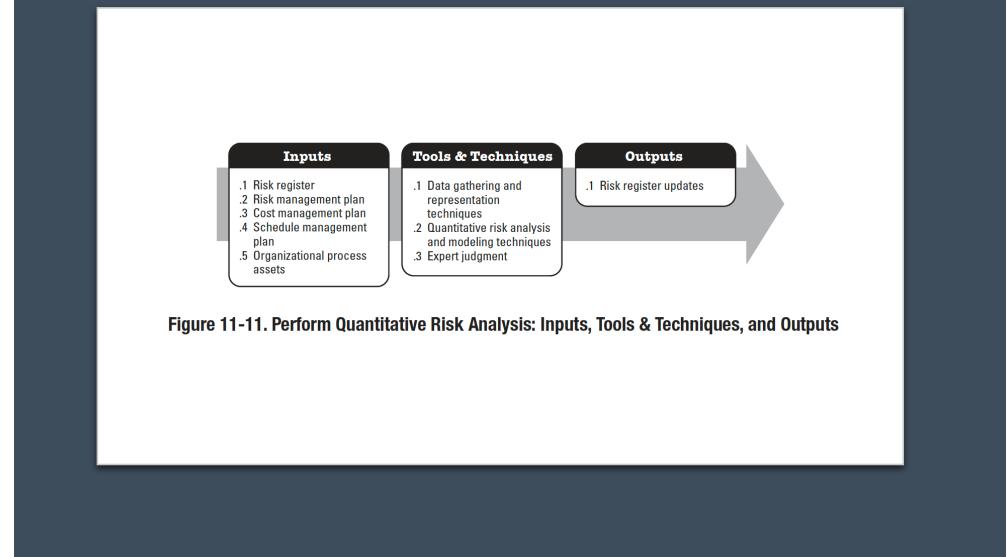
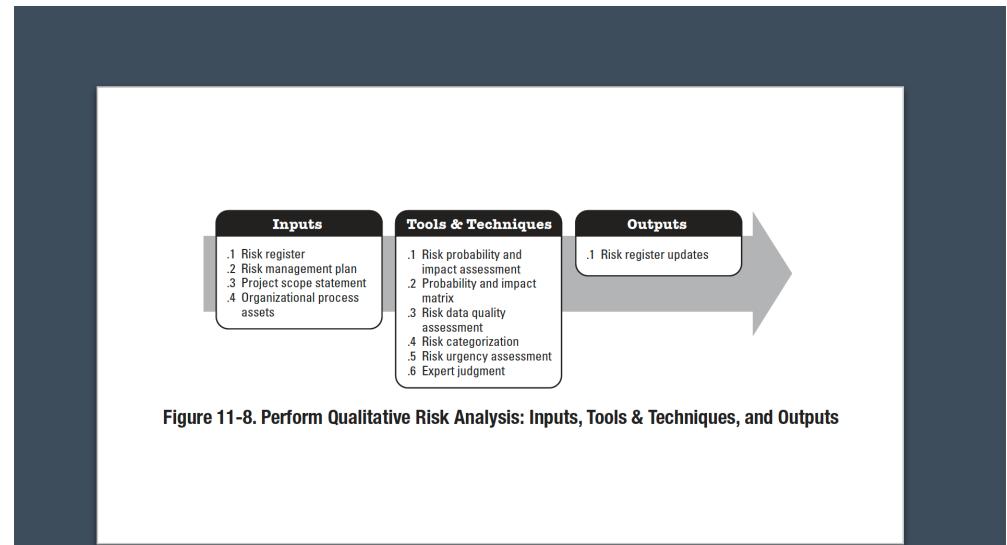
- Evaluating risks and risk interactions to assess the range of possible project outcomes
- Primarily concerned with determining which risk events warrant response

Complex activity:

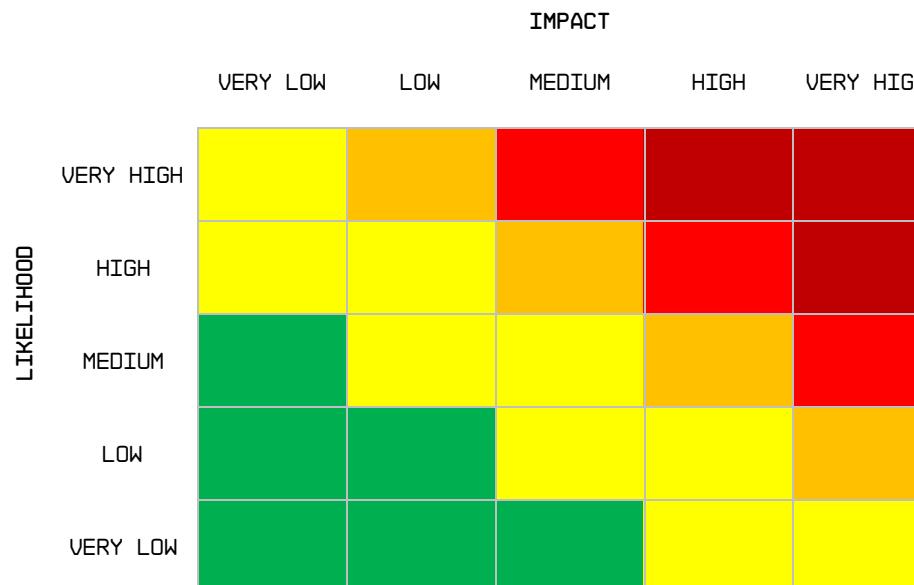
- opportunities/threats can interact, e.g. schedule delays may force an approach that reduces overall duration
- single risk event can cause multiple effects, e.g. late delivery of a key component produces cost overruns, schedule delays, a lower-quality product, ..
- opportunities for one stakeholder (reduced cost) may be threats to another (reduced profits)

