

ESA Business Applications How to write a good APQ

Norbert Hübner, ESA Business Applications Department

12 June 2019

business.esa.int

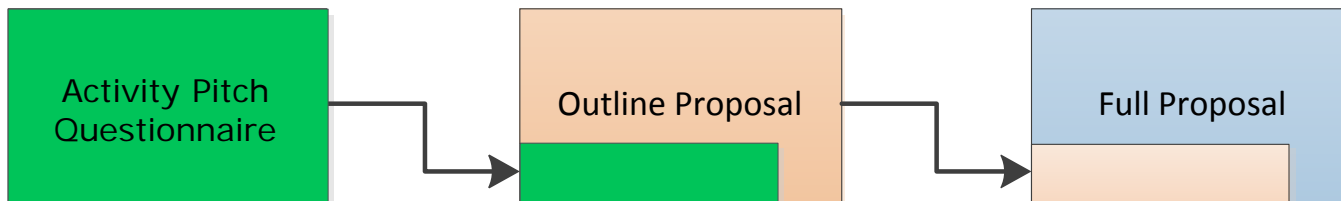
[@ESAbusinessapps](https://twitter.com/ESAbusinessapps)

European Space Agency

ESA UNCLASSIFIED – For Official Use

ESA-TIAA-HO-2019-1666

Stepwise building up the case in an interactive process with the applicant:



- Expertise
- Business potential
- Customers/users
- Space assets
- Eligibility

Objective: allowing ESA to quickly take informed decision on next steps, start interactive communication

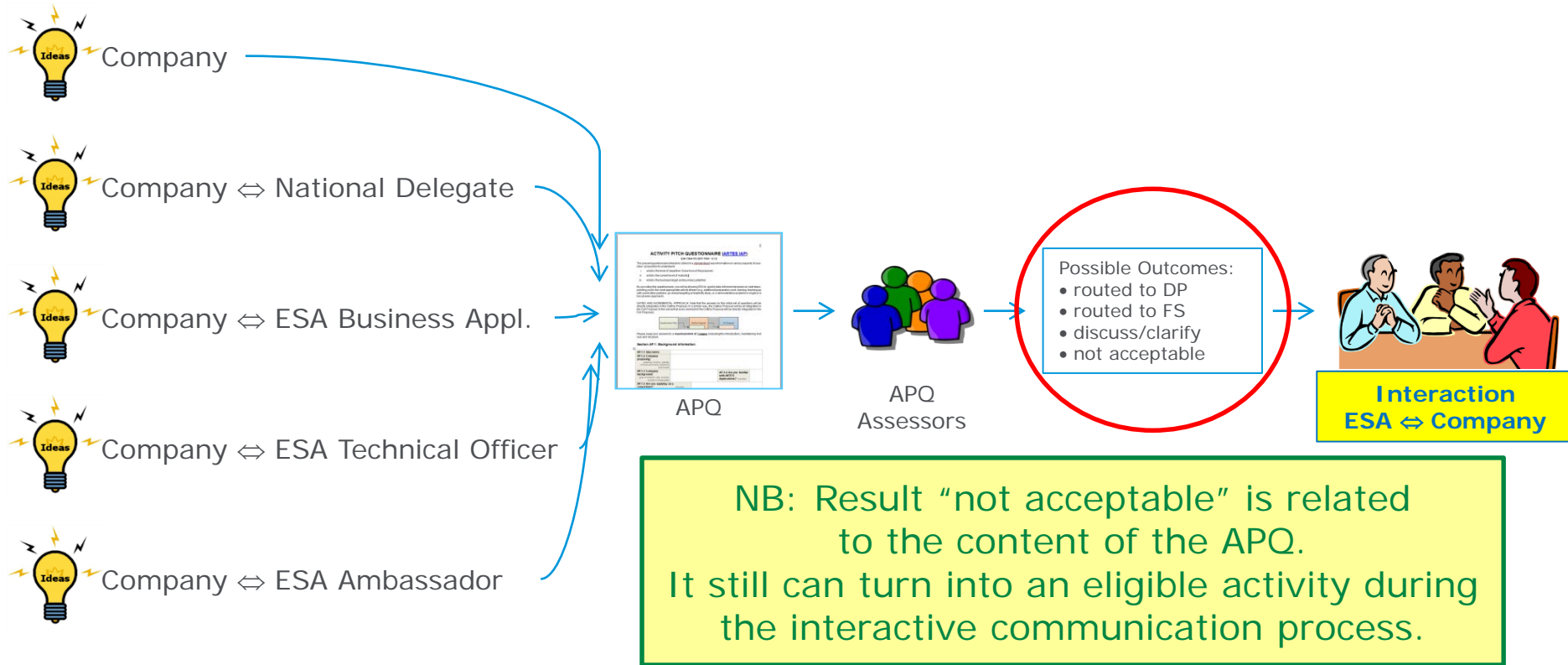
- Budget
- Partners
- Scope of work
- Planning

