

## **REPORT ON MARKET CONSULTATION**

Migration Services of IT applications or systems to the Governmental Cloud of Romania

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## Useful information

This document provides a summary of the process and outcome of the **market consultation run by the Authority for Digitalisation of Romania (ADR) with regards to the future award procedures for cloud migration services in the context of the project of national strategic interest of the Governmental Cloud**. This document does not represent the decision of the Contracting Authority, ADR, on the content of the contracting strategy/ies for running the procurement procedure/s associated with this market consultation. It should also be noted that no draft public procurement documentation was shared by the Contracting Authority with the participant organisations in the market consultation process.

The information provided by the respondents/organisations during the course of the market consultation will not bring them any advantages or disadvantages in view of the award procedure/s associated with this market consultation. **The responses or participation of economic operators in this market consultation do not constitute grounds for exclusion from the future award procedure/s related to the relevant cloud migration services.**

This market consultation **did not aim at selecting a specific bidder for the future award procedure/s**. This market consultation precedes the award procedure/s of which it forms part and does not replace the selection process. Respondents/participants did not submit requests to participate or bids in response to this market consultation.

**Participation in this market consultation was purely voluntary.** The Contracting Authority has not granted and will not grant financial compensation to the participants in the market consultation, nor it has reimbursed the expenses incurred by participating in it.

The information received by the Contracting Authority during the market consultation **may be used at its own discretion** in the planning and conduct of future procurement procedure/s, in compliance with the provisions of public procurement law, in particular with a view to not distort competition in the future award procedure/s and to not to infringe the principles of non-discrimination and transparency. During the consultation process, the Contracting Authority has taken all necessary steps to address the topic of the information declared by the participants in the consultation as confidential, classified or protected by an intellectual property right.

**No information contained in this document, in the documents published in SEAP or in other means in connection with this consultation process or any communication made between the Contracting Authority and any person/organisation in connection with this market consultation may be invoked as part of a contract, agreement or any other similar form.**

The Contracting Authority publishes this document in SEAP in the 'Market Consultation' section as a result of the market consultation.

## List of Abbreviations

Abbreviation	Explanation
<b>ADR</b>	Authority for the Digitalisation of Romania
<b>API</b>	Application Programming Interface
<b>AWS</b>	Amazon Web Services
<b>CMDB</b>	Configuration Management Data Base
<b>CPI</b>	Consumer Price Index
<b>DB</b>	Database
<b>EIB</b>	European Investment Bank
<b>GDPR</b>	General Data Protection Regulation
<b>HDFS</b>	Hadoop Distributed File System
<b>IAAS</b>	Infrastructure as a Service
<b>ITSM</b>	IT Service Management
<b>JOEU</b>	Journal of the European Union
<b>MoSCoW</b>	M - Must have, S - Should have, C - Could have, W - Won't have
<b>MRID</b>	Ministry of Research, Innovation and Digitalisation
<b>MS</b>	Microsoft
<b>NRRP</b>	(Romania's) National Recovery and Resilience Plan
<b>OS</b>	Operating System
<b>PAAS</b>	Platform as a Service
<b>PPM</b>	Project and Program Management
<b>SAS</b>	Statistical Analysis System
<b>SAAS</b>	Software as a Service
<b>SDLC</b>	Software Development Lifecycle
<b>SEAP</b>	Sistemul Electronic de Achizitii Publice (Electronic Public Procurement System)
<b>S3</b>	Simple Storage Service
<b>SLA</b>	Service Level Agreement
<b>STS</b>	Special Telecommunication Service
<b>UAT</b>	User Acceptance Testing
<b>VM</b>	Virtual Machine
<b>VPC</b>	Virtual Private Cloud

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# 1. Context of the Market Consultation

## 1.1 Future award procedure/s associated with the Market Consultation

Romania's National Recovery and Resilience Plan (NRRP) supports the digital transition with investments and reforms for the digitalisation of public administration in key areas such as justice, employment and social protection, environment, civil service management and skills development, public procurement, cybersecurity, tax, and customs, while building a secure **Governmental Cloud** infrastructure and supporting Electronic ID (eID) deployment.

**The Governmental Cloud infrastructure is the most significant public digital investment in Romania**, aimed at accelerating the development and delivery of digital public services to citizens and businesses and at significantly improving the interconnectivity among public institutions in Romania. More information about the Governmental Cloud can be found at the official link <https://www.adr.gov.ro/demararea-proiectului-aferent-investitiei-1-implementarea-infrastructurii-de-cloud-guvernamental-finantat-prin-pnrr-componenta-7-transformare-digitala/>.

Within the organisational set-up of implementing the Governmental Cloud, the **Authority for the Digitalisation of Romania (ADR) is responsible for ensuring the execution of migration of various IT applications**, as used by various public authorities and institutions, to the secure Governmental Cloud infrastructure. The applications in scope for migration to the Governmental Cloud are currently being defined, but the list will be constituted of enterprise grade applications/systems used to provide digital public services by the different Romanian institutions and authorities. ADR anticipates that **it will launch a public procurement procedure/s during the year of 2024 to procure Cloud migration services** and it contemplates the possibility of bundling / aggregating several applications to migrate to the new Governmental Cloud into fewer Cloud migration public procurement contracts.

The procurement procedure/s referred above will be organised to support the objectives defined as **Milestones 156 and 157** of the *Investments for cloud development/migration of Romania's National Recovery and Resilience Plan* (NRRP), Chapter 7 Digital Transformation):

Table 1 - Migration of Government Applications to Cloud (IaaS & PaaS)

Migration of Government Digital Service Applications to Infrastructure as a Service – IaaS / platform as a Service – PaaS – in two waves: (1) by Quarter 2, 2025 – at least 5 IT applications or systems, (2) by Quarter 2, 2026 – other applications or systems up to the total target of 30 such IT applications or systems migrated.
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In preparation of the future public procurement procedure, **ADR conducted a Market Consultation** process during the period **January - March 2024** to investigate the market's capabilities to provide support for this important initiative with the objective of **cost estimation, better planning and designing of the future public procurement procedures** via which it will purchase the cloud migration services.

**The Market Consultation was launched with the publication of Market Consultation Notification no. MC1027337 on 15<sup>th</sup> January, 2024** on the Romanian Public Procurement Electronic Platform (SEAP) and it was complemented with the notification being also promoted

via the Supplement to the Official Journal of the European Union via prior information notice 36007-2024-EN from 19<sup>th</sup> of January, 2024.

## 1.2 Need for the Market Consultation

This Market Consultation is the **foundational step for preparing the public procurement procedure/s** for the cloud migration services, increasing ADR capacity to understand the related critical success factors and address key risks. Specifically, it is fundamental to mitigate risks, given the importance of the Governmental Cloud investment to the Romanian government, the complexity of the cloud migration tasks and timelines associated with it. As already indicated, within the NRRP, ADR has the task of migrating at least 30 IT applications or systems to the Governmental Cloud which belong to various Romanian public institutions or public authorities. Overall, ADR is the responsible organisation for the cloud migration process, benefiting from a total **budget of approximately EUR 180 million** from the NRRP dedicated to this investment.

## 1.3 Objectives and expected results of the Market Consultation

ADR launched the investigation of the market's capabilities with the overall objective of **better planning and designing of the future public procurement procedure/s in scope**. The Market Consultation has been carried **at general level for all IT systems and applications in scope**, independently from the number of public procurement award procedures that will be launched during the public procurement process (i.e. the Market Consultation did not focus on a specific public procurement procedure, but on the overall package of cloud migration services in scope as per milestones obligations set in NRRP).

As part of the Market Consultation, ADR was particularly interested in the following aspects:

- The **general profile of economic operators** from Romania and abroad that could be relevant for the provision of services for the migration of applications and IT systems to the Romanian Governmental Cloud (portfolio, skills, business model, etc.).
- Opinions of the participating economic operators on **key elements of the migration of applications and IT systems** to the cloud such as: the costs of migration services, the duration of the implementation of various migration strategies, the risks of migration to the Cloud, ways to group applications and IT systems for migration.
- Opinions of participating economic operators regarding the **information that should be included in the public procurement documentation/s** for future migration services and the attractiveness of future cloud migration contracts for their business.

## 2. Summary of the Market Consultation Process

### 2.1 Market Consultation Process and Timeline

The market consultation process was structured into four phases to ensure an effective participation from the economic operators. The four phases are described below.

- **Phase 1: Information Sessions.** ADR launched a *Notification for the Market Consultation Process* that was published on several channels (i.e. SEAP, JOUE) and also promoted on ADR Social Media channels and website with target invitations also sent to individual companies. The Notification included an invitation to sign up to a Market Information session by 23<sup>rd</sup> January 2024. ADR then held two Market Information sessions to provide more information to participants on the migration of IT systems or applications to the Romanian Governmental Cloud. The first session

(Romanian language) was held on **25<sup>th</sup> of January 2024**. The second session (English language) was held on **26<sup>th</sup> of January 2024**. Each session addressed the same content, allowing participants to choose the session that best suited their language preference. **By providing a session in English language, ADR aimed to provide visibility of the future procurement procedures not only to companies registered in Romania, but also to other companies based in the European Union (EU) or abroad, in general.** In total, **51** companies participated in the Information Sessions, with **around 200** individual participants. The list of companies that took part in the Information Session can be found in the Annexes (5.1 - List of Companies that participated in Market Information Sessions).

- **Phase 2: Filling in the Questionnaire.** Companies were invited to submit a filled-in Market Consultation Questionnaire to ADR by **4<sup>th</sup> of February 2024**. Submission of the filled-in Questionnaire was not conditioned by participation in the information sessions. ADR accepted questionnaire responses in either Romanian or English, as per the preferences of the respondent companies. Only companies that responded to the questionnaire by the deadline were invited to the next phase (Bilateral Consultation Meetings). In total, 28 companies returned the Market Consultation Questionnaire with answers by the deadline. 2 additional companies returned the questionnaire after the deadline. The list of companies can be found in the Annexes (5.2 - List of Companies that submitted the Market Consultation Questionnaire)
- **Phase 3: Bilateral Consultation Meetings.** These meetings were conducted with companies that both submitted the completed questionnaire by the deadline of February 4th, 2024, and expressed interest in participating. All 28 companies expressed interest and were invited to attend the meetings. Ultimately, **meetings with 25 companies were held**, with two sessions being combined, and one session not taking place due to the company's absence. These meetings were conducted in either Romanian or English, depending on the preference of the participating company. The 24 sessions were held **from 26<sup>th</sup> February to 8<sup>th</sup> of March** and lasted about 60 minutes each. The meetings were conducted online (via WEBEX), and were recorded. After each session, a Meeting Summary was shared with the participants to allow them to provide feedback within two working days, or else the summaries were considered confirmed. The list of companies that attended the Bilateral Consultation Meetings can be found in the Annexes (5.4 - List of Companies that participated in the Bilateral Consultation Meetings).
- **Phase 4: Market Consultation Report.** The final step in the consultation process is the publication of the Market Consultation Report by ADR on the Romanian Electronic Public Procurement System (SEAP). The report, which encapsulates all main findings and discussions from the consultation process, is made this way accessible to any interested party, having participated or not in the market consultation process.

## **2.2 Market Consultation Process Approach**

The market consultation process was designed to encompass two fundamental steps to ensure a thorough understanding of the market dynamics and to tailor the cloud migration public procurement procedure/s to best suit both the Contracting Authority and potential bidders.

The first step involved the **dissemination of the Market Consultation Questionnaire** to capture detailed organizational profiles, market and operational insights, budgeting information, critical success factors and risks, and initial expressions of interest in subsequent

consultation meetings. The questionnaire provided a structured format for potential participants to offer their expertise and feedback directly.

Following the questionnaire, the second step of the consultation was the **facilitation of Bilateral Consultation Meetings**. These sessions were intended to foster direct and in-depth discussions, allowing for a more nuanced exchange of views and clarification of details offered as answers in the Market Consultation Questionnaire. It is important to note that completion and submission of the questionnaire were prerequisites for engaging in the bilateral dialogues.

This two-step approach was instrumental in achieving a comprehensive market consultation process.

### 2.3 Phase 1- Information Sessions

During the 2 Information Sessions ADR delivered a presentation which, fundamentally, offered **more details on the process of migration of IT systems or applications to the Governmental Cloud**. The presentation delivered can be found in **Annex 5.8** and **Annex 5.9**.

Participating companies were also given the **opportunity to ask some questions**, in the limit of available time, at the end of each meeting. The list of questions that were asked by the participating companies and answers provided are below.

#### Summary of Questions & Answers – Information Session in Romanian

Table 1 - Information Session (RO) Q & A

ID	Question from Company	Summary answer from ADR
1	What is the difference between the application and the system in terms of the two deadlines Q2 2025 and 2026 respectively?	There is no difference between applications and systems from a timeline perspective.
2	How many (number) applications/systems fit into each type of strategy?	We don't have that information. We are at the stage of in-depth technical analysis. After this we will choose the optimal strategy.
3	How many of the applications from the first wave are already containerized?	8% - the information is in the presentation.
4	Can you give as many examples as possible of IT systems selected among the 30?	Examples pertaining to the ADR have been given. The list will be finalized after the conclusion of the detailed technical analysis.
5	Among the 30 systems selected, what percentage target the internal cloud and what percentage the dedicated cloud?	There is no selection or split at this point.
6	As regards the clarification of the answers sent in the questionnaire, can they be addressed and debated during bilateral sessions, including in terms of estimated costs for proposals to be submitted?	Yes, during the bilateral meetings the main goal is to clarify the feedback sent via the questionnaire.
7	The procurement procedure will be launched in lots according to the 3 types of strategy so to ensure the relevance of the offers / competencies on each type of strategy?	We are interested in the opinions of operators to form grouping criteria. The timeline is the main criterion.
8	What happens if a system/application is considered to be part of one type of	ADR will be at the forefront and provide migration documents.



ID	Question from Company	Summary answer from ADR
	strategy and in practice another type of migration strategy proves necessary? Hosting vs. Architecture?	
9	Can you say more about the 2 units of the dedicated cloud? Are they technologically identical units or two stacks from different vendors? What are the selected technologies (MS/Oracle/AWS/etc.)?	The question is not in the scope of the meeting. Additional information in Government Emergency Ordinance no. 89/2022.
10	Are framework contracts for common technology solutions being considered for the 30 applications?	It's just an option at this point in the discussions.
10	What are the criteria by which it is decided whether an application will be migrated to the cloud of a hyperscaler vs the Government dedicated "private" cloud - out of the 4 datacenters?	All applications will be migrated to the Government private cloud.
12	Will you prioritize when migrating applications that only require "rehosting" - considering that the duration of migration operations would be much shorter anyway than in the other two situations (readaptation / rearchitecture)?	There are other criteria that are taken into account. The focus is on applications for public services. If the analysis shows that the migration can take place in the timeline, they can be considered.
13	Can you tell if all 30 projects to port applications will have an equal budget or will the budget be different from one project to another?	Budgets may differ depending on complexity.
14	Is migrating government applications to the commercial cloud subject to this?	All applications will be migrated to the government private cloud.
15	Please clarify what are the criteria based on which the location/Cloud component (Internal Cloud or Dedicated Cloud) where the system/application will be migrated will be decided?	The question has already been addressed.
16	How do you ensure the availability in practice of access to applications/systems and collaboration without delays from the institutions that currently own/support the applications/systems? Are there working protocols signed between ADR and beneficiary institutions?	A migration agreement will be signed between ADR and the respective institutions owning the IT systems. The collaboration with these institutions has been very successful so far.
17	How many of the selected applications are mapped exactly on OS, virtualization systems, DB purchased within the component currently run by STS?	The question is not in the scope of the meeting.
18	Is there a set of functional and performance tests that can be carried out both in the "as is" phase and in the "to be" phase?	Yes, there is a set of tests for performance, functionality and security.

ID	Question from Company	Summary answer from ADR
19	When do you envisage integration into the Governmental Cloud and other public institutions that are not part of the central administration?	After completion of NRRP milestones, depending on available resources.
20	Will you make individual procurement procedures for each of the 30 applications/systems, or some framework contracts for a migration template?	We focus on grouping into as few contracts as possible. The final calculation will determine the number of contracts.
21	Taking into account the complexity of the services and the potential duration of the deployment, especially considering the time constraints for the first milestone, when do you estimate that the public procurement procedure will start?	We estimate that the procedure will take place in the 1st semester of this year for the first wave.
22	What is the proposed contract model, time & materials, fixed cost, etc.?	We cannot provide an answer at this time.
23	What are the criteria for deciding whether an application will be migrated to the dedicated cloud of a hyperscaler vs internal governmental cloud? What will be the main differences between the roles of these two hosting destinations?	The two units form a unitary whole. ADR will decide the optimal migration path.
24	Does migrating applications also involve operating system upgrade (where applicable)?	Yes.
25	How will services be purchased from hyperscalers? E.g, a PaaS database.	As services. Main goal is to provide cloud services adapted to the needs of the systems to be migrated.
26	Among the 30 applications/systems there are instances where you identified the need to rebuild from scratch, with modern technologies / with different specifications?	Yes.
27	In the migration process, can tools from the public cloud be used?	Yes.
28	In the migration process (Re-Host, Re-platform, Re-arch type), if licenses or other components that cannot make migration possible will be required - will they be included in the offer or offered by ADR?	The need to purchase such instruments will be determined on a case-by-case basis. We will take into account participants' feedback on this matter.
29	Who will sign the acceptance on each migrated system/application? ADR or beneficiary institution of the application or ADR+beneficiary institution?	The contracting authority (ADR) in collaboration with the beneficiary institution.
30	Are applications that will be the basis for offering SaaS services to ADR the object of the approach?	Not in scope.
31	If you could elaborate a bit, please differentiate between dedicated cloud and on-prem internal cloud and to which	Both components are on-prem. The term hyperscaler is associated with the dedicated cloud unit because ADR wants

ID	Question from Company	Summary answer from ADR
	of them you associated the term "hyperscaler". Thanks.	a direct partnership with a hyperscaler in that area.
32	Will the level of involvement in the migration process of IT staff (who currently manage the IT systems/app of institutions) be clearly defined, as well as the involvement of ADR IT staff?	Yes, mandatorily. ADR is reinforcing its staffing in that direction.
33	What happens after a migration process? Will a provider who was responsible for a Cloud migration also be responsible for application maintenance, support, upgrades, etc.?	Yes, the maintenance element will be included for the migration services.

### Summary of Questions & Answers – Information Session in English

Table 2 - Information Session (ENG) Q & A

ID	Question from Company	Summary answer from ADR
1	Question for the Q&A panel - Based on which technology stack has the government private cloud fabric been built?	This information is not available at the moment, but it will be specified in the public procurement procedure/s.
2	Can we receive the deck that was presented today?	Yes.
3	Which are the DevOps and automation solutions used today?	It depends on the system. In the Governmental Cloud - at each unit (internal/dedicated) there will be a complete solution for DevOps.
4	Would the architects and technical product owners of the individual solutions be available during the migration phase for apps that need to be re-platformed or re-architected?	Initial developers are companies in the Romanian market. Protocols are in place to obtain as much documentation as possible; we can't intermediate a direct link with technical product owners, but we have documentation and contacts with the institutional owners.
5	Who will conduct the security assessment & pen-testing of the migrated applications?	A partner of the Governmental Cloud will test all the solutions for compliance.
6	Do I understand correctly, there's no plan yet which applications need to be migrated to the GovCloud or Private Cloud or Public Cloud? It is yet to be decided later? When the list of Source=Target will be shared? Thank you.	The list will be shared as part of the public procurement procedure/s after the technical analysis is finalised.
7	Which are the standards that the migrated applications need to be compliant with: ISO, SOC2, etc.?	This information will be available at the end of the ongoing analysis phase. Likely, there will be different standards applying to each system.
8	Which is the entity that will take care of cloud application devops services after the migration? Is there clear and written service transition process?	Responsibility is with the entities that own the applications.