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QUALITATIVE RISK ANALYSIS



Scale	Probability	Impact
Very Low	Unlikely to occur	Negligible impact
Low	May occur occasionally	Minor impact on time, cost or quality
Medium	Is as likely as not to occur	Notable impact on time, cost or quality
High	Is likely to occur	Substantial impact on time, cost or quality
Very High	Is almost certain to occur	Threatens the success of the project

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Probability	Threats					Opportunities				
	0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05

Impact (numerical scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

Figure 11-10. Probability and Impact Matrix

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QUANTITATIVE RISK ANALYSIS

CALCULATING RISK EXPOSURE

$$\text{EXP} = \sum p \times l$$

p = probability
 l = loss

$$\text{EXP risk A} = 0.9 \times 2 \text{ days} = 1.8 \text{ days}$$

$$\text{EXP risk B} = 0.1 \times 25 \text{ days} = 2.5 \text{ days}$$

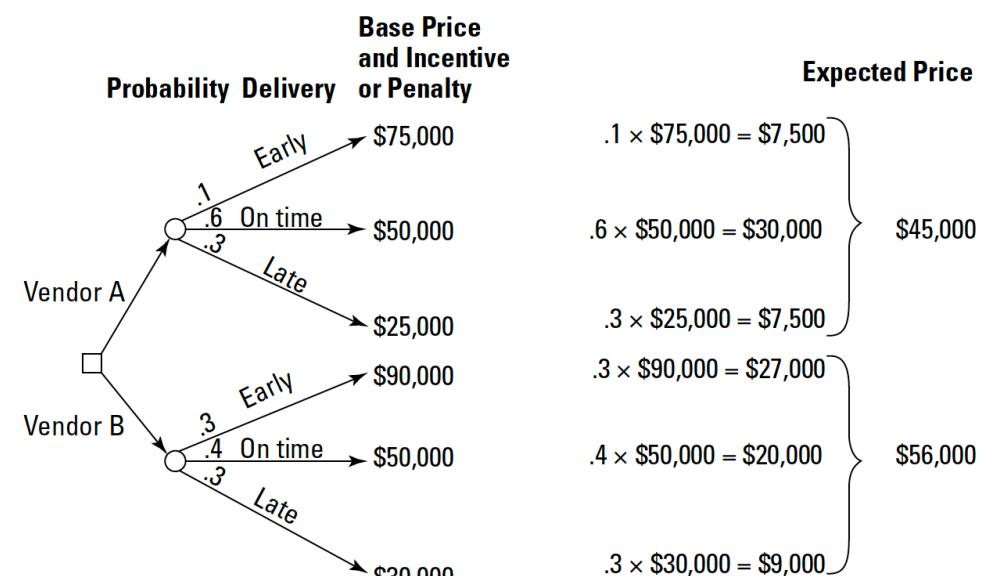
$$\text{EXP} = 4.3 \text{ days}$$

QUANTITATIVE RISK ANALYSIS

Determine which vendor to buy from

- Both have the same price if the equipment is delivered on time
- Both have proposed an incentive for delivering early and a penalty for delivering late
- Incentives and penalties differ.

The decision tree depicts the probabilities that each vendor will deliver the equipment early, on time, and late, and the resulting price



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RISK RESPONSE

	Negative risk	Positive risk
Aggressive	Avoid	Exploit
	Mitigate	Enhance
	Transfer	Share
Passive	Accept	Accept

AVOID: you want to be sure that the negative risk does not occur

TRANSFER: give to someone else like insurance company

MITIGATE: try to ensure it doesn't happen

ACCEPT: accept the risk when you can or you have to

EXPLOIT: you REALLY want the positive risk to happen

ENHANCE: try to ensure that the positive risk occurs.

SHARE: get a third party to try to help best capture the positive risk.