Objective: allowing ESA to obtain info for approval committees (JCB/AC/IPC)

- Admin stuff (CVs, WBS, WPDs, planning, cost forms, ...)
- Initial iteration docs

Objective: allowing ESA to complete procurement process

→ ACTIVITY PITCH QUESTIONNAIRE (APQ) - PROCESS



→ ACTIVITY PITCH QUESTIONNAIRE (APQ)

AP-1. Who are you?

AP-1.1 Idea name

AP-1.2 Company proposing
(*address, country, website, **contact person**, telephone, **email***)

AP-1.3 Company background
(***year of creation, turnover, size/number of employees***)

Company proposing:

1) Service provider

2) Supplier

3) Consultancy

4) Academia

⇒ Drive to market ?

⇒ AP-3.3 ?

a) Year of creation ⇒ credibility towards customers ?

b) Turnover ⇒ cash flow situation, co-funding capability ?

c) Employee number ⇒ capacity, know-how ?

d) Creation + size ⇒ seriousness wrt service implementation ?

Example 1: 2012, 100 k€, 2 employees ⇒ a? b? c? d?

Example 2: 2018, 50 k€, 3 employees ⇒ a? b? c?

Example 3: 2010, 5 M€, 30 employees ⇒ no questions

AP-1. Who are you?

AP-1.4 Are you familiar with ARTES Applications? (YES/NO)

AP-1.5 Are you applying as a consortium? (YES/NO)
Who are the other entities? (name, country, website)

Complementary know-how / expertise ?

Credibility increase towards customers ?

Academia ⇒ How do they co-fund ?

Various countries ⇒ Are all related National Delegations informed ?

AP-1.7 Have you (or your partners) contacted the ESA Business Applications Ambassadors (where available)?

Have you (or your partners) contacted your National Delegation? (YES/NO/PARTIAL + comments. If yes, please, *present the status of discussion with them*)

AP-1.8 How did you become aware of the ESA Business Applications Programme? (e.g. via ESA Web site, specific event, Ambassador Platform, National Delegation, brochure, Twitter, Facebook, from previous activities)

AP-1.6 Does your team (company/consortium) have the right skills and experience to deliver what you are proposing?
(YES/NO/PARTIAL + comments. Please indicate which skills/expertise you possess/miss with respect to the involved space assets like SatCom, SatNav, SatEO, Manned Space Flight, in the specific domain and in business development)

Business expertise

- Service Provisioning, Business Development, etc.

Domain expertise

- Market segment and trends, Customers access and engagement, etc.

Technical expertise

- Satcom, Navigation, Earth Observation & GIS, Drones, Sensor technology, Data fusion & modeling, Development expertise, etc.

Which expertise is missing, where ESA can help you to find a partner ?

→ ACTIVITY PITCH QUESTIONNAIRE (APQ)

AP-2. What do you want to offer, and what is the added value?

AP-2.1 What is the final service that you want to offer?

⇒ **what / to whom / how / how often / with which quality**

Example (fictive): "In South Africa, we will provide an irrigation information service to wine farmers and water boards."

Example (fictive): "In South Africa, we will provide information/maps for vineyard irrigation twice per week to the mobile phones of wine farmers with a resolution of 10m; to the water boards once per month on aggregated level with resolution of 100m."

AP-2.2 Who will be the customers/users of the final product/service?

(please note: users and customers can be different: users will use the final product/ service but they do not necessarily pay for it; customers will pay for the service, but they do not necessarily use it)

⇒ **which organisations / what is their role**

Example (fictive): "Users will be the wine farmers and the water boards."

Example (fictive): "Primary customer segment (B2B) will be consultants advising wine farmers, as well as wine farmers with a vineyard size > 1 ha. Secondary customer segment (B2G) consists of the water boards deciding on the amount of water to be distributed/allowed per farmer."

