
Creative Idea Description
Software Development Process
Offer and Initial Budget
THIS SESSION GOAL

Theme 3

OFFER AND BUDGET OF A SOFTWARE DEVELOPMENT PROJECT

Introduction

General goals:

- Learn the detailed activities involved in creating a software project offer
- Learn about some strategies to address cost estimation in early stages of a project
- Be able to develop an Offer document for the creative idea selected for the subject

Introduction

Where is the Offer activity of a software project located?

Phase 0 Not in Larman model	Planning and requirements specification phase (1 time)	Construction Phase (n times)	Installation phase (1 time)
• First draft of the use case model (if you want to make an estimation based on use case points) • Offer and Budget • Quality Plan • SCM Plan • SCM Plan Review • Estimation • Estimation review • Schedule • Schedule review	• Feasibility analysis (in requirements speci • Feasibility review • Use cases model • Use cases model • Definition of hi cases. • Definition of cases review • Prioritization of • Prioritization of use cases review.	eview ew Transition states diagram Transition states diagrams review ○ CODING ○ TESTING • Iteration 2 (idem) • ..... • Iteration n (idem)	• Deployment

- IN RED: All the revisions are derived from the quality plan. And they will be the ones that appear in that quality plan.
- IN BLUE: Management and control processes

Offer & Budget Considerations

- There exist **many kinds of bids for Software Projects**, each of which involves different aspects to focus on in the documents:
  - **Attending to the nature of the project:**
    - Development Projects: typically involving all phases of life-cycle but not always
    - Application Maintenance Services: typically ranging several months/years
  - **Attending to the size of the Project:**
    - Big projects: tipically long-term projects based on specific methodologies
    - Small or short-term projects: that may or may not involve all life-cycle phases
  - **Attending to the context:**
    - If we are incumbent in the client/service or not
    - If we want to invest in a client or not
    - Local/National/International
    - Financed/Private capital/Mixed
  - **Attending to the proposal:**
    - Initiative of the client via a RFP.
    - Initiative of a software company as business development of their products.
    - Promotion as a result of research an innovation.

Offer & Budget Considerations

- The Offering process is typically **carried out in workflow,** involving its ellaboration, validation and approval.
- **Project team members conceptualize and work on ellaborating the technical document (engineering view)** with all of the information related to the functions, business cases and services offered. In large organizations this task is usually carried out with the help of a another **team which is specialized in Offering and Business Development**.
- **Project managers add the financial view**, including a cost budget, fares or rates/hour and company margins.
- **Validation of the Offer** to be presented to the client may reside within the project team, but depending on the amount, additional approvals might be necessary. Big amount offers are typically approved by an **"Offer Commitee"** that can be composed of figures like general directors or even the CIO / CFO.
- This workflow is usually **carried out in systems** that track and manage commercial activity between an organization and their clients (v.g. a CRM system).

Offer & Budget
Characteristics of a good Offer document (I)

- **Add an executive summary**
  - Specially mid size and big projects need an executive summary. It's a concise, condensed version of the most important details from the rest of your proposal.
- **Identify the problem to be solved**
  - Whatever it is, make sure to state the challenge you're addressing clearly, and why.
  - The idea behind this step is to figure out who would be interested in reading your proposal and why they would want it at all. This helps you, as a writer, to focus efforts on the right things.
- **Describe the needs of your customer or client**
  - Any context regarding the knowledge and relation you already have from your client is a great value over competitors and shows deep alignment with your client.
  - Also, use the information they provide (or any other research you did) and compile it into a list of requirements for your proposed solution. This also shows the client that your goal is to solve their problem, not just get paid.

Offer & Budget
Characteristics of a good Offer document (II)

- **Outline what you are proposing to do for them, including timelines and deliverables**
  - Your proposal should include a description of what you will be doing for your customer or prospective client, as well as how long it will take and in what stages. Don't go into heavy detail with dates — that can come later.
  - Be as clear as possible about what they'll get from you. This helps remove any questions or doubts the customer may have about your skills or timing.
- **Explain how your solution works and why it is better than alternatives**
  - So why should anybody buy software from you rather than your competitors? Why are they paying for your services instead of just doing it themselves?
- **Present a high-level timeline with deadlines for milestones and dates for project completion**
  - A timeline also shows that you've done your dilligence in terms of planning and preparation. For the client, it means they can reliably fit the business proposal into their overall schedule.

Offer & Budget
Characteristics of a good Offer document (III)

- **Provide an estimate of cost based on previous projects or other estimation methods**
  - You should estimate what you are expecting to charge for the project so that your clients know exactly how much they will have to pay. Also, cover how they'll be charged.
- **Outline any contingencies or risks that might affect the proposal**
  - Always outline any potential issues that may come up during the actual development process, even if they are unlikely or you think they are not worth mentioning.
- **Include relevant testimonials, case studies, and references**
  - Include any relevant statistics or reports from experience working on similar projects. You can also include any good industry references (like other companies that were satisfied with your services), which would help prove your value.
- **Marketing is quite important. Make an attractive layout and exposure. End with a statement that you're available to answer any possible questions and give your contact information**

Offer & Budget
Index of an Offer document

1. Introduction. Background and Context
- Introduction to the document
- Analysis of the background and context
- Objectives of the proposal

2. Objectives of the System
- Description of the system. Scope & Functionality.
- Benefits of the system

3. Methodologies
- Brief description of the methodology to be used, including the fundamental tasks and the products generated as well as any certifications/standards available

4. Organization and Planning
- Schedule of activities and control
- Method of monitoring and control of deviations
- Place of execution of the works
- Relation Model & Service Level Agreements

5. TeamWork
- Resource effort estimation
- Description of the work team with the tasks of each person or group of people.
- Organizational chart of the work team (complete, that is, including the client)