ACCEPT: enjoy the benefits of the opportunity

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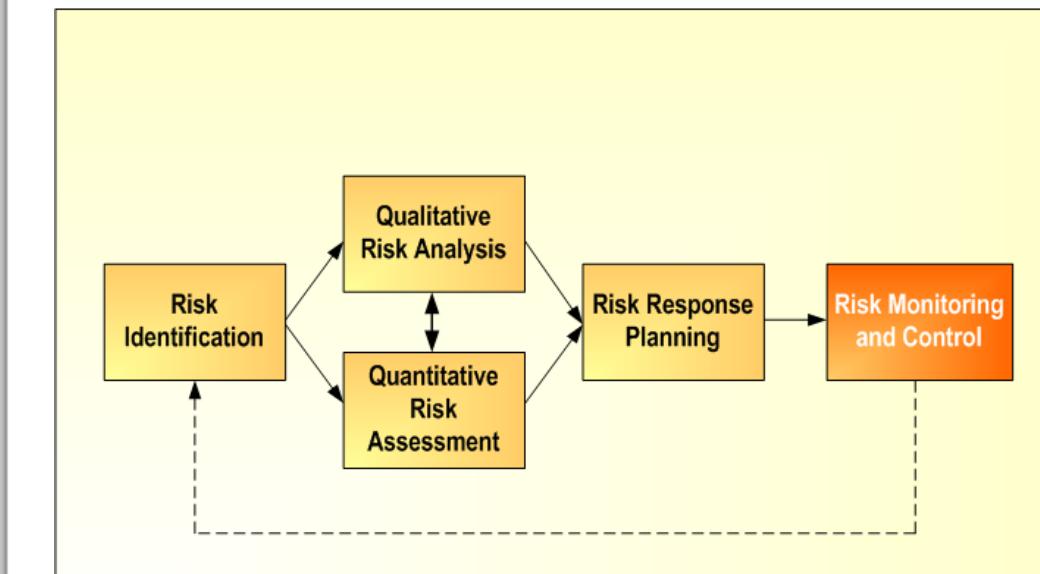
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RISK MANAGEMENT PROCESS

- Involves executing the risk management plan in order to respond to risk events over the course of the project
- Basic cycle of identify, quantify, and respond is repeated when changes occur
- Even the most thorough and comprehensive analysis cannot identify all risks and probabilities correctly (control and iteration are required)

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RISK REGISTER

Code	Date Created	Description	Category	Type	Owner	Risk Assessment			Plan					Progress	Status	Date Updated	
						Likelihood	Impact	Severity	Loss	Exposure	Risk Response	Trigger	Mitigation / Enhancement	Contingency			
				Negative Positive	Team member responsible for managing this risk	Very High High Medium Low Very Low	Very High High Medium Low Very Low		Measure of the negative impact to the project (time, money)	product of likelihood and loss	Risk responses	Triggers, symptoms, and warning signs of risks' occurrence	actions to reduce (increase) the probability and/or impact of an adverse risk (opportunity) event to be within acceptable threshold limits	Plan devised for an exceptional risk that, though unlikely, would have catastrophic consequences	Status of the actions	Identified Open Resolved	

A project risk register is a tool project managers use to track and monitor any risks that might impact their projects. The purpose of the risk register is to identify, log, and track potential project risks.

A risk in project management is anything unexpected that could happen that would positively or negatively affect your project. Any time someone identifies something that could impact your project, it should be assessed by the team and recorded in the risk register.

You need to keep in mind that the Risk Register is a living thing:

- The information you put in it is **changing** rapidly.
- Risks evolve and **change** attributes.
- A Risk Response Plan may not provide the required efficiency.
- Threats and opportunities may disappear, or they may become irrelevant.

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SOFTWARE RISK REGISTER (SIMPLE EXAMPLE)

Risk Description	Probability of Occurrence	Loss Size (Days)	Risk Exposure (Days)
Insufficient QA time to validate on all browsers and OS types.	45%	6	2.7
Lack of verifiable sample data may affect the ability of the primary external stakeholder to validate end product.	35%	18	6.3
Inadequate staff available from external stakeholders until very late in cycle.	25%	7	1.8
Following end-user testing, more effort on the user guide may be necessary.	25%	18	4.5
Backup and restore requires 3rd-party solutions (not evaluated yet).	20%	12	2.4
Insufficient time for external stakeholders to submit feedback on layout and composition of reports.	10%	5	0.5
Total Risk Exposure			18.2

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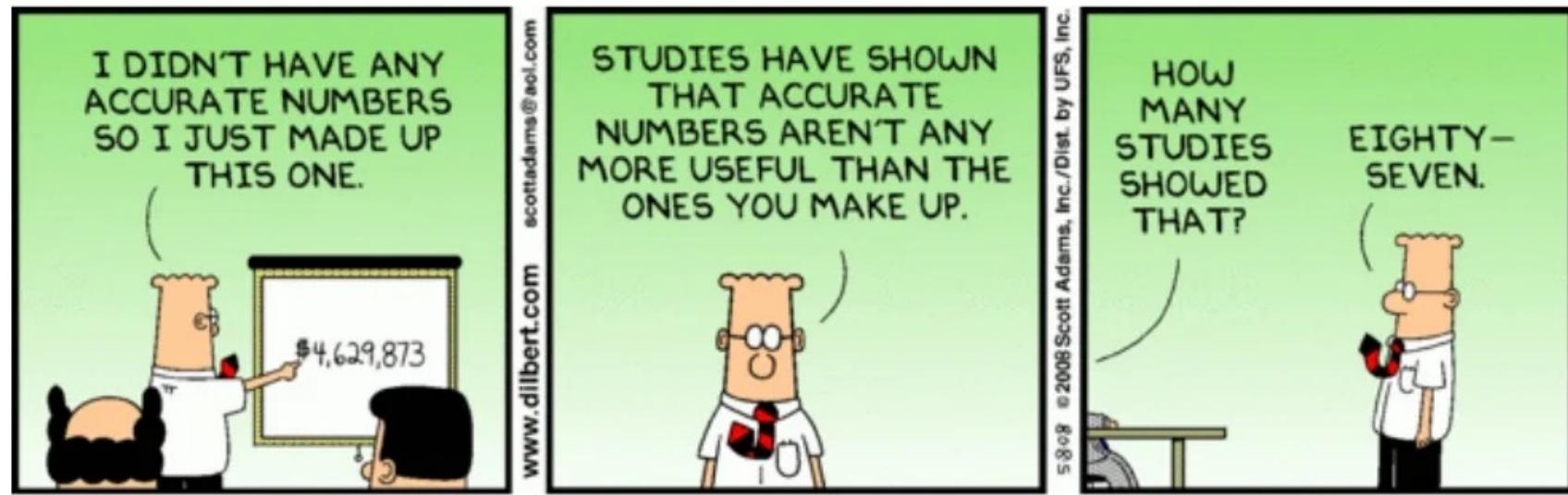
PROJECT RISK REGISTER (EXAMPLE)