ID	Question from Company	Summary answer from ADR
9	One of the slides presented mentioned that "The Dedicated cloud will consist of complete Cloud Units provided On Premise by a Hyper scaler ". Can you please elaborate on this? Is the expectation that the economic providers participating here only focus on the migration and run aspects?	Yes, the provider is only expected to focus on the migration.
10	Are there any requirements regarding Data Center localization where applications are going to be migrated?	No.
11	Who is responsible for delivery all necessary licenses e.g. Oracle, Microsoft?	The licenses will have different sources (e.g., re-used, provided by the cloud provider or in some cases provided by contractors). The list of required licenses will be provided in the tender document.
12	As there are 2 waves for migration, I believe there will be at least 2 public tenders. Do you envisage to award each tender to only one or to multiple bidders? E.g: Tender no 1 for the first 5 applications - 1 application per lot, Tender 2 - 25 applications, multiple bidders selected etc. Please provide an overview on how the future contracts will look like.	We are in the initial phase of the project, and a decision has not been taken yet on how many tenders and their scope. The distribution of the workload to make the project feasible within the timeline, and the intention to avoid market concentration are factors that will influence this decision. This is also an aspect where industry is expected to provide input during this Market Consultation.
13	If the DevOps solutions behind the individual applications are so different, would you look at the migration project as an opportunity to standardize code repositories, SDLC practices, automation, solutions, etc. or primary objective is to migrate the applications without standardization?	<p>The process standardization is a desirable outcome. There will be minimum level of standardization expected for aspects such as interoperability and security. Also on this aspect suggestions are expected during the market consultation.</p> <p>We expect to have benefit from economies of scale and standardization. When it comes to software development and DevOps, we also expect contractors to bring their best practices.</p> <p>As shared, we are currently in the investigation phase concerning the applications. The information regarding applications profiles will be shared with the public procurement documentations.</p>
14	If the contracts to be awarded at the end of this procedure are strictly related to migration services alone, how would you mitigate the risk of third-party subscriptions or licenses being needed in the TO BE scenario?	The PaaS licenses will be provided in the Cloud. Other licenses may be provided during implementation of contract.

## **2.4 Phase 2- Market Consultation Questionnaire**

The Market Consultation Questionnaire included **the five sections below**. The full list of questions included in the questionnaire can be found at the Appendix (**5.5** - Market Consultation Questionnaire – English Language; **5.6** - Market Consultation Questionnaire – Romanian Language).

- **Section 1: Organisation Profile**
  - Gathering detailed information on organizational size and capacity.
  - Evaluating previous delivery experience in the domain of application cloud migration.
- **Section 2: Market and Operations**
  - Capturing market insights to refine the tendering package.
  - Understanding current market practices in cloud application migration.
- **Section 3: Budgeting**
  - Collecting data to inform the cost and pricing structures of the tendering package.
- **Section 4: Scope of the future public procurement procedure/s**
  - Assessing the overall attractiveness of the tender package.
  - Delving into detailed experiences with system/application migration.
- **Section 5: Participation in Consultation Meetings**
  - Gathering expressions of interest for participation in bi-lateral consultation meetings.
  - Recording language preferences for the meetings.

### **Summary of the Responses to the Market Consultation Questionnaire**

In this section a comprehensive summary and analysis of the responses received for the Market Consultation Questionnaire is provided. The responses have been summarized to highlight the key points raised.

#### **Section 1: Organisation details**

##### **Q1: Please indicate the identification data of your organisation.**

27 of the 28 companies indicated that the company has declared an address in Romania. 1 company declared an address outside of Romania.

##### **Q2: When was your organisation established?**

The biggest part of the companies who responded to the survey have been established between 1990 and 2020.

Figure 1 – Year of company's establishment



**Q3. How many employees does your organisation have? (approximate number of employees in the last closed financial year)**

*See figures at the next page.*

Figure 2 - Total Employees of the Market Players by Services (Total)

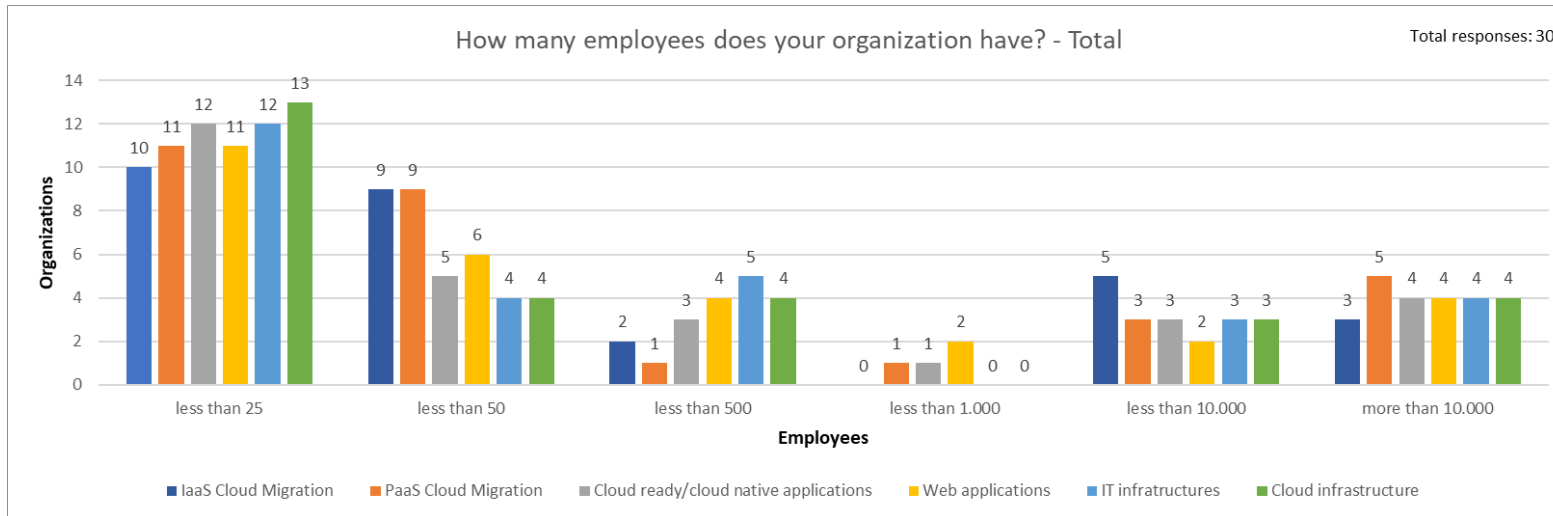


Figure 3 - Total Employees of the Market Players by Services (EU)

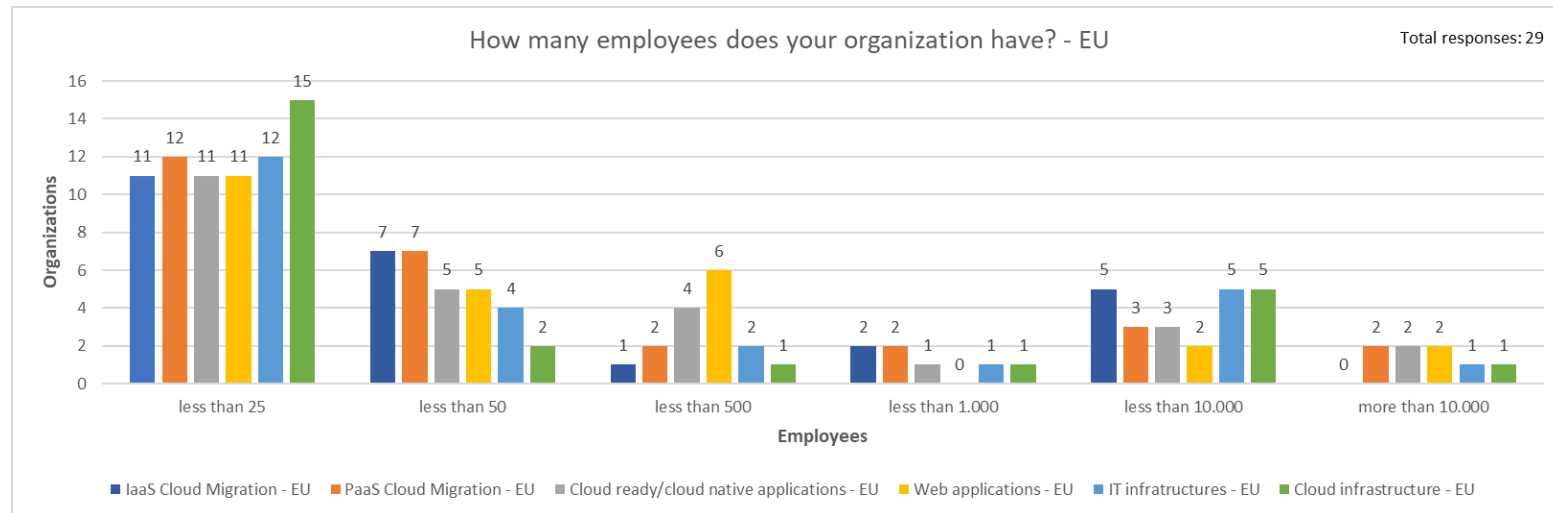
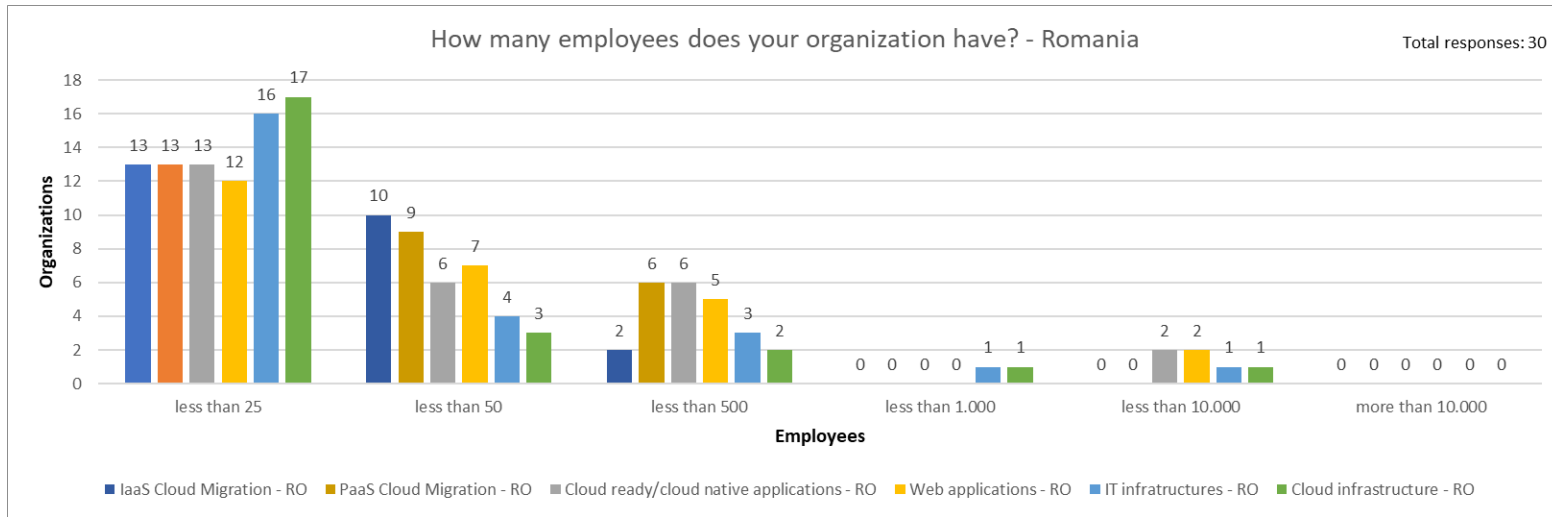


Figure 4 - Total Employees of the Market Players by Services (Romania)





**Q4. What was your total turnover in the last closed financial year? (Total, Europe, Romania)**

Figure 5 - Total Financial Turnover of Market Players

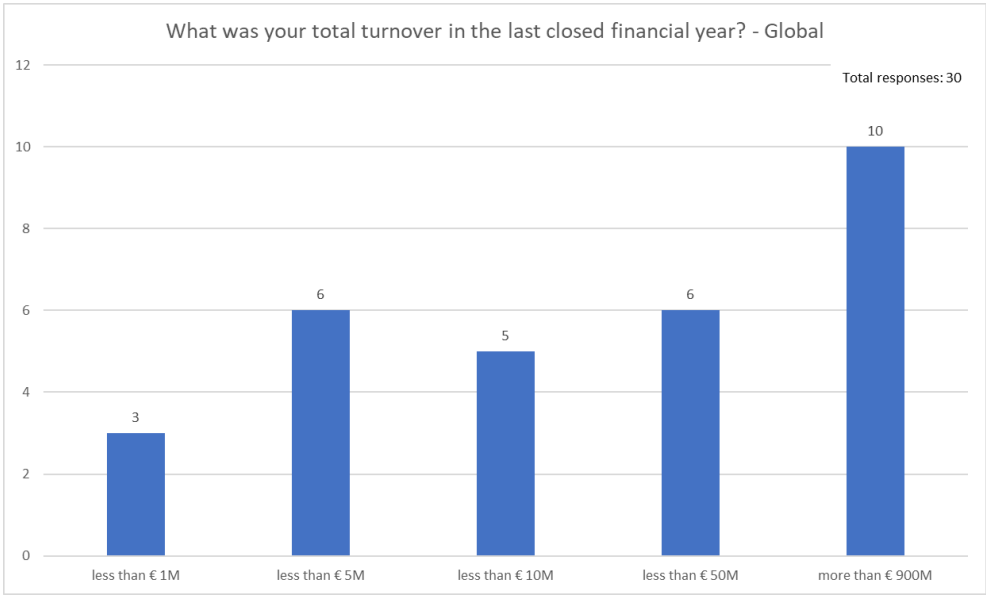


Figure 6 - Financial Turnover of Market Players in Europe

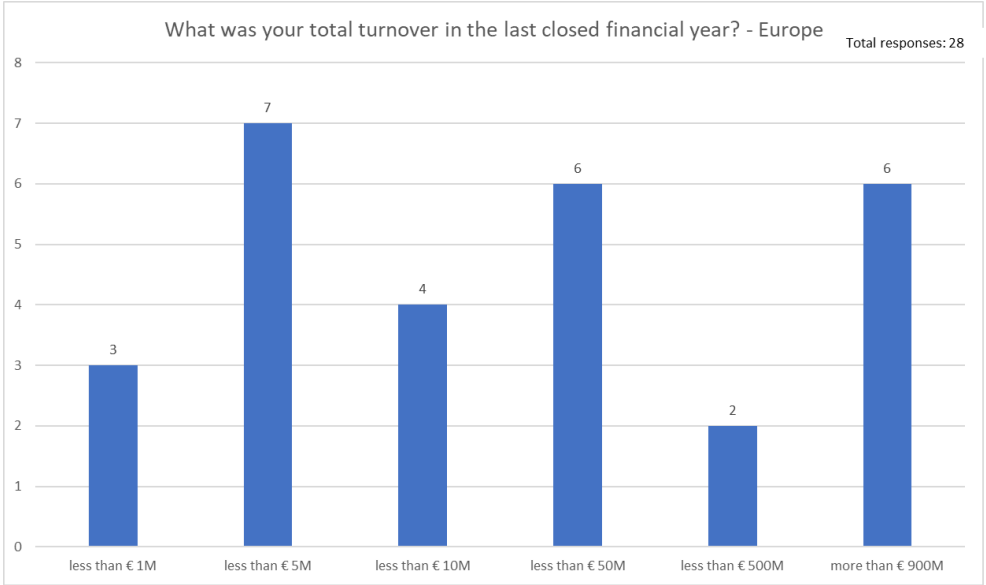


Figure 7 - Financial Turnover of Market Players in Romania

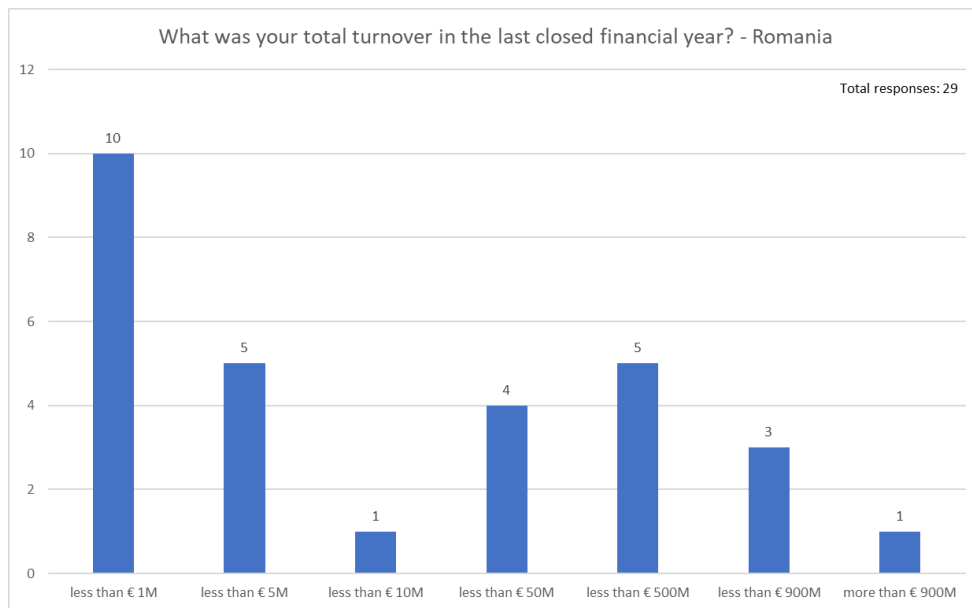


Figure 8 - Financial Turnover of Market Players (Europe)