6. Budget and Billing agreement

7. Risks

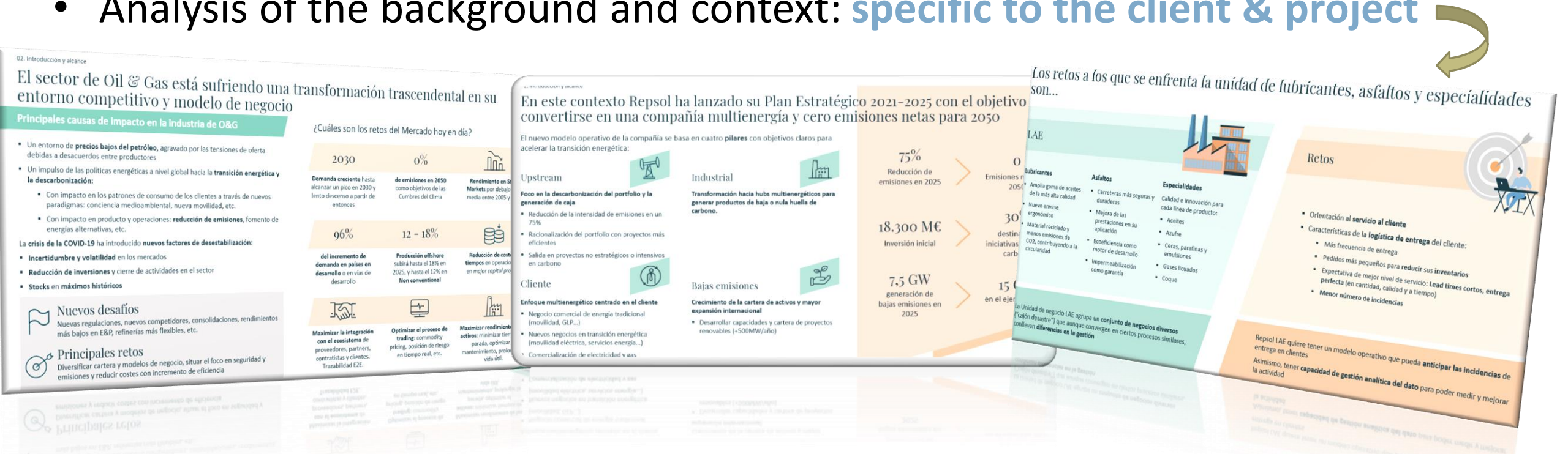
8. References

9. Annexes

Remember: as mentioned before, different types of Offers need different types of documents

Offer & Budget
Document: 1. Introduction Background and Context

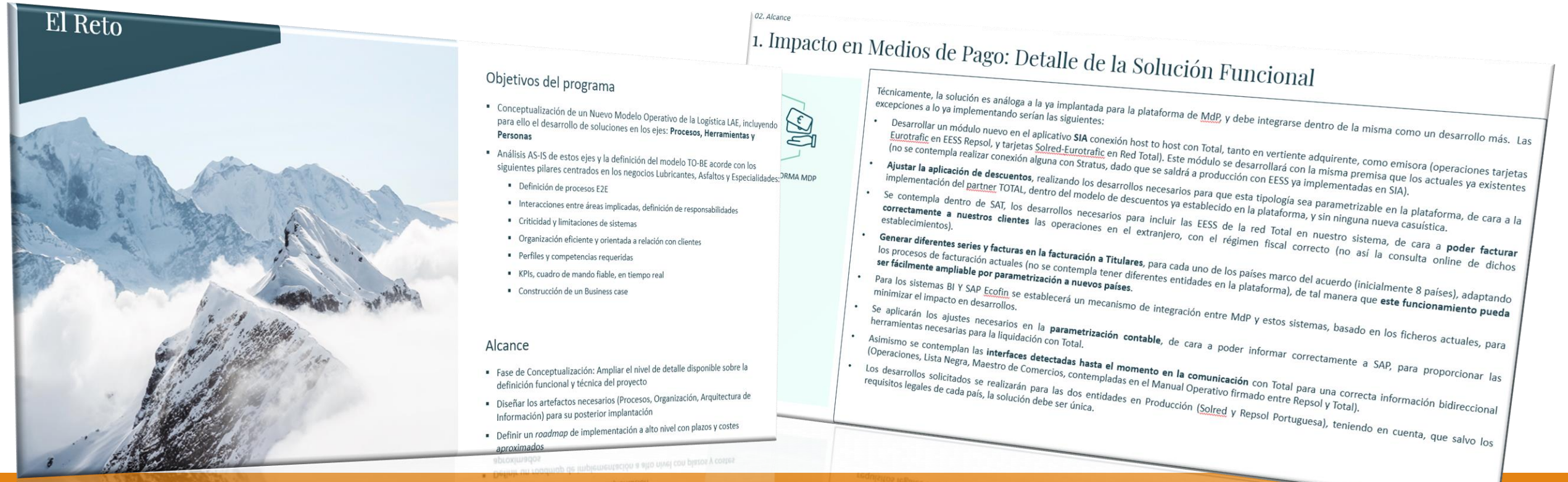
- Introduction to the document: **purpose, content, related documents**
- Objectives of the proposal: **brief, may be standard for company offers**
- Analysis of the background and context: **specific to the client & project**



At this point it is important to show a good understanding of the client company

Offer & Budget
Document: 2. Objectives of the System

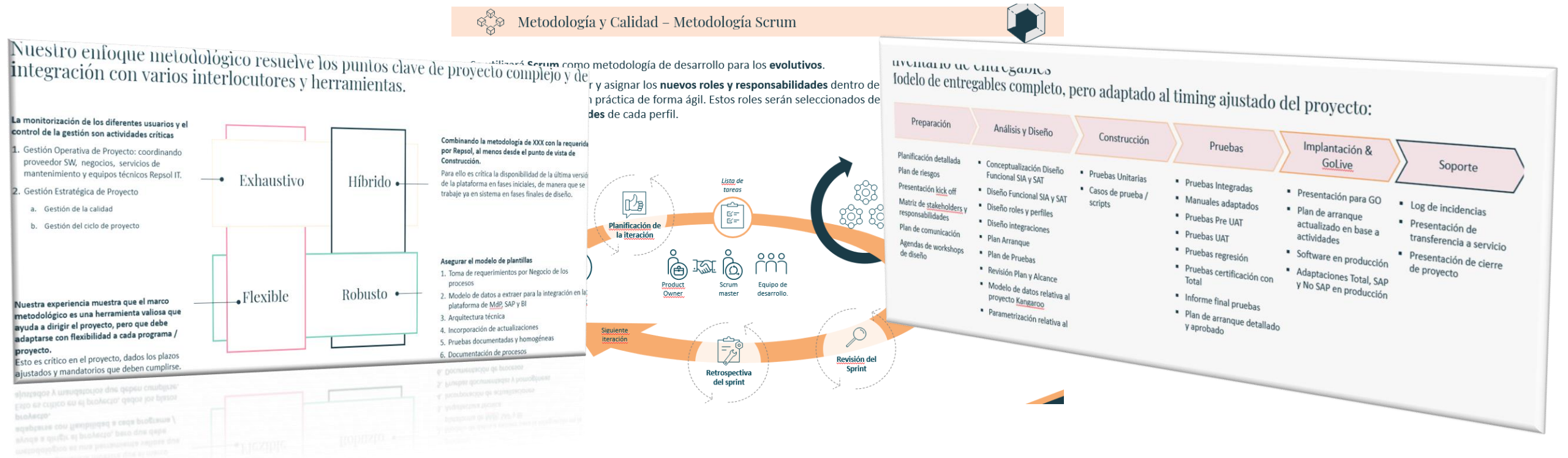
- Description of the system: **challenges addressed, scope and functionalities incorporated**
- Benefits of the system: **how the system addresses the challenge**



Try to explain why you are different than other competitors

Offer & Budget Document: 3. Methodologies

- Brief description of the methodology to be used, including the fundamental tasks and the products generated as well as any certifications/standards available



In our subject, !remember the previous Themes, you already know which methodology we will be using!