Risk Assessment															
Code	Date	Risk description	Negative or Positive?	Owner	Likelihood	Significance	Severity	Loss	Exposure	Risk response	Trigger	Mitigation / Enhancement	Contingency	Progress	Status
2	2/29/2020	Ionic version is earlier than thought and a change of version would be mandatory	Negative		LIKELY	MAJOR	High	Migration needs Features from last versions Loss of Ionic framework bug support		Mitigate Accept Avoid	Confirm in staging / production environments Ionic framework version	Accept: work with the version found Mitigate: Negotiate with the client what is more important: having his features developed or keep having an updated support from the community Avoid: See if it is possible to run with the most recent frameworks unchanged code	Negotiation about features to be done	Discovered a migration is not possible due to contract between LGP and Client. Client is not satisfied. Says "we could do more". Not possible to run with the whole framework. Only the server emulator (GL).	Closed
3	2/29/2020	Tacode was not developed with Angular but with other compatible framework	Negative		UNLIKELY	MAJOR	Moderate	Technical debt in another framework Slower learning curve		Avoid Mitigate	Confirm in staging / production environments if Angular is the associated framework	Avoid: the framework associated with the code is Angular Mitigate: lower the technical debt with the framework associated with self-learning	Execute the Mitigation Plan, no contingency associated Project done with Angular Javascript	To evaluate, as the code was not studied with details	Closed
4	2/29/2020	There is a lack of knowledge of Ionic on the team	Negative		CERTAIN	SIGNIFICANT	High	Technical debt in Ionic framework Needs a learning curve, which will impact the features delivered		Mitigate	Already confirmed most of the members have a technical debt in this framework	Mitigate: Team needs to learn Ionic as soon as possible to reduce technical debt Udemy courses were suggested by José Briones Romero to help mitigate this debt	Team needs to take courses and go into practice	Closed	
5	2/29/2020	The only way to do a CI/CD up to deployment would be using paid Ionic version	Negative		UNLIKELY	MINOR	Low	Ionic Growth Plan becomes necessary, starts at US\$ 102,00/- month		Avoid Accept	Team evaluates that no CI/CD is possible	Avoid: develop internally a CI/CD to build Ionic applications Accept: Buy Ionic Framework Growth version	We included the CI/CD PoC under our activities throughout the project and we concluded it	Closed	
6	2/29/2020	Due to Ionic or JS limitations it is not possible to deliver the Advisor	Negative		POSSIBLE	CATASTROPHIC	High	An important feature of the project is discovered to be not feasible, during the project's execution phase.	Critical success factor of the project	Accept Mitigate	Team evaluates Advisor as stated is not feasible.	Accept: As we do not have yet the needed Ionic knowledge in the team, we don't know how to avoid or mitigate such risk. Mitigate: Anticipate the Advisor beginning so we can determine as early as possible this risk.	We must monitor and seek knowledge, or negotiate, while this feature is suspended, on how to deliver even an inferior version of it. We had developed most of the idea of the Advisor. Some features will be finished by the client's team according to agreement.	Monitoring	Closed
7	2/29/2020	Equipment or connection problems	Negative		POSSIBLE	SIGNIFICANT	Moderate	Delay in delivering features that are associated to the equipment's owner		Accept	Problems related to VPN, cloud connections or even a failure of the equipment itself	Accept: Sometimes this problem is out of our control as we depend of other suppliers for such access. But we believe this will happen only a few times but, as nearer to the delivery we get, the more	Owners must replace their equipment and keep their work going	Monitoring	Open