Market:

- 1) Home market
- 2) Export market

Customers:

- 1) B2B
- 2) B2C
- 3) B2G

➤ **Conservative attitude**

Businesses have to guarantee uninterrupted operations to current quality levels
Low willingness to change or introduce new processes

➤ **Limited interest in non-operational products / services**

Limited capacity to test new things (minimum overheads to run operations: profit maximisation)
Limited interest in pioneering, statement “come back when it is operational”

➤ **Existing supplier network**

Trustful relations are established with existing supplier network
Credibility of a newcomer?

➤ **Clear cost / benefit needed**

“Money makes the world go around”
offer same performance for less cost, better performance for same cost

➤ **The larger the company the longer the decision process**

strategic / investment decisions are typically made by the executive board
going up the hierarchy can take some time

➤ **Make or Buy**

willingness of companies to outsource competences / services vs. keeping them in house

→ BUSINESS TO CONSUMERS (B2C) - CHALLENGES

- **Requirement collection process**
unclear how many questionnaires / interviews are required to achieve a representative view
- **Marketing strategy difficult**
consumers are flooded with apps,
how to differentiate from competition,
selection of apps based on consumer perception
- **Free apps vs. paid apps**
why would a consumer pay for an app when he can have another one for free
(even if the app offers less performance)
- **Low price levels require large number of customers**
how many customers are required to sustain the service (achieve break even, make profit)

- **Dispersed community with heterogeneous requirements**
requiring tailor-made services for every single customer, not allowing economies of scale
- **Disconnection between operations and procurement**
operational teams enthusiastic about potential of space based services, but disconnected from procurement and decision processes
- **Procurement depends on availability of public budgets**
public spending is under continuous scrutiny limiting the opportunities to implement new services, causing long decision cycles, favouring cost above quality of service
- **Public tenders based on limited know-how of new technologies**
support of companies providing know-how and training in preparation of public tenders does not necessarily pay off in receiving a contract
- **Public tendering**
often results in cheapest, but not most efficient / effective service
- **Interest in freely available services**

AP-2.3 What are the customers'/users' pains (e.g. problems) and gains (e.g. benefits)?
Can you quantify them?
(please note: whenever users and customers are different, pains and gains can be different as well)

Is there a due diligence process behind this information?

Have you spoken to any customer?

Are there references which can be quoted (e.g. new regulations)?

Example (fictive): "As water is a scarce resource in South Africa, we believe that wine farmers have an interest in reducing the amount of water used on their vineyards. Also the water boards should have an interest in such services."

Example (fictive): "We have spoken with 3 large wine farmers in South Africa and one of the 12 water catchment management boards. The wine farmers want to optimise the quality of the grapes. Therefore, they need to know the stress status of the grapes before the harvest in order to optimize the quality, resulting in higher revenues for better wines. The water boards want to control the utilization of the water by the wine farmers (check if they stick to the allowed water amount); they also want to optimise the utilisation of the resource water, reducing the overall amount of water usage for farming by 10%."

AP-2.4 What is innovative in what you propose?

What is your **unique selling point** with respect to what is available in the market?

Innovation can be related to technology and/or business. Competition starts with current operational processes, covers substitute processes / systems, and only ends with services provided in the market comparative to the proposed one.

Example (fictive):

“We have searched in the Internet and there is no other company that provides irrigation services based on SatEO data to wine farmers in South Africa.”

Example (fictive):

“Today, the wine farmers irrigate based on their experience / gut feeling, but not on the status of the grapes (stress). With the proposed services the information for irrigation will be based on objective and up to date measurements. This will also allow unexperienced / new wine farmers to optimize irrigation and achieve best results from the beginning. The water boards distribute water based on statistics and land size. With the proposed services the distribution of water will be based on actual demand.”

AP-2.5 Which space technology / space asset do you intend to use **and why?**
(e.g. Satellite Communications: narrowband/broadband, data rate, SatCom network operator, Earth Observation: optical/radar, spatial & temporal resolution, EO instruments, Satellite Navigation: accuracy, Manned Space Flight: technology/service)

Provide concrete information on the space asset to be used and the rationale. If you do not have the related expertise and miss an experienced partner, state this in AP-1.6

Example (fictive):

“We will integrate Earth Observation imagery and will transmit in-situ field sensor data with SatCom.”

Example (fictive):

“SatEO: Optical images will be sourced from Sentinel-2, to extract the NVDI to determine the stress status of the grapes. In case of demand, we will source also commercial VHR imagery from Pleiades.

Satcom: As there is only limited terrestrial communication available, narrowband Satcom (e.g. Iridium, Globalstar) will be used to transmit once per day measurements from local in-situ soil moisture sensors (SMS type of messages).”