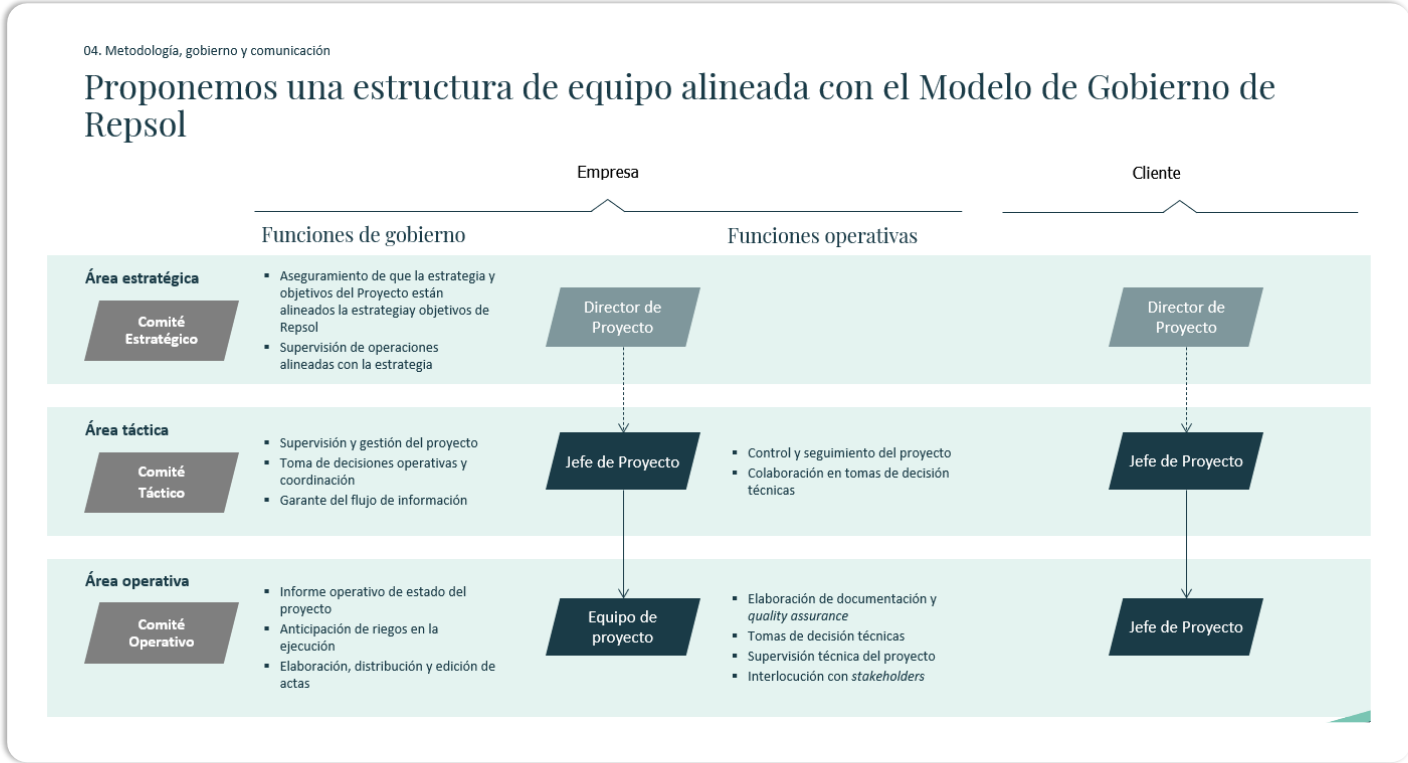
Offer & Budget
Document: 4. Organization & Planning (I)

- Schedule of activities and control: **outline of the planning, deliverables, milestones and key events for the client**
- Method of monitoring and control of deviations: **committees, meetings, tools, etc..**

At this point we still do not need a detailed MS Project with resources, etc… Use our schedule!

Offer & Budget
Document: 4. Organization & Planning (II)