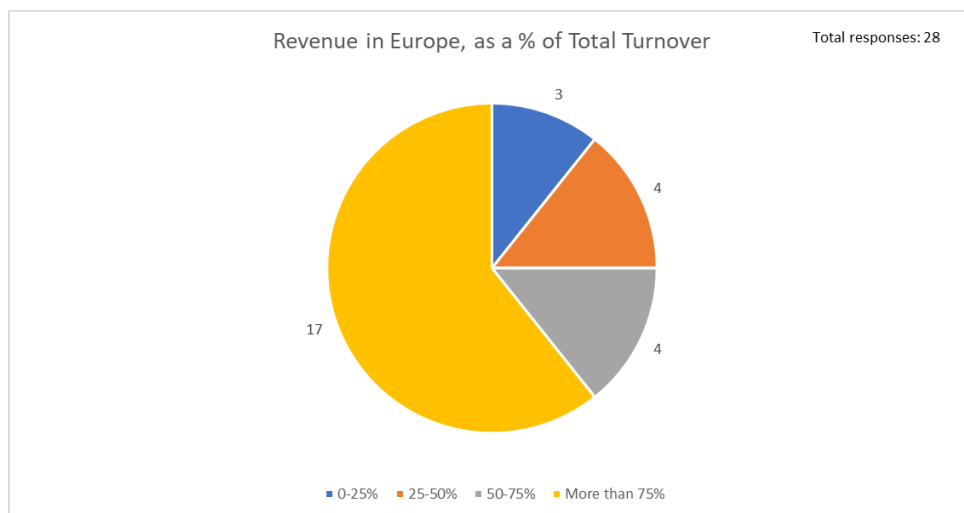
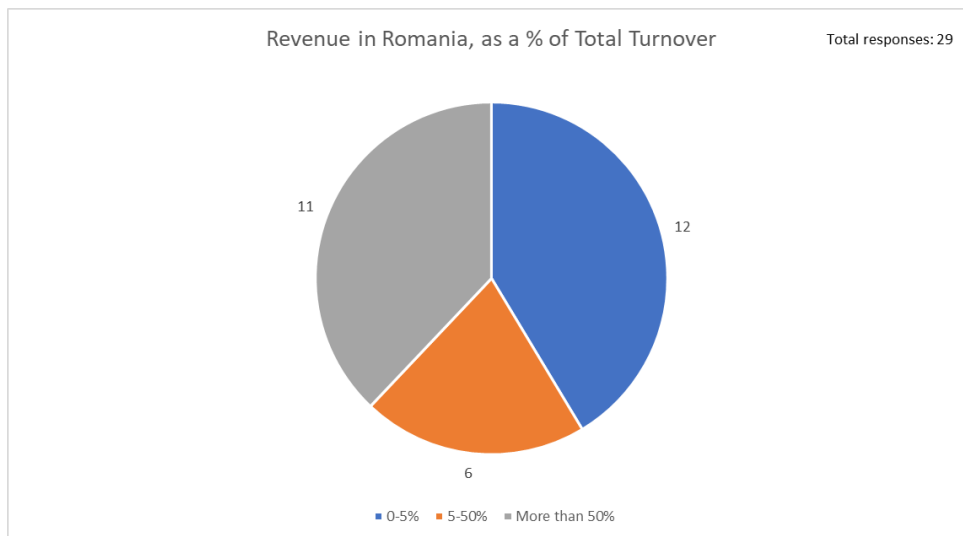


Figure 9 - Financial Turnover of Market Players (Romania)



**Q5. How many contracts/ projects related to the migration of IT applications/systems to cloud (IaaS/PaaS) have you implemented in the last five years and what has been the approximate total budget of these contracts/projects?**

#### Cloud Migration Projects and Contracts Summary

Over the last five years, the total number of cloud migration projects and contracts varied highly among the participants. Here's a summary of the answers provided by the companies:

- **4 Contracts/Projects:** a set of projects with a combined budget of €12,000,000.
- **15 Contracts/Projects:** each project in this group had a budget ranging from €40,000 to €60,000.
- **1 Contract/Project:** this project had a significant budget of €1,000,000.
- **50 Contracts/Projects:** the financial details for these projects have not been disclosed.
- **20+ Contracts/Projects:** the total for these projects is estimated between €10,000,000 and €12,000,000.
- **250 Contracts/Projects:** these projects had a maximum budget of up to €500,000.
- **3 Contracts/Projects:** the implementation of these systems amounted to €3,000,000.
- **200 Contracts/Projects:** a substantial venture with a budget of €200,000,000.
- **100+ Contracts/Projects:** totalling over €3,500,000, these contracts focused on cloud application migration/implementation.
- **5 Contracts/Projects:** with a total of €250,000.
- **26 Contracts/Projects:** a combined budget of €10,000,000.
- **1 Contract/Project:** worth €5,151,060.42.
- **400 Contracts/Projects:** approximately €92,000,000 in budget.
- **200 Contracts/Projects:** with a value of approximately €7,600,000.
- **8 Contracts/Projects:** totalling about €3,000,000.
- **50 Contracts/Projects:** over €100,000,000 in value.

- **5 Contracts/Projects:** with a budget of €200,000.
- **More than 1000 Contracts/Projects:** averaging an estimated 2 billion EUR per year.
- **1 Contracts/Projects:** totalling €180,000.
- **6 Contracts/Projects:** with an annual budget of €1,900,000.
- **3 Contracts/Projects:** an approximate total budget of €167,500.
- **5 Contracts/Projects:** totalling approximately €2,400,000.
- **12 Contracts/Projects:** amounting to €73,500,000.
- **5 Contracts/Projects:** over €200,000 in value for migrated systems.

**Q6. How many contracts/projects related to the migration of IT applications/systems to the cloud (IaaS/PaaS) have you implemented in Romania over the past five years and what has been the approximate budget of these contracts/projects?**

Over the last five years, the total number of cloud migration projects and contracts **in Romania** varied highly among the participants. Below is a list of the summarized answers provided by the companies that answered this question (as indicated individually by them, given that answers were provided in an un-unitary manner, with companies using various forms and expressions to quantify the prior experience) :

- **4 Contracts/Projects:** totalling approximately EUR 12 million.
- **1 Contract/Project:** about EUR 1 million for a public institution.
- **10 Contracts/Projects:** in an approximate amount of EUR 4-5 million.
- **20+ Contracts/Projects:** executed with Romanian experts for more than EUR 20 million for local and external clients.
- **80+ Contracts/Projects:** worth over EUR 3 million.
- **“Dozens of migration Contracts/Projects”:** exact number not specified.
- **5 Contracts/Projects:** Public institutions – EUR 250,000 euros
- **1 Contracts/Projects:** with a public institution worth around 5 M euros without VAT.
- **50+ Contracts/Projects:** related to the migration to Microsoft Azure in Romania. Financial amounts undisclosed.
- **15 Contracts/Projects:** with a total amount of approximately EUR 2.5 million.
- **3 Contracts/Projects:** the implementation of these systems amounted to EUR 3 million.
- **200 Contracts/Projects:** with a value of approximately EUR 7.6 million.
- **4 Contracts/Projects:** approximately 4 contracts/projects in Romania with a value of over EUR 20 million.
- **5 Contracts/Projects:** total amount of EUR 200,000.
- **Not specified,** but contract/s value: more than RON 450 million.
- **2 Contracts/Projects:** with an approximate total budget of 203,557,467 RON (using the exchange rate at the time the information was given, this would be converted to euros).
- **1 Contracts/Projects:** totalling EUR 180,000.

- **4 Contracts/Projects:** total value of EUR 160.000.
- **2 Contracts/Projects:** with an approximate total budget of EUR 35,500.
- **4 Contracts/Projects:** 2,368,676.34 EUR.
- **12 Contracts/Projects:** more than EUR 73,000,000 for public institutions in Romania.

## Section 2: Market & Operations

**Q7: What type of application migration to cloud services (IaaS/PaaS), if applicable, do you outsource/subcontract to third party partners or providers? Please explain why you outsource/subcontract these services.**

Summary of the information collected in the Questionnaires:

- Some organizations manage the application migration process internally but collaborate with consultants or experts from cloud service providers for their expertise and best practices.
- Certain companies may co-opt technical resources in exceptional cases for application migration to cloud services.
- Some organizations do not currently subcontract services but may reconsider doing so based on specific requirements for application migration to cloud services (e.g. should hardware be also purchased as part of the cloud migration).
- There are companies that perform 100% migration internally and do not subcontract to other providers for application migration to cloud services.
- There are companies with dedicated practices for migrations to the Cloud but may subcontract in rare cases where documentation or source codes are missing for application migration to cloud services.

Reasons for outsourcing/subcontracting these services include:

1. **Scalability:** outsourcing allows them to scale resources up or down based on project requirements without investing in permanent infrastructure.
2. **Pay-for-use model:** it enables them to adopt a cost-efficient pay-as-you-go model, avoiding upfront investment in hardware or software.
3. **Increased security:** leveraging the expertise of specialized providers can enhance security measures and compliance with industry standards.
4. **Access to latest hardware/software:** partnering with providers ensures access to cutting-edge technologies and software updates without additional investments.
5. **Low downtime:** outsourcing can minimize downtime during migration processes through efficient planning and execution by experienced professionals.
6. **Increased deployment speed:** expertise from third-party providers accelerates deployment timelines, enabling faster realization of benefits.
7. **Technology dependencies:** outsourcing helps address dependencies on specific technologies by tapping into external expertise.
8. **High workload:** in cases of heavy workload or resource constraints, outsourcing can alleviate pressure and ensure timely project completion.
9. **Need for experts with specific expertise:** accessing specialized skills and knowledge not available in-house is a key driver for outsourcing.

10. **Tackling large projects and diversifying expertise without compromising quality:** outsourcing allows organizations to undertake large-scale projects and diversify expertise while maintaining high-quality standards.
11. **Validated subcontractors:** engaging validated subcontractors for technologies beyond internal competencies ensures reliable and effective migration outcomes.

**Q8: The Contracting Authority is considering selecting one or more partners for migration services of ~30 applications in the Governmental Cloud (IaaS/PaaS). What would discourage you from submitting your offer for this/these award procedures?**

Summary of the information collected in the Questionnaires, grouped by themes:

#### **Process and Procedure Concerns**

- Lack of transparency in the award process
- Cumbersome selection procedures
- Inclusion of restrictive participation criteria
- Establishing disproportional minimum qualification and selection requirements
- Establishing restrictive minimum qualification and selection requirements for experience
- Unclear assessment factors for the technical component
- Selection process favouring larger firms
- Bureaucracy and complicated procedures

#### **Technical Specifications**

- Lack of technical specifications regarding the definition of the needs of the project
- Lack of clarity on the target infrastructure stack on which the Governmental Cloud will be hosted
- Mismatch between existing expertise and specific technical skills required for the cloud platforms and technologies targeted in the migration
- Ambiguous definition of technical specifications and architecture of applications to be migrated
- Unclear required technologies and specialization requirements
- Applications without cloud-ready architectures
- Lack of experience with required technologies

#### **Financial and Budgetary Concerns**

- Insufficient budgets
- Non-inclusion of partial payments in the contract to support project implementation
- Unrealistic implementation deadlines leading to potential financial overruns
- Financial criteria underestimating real costs
- Late payments
- Long payment terms

#### **Project Management and Capacity Issues**

- Mismatch between the scope and scheduled completion of the migration project with the available resources and time of the assigned teams
- A more complex project than expected that exceeds the company's work capacity
- Unrealistic deadlines for bid preparation, submission, and project execution
- Tight and unrealistic deadlines
- Resource allocation challenges

### **Documentation and Standards**

- Insufficient documentation of design patterns, standards, and best practices
- Absence of detailed background technical documentation for applications to be migrated
- Lack of provisions for onboarding new applications and vendor services across cloud platforms
- Lack of arrangements for third-party license agreements

### **Compliance and Legal Concerns**

- Uncertainty about the level of clarity in data classification, backup, and retention policies
- Lack of clarity on hardware, software, and license procurement
- Contractual risks
- Unclear or incomplete reception procedures
- Unclear or incomplete clauses on the transfer of intellectual property rights
- Excessive penalties

### **Tools and Technology Access**

- Absence of tools for ITSM, PPM, CMDB, Service Catalogue, Knowledge Management, Functional and Performance Testing
- Lack of permission to use professional tools for migrations

### **User and Stakeholder Engagement**

- Need for extensive training of ordinary users post-implementation
- Non-involvement of administrators of applications to be migrated
- Lack of performance indicators and reporting

### **Risks and Dependencies**

- Risks associated with unclear or unquantifiable elements in the specification
- Dependencies on hardware infrastructure
- Lack of agreement on detailed deliverables and conditions
- Selection of a single candidate for the migration services of all applications

**Q9: If the Contracting Authority decides to group applications into different lots or award procedures, what grouping criterion/ criteria would you suggest to be used?**

Summary of the information collected in the Questionnaires, grouped by themes:

### **Technical and Architectural Factors**

- Technical complexity
- Applications designed and run with similar technologies
- Application migration mechanism
- Initial application architecture
- Technology stack used by the original application
- Architecture dependency
- Complexity of backend services
- Complexity of user interface
- Technology used
- Technological stack or technical similarities

### **Data and Resource Considerations**

- Type of Data Processed
- Volume of Data and Resources Required
- Need and requirements for data migration
- Size and complexity of data
- Type of data/information

### **Functional and Operational Dependencies**

- Functional interdependence
- Number and complexity of integrated (connected) systems
- Dependencies between applications
- Functional interdependencies

### **Compliance and Security**

- Legal & Regulatory Compliance
- Regulatory requirements for the application
- Security requirements and existing patterns

### **User Impact and Usability**

- Impact on end users
- Expected difficulty of adapting existing users to the new application
- Usability and coverage of documentation

### **Organizational and Business Context**

- Applications from the same institution or department
- Service categories
- Field of activity of the company owning the migrated system
- Business priority and criticality
- Strategic importance of each application

### **Performance and Scaling**

- Maximum concurrent users predicted for the app
- Easy and efficient scaling
- Availability of the development and operations team

### **Service Level and Criticality**

- Criticality/SLA (Service Level Agreement)
- Vendor support contract dependence
- Number of active/total users
- Usage pattern

### **Migration Strategy and Prioritization**

- Infrastructure vs. applications
- Preferred migration priority
- Detailed assessment of applications requiring migration
- Complexity
- Business priority or emergency



### **Additional Operational Considerations**

- Automation
- Resource control
- Control access roles
- Cost efficiency
- Beneficiaries

### **Q10: What information would you need for each of the ~30 targeted applications to send a qualitative technical-financial offer?**

Summary of the information collected in the Questionnaires, grouped by themes:

#### **Application Architecture and Technology**

- Application architecture details, including technologies used, core components, and dependencies
- Frameworks, libraries, and technologies used by the application
- Existing architecture and cloud architecture envisaged for the future
- Documentation of existing hardware, software, and architecture
- Application description: architecture, technology stack, users, data sources, interfaces
- Existing technology description
- Source code and updated technical documentation

#### **Functional, Non-Functional, and Regulatory Requirements**

- Functional and non-functional requirements, as well as specific regulations or technical standards
- Security and compliance requirements, including levels of protection and legal compliance
- Interoperability requirements with other systems
- Performance requirements, peak periods, number of users
- Performance parameters and current stage of development
- Preferences regarding migration model (lift-and-shift, re-platforming, re-architecting)

#### **Data Management and Migration**

- Volume of data processed and number of users, including forecasts for future growth
- Data lifecycle, including data collection, processing, storage, and deletion procedures
- Volume of data to be migrated and storage evaluation
- Migration requirements, such as backup and disaster recovery strategies
- Volume and complexity of data to be migrated, including third-party sources

#### **Integration and Networking**

- Networking requirements and resource scaling needs
- Integration with third-party systems and data communication
- Requirements for support and maintenance
- Application documentation and configurable parameters
- Migration objectives, specific integrations, and customizations required

#### **Licensing and Contracts**

- Licensing details and existing support contracts
- Licensing mechanisms and requirements

- Licenses made available

### **Operational and Support Requirements**

- Acceptable migration plans and downtime restrictions
- Post-implementation support and maintenance requirements
- Support and maintenance details
- Prompt response to technical questions

### **Performance and Scalability**

- Uptime statistics and performance data
- Performance requirements
- Cloud products proposed
- PaaS technology envisaged for the future

### **Project Management and Logistics**

- Constraints related to time limitations for development and migration processes
- Working method (at beneficiary's headquarters or remotely)
- Necessity of travel or delegation
- List of technological limitations

### **Application Specifics and Historical Context**

- Purpose of the application and current deployment/update procedures
- Application history and current issues
- Details on the application to be migrated (if applicable)

### **Q11: In your opinion, what are the main risks and critical success factors in executing/managing application migration to the Governmental Cloud (IaaS/PaaS)?**

Summary of the information collected in the Questionnaires, grouped by themes:

### **Main Risks in Application Migration**

- **Technical and Compatibility Issues**
  - Adaptation to new technological requirements
  - Dependencies on other software vendors with which applications are integrated
  - Technological state of the source system (e.g., out-of-support versions)
  - Compatibility and integration issues between existing systems and the Governmental Cloud
  - Limitations associated with integration solutions
  - Risks of applications only working on specific versions of libraries/platforms
  - Errors, bugs, and performance issues with new libraries
- **Security and Compliance Challenges**
  - Data security and cyberattacks
  - Security breaches if security analysis is not up-to-date
  - Integrated security and continuous monitoring
  - Regulations and legislation affecting IaaS
  - Security and compliance requirements
- **Migration Process and Management Difficulties**
  - Temporary loss of critical services

- The impossibility of access to source systems
  - Lack of a minimum set of validation criteria
  - Risk of increased implementation time or impossibility of migration
  - Unforeseen costs and resource consumption
  - Short delivery times and dependence on other companies involved
  - Network latency and data residency issues
  - Risks from the procurement procedure, delay in completing the internal cloud unit.
- **Resource and Documentation Gaps**
    - Lack of expertise and knowledge in cloud migrations
    - Lack of specialized personnel and key users
    - Lack of software sources and need for software component rewriting
    - Lack of documentation and involvement of multiple providers in migrating a single application
  - **Operational and Strategic Concerns**
    - Change requirements during implementation
    - Need for a detailed migration plan and effective change management
    - Flexibility in the migration process for unforeseen dependencies
    - Internet dependence and reliance on a single IaaS provider
    - Lack of communication/collaboration with solution manufacturers

### **Critical Success Factors in Application Migration**

- **Planning and Strategy**
  - Meticulous, precise, and thorough planning
  - Setting clear objectives
  - Clear migration strategy
  - Proper change management
  - Data migration planning
  - Properly allocated time and budget
- **Technical Preparation and Compatibility**
  - Sustainable and flexible technology choices
  - Architectural compatibility
  - Thorough understanding of current infrastructure, applications, and dependencies
  - Technical documentation and architecture of the applications to be migrated
  - Availability of cloud migration tools
- **Security and Compliance Assurance**
  - Secure-by-design approach
  - Security and compliance
  - Compliance, data security, and data regulations planning
  - Appropriate monitoring controls
- **Collaboration and Communication**
  - Effective coordination between technical and operational teams
  - Strong partnership with cloud service providers and technology consultants
  - Inter-agency cooperation

- Customer willingness to work collaboratively
- General willingness, preparation, and cooperation of the whole organization
- **Training and Support**
  - Involvement and preparation of staff for new technologies and processes
  - Providing sufficient training and support to employees
  - Existence of a team ready to take-over and operate the new platform
- **Governance and Monitoring**
  - Matrix for delineating migration responsibilities
  - Proper governance
  - Monitoring and evaluation of post-migration systems
- **Resource Management**
  - Availability of required resources: subscriptions, licenses, tools
  - Existence of data migration procedures and processes

**Q12. Do you have any other information you want to communicate about the market and your operations on cloud migration services?**

The providers shared insights into their operations and strategies related to cloud migration services, emphasizing their expertise, accomplishments, and views on market trends:

- A significant number have extensive experience and hold **partnerships with major cloud platforms** like Google Cloud, AWS, and Azure, ensuring access to certified experts for migrations.
- Some mention notable projects, such as building **global data hubs for automotive giants**, and have robust portfolios that include working with well-known brands on complex cloud migrations.
- The depth of expertise in cloud technology, especially with large-scale, enterprise-level migrations, is highlighted, with companies offering **integrated services across software development, support, operations, and cloud technologies**.
- Expertise also extends to legacy application migration to modern architectures and infrastructures.
- Collaboration with major consultants and **utilizing internal networks across various departments**, including public sector and cloud operations, is a strategy used to manage end-to-end migrations.
- There is recognition of potential **human resource shortages due to the high volume of cloud migration projects across the EU**.
- Firms advocate for the **use of methodologies and tools that have been extensively tested** in practice to ensure effective migration strategies.
- **Transparency in contractual support sections and a comprehensive understanding of licensing**, especially when dealing with critical infrastructure and national security projects, is deemed important.
- Several providers underscore the **need for Time & Material contracts or Quality Gates with Critical Paths** to ensure timely delivery of quality solutions and to maintain pressure on both service providers and clients for successful project completion.
- Providers also express the importance of having **as much detail as possible about the applications to be migrated**.