AP-3. Who are the target beneficiaries addressed by your offer, and what are the expected impacts?

AP-3.1 What is the **market and its size** in the initially targeted primary market (which typically is the home market) and which **market position** to you expect to achieve in this market?

(e.g. target segments addressed, key quantitative figures, market position after 5 years.

NB: do not confuse the potential service market with the general market, e.g. the total size of railway operations is not representative for an information service related to track maintenance)

Typical mistakes: Presentation of the global market and statement that capturing only 1% of this market will be a huge business.

Provide information bottom-up: what is the situation in the primary/home market, what kind of market position do you realistically expect to achieve, also against competition .

Example (fictive): “The market segment is the one of Internet broadband services to trains; we target the major railway operators of high-speed passenger trains in Germany (1), France (2), Italy (1), Spain (1). The total number of high-speed trains with these train operators is 1200. The number of daily trips for routes longer than 200 km is 4000.

The direct customers are the train operators purchasing directly from us; the train operators provide then the Internet services to the train passengers for free (end users).

We expect to be able to establish business with 2 of these 5 train operators directly after the demo project, as they have confirmed their interest and involvement as demo project users.”

AP-3.2 Have you already identified potential individual customers?
(Yes/No + comments; if YES, indicate *who they are* and *what is your engagement with them*)

**Involvement of potential customers/users has to be secured before start of the activity.
Involved customers/users shall be representative of the targeted market segment(s).
If the business case is build on high/equal importance of several market segments, then representative customers/users from each of these market segments shall be involved.**

Example (fictive): We have identified railway operators of high-speed passenger trains as customer segment and intend to approach a few of them after kick-off of the activity. If nobody of them is interested, then we will approach regional railway line operators.

Examples (fictive):

"We have already established contacts with high speed train operators A and B, and both have indicated interest to be involved in the activity."

"We target as primary market segment (generating 60% of our revenues) business customers from our home country, and as secondary market segment (generating 40% of our revenues) business customers from abroad. As representatives of these two segments the following organisations will participate in the study/project: ..."

AP-3.3 How does the proposed product/service fit within your current business activities and your mid/long-term strategy?

**This information shall present the rationale why the applicant is interested to carry out the proposed activity, and how this fits into their company strategy.
In case of substantial involvement of other partners, it makes sense to also present their motivation for engaging in the activity.**

Example (fictive):

“We are a research organisation and one of our objectives is to create spin-off companies based on our know-how. We will create such a spin-off company after the demonstration project.”

Examples (fictive):

“We provide already Internet broadband services to cruise ships and intend to expand our business to another segment with similar requirements.”

“We have developed so far the equipment for broadband connectivity to trains, but would like to expand our business to service provision.”

“We have created the company to provide services especially in this market.”

AP-3.4 Have you already considered how much you would charge for your product/service?

(YES/NO/PARTIAL + comments. If Yes, please provide the planned selling price and how many customers you plan to have one year after the end of the ESA project)

If answer is “NO” ⇒ indication for early stage, e.g. Feasibility Study (or BIC)

If answer is “YES” ⇒ indication of higher maturity, e.g. Demo Project.

In the latter case, information should be provided how the selling price has been established, why it is considered acceptable to the potential customers, and if it has been already checked / verified with potential customers.

How does the number of customers one year after demo project relate to the numbers of customers involved in the demo project? Is there a credible scale up plan?

AP-3.5 When do you plan to enter the market with the proposed product/service?
How do you plan to bring the activity results to commercial exploitation?

Example (fictive): “We have already a prototype system ready. We target a market entry 3 years from now. During the IAP pilot trial we intend to win the involved train operators A and B as first customers. With these reference cases we expect to convince 3 other train operators and gain them as customers within a period of 1 year, resulting in 5 customers one year after end of ESA demo project.”

AP-3.6 What economic benefits is the product or service expected to deliver to those inside the consortium and over what timescale?
(Describe the expected benefits for you and your consortium partners if applicable, e.g. jobs created, revenues generated, scale up plans)

'Return on Investment (RoI)' is an important aspect to receive the support of the related National Delegations. In case of a multi-national consortium, this RoI needs to be made clear for every country/industry.

Example (fictive): "With the Internet on board of the trains, train travels will become more attractive for travelers in comparison to short flights. Therefore, the train operators will be able to attract more travelers and make more revenues. In addition, the pollution levels will be reduced, as more people travel by trains instead of airplanes. We also will create jobs."