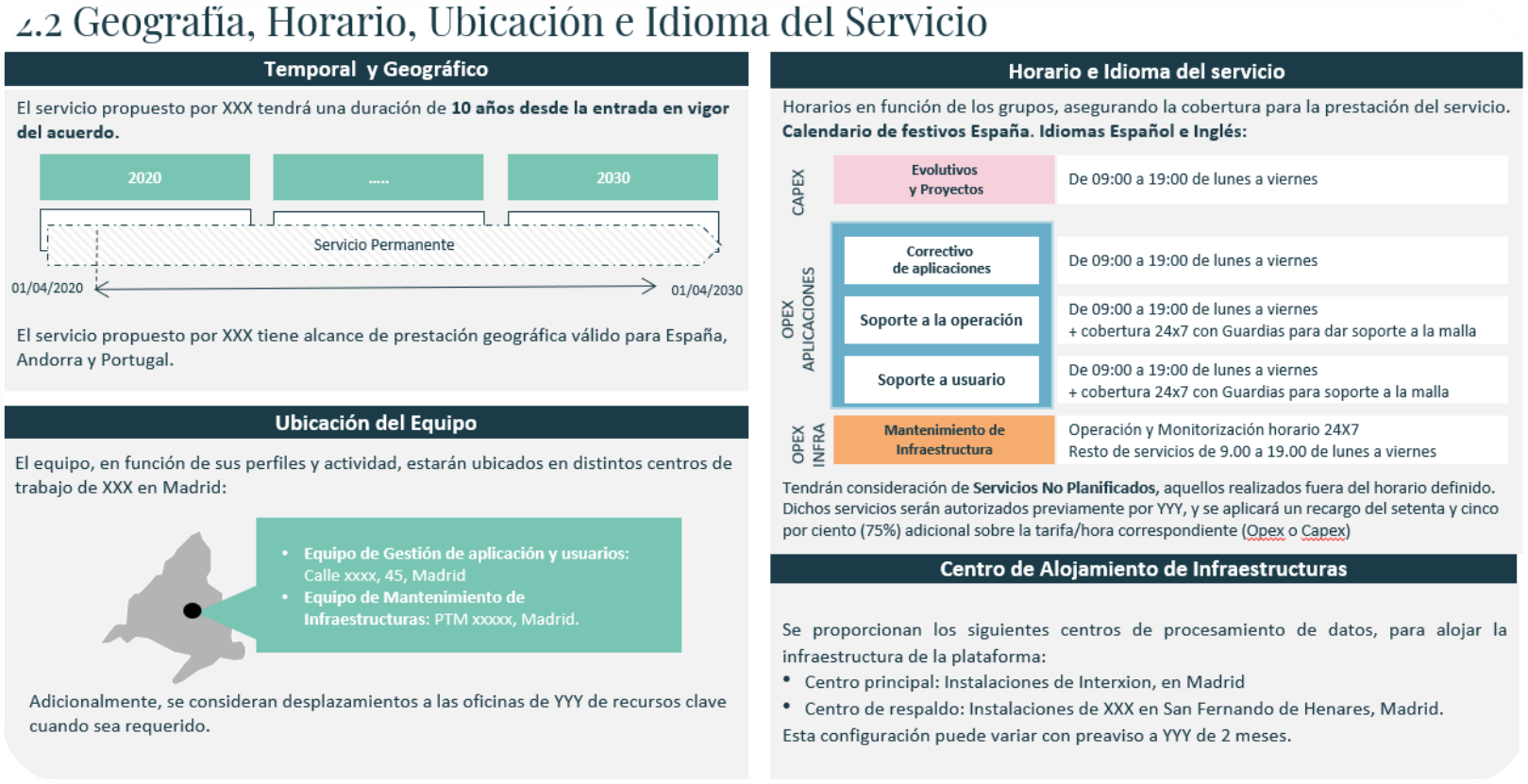
- **Relation Model:** configuration of the groups of teams in charge of the main responsibilities of the project both on the part of our company as well as the client company.



Three Levels of relation is usually appropriate for most of the projects

Offer & Budget
Document: 4. Organization & Planning (III)

- **Place of execution of the works:** may include geographies, languages, schedules…



4.2 Geografía, Horario, Ubicación e Idioma del Servicio

Temporal y Geográfico

El servicio propuesto por XXX tendrá una duración de **10 años desde la entrada en vigor del acuerdo.**

2020 2030

Servicio Permanente

01/04/2020 — 01/04/2030

El servicio propuesto por XXX tiene alcance de prestación geográfica válido para España, Andorra y Portugal.

Ubicación del Equipo

El equipo, en función de sus perfiles y actividad, estarán ubicados en distintos centros de trabajo de XXX en Madrid:

- **Equipo de Gestión de aplicación y usuarios:** Calle xxxx, 45, Madrid
- **Equipo de Mantenimiento de Infraestructuras:** PTM xxxxx, Madrid.

Adicionalmente, se consideran desplazamientos a las oficinas de YYY de recursos clave cuando sea requerido.

Horario e Idioma del servicio

Horarios en función de los grupos, asegurando la cobertura para la prestación del servicio. **Calendario de festivos España. Idiomas Español e Inglés:**

CAPEX	Evolutivos y Proyectos	De 09:00 a 19:00 de lunes a viernes
OPEX APLICACIONES	Correctivo de aplicaciones	De 09:00 a 19:00 de lunes a viernes
	Soporte a la operación	De 09:00 a 19:00 de lunes a viernes + cobertura 24x7 con Guardias para dar soporte a la malla
	Soporte a usuario	De 09:00 a 19:00 de lunes a viernes + cobertura 24x7 con Guardias para soporte a la malla
OPEX INFRA	Mantenimiento de Infraestructura	Operación y Monitorización horario 24X7 Resto de servicios de 9.00 a 19.00 de lunes a viernes

Tendrán consideración de **Servicios No Planificados**, aquellos realizados fuera del horario definido. Dichos servicios serán autorizados previamente por YYY, y se aplicará un recargo del setenta y cinco por ciento (75%) adicional sobre la tarifa/hora correspondiente (Opex o Capex)

Centro de Alojamiento de Infraestructuras

Se proporcionan los siguientes centros de procesamiento de datos, para alojar la infraestructura de la plataforma:

- Centro principal: Instalaciones de Interxion, en Madrid
- Centro de respaldo: Instalaciones de XXX en San Fernando de Henares, Madrid.

Esta configuración puede variar con preaviso a YYY de 2 meses.

Offers usually derive into Contracts but sometimes directly into PO, so better add every aspect

Offer & Budget
Document: 4. Organization & Planning (IV)

- **Service Level Agreements:** in case the client requires, SLAs will be added for the activities and milestones involved in the development project or service

Indicadores de servicio

Tiempos de respuesta en resolución

Nivel de criticidad	Descripción	Tiempo de respuesta (240)	Tiempo de comunicación (250)	Tiempo de resolución (260)
P1: Crítica (*)	• Pérdida completa de una aplicación o proceso crítico en producción. • Las incidencias clasificadas con esta prioridad serán las atendidas en soporte 24x7, previsiblemente tras la activación del autorizador (proceso crítico).	• 1h	• 2h	• 4 h
P2: Alta	• Pérdida parcial de una aplicación o proceso crítico que puede dejar dicha aplicación inutilizable o indisponible. • Bloquean procesos no críticos con elevado número de usuarios • No existe workaround razonable o si existe requiere un coste excesivo. • No permiten cumplimiento regulatorio	• 3h	• 6h	• 8 h
P3: Normal	• Degradación o pérdida de funciones de negocio no críticas en producción, con bajo número de usuarios • Los usuarios pueden continuar operando, aunque con un nivel de prestaciones inferior a lo deseable. • Se pueden solventar mediante un camino alternativo de elevado esfuerzo	• 8h	• 16h	• 40 h
P4: Baja	• Degradación o pérdida de funcionalidad en producción que afecta a usuarios individuales o a pequeños grupos de usuarios con mínimo impacto. • Impiden completar tareas no críticas sin impactar en otras tareas. • Se pueden solventar mediante un camino alternativo de bajo esfuerzo	• 8h	• 16h	• 120 h

There are several kind of SLAs. For incidents, for developments, for availability, downtimes, resources..