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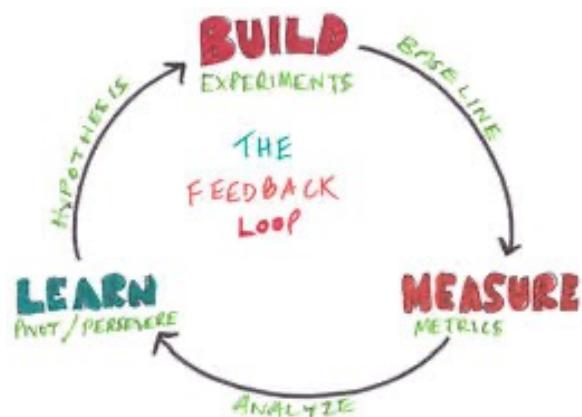
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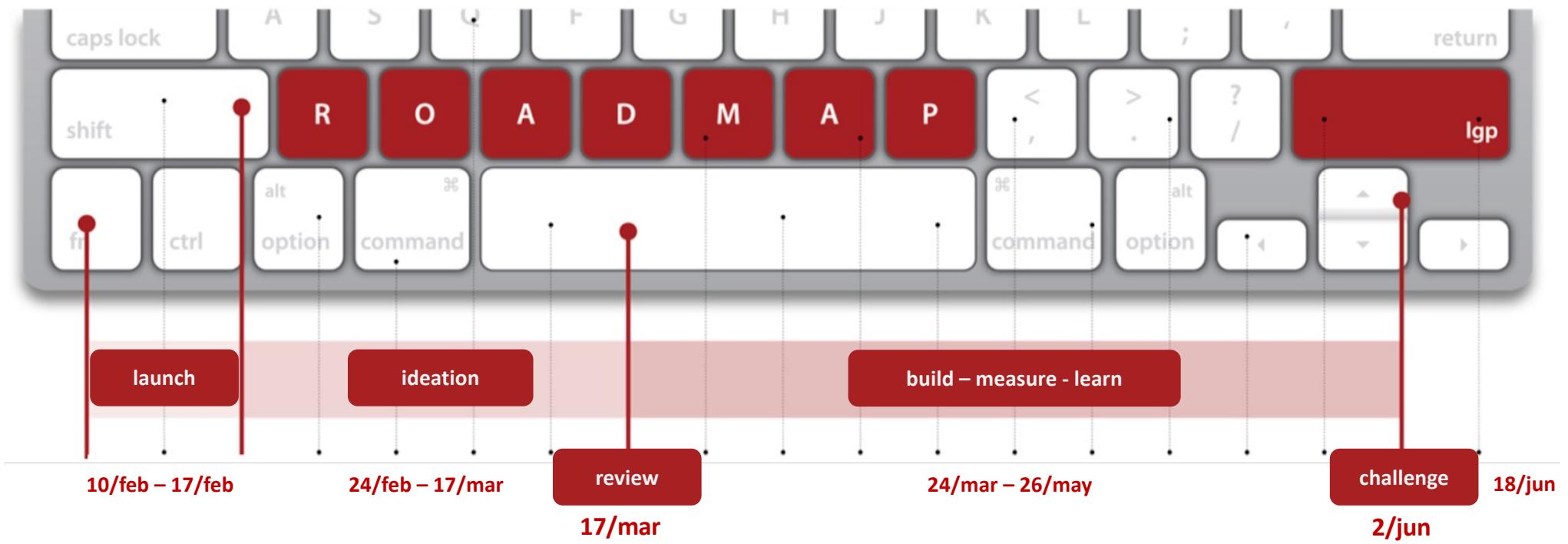
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