Example (fictive): "We expect to create 3 additional jobs during the IAP activity, and then with each new customer additional 2 jobs. The revenues are generated from product/system sales (train equipment) and Internet connectivity services. In the first year we expect to have sales for 50 trains (revenues of 2 M€ system sales + 500 k€ service fee/y), increasing every year by another 50 trains. We expect that this will support a modal switch from airplanes to trains."

AP-4. How do you intend to implement?

AP-4.1 What is the starting point for your activity?

(e.g. idea, prototype, existing product, existing service, results from other activities, discussions with potential users)

Present the starting point in terms of existing elements before start of the IAP activity. Low maturity on technical and/or business aspects points to a feasibility study, higher maturity to a demonstration project.

Example (fictive): "The starting point will be communication with users to collect the user requirements. Then we will do ..."

Examples (fictive):

"We are already running IoT services for 120 customers in 5 countries based on terrestrial communication only and intend to integrate Satcom in order to increase our business to current customers to sites without terrestrial communication coverage."

"As we are a newly founded company, we do not provide any services yet, but intend to establish such services."

AP-4.2 What are the key activities you propose to execute?

(e.g. on commercial aspects: market analysis, winning over potential customers, business case investigation/definition, validation of business plan assumptions, preparation of service level agreement, etc.,

on technical aspects: proof of technical feasibility, proof of concept, design, development, integration, testing, validation with pilot users/customers, etc.)

Early stage activities like market analysis, business case investigation, proof of technical feasibility, proof of concept point to a feasibility study. Development, integration, testing, validation with customers point to a demo project.

Focus only on technical developments without business related aspects is a typical sign of technology push, but not of a customer driven approach (market pull).

Example (fictive): “We intend to carry out a business case investigation to substantiate our first business analysis. In addition, we intend to establish a relationship with the user involved in the activity in order to win this organisation as first potential customer. From a technical point of view, there is one aspect where the technical feasibility still needs to be proven, i.e. ...

In addition, we would like to carry out a Proof of Concept in cooperation with the users involved.”

→ ACTIVITY PITCH QUESTIONNAIRE (APQ)

AP-4.3 What are the expected goals / outputs at the end of the activity?
And how will they contribute to the final product / service?

Examples (fictive):

“Commercially we aim for establishment of partnership agreements with our consortium partners. The involved users shall become also the potential customers to be involved in a potential follow-on pilot trial. The technical feasibility of ... shall be proven.”

“At the end of the demo project, we expect to have a fully validated product/service with only minor additional improvements required for roll-out into the market. On the commercial side, we plan to establish service level agreements with 2 of the 3 involved users.”

AP-4.4 What is the overall planning and costing of the intended activity?

Example (fictive): “The intention is to have a demo project of a duration of 2 years, with the first year covering the development of the system, and the second year the pilot trial with the involved potential customer XYZ. The cost of the activity is 1.2 M€.”

AP-4.5 Which co-funding are you seeking from ESA? (*e.g. k€, or percentage of activity cost*)

Example (fictive): “As we are a very small SME and aiming for a high-risk innovation, we are seeking 75% co-funding from ESA.”

NB: The default ESA co-funding rate is 50%. A co-funding rate of 75% for SMEs (EC definition) can only be decided by the related National Delegation ('Letter of Authorisation'). Some ESA Member States support 75% co-funding in special cases, others do not. To get a first feedback on this, and to manage expectations / avoid frustration, contact us (ESA).

AP-4.6 What other help/support are you expecting from ESA?
(e.g. access to space data, networking, coaching, branding, technical/business advice)

Example (fictive): "We expect that ESA can connect us to other customers in the energy sector. In addition, we expect to use ESA test facilities to test our antenna."

Example (fictive): "Beside the financial contribution we hope that ESA can connect us with EO added value service providers specialised in subsidence analysis. In addition, we hope that the involvement with ESA will increase our credibility to large customer organisations."

AP-4.7 What are the most important risks (technical / business / commercial) to your activity? What are your mitigation plans?

Typically, this part is very weak, with focus on technical problems, neglecting the business and commercial risks. This points usually to a weakness on the business know-how. However, to our experience, the most important risks are in most cases related to the commercial viability of the service (customer willingness to pay, price acceptance, co-funding capabilities, etc.).

Example (fictive): "The most important risk is the regulatory situation with respect to flying RPAS beyond line of sight. Mitigation: this is expected to be a temporary risk. Until implementation of the expected regulations, we consider the utilisation of manned airplanes as possible alternative."