Offer & Budget
Document: 5. TeamWork

- **Resource effort estimation by phase:** only effort! No translation to money yet..
- **Description of the work team:** with the tasks of each person or group of people
- **Organizational chart:** of the work team complete, that is, including the client

Offer & Budget
6. Budget - Concepts

- The elaboration of a software development **budget can be complex as you have to consider many dimensions affecting the costs**, such as: human resources with different expertise levels, materials, licences, travels and expenses, taxes, currencies, fiscality of the countries involved, insurances, guarantees, cpi, discounts and rappels, etc… Nonetheless, **many of these may only apply in certain projects**
- Important Concepts:
  - Product Cost: gross amount of all the dimensions affecting the costs of the project. This measure is usually the result of some product sum (effort hours x rate) adding extra expenses.
  - Sale Price: gross amount of the income expected for the sell of the product. This measure is usually the result of applying some commercial margin to the Product Cost or its components (rates).
  - Trade Margin:
    - Percentage of gaining expected in the project. Calculated as:

$$\%\ Trade\ Margin = \frac{Sale\ Price - Product\ Cost}{Sale\ Price}\ x\ 100$$

    - Or, if we want a specific margin, what we would do is infer the Sale Price from the cost and margin this way:

$$Sale\ Price = \frac{Product\ Cost}{1\ - \%\ Trade\ Margin/100}$$

Offer & Budget
6. Budget – Determining Product Cost (I)

- When an engineer considers making an offer, **there are several ways in which the efforts can be estimated:**
  - Use company project history.
  - Use expert judgement.
  - If you do not have any of the above:
    - If you are a trained engineer, you could apply some of the estimation techniques that you have been taught in your degree or professional life, as long as you have enough Information to apply it.
    - Otherwise use the following rules (parametric method):
      1. Using the initial Information about the Project, make a draft of the use case diagram
      2. Every 4 use cases will take 1 month to be developed end-to-end (this is a very conservative approach). So for instance 10 use cases will be developed in 2.5 months. This rule must be adjusted, depending on the complexity of the use cases.

Use Case Complexity	Description	Adjustment Factor
Simple	1-3 transactions	x 1
Average	4-7 transactions	x 1,5
Complex	More than 8 transactions	x 2

What is a transaction at this level? It can be considered as a completed action that is perceivable for an actor

Offer & Budget
6. Budget – Determining Product Cost (II)

- Example: 19 use cases in the model performed:

Use Case Complexity	Description	Number of Use Cases	Time months
Simple	1-3 transactions	8	(8/4)*1 = 2
Average	4-7 transactions	9	(9/4)*1.5 = 3.8
Complex	More than 8 transactions	2	(2/4)*2 = 1

- In this case we would have a **Total Months (unadjusted)** of:
  (8/4) + (9/4) + (2/4) = 2 + 2.25 + 0.5 = 4.75 months
- And a **Total Months (adjusted)** of:
  2 + 3.8 + 1 = 6.8 months
- The **cost will depend on the number of people you have working over each month**:
  Let´s say there are 2 people developing the project being their hour/rate 30€/h:
  6.8 months * 160 hours/month * 2 people * 30 €/H = 65.280 euros

Offer & Budget
6. Budget – Determining Product Cost (III)

- Example: 19 use cases in the model performed:

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The Key to the exercise is to get the draft of the high-level use case diagram

Offer & Budget
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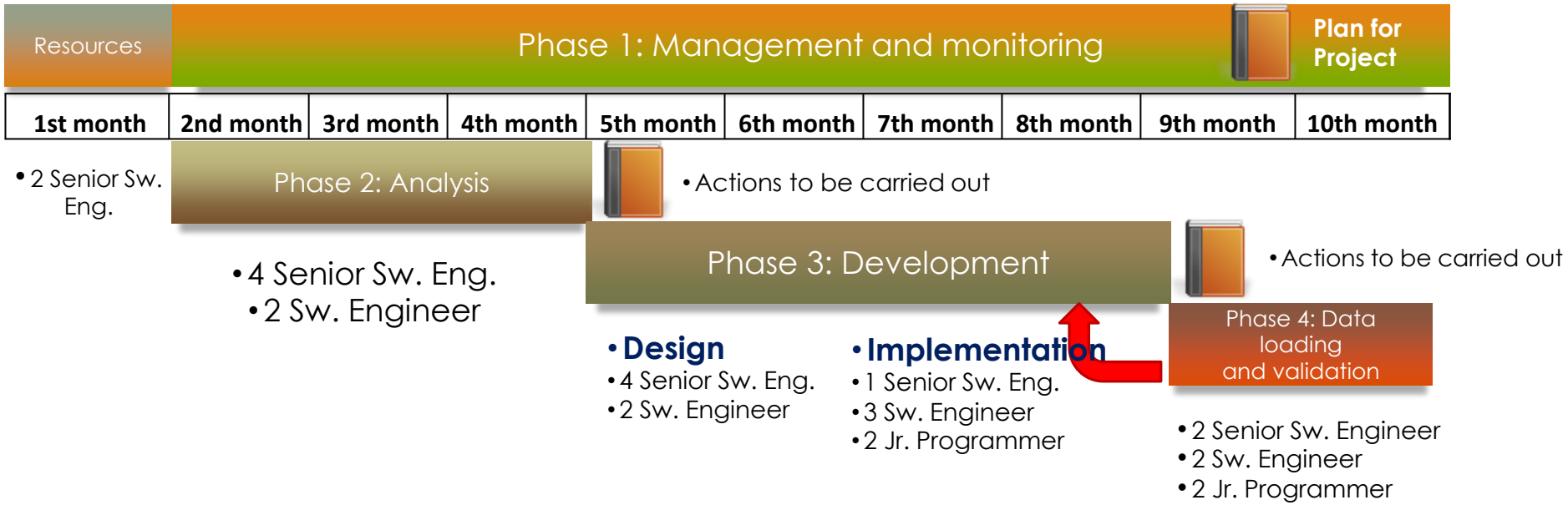
  6.8 months * 160 hours/month * 2 people * 30 €/H = 65.280 euros

And to know rates and number of people for every month

The Key to the exercise is to get the draft of the high-level use case diagram

Offer & Budget
6. Budget – Determining Product Cost (IV)