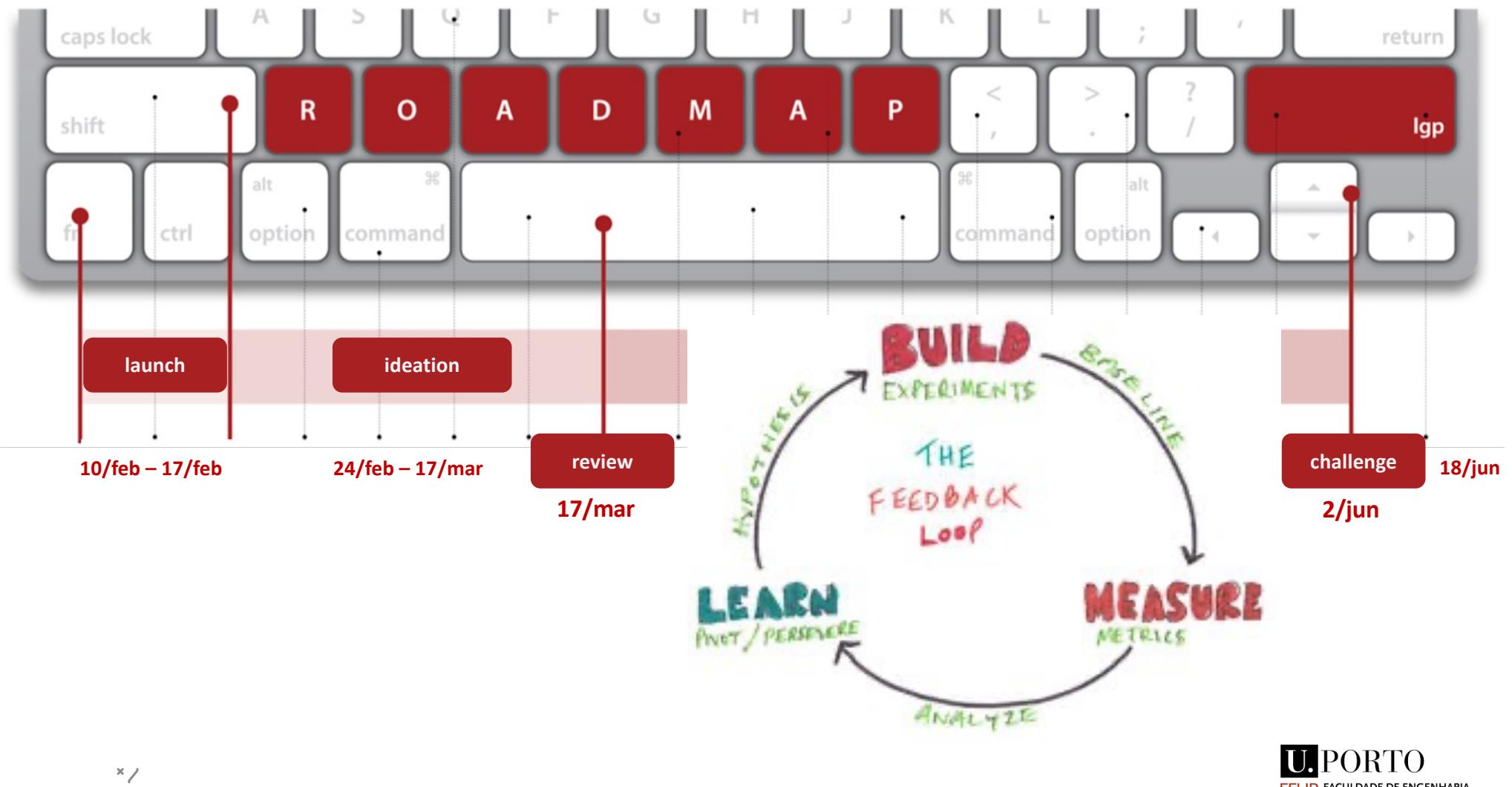
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Phases	Dates	what	when	whom
Review	17-Mar	SD CTSA PST PMIR	17-Mar 24-Mar 24-Mar 24-Mar	public supervisor supervisor supervisor