In summary, providers stress the importance of strategic partnerships, proven methodologies, extensive certifications, and close collaboration with clients to ensure successful cloud

migration outcomes. They highlight the need for thorough upfront analysis and careful resource allocation.

### Section 3: Budgeting

**Q13: What are the main cost components and what would their relative share of cloud application migration (IaaS/PaaS) be, in your experience? Where applicable, please specify this for each of the migration strategies considered by ADR and described above.**

Summary of the information collected in the Questionnaires, grouped by themes:

#### Common Cost Components:

- **Cloud Infrastructure (IaaS):** costs for compute, storage, and network resources, which can be a significant portion of the budget.
- **Cloud Platform (PaaS):** costs for platform services like managed databases and development services.
- **Consulting and Professional Services:** fees for migration consulting and adapting applications to cloud platforms.
- **Licenses and Subscriptions:** software license costs and subscriptions for third-party services.
- **Security and Compliance:** investments in cybersecurity solutions and ensuring regulatory compliance.
- **Staff Training:** budget allocated for team training in new technologies and processes.
- **Labor Costs:** often holds the largest share in total costs, varying based on project specifics.
- **Tools and Technology Costs:** expenses related to purchase or licensing of migration tools.
- **Testing and Validation:** costs for quality assurance during and after migration.
- **Interruption Costs:** potential penalties for violating SLAs during migration.
- **Post-Migration Support and Optimization:** ongoing costs after migration for support and further optimization.
- **Data Transfer:** costs for physical transportation of data or bandwidth for data over dedicated lines.
- **Infrastructure Consumption:** costs for using cloud resources during migration.
- **Software Development:** cost of developing cloud-compatible application versions.
- **Project Management:** planning and overseeing the migration process.

#### Relative Cost Estimates by Migration Strategy:

- **Re-hosting** (very small XS – small system S) cost weights in overall cost/budget: Analytics and export around 15% each, conversion at 40%, import and integrated testing at 15% each.
- **Re-platforming** (medium M-L large system) cost weights in overall cost/budget: Analysis at 25%, design at 40%, deployment at 20%, integrated testing at 15%.
- **Re-architecting** (extra large system XL+) cost weights in overall cost/budget: Analysis at 25%, development operations (devops) at 60%, integrated testing at 15%.
- General Estimates on cost weights in overall cost/budget (based on spectrum of answers):
  - 10-30%: Evaluation and planning
  - 20-60%: Actual migration effort
  - 10-50%: Post-migration activities including monitoring and optimization

### Other cost weighting estimates:

- Analysis Services: can take up around 30%
- Migration Process Design Services: approximately 20%
- Migration/Redeployment Services: about 40%
- Testing Services: generally around 10%

### Additional main considerations formulated by the respondents:

- Costs can be underestimated or deadlines set unrealistically, not accounting for **change management or software architectural planning**.
- Cost components can vary significantly based on each system's particularities, and a detailed analysis is essential for accurate budgeting.
- Costs associated with cloud migration strategies vary, with **redesign requiring substantial investment**, and rehosting generally being less costly.
- Costs can be influenced by **on-site versus remote work**, with on-site presence generally being more expensive.
- Costs are also affected by **whether tasks are performed in collaboration with remote factories and communication can take place also in English**.

### Q14: What would be an appropriate contract price adjustment mechanism for the migration of applications to the cloud (IaaS/PaaS) from your experience?

Companies have responded to this question in various ways, with **some providing direct answers to specific points raised, while others have chosen to provide more detailed explanations and additional information related to the questions**. This variation in response style is the reason why not all answers given under this question may be considered as direct responses. The summary below captures the main information in the varied spectrum of answers provided by companies in the filled-in questionnaires, grouped by themes:

#### Fixed-Price and Service Package Models

- Service Packages: pre-defined service packages with fixed prices for each migration phase, adjusted by measurable goals.
- Fixed Price for Analysis Services: a set price for initial analysis, with other phases potentially using different pricing mechanisms.
- Fixed Price with Change Management: a fixed price approach with controls for change management and contingencies.

#### Performance-Based Models

- Performance Bonuses: adjusting prices or providing incentives based on application performance post-migration.
- Bonus-Malus Mechanisms: adjustments made based on performance outcomes relative to agreed standards.

#### Flexible and Volume-Based Pricing

- Flexible Tariffs: prices fluctuate based on data volume, application complexity, and customization levels.
- Variable Time and Material Pricing: costs based on actual time and materials utilized for design, migration, and testing services.

#### Time and Material Contracts

- Time and Material Regime: base price for core migration with additional services charged hourly.

- Time and Material with Milestones: costs are based on time and materials with prices tied to achieving specific milestones.

### **Progress and Review-Based Adjustments**

- Periodic Reviews: regular assessments to revise and adjust pricing as the project progresses.
- Review Clauses for Estimated Effort: regular reviews of efforts against estimates to adjust pricing.
- Monitoring and Checking Time Recorded: adjusting costs based on the monitored time spent on tasks.

### **Market and Economic Factor Adjustments**

- Adjusting for External Economic Factors: prices change in response to economic changes or unforeseen realities.
- Annual CPI Adjustment: annual price adjustments aligned with the Consumer Price Index (CPI) for consistency.

### **Strategic and Assessment-Based Adjustments**

- Framework Agreements: using estimated quantities within a framework agreement for flexible pricing.
- External Validation of Proposals: employing a third party to validate service providers solutions and adjust pricing accordingly.
- Pre-Engagement Assessment: conducting thorough assessments of source systems to inform contract pricing.

### **Milestone and Objective-Based Pricing**

- Milestone-Based Payments: pricing based on reaching certain project milestones.
- Price Adjustment for Specific Objectives: altering costs when specific project objectives are achieved.

### **Licensing and Maintenance Specific Adjustments**

- Framework Agreements for Software Licenses: adjusting license costs based on the parameters required.
- Time and Material for Maintenance: maintenance costs based on time and materials used.

### **Resource Utilization and Scalability Considerations**

- Pricing Model based on Resource Consumption: Costs reflect actual resource consumption.
- Elasticity and Scalability Adjustments: Pricing that accommodates the scalability and elasticity of resources used.

### **Combination and Bundling Approaches**

- Combining Applications: reducing per-application cost by migrating multiple applications together.
- Two-Stage Cost Distribution: separating the project into an assessment stage and a migration/validation stage with distinct pricing.

### **Contract and Service Level Agreement (SLA) Clarity**

- Change Control Procedures: price adjustments made through formal change control mechanisms.
- Clear SLAs and Additional cost clarifications: defining service level agreements and additional costs upfront.

### **Contracting and Service Providers Management**

- Assigning services providers based on competence: selecting service providers with relevant experience, possibly affecting costs.
- Conducting technical interviews: evaluating service provider teams, which could influence price negotiations.

### **Q15: What factors would cause you unforeseen costs when migrating applications to the Governmental Cloud and what would be the best way for ADR to prevent those unexpected costs?**

The summary below captures the main information in the varied spectrum of answers provided by companies in the filled-in questionnaires, grouped by themes:

#### **Factors leading to unforeseen costs:**

- **Application Complexity:** complex architectures and dependencies requiring more effort and resources.
- **Security and Compliance:** additional costs for implementing strict security and meeting compliance standards.
- **Integration and Interoperability:** extra expenses due to the need for integration with other systems or ensuring interoperability.
- **Big Data:** costs associated with transferring and storing large volumes of data.
- **Scope Changes:** alterations in migration requirements or project scope during the implementation.
- **Functional Code Quality:** varying code quality could necessitate additional work.
- **Unforeseen User Requests:** new requirements emerging from users during the migration process.
- **IT Security Practices:** ensuring secure operations, particularly for applications initially designed for on-premises or VPN access only.
- **Performance Targets:** changes in performance expectations due to cloud migration.
- **Legal Compliance:** costs related to ensuring legal compliance in the new environment.
- **Technical Specifications Ambiguity:** unclear technical requirements leading to miscalculated efforts, undocumented source code.
- **Dependencies and Interconnectivity:** software dependencies or SLA issues with external vendors.
- **Legislative Requirements:** ensuring compliance with mandatory legal standards.
- **Refactoring Needs:** costs arising from rewriting systems due to incompatibility with the cloud ecosystem.
- **Training and Downtime:** expenses for staff training and potential costs due to migration delays.
- **Inflation and Deflation:** economic factors affecting overall costs.
- **Project Management:** potential increases due to additional project management needs.



- **Governmental Cloud:** lack of support from the Governmental Cloud administrator.

#### **Strategies to prevent unexpected costs:**

- **Preliminary Technical Audit:** identifying potential issues before migration starts.
- **Detailed Planning:** comprehensive planning to cover all aspects and potential challenges.
- **Simulations and Testing:** conducting tests to anticipate problems.
- **Service Providers Collaboration:** maintaining open communication with service providers to manage costs.
- **Contractual Flexibility:** including clauses to adjust for unpredictable changes.
- **Technical Analysis:** in-depth initial analysis to estimate resources and costs accurately.
- **Clear Requirements:** defining all requirements in detail to prevent misunderstandings.
- **Dependency:** ensuring all necessary infrastructure is known and interconnections are understood.
- **Budget Allocation:** allowing for potential budget increases within a set percentage of the total cost.
- **Expert Involvement:** engaging experts early for careful planning and risk management.
- **Negotiating Favourable Terms:** achieving favourable terms with providers and using cost management tools.
- **Clear Roles and Responsibilities:** defining a clear matrix to prevent incorrect licensing counts.
- **Beneficiary Cooperation:** ensuring cooperation with the application users and owners.
- **Resource Estimation:** accurately predicting the consumption of resources.
- **Good Project Management:** ensuring competent project management from the start.
- **Review Clauses:** including review clauses for estimated efforts and costs.
- **Time & Material Regime:** budgeting with a time and material approach to accommodate uncertainties.
- **Margin for Technical Complexities:** including a margin to cover complexities not identified in the assessment stage.

**Q16. Do you have any other information you want to communicate about prices to help ADR budget properly the cloud migration contract(s) (e.g. fee rate day/person per expert)?**

The providers communicated several key points for ADR to consider when budgeting for cloud migration contracts:

- **Transparency and Balance:** defining transparent service tariffs with a detailed structure, including day/person rates for expert roles, to balance financial efficiency with quality and security standards.
- **Competition and Expertise:** encouraging competition among service providers can lead to increased efficiency and quality, and investing in world-class consultants is important to ensure high levels of expertise in the project.
- **Security and Sensitivity:** given the project's national security implications, allocating adequate funds for top-tier consultants and adhering to strict security standards is essential.

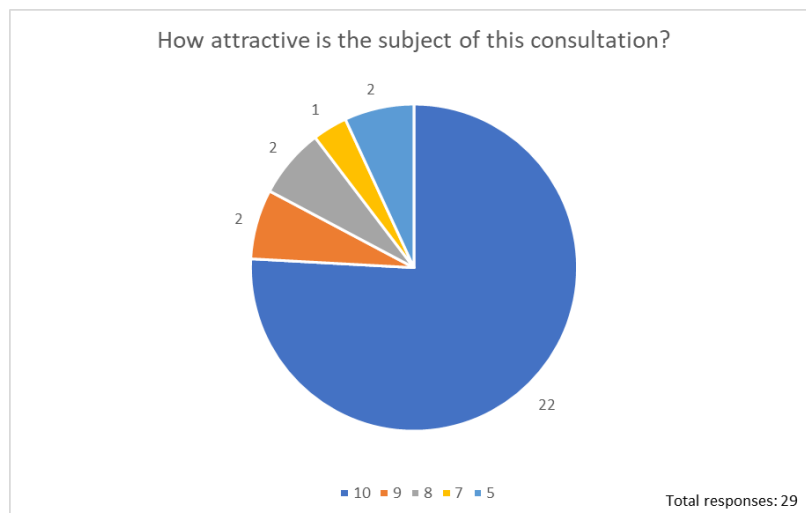
- **Realistic Budgeting:** providers recommend against excessive budget cuts to maintain service quality and highlight the variability of specialist rates, ranging from 40 to 1200 EUR/consulting-day, depending on expertise and project complexity.
- **Flexible Pricing Models:** a time and materials approach is suggested by some providers, with a willingness to adjust pricing based on project scope and size.
- **Complexity and Scope:** accurate pricing is challenging without full project details, and rates may vary significantly based on the competency and experience required.
- **Additional Costs:** apart from human resource costs, additional expenses like equipment depreciation, administration, and communications must be considered.
- **Unforeseen Costs:** providers suggest that detailed analysis and planning can help avoid unforeseen costs, emphasizing the need for a flexible budget and close collaboration with cloud providers.

Overall, ADR should be prepared for a range of cost factors and consider, when budgeting, to account for the complexity and varying requirements of cloud migration projects.

#### Section 4: Scope of the Contract with ADR

**Q17. How attractive is the subject of the public consultation notice to your organisation? [0 – Not attractive at all; 10 – Very attractive]**

Figure 10 - Market interest in the subject of the market consultation



**Q18: For the previous question, please indicate the main criteria on which your assessment is based:**

The summary below captures the main information in the varied spectrum of answers provided by companies in the filled-in questionnaires:

- **Experience:** matching the project with the company's prior experience in similar cloud migration projects and expertise in developing cloud-native applications.
- **Company Services and Scope:** evaluating whether the company's service offerings align with the scope and purpose of the acquisition.
- **Technical and location fit:** considering the company's technical capabilities and staff proximity to the project.
- **Market Understanding:** using the consultation to gain insight into specific deliverables and whether the project fits the company's specialization.

- **Strategic Importance:** the unique nature of the project for the Romanian market and its strategic importance for the company's growth.
- **Project Complexity:** assessing the level of complexity and the technical solution involved in the project.
- **Public Interest:** desire to contribute to public interest projects and digitization efforts.
- **Opportunity for modernization:** the chance to be involved in modernizing government infrastructure.
- **Risk Management:** understanding the project's risk profile and ensuring that risk security management capabilities are adequate.
- **Financial Considerations:** assessing the predictability of revenue, appropriate remuneration, and the potential for a long-term relationship.
- **Reputation:** the company's reputation and references from previous work.
- **Project Transparency:** appreciation of clear information regarding the number of applications to be migrated and migration plans.
- **Technical Solution:** the uniqueness of the technical solution proposed for the Romanian market.
- **Resource Mobilization:** anticipating a large volume of migrations that will mobilize significant resources from the local IT industry.
- **Digital Transformation Contribution:** the project's alignment with the company's strategy to support digital transformation in Romania.
- **Opportunity Experience:** the experience of participating in large-scale projects and the alignment with the company's expertise.
- **Availability of Resources:** assessing whether the company has the necessary skills and available personnel to contribute to the project.

**Q19: How can ADR increase the attractiveness of targeted award procedure/s for your organisation?**

The summary below captures the main information in the varied spectrum of answers provided by companies in the filled-in questionnaires, grouped by themes:

- **Transparency and Clarity:** provide clear, transparent information about the project's requirements, processes, and objectives. Offer detailed technical specifications and ensure transparency in the evaluation process.
- **Open Communication:** allow direct communication sessions with ADR representatives for effective information exchange and offer constructive feedback.
- **Collaboration:** promote partnerships and collaboration, facilitating the sharing of expertise and resources.
- **Innovation Emphasis:** integrate advanced technologies and emphasize innovation in project specifications.
- **Security and Compliance Focus:** highlight commitments to security and adherence to compliance regulations.
- **Flexible Contracting:** offer contracts with flexibility clauses to accommodate changing project requirements and include partial payments to support implementation.
- **Experience Recognition:** value vendors' similar project experience and portfolio alignment with the project scope.
- **Financial Considerations:** ensure competitive financial offers and highlight long-term benefits of the project.
- **Simplified Documentation:** require straightforward documentation to reduce bidder risks.
- **Realistic Timelines:** establish realistic implementation deadlines and provide adequate time for Q&A during the procurement phase.

- **Partnership Opportunities:** open avenues for potential partnerships and collaboration, particularly with well-established technology providers.
- **Risk Management:** include provisions for managing unforeseen situations and risks within the contract.
- **Clear Scope and Evaluation Criteria:** define the scope and evaluation criteria clearly, avoiding overly restrictive qualifications based on experience.
- **Quality Focus:** orient the tenders toward quality rather than just cost.
- **Expert Consultations:** consult with technical experts to ensure realistic and effective technical requirements.
- **Resource and Lot Division:** this approach involves breaking down a project or procurement into smaller, manageable parts or lots. It allows for smaller teams to handle each part, facilitating better coordination and efficiency.

**Q20: From your experience, what would be the typical migration duration for each of the three application migration strategies? Please submit information separately for (i) Rehosting, (ii) Platform reorganisation (revision) (Re-platform) and (iii) Redesign (Rearchitecture) as per your experience.**

The typical migration durations for each application migration strategy as experienced by the service providers are summarized below:

#### **Rehosting (Lift-and-Shift):**

- Ranges from a few weeks to several months.
- Specific durations cited include 1-3 months, 2-4 weeks per application, and 1-2 months to 6-9 months, varying with application complexity and infrastructure.
- Some companies are able to rehost up to 10 applications per week under specific conditions.

#### **Re-platform (Platform Reorganization):**

- Estimated duration ranges from a few months to about a year.
- Specific durations cited include 3-6 months, 2-3 months, and 3-12 months.
- Re-platforming can also take from 4 days to 1 month, depending on data volume and migration tools.

#### **Redesign (Rearchitecture):**

- The most time-intensive strategy, taking from several months to more than a year.
- Specific durations cited include 6-12+ months, 6 months to 1 year, and in some cases more than 1 year.
- Redesign is highly dependent on the complexity and size of the applications, with estimates ranging from 16-18 months to 6-24 months for complex applications.

#### **Common Factors Influencing Duration:**

- The complexity of the application's architecture.
- The volume and complexity of the data.
- The quality of the initial application implementation.
- The availability and proximity of skilled resources.
- The interdependencies of the application with other systems.
- The level of change management and adaptation required.

#### **Service Providers Recommendations to Optimize Migration Duration:**

- Conduct a comprehensive initial assessment and platform preparation.

- Implement detailed planning and analysis stages.
- Engage in rigorous project management and risk management practices.
- Consider application scope and underlying infrastructure variations.
- Utilize automation tools where available.
- Engage in pre-migration evaluation to anticipate complexity.

**Q21: Please explain the main types of expertise and competence you usually use in cloud migration services. Please elaborate for (i) Rehost, (ii) Reorganisation (revision) of the platform (Re-platform) and (iii) Redesign (Rearchitect).**

The service providers provided insights into the types of expertise and competences used in cloud migration services, structured by each migration strategy:

#### **Rehosting (Rehost):**

- **Infrastructure Expertise:** knowledge in migrating and managing cloud resources, performance optimization.
- **Data Migration:** efficient data transfer techniques, minimizing downtime.
- **Virtualization and Containerization:** skills in these areas for creating scalable cloud environments.
- **Automation and Scripting:** using tools like Terraform, Ansible, and scripting languages for automation.
- **Network Management:** managing secure connectivity between on-premises and cloud environments.
- **Security:** implementing measures to protect data in cloud environments.