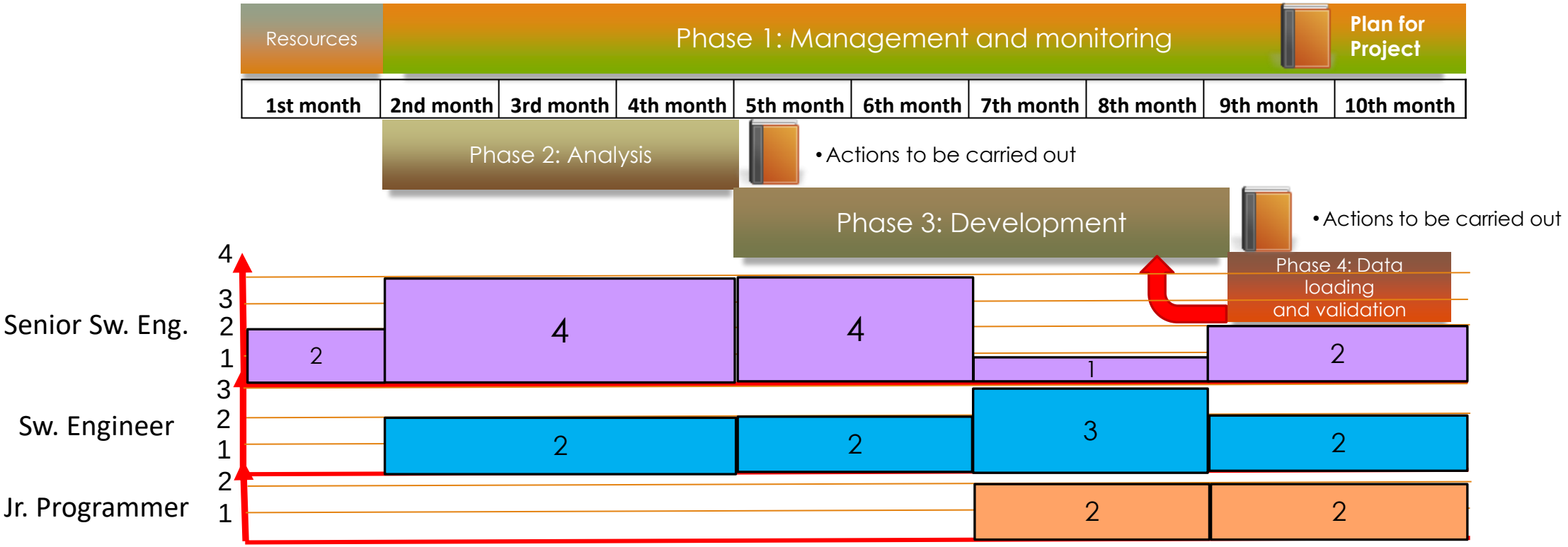
- The refined exercise requires to **determine the span of each Phase** (thoroughly the Planning draft) and **how many people of each profile will be working for each time-slot (week/month):**



Offer & Budget
6. Budget – Determining Product Cost (V)

An FTE or **full-time equivalent**, sometimes abbreviated as FTE, is a unit to measure employed persons or students in a way that makes them comparable although they may work or study a different number of hours per week

- We get a better view if we draw the **Resource Allocation Histogram**. Notice that although we used integers for FTE(*) people, most common is use one decimal numbers:

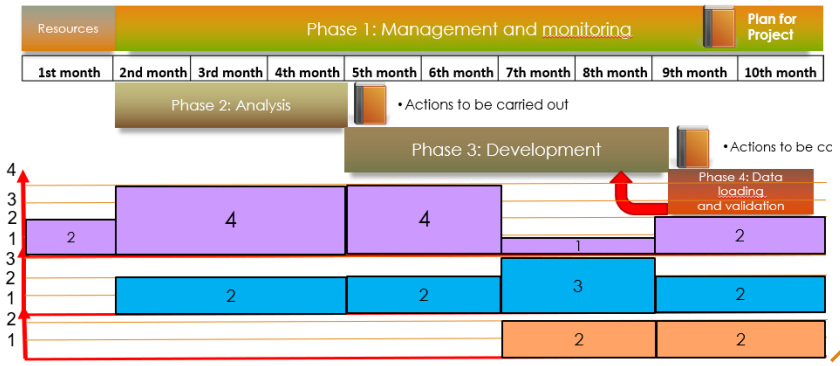


In bigger projects another interesting view is the curve of resources along time which should be bell-shaped

Offer & Budget
6. Budget – Determining Product Cost (VII)

- In order to be able to **transform human resource allocation to monetary cost** we need to have a **table containing the rates of the people**, which usually will be the **rates of the profiles indeed:**

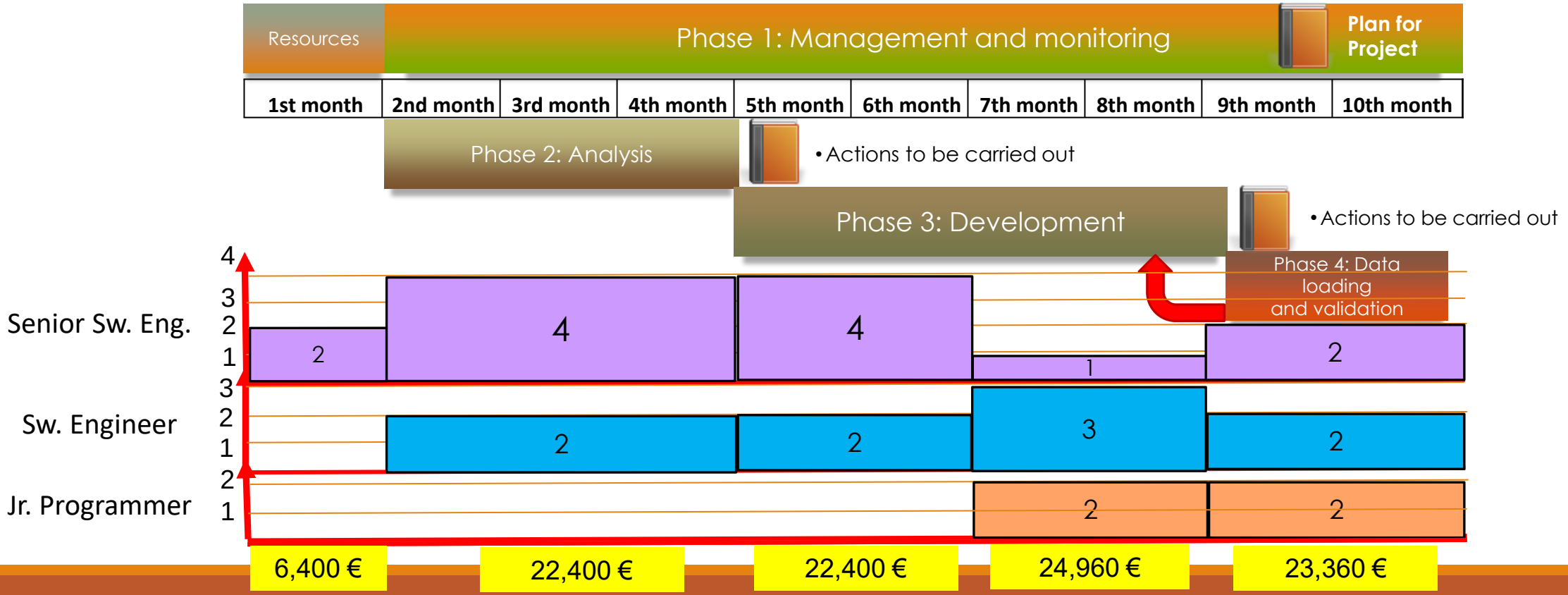
- Senior Sw. Engineer
  - Cost per person per hour: 40€/H
  - Dedication: 50%
- Software Engineer
  - Cost per person per hour: 30€/H
  - Dedication: 100% (Full-Time)
- Jr. Programmer
  - Cost per person per hour: 23€/H
  - Dedication: 100% (Full-Time)