→ USELESS STATEMENTS

- My idea is great.
- I don't want to talk about my idea, I'm afraid somebody will steal it.
- I have the best product on the market
- I have no competitors: nobody does what I do.
- I make a market study that confirms that my idea is great.
- This market is enormous, I just have to take 1%.
- My idea is protected by a patent.
- The big corporate competitors are too slow, I have a first mover advantage.
- My financial plan is pessimistic.
- We will build our marketing on social media and Internet.
- My first client will be profitable.

→ WHAT HAPPENS AFTER APQ SUBMISSION

- ESA will have an **internal discussion** about the proposed activity, involving experts on the subject (typically experts who have followed similar activities in the past).
- ESA will then **provide feedback within 10 working days**, offering usually a debriefing on the feedback. If the activity is **eligible**, an **interactive communication process** will be initiated, to shape and improve the idea.
- ESA will **contact the National Delegation** to inform about a new idea / application and the companies involved, it will ask if there is a potential “no-go”.
- If there are **no principle show-stoppers**, the applicant will be asked to elaborate on the idea and **submit an Outline Proposal** (in order to provide all information which allows ESA to start the necessary approval processes)

→ PRINCIPLES TO OBSERVE FOR PROPOSAL PREPARATION

- Contact early the **National Delegation** to understand what the information requirements and funding limitations are, and if the activity is potentially supported.
- Consolidate the involvement of potential **customers / users** in the activity, solicit a **'letter of intent' (FS)**, **'letter of commitment' (DP)**
- **Read carefully the instructions** of the various application documents
- **Define clearly the services** that will be provided to the customers / users
- Demonstrate with concrete information an **understanding of the initial focus market**, its processes and difficulties
- Present the **initial market perspective / expectation** (avoid the 11 useless statements mentioned on slide 40)
- Present the **service value chain end-to-end** and **your position** in it, potentially naming the other organisations in the chain

→ PRINCIPLES TO OBSERVE FOR PROPOSAL PREPARATION

- Provide a **system architecture end-to-end** (not just pieces or sub-elements), i.e. required building blocks for data collection, data processing, information creation, information distribution
- Define and justify the involvement of **Space Assets**, and provide a **shortlist** of the assets to be used (e.g. which satellites, which sensor data)
- **Business Plan and business related task: do not entrust this to an engineer!**
Check if **adequate resources** are allocated to this task (esp. feasibility study)
- **Proof of Concept (FS) / Demo Pilot Trial (DP)**: present what will be done, for how long, where it will be done, how it will be done, what equipment is required, how the customers / users will be involved
- Present the **know-how / expertise** that is required and will be involved in the activity (incl. know-how on technical aspects, market domain, business development)
If know-how is not available in the consortium, provide information from where it will be sourced and how.

→ PRINCIPLES TO OBSERVE FOR PROPOSAL PREPARATION

- Check the **completeness of the proposal**.
- In the final proposal, check the **coherence** of **technical content** description with **work package task** descriptions.
- In the final proposal, check the **coherence** of the **financial information** provided in the cover letter, in the proposal, in the financial forms.
- Check the **proposal content against the evaluation criteria** of the tender (contained either in 'Special Tender Conditions' or in 'Cover Letter') to see if it makes sense what you wrote in the proposal and if the TEB is able to come to positive conclusions.
- For co-funded activities, provide ESA the **draft full proposal for a final compliance check** to avoid non-compliances / show-stoppers.
- Keep the **National Delegation informed** on the process and include the **“Letter of Authorisation”** of the National Delegation in the final proposal.

Information material available on request:

- Guide "Satellite Communication"
- Guide "Satellite Navigation"
- Guide "Earth Observation"

- Website: business.esa.int
- General email address: business@esa.int
- Project web pages of studies and projects on business.esa.int/projects
- IAP Open Call for co-funded activities (AO-9305) online on EMITS: emits.esa.int
- Various proposal templates on business.esa.int/documents incl. "Activity Pitch Questionnaire", "Outline Proposal", "Full Proposal" and study/project related "Management Requirements"
- Tender information on Kick-Start themes (AO-xxxx) online on
 - EMITS during the tender opening period: emits.esa.int
 - preparatory information under: business.esa.int/kick-start
- Tender information on Competitive Tender Studies (AO-xxxx) online on
 - EMITS during the tender opening period: emits.esa.int
 - preparatory information under: business.esa.int/intended-tenders/all