#### **Re-platform (Platform Reorganization):**

- **Platform Optimization:** aligning applications with PaaS to improve efficiency and performance.
- **Code Change Management:** adjusting source code for cloud integration without functionality loss.
- **Containerization Tools:** utilizing Docker, Kubernetes for packaging and deploying applications.
- **Cloud Service Integration:** experience in deploying and managing serverless solutions and cloud-native services.
- **DevOps Practices:** implementing collaborative, automated, and continuous delivery workflows.

#### **Redesign (Rearchitect):**

- **Cloud-Native Architecture Design:** creating architectures that fully utilize cloud capabilities.
- **Advanced Software Development:** development skills for complex solutions, focusing on cloud-native services.
- **Microservices Transformation:** converting monolithic applications into microservices for better scalability.
- **Serverless Computing:** knowledge in serverless architecture development to optimize operational costs.
- **Advanced Data Analytics:** utilizing cloud tools for data processing and analysis.

**Additional Skills for all Strategies:**

- **Project Management:** ensuring adherence to frameworks like Prince2 or PMP for managing migration projects.
- **Cloud Solution Architect:** overseeing the design and adaptation of cloud solutions.
- **Security Expertise:** protecting applications and data during and after migration.
- **DevOps:** enabling automation and efficiency throughout the migration process.
- **Certified Engineers:** utilizing certified personnel for specialized tasks within the migration process.

Service providers emphasized that a combination of these expertise areas is critical to successful cloud migrations. They also noted the importance of using certified professionals, engaging in careful planning, and maintaining clear communication throughout the migration process.

**Q22. Would you consider submitting your offer if ADR decides to launch an award procedure for cloud migration services?**

All companies answered positively to the question.

**Q23: Do you have any other information that you would like to provide on the subject matter of the migration services to be considered by ADR?**

The service providers provided various suggestions and insights on how ADR can enhance the process and outcomes of cloud migration services:

- **Flexibility and Direct Engagement:** work directly with small and medium-sized enterprises (SMEs), rather than have them work as subcontractor of larger companies.
- **Comprehensive Service Experience:** work with companies with extensive experience in database migrations, application migrations, infrastructure management, troubleshooting, proactive improvements, incident management, and integration services.
- **Clear Requirements and Selection Criteria:** bring clarity to tender requirements, division of applications into lots, and transparency in selection criteria.
- **End-User Training:** focus on end-user training to ease the adaptation to major changes, especially for users with limited digital skills.
- **Service Support and Public Cloud Access:** end-to-end vendor support is crucial, and providing access to advanced public cloud technologies would benefit the government digital strategy.
- **Cloud Technology Consideration:** match the cloud technology in the target system with the technology of the source systems for optimal migration.
- **Communication and Engagement:** involve both the migration team and application users in the migration process through open communication.
- **Market Growth and Certification:** allowing participation from companies with uncertified but qualified resources could bring additional value.
- **Project Complexity Management:** start with less complex projects to establish effective working relationships and gradually increase project complexity.
- **Preliminary Assessment and Training:** perform a detailed assessment to identify critical applications and prioritize migrations, as well as training for teams on new cloud technologies.
- **Security-by-Design:** adopt a security-by-design approach to ensure data and application protection in the cloud environment.

- **Application Selection:** perform careful application selection for migration, considering the future plans of the owning institutions and don't migrate solutions that should be rewritten or decommissioned.

## Section 5: Participation in Consultation Meetings

**Q24: Please indicate whether your organisation would also like to participate in a bilateral consultation meeting with ADR (online).**

All companies indicated their interest in participating in the online Bilateral Consultation Meetings.

**Q25: Please indicate your language preferences for the consultation meeting.**

Out of 28 Questionnaire received by the deadline, 10 companies indicated their preference for English and 17 companies for Romanian.

## 2.5 Phase 3 - Bilateral Consultation Meetings

### Approach to the Bilateral Consultation Meetings

On a general level, the bilateral consultation meetings demonstrated a **strong interest and willingness from the participants to provide insights, views with regards to the market consultation objectives.**

Out of the 28 companies that returned the Market Consultation Questionnaire by the deadline, an encouraging number of **25 companies took part in bilateral consultation meetings.** Each session was planned to last one hour, ensuring focused and efficient discussions. These meetings were marked by the presence of participants from ADR, EIB and/or Gartner Consulting and the respective company, ensuring a diversity of perspectives and expertise. The language of communication varied, with 9 of the 25 meetings being conducted in English while the remaining sessions were held in Romanian, accommodating the participants' language preferences.

**All sessions were conducted online**, which provided a flexible and accessible platform for all parties involved. The agenda for these consultations was prepared to include **follow-up questions arising from the questionnaire responses**, as well as to facilitate a detailed discussion on a specific use case with the company. This structured approach ensured that each meeting was both targeted and comprehensive, allowing for meaningful exchanges and a clearer understanding of each company views, opinions.

### Overview of the Bilateral Consultation Meetings

Table 3 - Overview of consultation meetings

Nr.	Company	Date	Language
1	Asee Solutions SRL	26/02/2024	Romanian
2	Zitec COM SRL	26/02/2024	Romanian
3	Microsoft Romania	27/02/2024	English
4	OVES Enterprise	27/02/2024	Romanian
5	ATOS Global Delivery Center SRL	28/02/2024	English
6	Dvloper (SQS BUSINESS SERVICES S.R.L.)	28/02/2024	Romanian
7	DEV HD SERVICES SRL	28/02/2024	Romanian
8	PricewaterhouseCoopers Management Consultants S.R.L	29/02/2024	English

Nr.	Company	Date	Language
9	Deloitte Consultanta SRL	29/02/2024	English
10	Cyberllence Inovatie S.R.L.	29/02/2024	Romanian
11	Endava	01/03/2024	English
12	Q-East Software S.R.L.	01/03/2024	Romanian
13	Oracle Romania S.R.L.	04/03/2024	English
14	TRENCADIS CORP S.R.L.	04/03/2024	Romanian
15	IBM Romania S.R.L.	05/03/2024	Romanian
16	Avaelgo Romania S.R.L.	05/03/2024	Romanian
17	Software Imagination & Vision S.R.L.	05/03/2024	Romanian
18	SAP Romania SRL + Redpoint Software Solutions S.R.L.	06/03/2024	English
19	ADAMO TECHNOLOGY SRL	06/03/2024	Romanian
20	Ascendro	06/03/2024	Romanian
21	CLOUD SERVICES LLC	07/03/2024	English
22	HEADLIGHT SOLUTIONS SRL	07/03/2024	Romanian
23	Orange Romania S.R.L.	07/03/2024	English
24	Wirtek S.R.L.	07/03/2024	Romanian
25	DATA CONCEPT DEV SRL	08/03/2024	Romanian

### Topics of the Bilateral Consultation Meetings

The bilateral consultation meetings were conducted in a structured manner, following a predefined agenda:

1. **Introductory words from ADR**
2. **Presentation of the participants**
3. **Answers to questions of clarifications from ADR (see table below)**
4. **Next steps and other topics relevant for the discussion**

Each meeting started with **introductory words from ADR**, providing an overview of the purpose and objectives of the bi-lateral consultation meeting. This was followed by a presentation of the participants and their organization. After the presentation there was time to discuss **open and follow-up questions based on the responses to the questionnaire** to ensure a deeper and more detailed understanding the views expressed. Also, on a case-by-case, **participants also asked questions to which ADR offered answered in the limit of what was known, decided and could be shared at the moment of the market consultation process**. The last part of the meeting focused on thanking the participants for their contributions and on **informing companies' representatives that a market consultation report will be published** that will reflect in an aggregated manner the information obtained by ADR from the market consultation process.

Typical topics that were discussed during the meetings included:

#### 1. Bundling and grouping of applications into (smaller) lots

- Service providers advocate for grouping applications by institution, department, and technology to streamline knowledge and operational responsibilities. This is viewed as an attractive package, emphasizing the alignment of applications with organizational structures and expertise.



- Risk reduction is a recurring theme, with bundling based on contract type (Time&Material or Fixed Price), migration strategy, and technology stack seen as key strategies. Such grouping aims to manage dependencies and optimize migration processes effectively.
- Grouping by government agencies and technological dependencies is recommended to facilitate cohesive migration to cloud services. Factors such as the complexity of migration, hardware age, and performance issues are vital in determining migration priorities.
- Some participants expressed a preference for granularity, translating to a larger number of smaller contracts for specialized services. Smaller contracts are preferred for their potential in resource management and tailored service provision.
- Functional outcomes of applications dictate grouping strategies, considering long-term data storage, scalability, and operational duration. Long-term operations might benefit from cost-saving measures in cloud service pricing.
- Similarities in technology stacks are also a basis for grouping applications, suggesting a focus on technical manageability. This approach could lead to more efficient technical support and maintenance.

In summary, service providers seek an accurate and strategic approach to the grouping and bundling of applications, aiming for technical congruence, operational efficiency, and cost-effectiveness. The feedback suggests a preference for flexible, granular contracts that align with specific service and technology requirements.

## 2. Specific technologies for cloud migration services

The meetings also touched upon the **technologies that the company's teams specialize in** for cloud migration services. The participants were asked to elaborate on the specific technologies they have used in the past and whether they are able to provide licenses for migration and maintenance activities. The responses indicate a diverse range of tools and strategies employed by various service providers:

1. Use of programming languages like Java and Scala, with a focus on data engineering tools within Apache Spark distributed systems, and other components like Hadoop, HDFS, YARN.
2. Expertise in database management and web development, including APIs, with specific mention of WSO2 for service publication.
3. AWS services for hosting applications, with S3, VPC, ECS, GitHub Actions, and Amazon Aurora being utilized.
4. Kubernetes in private cloud environments for UAT and production, with custom tools for database migrations.
5. A mix of proprietary and partner tools for automated migrations, with up to 99% automation achievable using self-learning technologies.
6. Microsoft Azure as the primary platform, with tools like Azure Migrate, Terraform, and Azure Resource Manager highlighted.
7. Various tools for assessments and migrations, emphasizing the Microsoft cloud stack including Azure Data Factory and Azure Synapse Analytics.
8. A preference for Microsoft technologies, with capabilities extending to Oracle, Amazon, Google, and full-stack Node.js.
9. Cloud-agnostic approach, using technologies like ServiceNow for cloud-based and on-premise installations.
10. Some economic operators use specific tools for legacy code conversion.

11. Use of Terraform and alignment with customer preferences.
12. Proprietary technologies.
13. Infrastructure-as-code tools such as Terraform, and Jenkins or GitHub Actions for migration operations.
14. Utilization of hyperscaler tooling and acceleration frameworks for public, private, and hybrid cloud migrations.
15. Focus on database synchronization with SharePlex, identity management with One Identity, and performance management with proprietary tools.
16. Reliance on Microsoft Azure technologies, including AKS, SQL server, Azure Key Vault, and tools for security and scalability.
17. Expertise with Oracle technologies and their adaptability to various clouds.
18. Proficiency in Terraform, Ansible, and various programming languages, with partnerships including AWS, Azure, and Google Cloud.
19. Use of VMware, VEEAM, SAS, Oracle, Spark, and Airflow for infrastructure and analytics tasks.
20. Use of PHP Symfony, .NET, Node.js, JavaScript, and Java for migrations, with a focus on databases like MySQL and SQL Server and GDPR compliance tools.

In conclusion, service providers leverage a wide array of technologies for cloud migration, with a clear preference for tools that offer automation, flexibility, and are compatible with a range of programming languages and cloud environments. There is an evident expertise across different clouds and a tailored approach to each migration project, ensuring efficient transitions to cloud infrastructure.

### 3. Cost calculation method and estimated time

The responses to detailing the calculation method and cost components for a migration process, along with the estimated time to complete such a process, reveal several common themes and specific practices:

- **Cost Components:** The main components include team composition, server sizing, application analysis, architecture, dependencies, cloud provisioning, development, functional testing, integration, security, and interoperability considerations.
- **Time Estimates:** Estimates for the migration process range widely, from as short as 2 weeks to as long as several months or even years, depending on the migration strategy (lift & shift vs. rearchitecture into microservices), application complexity, and whether changes during the migration are minimal or extensive.

Several key points and steps were identified:

- **Analysis and Design Phases:**
  - Require 2-4 weeks for analysis to identify suitable cloud provider services.
  - Detailed analysis and solution design are critical to accurately detail costs and migration times.
  - The analysis phase can range from 2-3 months, with efforts including understanding application dependencies, ecosystem impact, and existing security features.
- **Migration Strategies:**
  - Lift & shift migrations are quicker, while re-architecture and rewriting can significantly extend the timeline.

- Containerization, re-platforming (e.g., transitioning to DBaaS), and adopting infrastructure as code practices are commonly used.
- Re-platforming often requires code adaptation due to differences in database behaviour in cloud environments.
- **Estimation and Costs:**
  - Efforts are estimated in man-days or man-hours and can range from 400-500 man-days for minimal change scenarios .
  - Prices range significantly based on expertise and complexity, with hourly rates mentioned from 40 to 700 euros.
- **Implementation and Post-Migration:**
  - Stages include technical migration, testing, transitioning to the client, and user training, with the latter often involving continuous education rather than one-time instruction.
  - Post-migration activities like hypercare and application management in the new environment are factored into the total cost.
- **Other Considerations:**
  - The choice of technology stack, performance indicators, identity management, and compliance with standards like GDPR are integral to the process.
  - Bidders must consider migration budgets to cover for several agile iterations, with some preferring fixed-price contracts.
- **Cultural Transformation:**
  - Beyond the technical aspects, cloud migration is recognized as involving a significant cultural transformation for the client organization.

In conclusion, cloud migration is a multifaceted process with varying cost and time implications. The strategies and tools employed are tailored to each project's needs, with a shared focus on minimizing operational impact and maximizing post-migration efficiency and security compliance.

#### 4. The risks and proposed mitigations

The responses regarding risk management in the context of cloud migration projects point out various potential risks and corresponding mitigation strategies. Summarizing these, the main risks include (grouped on themes):

- **Risks of Monolithic Applications:** interoperability issues arise with monolithic applications. Ensuring the application is correctly decoupled into services can mitigate this.
- **Comprehensive Analysis:** inadequate analysis could lead to underestimation of the effort required. A thorough initial analysis, including purpose, data volume, time, and budget constraints, is necessary.
- **Collaboration with Stakeholders:** ensuring close collaboration with the contracting authority and clear communication with all stakeholders is crucial.
- **Testing and Validation:** provision of testing platforms for identifying potential issues during the actual migration phase is recommended. And validation of the final migration from a business perspective is essential.
- **Access to Systems:** provider's access to both source and destination systems or at least detailed reports on current status is needed to avoid delays.
- **Change Management:** implementing effective change management and post-migration support programs to assist customers in the transition phase.

- **Commercial Risks:** complexity of the ecosystem and potential for increased licensing costs post-migration; utilizing tools for cost calculation and managing stakeholder expectations can help.
- **Data Regulations Compliance:** ensuring data stays within the country and adherence to other regulatory requirements.
- **Migration Strategy Clarity:** lack of a well-defined strategy and working on outdated technologies pose significant risks. Strategies should be defined clearly with attention to the lifespan of the technologies involved.
- **Landing Zone Preparation:** insufficient investment in planning the future platform may lead to re-work. Involvement of the migration partner in this phase is advisable.
- **Technology Upgrades and Re-architecting:** choosing whether to upgrade applications before or after migration is a key decision point. Non-disruptive migration reduces potential issues.
- **Stakeholder Management:** poor stakeholder management can lead to misunderstandings about the scope and deliverables.
- **Complex Technical Integrations:** hidden or external dependencies that are not identified initially can lead to security risks and require additional effort.
- **Ensuring Resource Availability:** the availability of necessary resources from the beneficiary and third parties is critical to mitigate delays or the need for additional resources.
- **Maintaining Data Security and Compliance:** post-migration maintenance, monitoring, and addressing data security and compliance throughout the migration process are essential.
- **Client Involvement:** the involvement of the client's infrastructure team with technical experience in the languages and technologies used is important for efficient migration.
- **Seniority of Experts:** engaging highly senior experts ensures the migration process is managed efficiently.
- **Well-Developed Operation Plan:** a comprehensive post-migration operation plan is crucial, whether operations continue with the same provider or are internalized.

To limit or prevent these risks, the Contracting Authority (ADR) can take several steps:

- **Provide Detailed Documentation:** supplying comprehensive documentation on the current "as-is" situation, including interactions between applications, integrations with external partners, and hardware/software versions.
- **Ensure Rigorous Technical Analysis:** facilitating a rigorous technical analysis of the systems to be migrated to understand the full scope of the project.
- **Establish Clear Migration Modes:** clearly defining and agreeing on the migration strategy to avoid scope creep and change requests.
- **Invest in Training:** allocating budget for sufficient training activities to manage organizational culture changes and new technology adoption.
- **Stakeholder Buy-in:** building consensus among all stakeholders, including application owners, to prevent migration blocks and delays.
- **Commit Resources for Testing:** committing resources from the client side for thorough testing of applications before and after migration.
- **Involve Migration Partners Early:** including migration partners in the planning stages, especially when preparing the landing zone, to ensure all technical considerations are addressed.

## 5. Critical success factors to ensure successful migration services

The participants were asked to elaborate on the critical success factors they have raised and how ADR could enhance these factors to ensure successful cloud migration services. The responses highlight the importance of accurate planning and collaboration for the success of cloud migration projects. Summary of the critical success factors and how the contracting authority could enhance them:

- **Thorough Planning and Pre-migration Assessment:** ensuring detailed pre-migration assessment is crucial, as inadequate planning often leads to project delays and cost overruns. The Contracting Authority can enhance this by possibly involving third-party experts to assess the current state and assist in planning.
- **Operating Model with Defined Roles:** a well-established operating model with clear roles and responsibilities is essential during and after migration. The Contracting Authority can facilitate this by defining a governance structure that delineates roles and responsibilities across all involved parties.
- **Technical Foundation and Training:** building a strong technical foundation and providing training and documentation for application teams are significant for post-migration operations. The contracting authority can promote success by investing in comprehensive training programs and detailed documentation.
- **Technology Selection and Requirements Consideration:** choosing appropriate technologies and considering non-functional requirements are imperative. The contracting authority can support this by engaging with technical experts to ensure that the selected technologies align with the functional and non-functional requirements of the project.
- **Cybersecurity Measures:** addressing cybersecurity concerns from the outset is critical. The contracting authority should integrate cybersecurity considerations into the initial planning and ensure that all teams are aware of and adhere to security protocols.

By focusing on these factors, the contracting authority can play a pivotal role in ensuring that cloud migration projects are carried out efficiently, securely, and effectively.

## 6. Lessons learned from performing cloud migration services

ADR was interested in knowing the 2-3 most important lessons that they should consider. From the provided responses, the following lessons are emphasized for successful cloud migration services:

### 1. Early and Thorough Discovery Phase:

- Identifying hard dependencies and complexities early in the discovery phase is crucial.
- Proper staffing and comprehensive assessments including infrastructure, data, application, and security should be conducted.
- Inclusion of both business and technical stakeholders in the discovery process helps define clear requirements, risks, and a migration strategy.

### 2. Post-Migration Support and Documentation:

- Continuous support post-migration is key, including 24/7 assistance, sunset management of old systems, and addressing regulatory requirements like GDPR.
- Provision of adequate documentation for the management of applications is necessary.

### 3. Cloud Governance and Security:

- Implementing cloud governance, defining landing zones, determining the level of automation, and establishing monitoring and auditing processes are important.
- Security considerations should be integrated from the start of the project, not just before the go-live phase.