						Month Hours	160
			FTE / Phase				
	€/H	Dedication	M1	Analysis	Design	Implementation	M9 y M10
Senior Sw. Eng.	40,00 €	50%	2,00	4,00	4,00	1,00	2,00
Sw. Engineer	30,00 €	100%	-	2,00	2,00	3,00	2,00
Jr. Programmer	23,00 €	100%	-	-	-	2,00	2,00
Total			6.400,00 €	22.400,00 €	22.400,00 €	24.960,00 €	23.360,00 €
Grand Total							99.520,00 €

Offer & Budget
6. Budget – Determining Product Cost (VIII)

- We get a better view if we draw the **Resource Allocation Histogram**. Notice that although we used integers for FTE(*) people, most common is use one decimal numbers:



Offer & Budget
6. Budget – Summary (I)

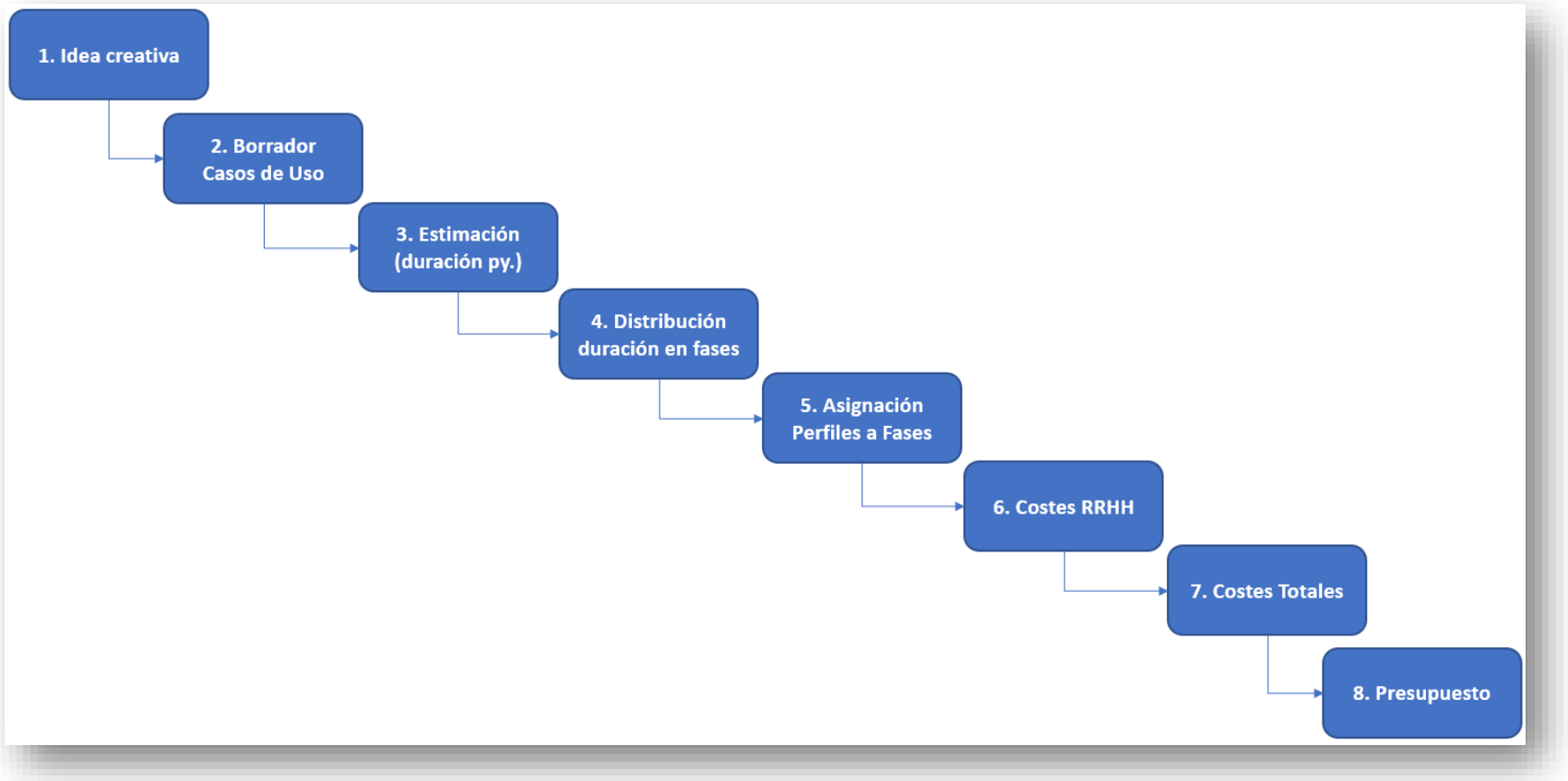
- **Now, to complete the budget we need to add some things:**
  - Additional sources of cost.
  - Company margins or expected Profits.
  - Taxes (usually ommited until Billing).
  - Risk Factor. As we are in a early steps of the work, we might add a risk factor ranging 10% to 15%

Description	Total
1. Project Staff	
2. Infrastructures and Equipments	
3. Software / Licenses	
4. Consumables	
5. Travel and Expenses	
6. Other costs (v.g. indirect costs)	
7. TOTAL COSTS	**1+2+3+4+5+6**
8. % Margin	X%
9. % Risk	Y%
10. Sell Price (before taxes)	**7 / (1 – ((8+9)/100))**

- **Taxes, and some other billing issues** are usually not added to the offer because they might change along time, so a sentence indicating that appropriate taxes that will be charged is usually added.
- There may exist **discounts to prices**. They would appear after calculating the first sell price.