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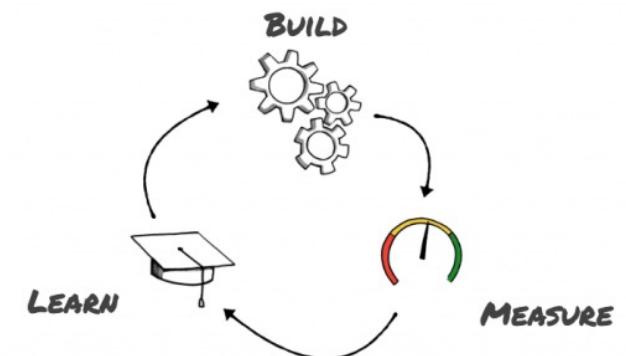
BUILD-MEASURE-LEARN (BML)

Process of building a product, **measuring consumer metrics** and **learning** from them to better respond to customer needs and improve the product for the ultimate sustainability of the company.

Relies on releasing a minimum viable product (MVP), one that **satisfies market demands without going overboard on features** that customers don't want.

After release of the MVP, customer feedback and metrics can be used to **improve future versions** of the product.

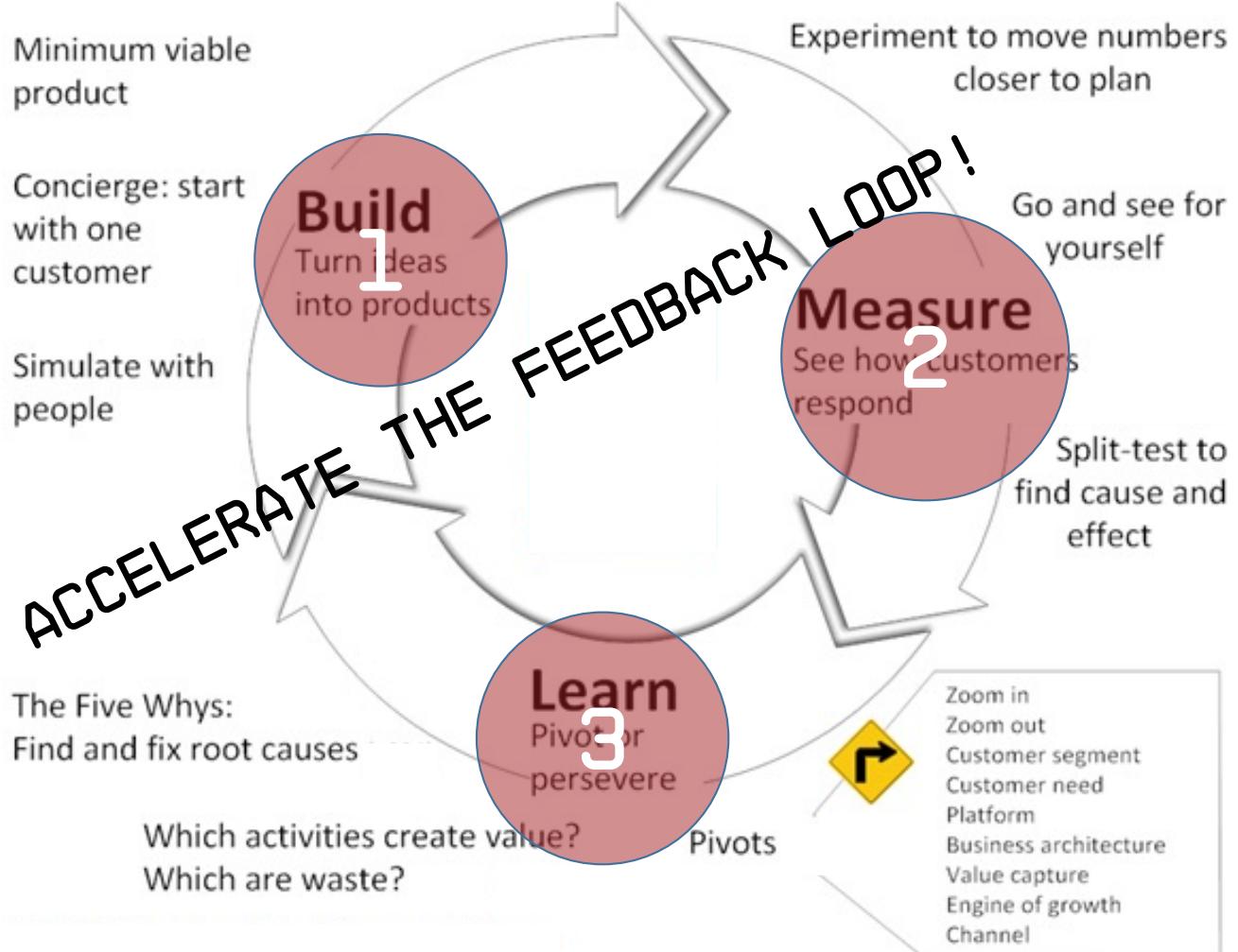
In the process, multiple **minimum viable interactions** (or tests) should be built to collect customer feedback and metrics and are used to **verify hypotheses** (validate some learning about customers and the market).



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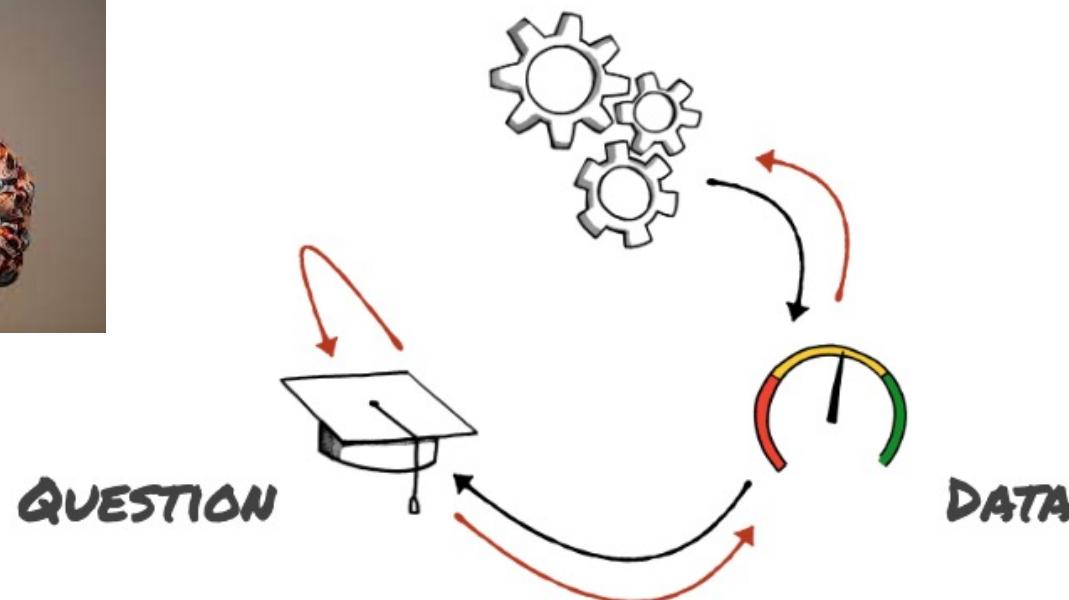
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KENT BECK TALKS BEYOND AGILE PROGRAMMING

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=D4QldY0g_DI&LIST=PL1M9PU1POLEM6QJOXWZF9MWMSBT8-7IDE&INDEX=4](https://www.youtube.com/watch?v=D4QldY0g_DI&list=PL1M9PU1POLEM6QJOXWZF9MWMSBT8-7IDE&index=4)