#### **4. Upfront Analysis for Contract Basis:**

- Some economic operators suggested an initial assessment before signing the migration contract to form the basis of a (fixed price) quote.
- If the assessment phase is not possible, a time & material contract is preferred by some economic operators to mitigate risks.

#### **5. Clarity and Standardization:**

- Clear definition of the scope of the migration and understanding inter-application dependencies are essential.
- Standardization of technology and versions is necessary, finding a balance between lift & shift strategies and application modernization.

The ADR (contracting authority) can enhance these success factors by ensuring a rigorous and proactive approach to discovery, investing in post-migration support structures, defining clear governance policies, integrating security at every project phase, and mandating upfront comprehensive assessments. Additionally, fostering a standardized technology environment can facilitate smoother transitions and modernizations during cloud migrations.

### **7. Capacity to perform cloud migration processes in parallel and capacity limitations**

The responses about the capacity for conducting cloud migration processes in parallel highlight several factors that the ADR (contracting authority) should consider:

#### **1. Team Size and Expansion Capability:**

- Providers have varying numbers of personnel available for cloud migrations, ranging from 50 to thousands of employees, with some able to insure up to 50 people for migration processes.
- Many companies can expand their capacity through partnerships, often enabling 3 to 10 migrations to be performed concurrently.

#### **2. Project and Resource Management:**

- The capacity for parallel migrations depends on project complexity and the organization of the migration teams.
- Some companies structure their teams to handle different phases of multiple projects simultaneously, allowing for efficient resource allocation.

#### **3. Technical Constraints:**

- The complexity of the applications, technical aspects such as line capacity, and the need for unit testing can limit the number of concurrent migrations.
- Companies can use automation to increase productivity and handle more projects in parallel.

#### **4. Client Collaboration:**

- Successful parallel migrations require close collaboration with the client, especially for operations and the post-migration phase.
- The client's readiness, including the availability of infrastructure, licenses, and timely information provision, can be a bottleneck.

**5. Migration Strategy:**

- Migrations should ideally not all be executed in parallel but rather in waves to account for capacity constraints at both the provider and the client organization.
- Grouping applications with similar technical requirements can optimize parallel migration processes.

**6. Change Management:**

- The approach to change management is critical, affecting the end management of applications and the overall migration success.
- Training for post-migration operation is essential and should be factored into parallelization considerations.

**7. Pre-Migration Assessment:**

- A thorough pre-migration assessment is crucial for defining the scope of work and ensuring that the resources and timelines are realistic.

**8. Migration Tools:**

- Providers use a variety of migration tools specialized for different technologies, and the choice of tools can affect the number of simultaneous migrations.

**8. Capacity to submit proposals**

ADR wanted to understand the capacity of companies to bid if multiple cloud migration tenders were launched simultaneously. The responses indicate that service providers have varying capacities to submit proposals for cloud migration services. Summarizing these capacities:

- Several providers are capable of preparing 2-3 offers within a two-month period, suggesting that they have established processes for bid preparation.
- One company noted its capability to submit up to 5 bids per week, highlighting a robust bidding team and a high degree of organization.
- One player mentioned the ability to prepare dozens of proposals at once, indicating significant resources dedicated to the bidding process.
- Some smaller firms indicated that their capacity is limited to 1-2 offers at a time, unless they partner with other firms to increase their bid preparation capabilities.
- Certain larger organizations claim they have virtually no limitations and can submit multiple bids simultaneously due to their extensive resources.
- The preparation of bids is influenced by the complexity of the tender documentation; some providers suggest that they could handle one bid per week or every two weeks.
- One company pointed out potential bottlenecks in the contracting process itself, such as signing NDAs and master agreements, which can delay the project start.
- It was also mentioned that providers can respond more effectively if there is visibility on the pipeline, allowing them to adjust their sales model accordingly.
- Some providers highlighted the need to consider realistic execution periods, factoring in legal evaluation and contracting timelines which can impact the contractual term in tenders.
- Several providers emphasized the importance of knowing when tenders will be launched to better assess resource availability for bid preparation.

**Common questions during the consultation meetings**

The list of questions asked during the Bilateral Consultation Meetings is reported below. Sometimes the questions were complemented and/or adjusted to include references to specific information provided by the companies in the questionnaires (e.g., if a company

expressed relatively low interest in the market opportunity it was asked to identify specific reason why it would see the opportunity as not attractive).

Table 4 - Most frequent / standard questions asked during the Bilateral Consultation Meetings

ID	Common questions during consultation meetings
1	Can you elaborate on the most relevant recent application migration projects (max 3) you have performed - what type of migration was involved, what was their value and duration?
2	What was the composition of the team (mix of company resources and partners) and the specializations of its members within the application migration projects mentioned?
3	Can you elaborate on what technologies your company's teams specialize in for cloud migration services?
5	Have you used specific cloud migration technologies in the past? (If yes, please specify what technologies)
6	Are you able directly or indirectly to provide licenses for migration and maintenance activities? For which main technologies, and under which conditions?
7	Please detail the cost calculation method/components for one migration process and the estimated time for completing a migration process (reference to case-study / scenario presented by ADR during the meeting on screen, as part of the support Power Point Presentation held by the latter).
8	Can you elaborate on the risks you have raised as part of the answer to question xi in the questionnaire and discuss your proposed mitigations to these? How could the contracting authority (ADR) mitigate some of these perceived risks?
9	(if needed as follow-up from no. 9) Can you elaborate on the critical success factors you have raised as part of the answer to question xi in the questionnaire? How could the contracting authority (ADR) enhance some of these success factors?
10	(if needed as follow-up from no. 9) What are 2-3 most important lessons you have learned from performing cloud migration services that ADR should know/use?
11	Given your capacity, how many cloud migration processes would you be able to perform in parallel? What vendor capacity limitations should ADR consider when bundling the IT systems into contracts?
12	How many proposals for cloud migration services would you be able to submit within, for instance, a 2-months period? Can you elaborate on your capacity to bid if ADR should launch several cloud migration tenders during the same period?
13	(Optional) If you were to choose just one most important advice you would give to ADR in approaching the preparation of tender procedure, what would that be?
14	(Optional) Would you like to add anything more to complement the answers you provided in the questionnaire?

Following the series of consultation meetings, summary notes were meticulously prepared and dispatched to the service providers for their review. This step was integral to ensure accuracy and comprehensiveness, **providing each company with an opportunity to suggest any necessary corrections**. Notably, some companies went beyond mere corrections, taking the initiative to supplement their responses as captured in the summary notes. They submitted additional documents and presentations, enriching the initial information. These supplementary materials covered a broad spectrum of topics, ranging from



more information to answers to specific questions that had been raised during the consultations, to sometimes including marketing / promotional materials.

### Summary of Questions & Answers – Consultation meeting

Table 5 - Questions asked by the service providers during the Bilateral Consultation Meetings

ID	Question from Company	Summary answer from ADR
1	In the next year, will SEAP tenders be launched for all 30 applications to be migrated? Will auctions be launched for individual or bundled apps?	We intend to group systems for contracting, as indicated by the questionnaire question on criteria for grouping systems into contracts.
2	In the case of the re-architecting strategy, is an interactive way of working envisaged, based on a MoSCoW technology to prioritize the functionalities that exist in the old application, to prioritize their implementation in the new application or is it desired to migrate 1 to 1 of the existing functionalities?	The way of working will be determined on a case-by-case basis, depending on the system. Details will be provided in due course.
3	What is the timeline for launching auctions and their structure?	These procedures are intended to be launched later this year. There is not yet a decision to group systems into one or more contracts.
4	What is the role of ADR in the project and especially after the migration of applications is completed?	ADR will be the operational administrator together with STS and Cyberint, according to Government Decision no. 112/2023. ADR will manage the services, STS will manage the IaaS, PaaS and Cyberint infrastructure part, the cyber security part. There will be contracts for the provision of cloud services between ADR and USC (Cloud Service Users). Apps will be managed by their users.
5	In order to manage such a construction, an ITSM tool is needed to organize these support processes. Does ADR plan to include another tool in the migration project or will it be based on the STS one?	It will be a unitary management platform that will be purchased by ADR, through which the cloud infrastructure will be managed.
6	Is there a preference to which cloud you plan to migrate?	The migration is done to the Governmental Cloud, consisting of two cloud units.
7	Which legal framework is applicable to the contract?	The contract will fall under Romanian public procurement regulation.
8	When will contracts start?	The public procurement procedures will be published after the market consultation process has been completed.
9	What criteria matter most to get such a project?	The award procedures work with a mix of qualification and selection criteria, factors for evaluating the technical proposal. We cannot say anything specific at this time about the future requirements for these award procedures. The qualification requirements in public procurement

ID	Question from Company	Summary answer from ADR
		legislation concern the company's portfolio, similar experience, etc. The evaluation factors may concern the methodology, the composition of the team, as provided by the public procurement legislation.
10	When do you plan to launch the procurement procedure?	Once the consultation period is complete, it won't be long before launch.
11	Is the migration of the 30 services to one of the two cloud components or to the cloud as a whole, and the decision on where to run the services will be a specific migration project decision?	Romania's Governmental Private Cloud is hybrid, with 2 cloud units – internal cloud and dedicated cloud. The cloud will be seen as a whole: cloud components will be installed in 4 data centers.
12	How do you see the situation where there is an application implemented by a certain company and this application needs to be moved to the Governmental Cloud without that company?	We are looking at some strategies that will be made public after they are finalized.

### 3. Outcome of the Market Consultation Process

#### 3.1 Market Consultation Questionnaire (main questions)

##### Section 1: Organisation Profile Conclusions

**Conclusion Q1: A significant number of organizations from Romania or with an entity in Romania are offering cloud migration services.**

The market consultation received a notable response from organizations either based in Romania or possessing a Romanian entity, underscoring the prevalence of companies within the region offering cloud migration services. With 27 out of 28 companies confirming a Romanian address, and only one declaring an address outside of Romania, it is inferred that the interest in participating in the tender process is predominantly from resident companies. This highlights a **strong domestic engagement in cloud service initiatives, indicating a robust local market presence** and interest in cloud migration projects.

**Conclusion Q2: Most of the companies who responded to the survey have been established between 1990 and 2020 and the Romanian market consists of experienced companies.**

The data indicates a diverse range of establishment dates for organizations operating within Romania, reflecting a broad spectrum of market maturity. **We see a mix of long-standing players with roots dating back to 1972, and more recent established in 2023.** This variability suggests a dynamic market that accommodates both established companies with a long history of operation and newer entities that may introduce innovative approaches and technologies.

The presence of subsidiaries for global companies established in Romania between the 1990s and early 2000s, alongside Romanian-founded firms **indicates a market that has been attractive to foreign investment for several decades.** Moreover, the establishment of entities in recent years (e.g., the 2019 and 2021) points to ongoing interest and investment in the Romanian market.

Overall, the establishment dates within Romania suggest that the market has a **well-founded base of experienced companies**, while also continuing to attract new investments and ventures. This diversity in company age may contribute to a healthy competitive environment,

fostering innovation and growth in the sector. The maturity of the market, indicated by the sustained establishment of new companies, also suggests a promising outlook for future business developments and technological advancements in Romania.

**Conclusion Q3: Highly stratified landscape in terms of employee expertise in cloud related services among the respondents.**

The findings show a stratified landscape in terms of employee expertise in cloud-related services among the responding organizations. Notably, there is a group of substantial entities with a significant global workforce exceeding 1,000 employees and a pronounced presence in Romania. Medium-sized entities also contribute to the market, some with a distinct presence in Romania.

When assessing specific cloud-related services, the market showcases a range of capabilities:

1. **Cloud Migration (IaaS and PaaS):** There's a mixture of large global entities with a modest local presence and smaller firms, the latter often operating primarily within Romania or the EU, possessing under 100 employees skilled in cloud migration.
2. **Development and Maintenance of Cloud Applications:** A number of large companies have a strong local presence, while other medium-sized and smaller firms, including local businesses, have substantial expertise ranging from 100 to 500 employees. However, some organizations with extensive global operations report a lesser local presence.
3. **Web Application Development and Maintenance:** Several large firms boast a significant number of skilled employees locally, while others, including medium-sized businesses, have a moderate local presence, ranging between 100 to 500 employees.
4. **Operation of IT and Cloud Infrastructures:** Certain large companies stand out with a vast local workforce, while others, including some with sizeable global operations, have between 100 to 1,000 employees with relevant expertise in Romania.

Overall, the responses depict a robust and mature market with a variety of companies ranging from local to global scales, providing a wide array of cloud-related services. The depth of expertise in Romania, specifically, is notable, suggesting a **competitive edge and a high potential for continued growth in cloud technology services within the region.**

**Conclusion Q5: In the past 5 years, the number of projects ranges from 1 project to 1000+ projects, and the value of the contracts ranges from 167.500,- EUR to 2 billion EUR.**

- **Highest Value Project:** The highest value project comes from the entity with "more than 1000 Projects," with an estimated annual budget of 2 billion EUR, highlighting the scale and financial commitment involved in cloud migration endeavours.
- **Lowest Value Project:** On the other end of the spectrum, the project with the lowest budget is valued at 167,500 EUR for "3 Projects," signifying smaller scale operations yet vital contributions to cloud adoption.
- **Most Projects:** The most prolific contributor to cloud migrations boasts over 1000 projects, showcasing a massive undertaking in moving IT applications/systems to the cloud infrastructure.
- **Least Projects:** The entity with the least number of projects conducted one project with a significant budget of 1,000,000 EUR, indicating a focused and perhaps more in-depth single-project investment.
- **Average Value per Project:** While the average value of a project can be influenced by both large and small scale projects, a rough estimation suggests a substantial

average budget, pointing towards significant investment into cloud infrastructure across the board.

**Conclusion Q6: In the past 5 years in Romania, the number of projects ranges from 1 project to 1000+ projects, and the value of the contracts ranges from 35.500,- EUR to 73 million+ EUR.**

21 of the 28 companies reported projects over the past five years. The landscape of cloud migration projects involving the transition of IT applications/systems to the cloud (IaaS/PaaS) in Romania has been quite diverse, with various companies undertaking a range of projects of differing scopes and budgets.

The highest-value reported had a budget of approximately 73,000,000 euros, exclusive of VAT, encompassing 12 projects for public institutions in Romania. On the lower end, the smallest project had a budget of about 35,500 euros.

The greatest number of projects conducted by a single entity exceeded 200, reflecting a significant engagement in cloud migration activities. Conversely, the smallest number of projects undertaken by entities that met the minimum requirement for consideration was a single project.

## **Section 2: Market and Operations**

**Conclusion Q7: Companies can leverage partnerships with other vendors when their in-house expertise is not sufficient and specialized knowledge is required.**

In summary, **while most companies handle cloud migration in-house, partnerships with external experts are leveraged for their specialized skills and technology.** Outsourcing, when adopted, is primarily for scalability, cost-efficiency, enhanced security, advanced technology access, minimizing downtime, and speeding up deployment. It allows organizations to tackle larger projects and manage heavy workloads effectively, particularly when in-house expertise is insufficient. Despite the general preference for internal management, the benefits of outsourcing are recognized for specific needs in application migration to cloud services.

**Conclusion Q8: Process complexity, lack of technical information and insufficient budget are factors that can discourage vendors from bidding for public contracts.**

In brief, potential bidders for the Governmental Cloud migration service are primarily **discouraged by process complexities, technical ambiguities, and financial concerns.** Specifically, lack of transparency, cumbersome procedures, restrictive criteria, unclear technical specifications, insufficient budgets, and unrealistic timelines are major deterrents. Additional factors include project management challenges, inadequate documentation, compliance uncertainties, insufficient access to necessary tools, and risks related to unclear specifications and dependencies. Companies are seeking clarity and fairness in the selection process, realistic project scopes, and timelines, as well as comprehensive technical and financial details to consider participation.

**Conclusion Q9: Companies generally suggest to group applications based on their technologies and interdependencies.**

For the grouping of applications into different lots or award procedures, participants suggest a variety of criteria centred primarily around technical, architectural, and operational factors. The key recommendations include:

- **Technical Complexity:** grouping based on the technical complexity and the technology stack used by applications, including architectural dependencies and backend services.

- **Data Considerations:** the type and volume of data processed, and the requirements for data migration.
- **Functional and Operational Dependencies:** considering the functional interdependence between applications and their integrated systems.
- **Compliance and Security:** grouping based on legal, regulatory compliance, and security requirements.
- **User Impact:** factors related to the impact on end-users and the usability of migrated applications.
- **Organizational Context:** applications belonging to the same department or having similar business priorities.
- **Performance and Scaling:** considerations for maximum concurrent users and scalability.
- **Service Level and Criticality:** criticality and the dependency on vendor support contracts.
- **Migration Strategy:** prioritization based on infrastructure versus applications and the detailed assessment of migration needs.

Technical and Architectural Factors emerged as the most emphasized, with more than ten companies highlighting them. Additional operational considerations like automation, resource control, and cost efficiency were also suggested. Furthermore, the table below summarizes the number of service providers endorsing various bundling criteria, highlighting Technology and Interdependencies as the most frequently mentioned, followed by Legal Requirements, Architecture, and others, suggesting a multi-faceted approach to grouping applications for migration to cloud services.

Table 6 - Count of Bundling Criteria mentioned

Bundling Criteria	# of service providers
Technology	11
Interdependencies	8
Legal requirements	5
Architecture	4
By Institution	4
Complexity	4
Migration Strategy	4
Business Function	4
Application Type	4
Size	4
Urgency/Priority	4

**Conclusion Q10: Companies required detailed information on architecture, technology, and functional requirements to provide a technical-financial offer.**

To formulate a comprehensive technical-financial offer for migrating ~30 applications to the Governmental Cloud, companies require detailed information across several key areas:

- **Application Architecture and Technology:** details on the current architecture, technologies, frameworks, and dependencies, along with envisaged cloud architectures and existing documentation.
- **Functional, Non-Functional, and Regulatory Requirements:** including security and compliance requirements, interoperability with other systems, performance metrics, and preferences for migration strategies.
- **Data Management and Migration:** information on data volume, lifecycle, storage needs, and specific migration requirements like backup and disaster recovery strategies.
- **Integration and Networking:** networking and resource scaling needs, integration with third-party systems, and detailed application documentation.
- **Licensing and Contracts:** current licensing details, support contracts, and licensing requirements.
- **Operational and Support Requirements:** acceptable migration plans, downtime restrictions, and post-migration support and maintenance needs.
- **Performance and Scalability:** uptime statistics, performance data, and future PaaS technology considerations.
- **Project Management and Logistics:** time constraints, working method, travel requirements, and technological limitations.
- **Application Specifics and Historical Context:** the application's purpose, history, current deployment issues, and any specifics related to the migration.

This extensive information would ensure that the offers are both technically sound and financially viable, allowing for a smooth and efficient migration process to the cloud.

**Conclusion Q11: Main risks include technical and compatibility issues with applications. Careful planning, and effective collaboration and communications, are some of the key success factors highlighted by the companies.**

The main risks identified in migrating applications to the Governmental Cloud (IaaS/PaaS) include technical and compatibility challenges, security and compliance issues, migration process and management difficulties, resource and documentation gaps, and operational and strategic concerns. **Among these, technical and compatibility issues, as well as security and compliance challenges, stand out as particularly significant.** These risks encompass adapting to new technologies, ensuring data security, managing dependencies, and overcoming integration hurdles.