Offer & Budget
6. Budget – Summary (II)

- **Now, let's outline the steps needed to get to the final Budget.**



Offer & Budget
6. Billing Agreement

- As a competitive company we **want to bill as soon as possible** so our expenses are compensated by the incoming payments. **We look for an appropriate cash-flow along the months** so that we don't get to the end of a project with still a big amount of the payments left.
- A good strategy, and well accepted by the clients is to **associate billing milestones with delivery milestones of the project.** In services kind of projects, usually a fixed amount per month is agreed upon conditions of revision.
- Some examples:

Fase del proyecto	%	Importe (€)
Kick-off	25%	24.985 €
Fase 1: Entregables AS-IS e inicio Modelo TO BE, Business Case y Roadmap	55%	54.966 €
Fase 2: Versión definitiva de entregables	10%	9.994 €
Fase 3: Cumplimiento de plazos y calidad	10%	9.994 €
	100%	99.938 €

Fase del proyecto	%	Importe (€)
Finalización Fase Conceptualización		35.191,20 €
80% Fase Desarrollo MVP distribuido en los 4 Sprints		16.460,40 € (por sprint)
Finalización Fase Soporte		33.917,20 €
		€
		€
		€
	100%	134.950 €

Things get much more complicated when involving transactions between companies of different countries and currencies

Offer & Budget
7. Risks

- It is important to show from the first moment **that you are aware of the possible risks** associated with the execution of a software development project.
- At this stage, **at least an enumeration of risks, a rough analysis of impact and their probability** must be acknowledged.
- This rough analysis **will be used later in the SQA (software quality assurance) plan.**

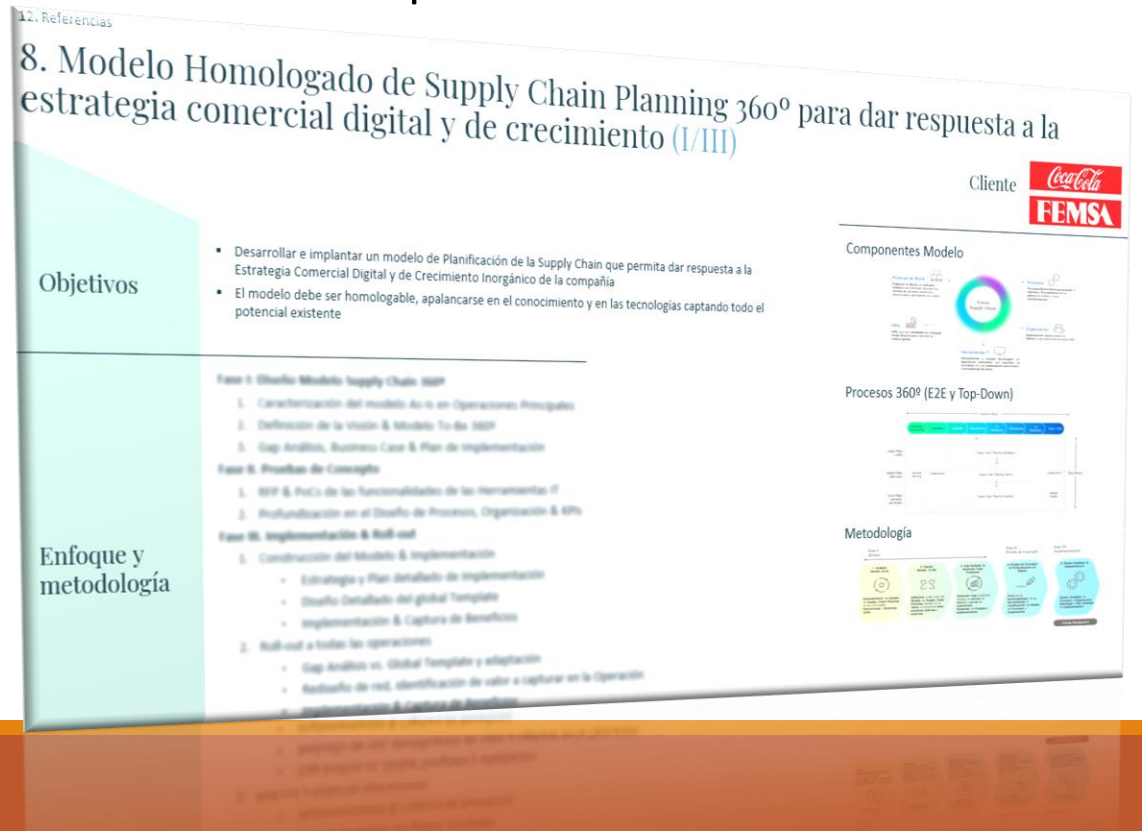
07. Riesgos

Indicamos los riesgos que, en base a nuestra experiencia y criterio, consideramos de especial relevancia para este proyecto

Tipo	Descripción	Probabilidad (1-5)	Impacto (1-5)	Medidas de mitigación propuestas
Disponibilidad de stakeholders del cliente	Falta de disponibilidad de los stakeholders comerciales para la fase de contraste de procesos y estrategia comerciales	2	4	• Identificación de usuarios clave de contingencia. • Definición con suficiente antelación de reuniones y sesiones de trabajo. • Conocer con anticipación su % de disponibilidad.
Retraso en entregas	Retrasos en el "sign of" de los entregables del proyecto	2	3	• Definición de procedimiento de aprobación de entregables, estableciendo tiempos máximos. • Establecer hitos de control intermedios previos a la entrega final de entregables.
Disponibilidad de información	Disponibilidad de documentación de los procesos llevados a cabo por Repsol que permita realizar una definición funcional correcta	2	2	• Levantamiento de información mediante reuniones y peticiones de información, donde se realice una petición global del proyecto y solicitud a demanda según información obtenida en las reuniones.
Temporal	Riesgo de no cumplir el requerimiento temporal	2	4	• El equipo es experto en esta tipología de proyectos y en los comités de seguimiento se identificarán riesgos ante posibles retrasos
Temporal	Infravaloración de esfuerzos debido a las diferencias entre negocios	2	3	• Analizar de manera conjunta el esquema global para conocer las diferencias entre negocios y comprender los esfuerzos que requiere

Offer & Budget
8. References

- Nothing better **to get the client confidence than showing them how well you already performed** in previous similar project or clients.
- Including some **references (verifiable) from previous clients (including this one!),** is an important key factor to be a successful winner.
- Some examples:




Creative Idea Description
Software Development Process
Offer and Initial Budget
THIS SESSION GOAL
DOUBTS?