EXPERIMENT AND RESEARCH



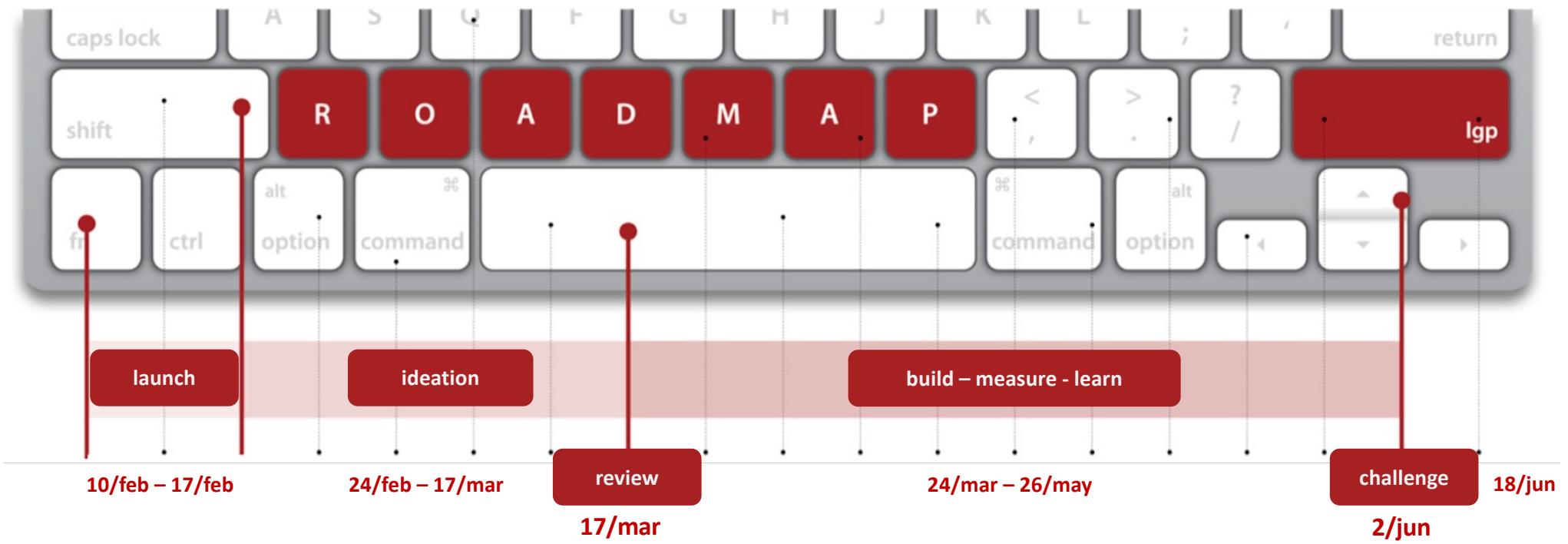
Build-Measure-Learn

or

Learn-Measure-Build?

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Phases	Dates	what	when	whom
Build - Measure - Learn		CMPK Company Media Press Kit	19-May	public
		SFE Script for the Final Event	19-May	supervisor
		MVP Minimum Viable Product	26-May	client / supervisor

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The screenshot shows a web browser window with the URL `spare.dgs.pt` in the address bar. The page has a green header bar with the SPARE logo (a stylized yellow and green apple) and the text "Sistema de Planeamento e Avaliação de Refeições Escolares". On the right side of the header are links for "SOBRE NÓS" and "PERGUNTAS FREQUENTES". Below the header, there's a login form with fields for "E-mail" and "Palavra-Chave", a "ENTRAR" button, and a link "Esqueceu-se da sua palavra-chave?". To the right, there's a message "Ainda não tem conta? Registe-se". The main content area features a large circular image of various vegetables (carrots, tomatoes, cucumbers, etc.) surrounding a white plate. On the left, there's a section about the SPARE system and a "Conheça-nos mais" button.

SPARE

O SPARE Sistema de Planeamento e Avaliação de Refeições Escolares é uma ferramenta informática que permite planejar refeições de forma efetiva e organizada, de acordo com as principais recomendações alimentares e nutricionais nacionais e internacionais vigentes. Esta ferramenta permite o planeamento, avaliação, monitorização e verificação no sentido da melhoria contínua da qualidade das refeições escolares.

Conheça-nos mais >

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RETROSPECTIVE ASSESSMENT (REVIEW PHASE)

EXPERIMENTAL LEARNING CREATES TACIT KNOWLEDGE . . THAT NEEDS TO BECOME EXPLICIT!

To turn tacit knowledge into explicit knowledge, each student is asked to make a short individual assessment with a personal reflection on the LGP experience, addressing the aspects related to:

- The PMBOK and the PMBOK knowledge areas
- Project management practices implemented in your project (having the PMBOK in the background)
and
- Expectations for the build-measure-learn phase.

Assignment (5 questions, 20 minutes) in moodle to be completed between the 24th March and the 31st of March.

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- IDENTIFY (MAJOR) ACTIVITIES
- PLAN THE BML PHASE
- CREATE THE “RISK REGISTER” (IN TEAMS)
- DISCUSS RISKS WITH YOUR SUPERVISOR AND CLIENTS
- PLAN YOUR EXPERIMENT AND BUILD YOUR MVP
- ACCELERATE THE FEEDBACK LOOP

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