To mitigate these risks and ensure a successful migration, **critical success factors highlighted include meticulous planning and strategy, technical preparation and compatibility, security and compliance assurance, effective collaboration and communication, comprehensive training and support, robust governance and monitoring, and efficient resource management.** Planning, security measures, and technical readiness are emphasized as key to navigating the complexities of cloud migration effectively.

**Conclusion Q12: Planning and analysis, before the migration phase, and careful allocation of resources are additional success factors**

In summary, providers stress the importance of strategic partnerships, proven methodologies, extensive certifications, and close collaboration with clients to ensure successful cloud migration outcomes. They highlight the need for **thorough upfront analysis and careful resource allocation.**

**Conclusion Q13: Labour and licenses are the two main cost components of migration projects. The budget for projects depend on various factors, including the migration strategy, and can have large variations.**

The summary of responses to Q13 on budgeting for cloud application migration highlights the **multifaceted nature of cost components** involved in such projects. Key cost areas include cloud infrastructure and platform services, consulting, licenses, security, training, labor, tools, testing, and post-migration support. Costs vary significantly across different migration strategies—Rehosting, Replatforming, and Rearchitecting—with labor often being the most substantial expense. The relative share of costs depends on numerous factors, including the complexity of the migration, the specific needs of the system being migrated, and the strategy employed.

Respondents emphasized the importance of thorough planning and analysis to avoid underestimating costs or setting unrealistic deadlines. They also noted that costs could vary based on whether work is done on-site or remotely, and highlighted the potential for additional expenses due to compliance with security standards and the need for software development to ensure cloud compatibility. Overall, the feedback **underscores the complexity of accurately budgeting for cloud migration and the necessity of detailed preparation to manage financial and operational risks effectively.**

**Conclusion Q14: Payment models based on variable prices, which depend on effort or performance, can be implemented for Cloud migration projects in alternative or in addition to the Fixed-Price Model.**

The feedback on appropriate contract price adjustment mechanisms for cloud migration projects (IaaS/PaaS) reveals a consensus on the need for flexible, transparent, and performance-oriented pricing models. Key suggestions include:

- **Fixed-Price Models** with predefined service packages for each migration phase, allowing for adjustments based on measurable goals. This model offers predictability in costs and aligns payment with project milestones.
- **Performance-Based Models** that incorporate bonuses or penalties (bonus-malus mechanisms) based on the post-migration performance of applications, promoting quality and efficiency.
- **Flexible and Volume-Based Pricing** to accommodate the varying complexity and size of migration projects, with costs adjusted for the actual time and materials used.
- **Time and Material Contracts**, recommended for their flexibility in accommodating changes in project scope and unforeseen requirements.
- **Periodic Reviews and Adjustments** based on project progress, external economic factors, and actual resource consumption, ensuring that pricing remains fair and reflective of the work done.
- **Strategic Adjustments** through framework agreements and third-party validations, aiming for contractual flexibility to handle project uncertainties.
- **Milestone and Objective-Based Pricing**, aligning payments with the achievement of specific project milestones and objectives.
- **Resource Utilization and Scalability Considerations**, with pricing models that adapt to the actual consumption of resources and the scalability needs of the project.

These models emphasize the importance of balancing financial predictability with the need to accommodate the complexities and dynamic nature of cloud migration projects. Implementing clear, flexible, and fair pricing models is crucial for attracting skilled service providers and ensuring the successful migration of applications to the cloud.

**Conclusion Q15: Risks can lead to unforeseen increases in costs and timeline of Cloud migration – companies suggest to adopt mitigation measures which include thorough preparation, planning, flexibility, and collaboration with service providers and stakeholders.**

The feedback highlights **several factors that could lead to unforeseen costs in migrating applications to the Governmental Cloud**, including application complexity, security and compliance requirements, integration challenges, data management, scope changes, code quality variability, user requests, IT security practices, performance targets, legal compliance, technical specifications ambiguity, dependencies, legislative requirements, refactoring needs, training and downtime, economic fluctuations, project management issues, and support from the Governmental Cloud administrator.

To mitigate these risks and prevent unexpected costs, companies suggest **a variety of strategies**. These include conducting preliminary technical audits, engaging in detailed planning, performing simulations and testing, collaborating closely with service providers, incorporating contractual flexibility, conducting thorough technical analyses, defining clear requirements, ensuring a comprehensive understanding of dependencies, allocating a flexible budget, involving experts early on, negotiating favourable terms with providers, clarifying roles and responsibilities, accurately estimating resource consumption, employing competent project management, including review clauses for ongoing evaluation, adopting a time and material budgeting regime, and accounting for potential technical complexities from the outset.

In conclusion, ADR was advised, in order to effectively manage and minimize unforeseen costs associated with cloud migration projects, to adopt a multifaceted approach that combines thorough preparation, detailed planning and open collaboration with service providers and stakeholders. By proactively addressing the identified risk factors and implementing the suggested strategies, ADR could enhance the predictability, efficiency, and success of its cloud migration efforts.

**Conclusion Q16: Budget should also be allocated for security and expert consultancy, considering the sensitivity of the project.**

Service providers recommend ADR to focus on transparent, detailed pricing and to allocate adequate budget for security and expert consultancy, considering the project's national security implications. Specialist rates vary widely, emphasizing the need **to accommodate project complexity and unforeseen costs**. Effective planning and collaboration with providers are crucial to mitigate risks and ensure the project's financial and operational success.

**Conclusion Q17: The subject of cloud migration is very attractive (9.3/10) for service providers and indicates that the future tender will grasp the attention of service providers.**

The service providers indicated **how attractive the subject** of this **consultation** was for them. An **average attractiveness score of 9.3/10** indicates that the subject is very attractive for service providers in this space. Only **2 service providers** indicated that the subject is **somehow attractive** for them.

However, this attractiveness score of the subject is **not a direct indicator** of the **level of participation** and does not automatically imply a high level of participation of the future tender. Nevertheless, it is **likely** that this the future tender will **grasp the attention** of solid number of service providers.

### **Section 3: Budgeting**

**Conclusion Q18: Companies will assess the risk profile, financials, and their resources when considering whether to bid for the Cloud migration project(s).**

When considering participation in a tender, companies evaluate a **range of criteria** including their experience with similar projects, alignment of their services with the tender's scope,



technical capabilities, proximity of their staff to the project location, and their understanding of the market. The strategic importance of the project, its complexity, and the opportunity it presents for modernization and public interest are also significant factors. **Companies assess the risk profile, financial considerations such as revenue predictability and remuneration, their reputation, transparency of project details, the uniqueness of the technical solution, resource mobilization potential, and their ability to contribute to digital transformation in Romania.** These criteria help companies decide whether a tender fits their specialization and strategic goals, ensuring they can allocate the necessary skills and resources for successful participation.

**Conclusion Q19: The project should provide transparent information to bidding companies and look at dividing the scope into manageable lots for the awards.**

To enhance the appeal of its award procedures for organizations, ADR should focus on ensuring **clear and detailed project information**, promoting collaboration and innovation, emphasizing security and compliance, offering flexible contracting options, and valuing previous experience. **Simplifying documentation, setting realistic timelines, encouraging quality-focused tenders, consulting with technical experts, and potentially dividing projects into manageable lots** are also key strategies. Implementing these approaches could lead to more competitive and innovative proposals, benefiting both ADR and participating organizations.

**Conclusion Q20: The re-architecting migration strategy is the most time-intensive, though it can carry long-term technical benefits**

The typical durations for Cloud migration projects vary significantly based on several factors, with rehosting generally being the quickest and redesign the most time-intensive. Each of the strategies is dependent on by the application's complexity, data volume, initial implementation quality, resource availability, system interdependencies, and the extent of change management needed.

1. **Rehosting is the quickest:** Rehosting or "Lift-and-Shift" is generally the fastest migration strategy, but even this can take up to several months, highlighting the need for ADR to plan for potentially significant downtimes or parallel operations.
2. **Re-platforming requires moderate time:** This approach takes longer than rehosting, indicating a need for careful consideration of the balance between improving performance or functionality and the time investment required.
3. **Re-architecting is highly time-consuming:** As the most comprehensive strategy, redesigning for cloud-native architecture demands the most significant time commitment. ADR must weigh the long-term benefits of a full redesign against the extended timeline.

To optimize migration duration, service providers recommend comprehensive initial assessments, detailed planning, rigorous project management, use of automation tools, and pre-migration evaluations to anticipate complexities. Clarity on technical specifications and readiness of the customer are crucial for managing the migration process effectively. These insights suggest the importance of careful preparation, strategic planning, and resource allocation to ensure a smooth and efficient migration to cloud platforms.

**Conclusion Q21: The three migration strategies require different types of expertise, including infrastructure management for rehosting, and development skills for re-platforming and re-architecting.**

The service providers' responses highlight the critical expertise and competencies necessary for different cloud migration strategies: **re-hosting focuses on infrastructure management, data migration, and automation; re-platforming requires platform optimization, code adjustments, and containerization skills; while re-architecting involves designing cloud-native architectures**, developing advanced software solutions, and transforming applications into microservices. Across all strategies, skills in project management, cloud solution architecture, security, and DevOps practices are essential. Successful cloud migration demands a blend of these competencies, along with certified professionals and effective communication and planning. This underscores the multifaceted nature of cloud migrations, necessitating a comprehensive skill set to address the technical challenges and ensure a smooth transition to the cloud.

For each cloud migration strategy, the profile of expertise required varies to address the specific challenges and goals of the migration:

- **Rehosting (Lift and Shift):** This strategy requires professionals with strong backgrounds in infrastructure management, capable of efficiently migrating physical and virtual servers to the cloud. Experts in data migration are essential to ensure data is transferred securely and without loss, while automation and scripting specialists use tools like Terraform and Ansible to streamline the migration process. Network management skills are also crucial for establishing secure and reliable connections between on-premises environments and the cloud.
- **Re-platform (Platform Reorganization):** Here, the focus shifts towards optimizing applications for cloud platforms without major code rewrites. This requires platform optimization experts who can adjust and fine-tune applications to leverage cloud-native services for enhanced performance and scalability. Containerization experts proficient in Docker and Kubernetes are key to packaging applications in a way that maximizes the benefits of cloud environments. Additionally, integration specialists are needed to ensure seamless interaction between the migrated applications and cloud services.
- **Redesign (Rearchitect):** The most complex strategy involves fundamentally rethinking the application architecture to exploit cloud-native features fully. This demands cloud-native architecture designers skilled in creating scalable, resilient, and efficient cloud-based solutions. Software developers with experience in microservices architectures and serverless computing are pivotal in building applications that are optimized for cloud performance and cost-efficiency. Advanced data analytics experts harness cloud tools for sophisticated data processing and analysis tasks.

Across all strategies, certified engineers and professionals skilled in project management, cloud solution architecture, and security are indispensable. Their combined efforts ensure that migration projects are executed effectively, adhering to technical and security standards while meeting the project's timelines and objectives.

**Conclusion Q23: Other information provided by the participating companies emphasizes the importance of training and change management for successful Cloud migration.**

Service providers emphasize the importance of ADR enhancing cloud migration processes by directly engaging with subject-matter experts, ensuring clear requirements and selection criteria, and focusing on comprehensive service experience. They suggest prioritizing **end-**

**user training, supporting end-to-end service providers involvement**, and selecting appropriate cloud technologies. The importance of clear communication, market inclusivity, managing project complexity, and adopting security-by-design approaches is also highlighted. Service providers advocate for preliminary assessments, training on cloud technologies, and thoughtful application selection. The collective feedback points towards the need for ADR to adopt a flexible, transparent, and security-focused approach, with an emphasis on direct engagement with service providers and comprehensive planning to facilitate successful cloud migrations.

### **3.2 Bilateral Consultation Meetings**

#### **Conclusion 1: Preference for flexible, granular contracts that align with specific service and technology requirements.**

In summary, service providers seek an accurate and strategic approach to the grouping and bundling of applications, aiming for **technical congruence, operational efficiency, and cost-effectiveness**.

#### **Conclusion 2: Specific technologies for cloud migration services**

In conclusion, service providers leverage a wide array of technologies for cloud migration, with a clear preference for tools that offer automation, flexibility, and are compatible with a range of programming languages and cloud environments. There is an evident expertise across different clouds and a tailored approach to each migration project, ensuring efficient transitions to cloud infrastructure.

#### **Conclusion 3: Cost calculation method and estimated time**

Cloud migration is a multifaceted process with varying cost and time implications. Companies prioritize detailed analysis and collaborative design with clients to establish accurate estimates and successful migrations. The strategies and tools employed are tailored to each project's needs, with a shared focus on minimizing operational impact and maximizing post-migration efficiency and security compliance.

#### **Conclusion 4: The risks and proposed mitigations**

In conclusion, managing the risks of cloud migration involves a combination of thorough **planning, stakeholder collaboration, technical expertise, and strategic foresight**. The contracting authority plays a pivotal role in enabling clear communication, providing detailed documentation, and ensuring that the chosen migration strategies are well-aligned with organizational goals and regulatory requirements.

#### **Conclusion 5: Critical success factors to ensure successful migration services**

To ensure successful cloud migrations ADR could enhance outcomes by conducting expert-led pre-migration assessments, establishing clear roles and governance, investing in comprehensive training and documentation, selecting technologies with expert advice to meet project requirements, and integrating cybersecurity from the beginning. Such proactive measures would be pivotal in steering cloud migrations towards efficiency, security, and overall success.

#### **Conclusion 6: Lessons learned from performing cloud migration services**

In conclusion, the ADR (contracting authority) can enhance these success factors by ensuring a rigorous and proactive approach to discovery, investing in post-migration support structures, defining clear governance policies, integrating security at every project phase, and mandating upfront comprehensive assessments. Additionally, fostering a standardized technology environment can facilitate smoother transitions and modernizations during cloud migrations.

#### **Conclusion 7: Capacity to perform cloud migration processes in parallel and capacity limitations**

ADR was advised to consider these capacity-related factors when grouping IT systems into contracts to ensure realistic expectations and efficient migration processes. Providers suggest that clear communication, proper planning, and collaboration with the client are as critical as technical capacity for the success of parallel migrations.

#### **Conclusion 8: Capacity to submit proposals**

There are varying capacities of service providers to prepare bids when launching multiple award procedures for cloud migration. The ability of these organizations to respond effectively is influenced by **internal resources, complexity of tender documentation, potential bottlenecks in contracting processes, and visibility of tender timelines**. For a smooth tendering process, ADR could consider **staggering the release of tenders or providing longer response times**, especially for more complex migrations.

### **4. Other relevant information in application of the Public Procurement Principles during the Market Consultation**

The Contracting Authority has rigorously adhered to the provisions outlined in the procurement legislation to ensure fair competition, non-discrimination, and transparency in the future award procedure/s. Measures taken to uphold these principles include among others:

- Ensuring that the market consultation notification is published not only on the Romanian Public Procurement Electronic Platform (SEAP), **but also in the Supplement to the Official Journal of the European Union, in both Romanian and English** (the latter as a measure to stimulate interest also from companies that do not traditionally act on the Romanian market). The market consultation process was presented in a clear, transparent and concise manner, encouraging market operators to participate in the process and provide insights.
- Enhancing the reach-out of the market consultation notification by promoting the respective announcement in SEAP and in JOUE also via **email notifications sent by ADR to more than 180 companies acting in the relevant industry**. In addition, publication of the market consultation notification also on the **website of ADR**.
- Encouraging even more the participation of relevant companies by delivery by ADR of two briefing sessions (one in Romanian and one in English) during which participant companies learnt more about the migration process in the Governmental Cloud and **were reminded the rules / requirements of the upcoming market consultation process**.
- To ensure an increased level of transparency and stimulate participation from the market operators, **allowing participating companies to fill-in the market consultation questionnaire in either Romanian or English and running the bilateral consultation meetings with the same language options**, depending on the preferences of companies. Answering in English was an option for a significant number of companies participating in the market consultation process, which is proving the appropriateness of this tactic to attract a varied spectrum of market operators.
- Proactively addressing any concerns or queries raised by participant companies during various meetings to maintain a level playing field and foster trust in the procurement process. As part of this approach, **allowing companies to participate in individual bilateral meetings** as an opportunity to clarify their answers / positions formulated in the filled-in questionnaires – main answers have been captured in summary notes which were shared by ADR with respective companies.

- Clearly communicating as part of the market consultation notification the **obligations regarding the handling of confidential information** that may be shared by market participants with ADR. Along with this, providing participants with the option to designate certain information as confidential, classified, or protected by intellectual property rights.
- Focusing the market consultation process on obtaining general information about how companies deliver cloud migration services, how big and diversified is the relevant market, what risks and critical success factors may affect the cloud migration procurement procedure/s etc and **not asking for direct feedback on draft public procurement documentation/s - no such document was shared with the market.**
- **Publishing the Market Consultation Report in the Romanian Public Procurement Electronic Platform (SEAP), in both Romanian and English** and made this way available to all participants or interested persons. This ensures transparency and accessibility to information regarding the market consultation process.

## 5. Annexes

### 5.1 List of Companies that participated in Market Information Sessions

1. ADAMO TECHNOLOGY S.R.L
2. Arxia Srl
3. Ascendro
4. Asee Solutions S.R.L
5. Asociației Patronale a Industriei de Software și Servicii (ANIS)
6. ATOS Global Delivery Center S.R.L
7. Avelgo
8. BTS Pro Moldova
9. Cascadeo
10. CLOUD SERVICES
11. Connections Consult SA
12. Cyberllence Inovatie S.R.L.
13. DATA CONCEPT DEV S.R.L
14. Datanet Systems Integration
15. Deloitte Consultanta S.R.L
16. DEV HD SERVICES S.R.L
17. Dvloper
18. Endava
19. Ernst & Young Romania
20. Esempla Systems
21. Essensys Software
22. Evozon Systems S.R.L
23. Flame Data Technologies
24. FRONTAL INTEGRATEG SOLUTIONS S.R.L.
25. Google Cloud
26. Harrison
27. IBM Consulting
28. Indsoft
29. Innova Systems
30. ITPS SRL
31. KNM
32. KPMG Romania S.R.L
33. METAMINDS
34. Microsoft Romania
35. Oracle
36. Orange
37. OVES Enterprise
38. OVHcloud
39. Power Net Consulting
40. PWC Consultants S.R.L
41. Red Point Software Solutions S.R.L
42. SAP Romania S.R.L
43. SC ANSE Info S.R.L
44. SC HEADLIGHT SOLUTIONS S.R.L
45. Software Imagination and Vision
46. TNT Computers
47. To the new
48. TRENCADIS CORP S.R.L
49. Vodafone
50. Wirtek SRL
51. Zitec COM S.R.L

## **5.2 List of Companies that submitted the Market Consultation Questionnaire**

1. Adamo Technology S.R.L
2. Ascendro Pro Development S.R.L
3. Asee Solutions S.R.L
4. ATOS Global Delivery Center S.R.L
5. Avelgo Romania S.R.L
6. Cloud Services Llc
7. Cyberllence Inovație S.R.L.
8. DATA CONCEPT DEV S.R.L
9. Deloitte Consultanta S.R.L
10. DEV HD SERVICES S.R.L
11. Endava
12. HEADLIGHT SOLUTIONS S.R.L
13. IBM Romania S.R.L
14. Inteli Management Systems S.R.L
15. Metaminds S.A
16. Microsoft Romania
17. Oracle Romania S.R.L
18. Orange Romania S.A
19. OVES Enterprise S.R.L
20. PricewaterhouseCoopers Management Consultants S.R.L
21. Q-East Software S.R.L.
22. Red Point Software Solutions S.R.L
23. SAP Romania S.R.L
24. Software Imagination & Vision S.R.L.
25. Sqs Business Services
26. TRENCADIS CORP S.R.L
27. Wirtek S.R.L
28. Zitec COM S.R.L

The following companies provided a filled-in questionnaire after the deadline of 4<sup>th</sup> February 2024:

- Connections Consult
- BTS PRO

### **5.3 List of Companies invited to the Bilateral Consultation Meetings**

1. Adamo Technology S.R.L
2. Ascendro Pro Development S.R.L
3. Asee Solutions S.R.L
4. Atos Global Delivery Center S.R.L
5. Avelgo Romania S.R.L
6. Cloud Services Llc
7. Cyberllence Inovație S.R.L.
8. Data Concept Dev S.R.L
9. Deloitte Consultanta S.R.L
10. Dev Hd Services S.R.L
11. Endava
12. Headlight Solutions S.R.L
13. IBM Romania S.R.L
14. Inteli Management Systems S.R.L
15. Metaminds S.A
16. Microsoft Romania
17. Oracle Romania S.R.L
18. Orange Romania S.A
19. Oves Enterprise S.R.L
20. PricewaterhouseCoopers Management Consultants S.R.L
21. Q-East Software S.R.L.
22. Red Point Software Solutions S.R.L
23. SAP Romania S.R.L
24. Software Imagination & Vision S.R.L.
25. Sqs Business Services
26. Trencadis Corp S.R.L
27. Wirtek S.R.L
28. Zitec Com S.R.L



#### **5.4 List of Companies that participated in the Bilateral Consultation Meetings**

1. Adamo Technology S.R.L
2. Ascendro Pro Development S.R.L
3. Asee Solutions S.R.L
4. Atos Global Delivery Center S.R.L
5. Avelgo Romania S.R.L
6. Cloud Services Llc
7. Cyberllence Inovație S.R.L.
8. Data Concept Dev S.R.L
9. Deloitte Consultanta S.R.L
10. Dev Hd Services S.R.L
11. Endava
12. IBM Romania S.R.L
13. Microsoft Romania
14. Oracle Romania S.R.L
15. Orange Romania S.A
16. Oves Enterprise S.R.L
17. PricewaterhouseCoopers Management Consultants S.R.L
18. Q-East Software S.R.L.
19. Red Point Software Solutions S.R.L
20. SAP Romania S.R.L
21. Software Imagination & Vision S.R.L.
22. Sqs Business Services
23. Trencadis Corp S.R.L
24. Wirtek S.R.L
25. Zitec Com S.R.L

It should be noted that SAP Romania and Red Point Software Solutions participated in the same bi-lateral session.

## 5.5 Market Consultation Questionnaire – English Language

### Section 1: Organisation profile

Please tell us about your organisation.

**1. Please indicate the identification data of your organisation.**  
[Please provide the name of the organisation, identification details, website, contact address and contact information (phone number and e-mail address) for the person responsible on behalf of your organisation for participating in this market consultation ]

**2. When was your organisation established?**

[Please insert year – 4 digits]

**3. How many employees does your organisation have? (approximate number of employees in the last closed financial year)**

[Please mark the relevant range in yellow]

Type of experience of the employees	In total	...of which in the EU	...of which in Romania
Experience in cloud migration of IT applications/ systems in IaaS	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+
Experience in cloud migration of IT applications/ systems in PaaS	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+
Experience in developing and maintaining <i>cloud ready and/or native cloud</i> applications	<25 <50 <100 <500	<25 <50 <100 <500	<25 <50 <100 <500

Type of experience of the employees	In total	...of which in the EU	...of which in Romania
	<1.000 <10.000 10.000+	<1.000 <10.000 10.000+	<1.000 <10.000 10.000+
Experience in web application development and maintenance	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+
Experience in operating IT infrastructures in cloud computing environments	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+
Experience in operating cloud infrastructures	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+

4. What was your total turnover in the last closed financial year? Please indicate in the table below the year of your last closed financial year. Please mention the year to which you refer, the overall consolidated turnover, the turnover in Europe and the turnover in Romania as approximate percentages.

Year	Turnover in Euro (global)	Turnover in Euro (Europe)	Turnover in Euro (Romania)
20....	EUR...	... % of global turnover	... % of global turnover

- 5. How many contracts/ projects related to the migration of IT applications/systems to cloud (IaaS/PaaS) have you implemented in the last five years and what has been the approximate total budget of these contracts/projects?**

[Number of contracts/projects total and total amount in euro], of which  
[Number of contracts/projects for public institutions and related amount in euro]

- 6. How many contracts/projects related to the migration of IT applications/systems to the cloud (IaaS/PaaS) have you implemented in Romania over the past five years and what has been the approximate budget of these contracts/projects?**

[Number of contracts/projects and total amount in euro]

## **Section 2: Market and operations**

Please tell us about the market you are active in when it comes to migrating applications to cloud services (IaaS/PaaS).

- 7. What type of application migration to cloud services (IaaS/PaaS), if applicable, do you outsource/subcontract to third party partners or providers? Please explain why you outsource/subcontract these services.**

[Free text – 500 character limit]

- 8. The Contracting Authority is considering selecting one or more partners for migration services of ~30 applications in the Governmental Cloud (IaaS/PaaS). What would discourage you from submitting your offer for this/these award procedures?**

[Free text – 500 character limit]

- 9. If the Contracting Authority decides to group applications into different lots or award procedures, what grouping criterion/ criteria would you suggest to be used?**

[Free text – 1000 character limit]

- 10. What information would you need for each of the ~30 targeted applications to send a qualitative technical-financial offer?**

[Free text – 500 character limit]

- 11. In your opinion, what are the main risks and critical success factors in executing/managing application migration to the Governmental Cloud (IaaS/PaaS)?**

[Free text – 1000 character limit]

- 12. Do you have any other information you want to communicate about the market and your operations on cloud migration services?**

[Free text – 500 character limit]

## **Section 3: Budgeting**

Please present experiences and opinions on budgeting for the migration of applications to cloud services (IaaS/PaaS).

- 13. What are the main cost components and what would their relative share of cloud application migration (IaaS/PaaS) be, in your experience? Where applicable, please specify this for each of the migration strategies considered by ADR and described above.**

[Free text – 500 character limit]

- 14. What would be an appropriate contract price adjustment mechanism for the migration of applications to the cloud (IaaS/PaaS) from your experience?**

[Free text – 500 character limit]

- 15. What factors would cause you unforeseen costs when migrating applications to the Governmental Cloud and what would be the best way for ADR to prevent those unexpected costs?**

[Free text – 500 character limit]

- 16. Do you have any other information you want to communicate about prices to help ADR budget properly the cloud migration contract(s) (e.g. fee rate day/person per expert)?**

[Free text – 500 character limit]

#### **Section 4: Scope of the contract with ADR**

- 17. How attractive is the subject of the public consultation notice to your organisation?**

[0 – Not attractive at all; 10 – Very attractive]

- 18. For the previous question, please indicate the main criteria on which your assessment is based:**

[Free text – 500 character limit]

- 19. How can ADR increase the attractiveness of targeted award procedures for your organisation?**

[Free text – 500 character limit]

- 20. From your experience, what would be the typical migration duration for each of the three application migration strategies? Please submit information separately for (i) Rehosting, (ii) Platform reorganisation (revision) (Re-platform) and (iii) Redesign (Rearchitecture), in your experience**

[Free text – 1000 character limit]

- 21. Please explain the main types of expertise and competence you usually use in cloud migration services. Please elaborate for (i) Rehost, (ii) Reorganisation (revision) of the platform (Re-platform) and (iii) Redesign (Rearchitecture).**

[Free text – 1000 character limit]

- 22. Would you consider submitting your offer if the ADR decides to launch an award procedure for cloud migration services?**

[Yes/No]

- 23. Do you have any other information that you would like to provide on the subject matter of the migration services to be considered by ADR?**

[Free text – 500 character limit]

#### **Section 5: Participation in consultation meetings**

- 24. Please indicate whether your organisation would also like to participate in a bilateral consultation meeting with ADR (online).**

[Yes/No]

- 25. If yes to the previous question, please indicate your language preferences for the consultation meeting** by choosing one of the answers below:  
I can ensure the participation of relevant staff in the consultation meeting in Romanian.  
I can ensure the participation of relevant staff in the consultation meeting in English.  
I don't have a preference for the working language.

## 5.6 Market Consultation Questionnaire – Romanian Language

### Chestionar

#### Secțiunea 1: Profilul organizației

Vă rugăm să furnizați informații despre organizația dvs.

- 1. Vă rugăm să indicați datele de identificare ale organizației dvs.**  
[Vă rugăm să furnizați numele organizației, datele de identificare, site-ul web, adresa de contact și informațiile de contact (numărul de telefon și adresa de e-mail) pentru persoana responsabilă din partea organizației dvs. pentru participarea la această consultare a pieței]
- 2. Când a fost înființată organizația dvs.?**  
[Vă rugăm să introduceți anul – 4 cifre]
- 3. Câți angajați are organizația dvs.? (numărul aproximativ de angajați în ultimul exercițiu financiar închis)**  
[Vă rugăm să marcați intervalul relevant cu galben]

Tip de experiență a angajaților	Nr. total	... din care în UE	... din care în România
Experiență în migrarea în cloud a aplicațiilor / sistemelor informatice în IaaS	<25	<25	<25
	<50	<50	<50
	<100	<100	<100
	<500	<500	<500
	<1.000	<1.000	<1.000
	<10.000	<10.000	<10.000
	10.000+	10.000+	10.000+
Experiență în migrarea în cloud a aplicațiilor / sistemelor informatice în PaaS	<25	<25	<25
	<50	<50	<50
	<100	<100	<100
	<500	<500	<500
	<1.000	<1.000	<1.000
	<10.000	<10.000	<10.000
	10.000+	10.000+	10.000+
Experiență în dezvoltarea și întreținerea aplicațiilor <i>cloud ready</i> și/sau <i>cloud native</i>	<25	<25	<25
	<50	<50	<50
	<100	<100	<100
	<500	<500	<500

Tip de experiență a angajaților	Nr. total	... din care în UE	... din care în România
	<1.000 <10.000 10.000+	<1.000 <10.000 10.000+	<1.000 <10.000 10.000+
Experiență în dezvoltarea și întreținerea aplicațiilor web	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+
Experiență în operarea infrastructurilor informatice în medii cloud computing	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+
Experiență în operarea infrastructurii cloud	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+	<25 <50 <100 <500 <1.000 <10.000 10.000+

4. Care a fost cifra dvs. de afaceri totală în ultimul exercițiu financiar închis? Vă rugăm să indicați în tabelul de mai jos anul ultimului dvs. exercițiu financiar închis. Vă rugăm să menționați anul la care vă referiți, cifra de afaceri globală consolidată, cifra de afaceri în Europa și cifra de afaceri în România ca procente aproximative.

Anul	Cifra de afaceri în Euro (globală)	Cifra de afaceri în Euro (Europa)	Cifra de afaceri în Euro (România)
20....	€ ...	... % din cifra de afaceri globală	... % din cifra de afaceri globală

5. Câte contracte/proiecte care au avut ca obiect migrarea de aplicații/sisteme informatice în cloud (IaaS/PaaS) ați implementat în ultimii cinci ani și care a fost bugetul total aproximativ al acestor contracte/proiecte?

[Numărul de contracte/proiecte total și suma totală în euro], din care  
[Numărul de contracte/proiecte pentru instituții publice și suma aferentă în euro]

- 6. Câte contracte/proiecte care au avut ca obiect migrarea de aplicații/sisteme informatice în cloud (IaaS/PaaS) ați implementat în România în ultimii cinci ani și care a fost bugetul aproximativ al acestor contracte/proiecte?**  
[Numărul de contracte/proiecte și suma totală în euro]

## **Secțiunea 2: Piața și operațiunile**

Vă rugăm să ne vorbiți despre piața pe care vă desfășurați activitatea în ceea ce privește migrarea aplicațiilor către servicii cloud (IaaS/PaaS).

- 7. Ce tip de migrare a aplicațiilor către servicii cloud (IaaS/PaaS), dacă este cazul, externalizați/ subcontractați către parteneri sau prestatori terți? Vă rugăm să explicați de ce externalizați/ subcontractați aceste servicii.**  
[Text liber – limită de 500 de caractere]
- 8. Autoritatea contractantă ia în considerare selectarea unuia sau mai multor parteneri pentru prestarea de servicii de migrare a ~30 de aplicații în Cloud-ul Guvernamental (IaaS/PaaS). Ce anume v-ar descuraja să participați la această procedură/ aceste proceduri de atribuire?**  
[Text liber – limită de 500 de caractere]
- 9. În cazul în care Autoritatea Contractantă decide să grupeze aplicațiile în loturi sau proceduri de atribuire diferite, ce criteriu/criterii de grupare ați sugera să fie utilizate?**  
[Text liber – limită de 1000 de caractere]
- 10. De ce informații ați avea nevoie pentru fiecare dintre cele ~30 de aplicații vizate pentru a transmite o ofertă tehnico-financiară de calitate?**  
[Text liber – limită de 500 de caractere]
- 11. În opinia dvs., care sunt principalele riscuri și principalii factori critici de succes în executarea/ gestionarea migrării aplicațiilor în Cloud-ul Guvernamental (IaaS/PaaS)?**  
[Text liber – limită de 1000 de caractere]
- 12. Aveți alte informații pe care doriți să le comunicați despre piață și despre operațiunile dvs. cu privire la serviciile de migrare în cloud?**  
[Text liber – limită de 500 de caractere]

## **Secțiunea 3: Bugetare**

Vă rugăm să prezentați experiențe și opinii privind bugetarea pentru migrarea aplicațiilor către servicii cloud (IaaS/PaaS).

- 13. Care sunt principalele componente de cost și care ar fi ponderea relativă a acestora pentru migrarea aplicațiilor în cloud (IaaS/PaaS), din experiența dvs.? Acolo unde este cazul, vă rugăm să specificați acest aspect pentru fiecare dintre strategiile de migrare luate în considerare de către ADR și descrise mai sus.**  
[Text liber – limită de 500 de caractere]
- 14. Care ar fi un mecanism adecvat de ajustare a prețului contractului pentru migrarea aplicațiilor în cloud (IaaS/PaaS), din experiența dvs.?**  
[Text liber – limită de 500 de caractere]



15. Care ar fi factorii care v-ar cauza costuri neprevăzute la migrarea aplicațiilor în Cloud-ul Guvernamental și care ar fi cea mai bună modalitate pentru ca ADR să prevină acele costuri neașteptate?

[Text liber – limită de 500 de caractere]

16. Aveți alte informații pe care doriți să le comunicați cu privire la prețuri pentru a ajuta ADR să bugeteze în mod corespunzător contractul/ contractele de migrare în cloud (ex: tarif unitar zi/om per expert etc.)?

[Text liber – limită de 500 de caractere]

#### **Secțiunea 4: Aria de cuprindere a contractului cu ADR**

17. Cât de atractiv este pentru organizația dvs. obiectul anunțului de consultare publică?

[0 - Deloc atractivă; 10 - Foarte atractivă]

18. Pentru întrebarea precedentă, vă rugăm să indicați criteriile principale pe care se bazează evaluarea dvs.:

[Text liber – limită de 500 de caractere]

19. Cum poate ADR să crească atractivitatea procedurilor de atribuire vizate pentru organizația dvs.?

[Text liber – limită de 500 de caractere]

20. Din experiența dvs., care ar fi durata tipică de migrare pentru fiecare dintre cele trei strategii de migrare a aplicațiilor? Vă rugăm să transmiteți informații separat pentru (i) Regăzduire (en. Rehosting), (ii) Reorganizarea (revizuirea) platformei (en. Re-platform) și (iii) Reproiectare (en. Rearchitect) în experiența dvs.

[Text liber – limită de 1000 de caractere]

21. Vă rugăm să explicați principalele tipuri de expertiză și competență pe care le folosiți de obicei în cadrul serviciilor de migrare în cloud. Vă rugăm să detaliați pentru (i) Regăzduire (Rehost), (ii) Reorganizarea (revizuirea) platformei (Re-platform) și (iii) Reproiectare (Rearchitect).

[Text liber – limită de 1000 de caractere]

22. Ați lua în considerare trimiterea ofertei dvs. dacă ADR decide să lanseze o procedură de atribuire pentru servicii de migrare în cloud?

[Da/Nu]

23. Aveți alte informații pe care ați dori să le prezentați cu privire la obiectul serviciilor de migrare, pe care să le ia în considerare ADR?

[Text liber – limită de 500 de caractere]

#### **Secțiunea 5: Participarea la întâlnirile de consultare**

24. Vă rugăm să indicați dacă organizația dvs. ar dori să participe și la o întâlnire de consultare bilaterală cu ADR (online).

[Da/Nu]

25. Dacă ați răspuns afirmativ la întrebarea anterioară, vă rugăm să indicați preferințele de limbă pentru întâlnirea de consultare alegând unul dintre răspunsurile de mai jos:

[Vă rugăm să marcați răspunsul relevant cu galben]

- Pot asigura participarea personalului relevant la întâlnirea de consultare în limba română
- Pot asigura participarea personalului relevant la întâlnirea de consultare în limba engleză
- Nu am o preferință pentru limba de lucru

## 5.7 Bilateral Consultation Meetings – Presentation (ENG and RO)



MINISTERUL CERCETĂRII,  
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Planul Național  
de Redresare și Reziliență

# Market Consultation Bilaterals

Cloud migration services that will be procured for the new  
Romanian Governmental Cloud

2024

**This meeting is being recorded.**



MINISTERUL CERCETĂRII,  
INOVĂRII ȘI DIGITALIZĂRII



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### Meeting Agenda

Total duration of the meeting: max. 60 minutes

Subject	Duration
1 Introductory words from ADR	5m
2 Presentation of participants	5-10m
3 Answers on questions of clarifications from ADR	40-45m
4 Next steps and other topics relevant for the discussion	5m



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## Market Consultation Bilaterals - Housekeeping Rules

- The bilateral consultation is part of the Market Consultation process and aims to **clarify the information submitted in the questionnaires filled in by the participants** in the Market Consultation Questionnaire
- The session will last **max 60 minutes** and the participant will be asked **several questions** to clarify and elaborate on the information provided by the participant in the Market Consultation Questionnaire
- We **do not aim to share more technical and procurement-related information** at this stage, apart from what has already been shared in the dedicated vendor briefing session. The process of preparing the IT systems and applications for migration and the associated procurement procedures is on-going and will also be influenced by the outcomes of this market consultation process
- After the session, **a summary (representing the key points communicated) will be prepared and shared** with the participants for agreement. Feedback can be submitted within 2 working days, after which the summaries will be considered confirmed
- The results of the bilateral consultation will support the **preparation of a final Market Consultation report**
- The meeting **will be recorded**



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## Ședință bilaterală de consultare a pieței Servicii de migrare în cloud care vor fi achiziționate pentru Cloud-ul Guvernamental al României

Februarie – Martie 2024

**Această întâlnire este în curs de înregistrare**



MINISTERUL CERCETĂRII,  
INOVĂRII ȘI DIGITALIZĂRII



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## Ordinea de zi a ședinței

Durata totală a întâlnirii: max. 60 de minute

Subiect	Durată
1 Introducere din partea ADR	5 minute
2 Prezentarea participanților	5-10 minute
3 Răspunsuri la întrebările de clarificare ale ADR	40-45 minute
4 Pași următori și alte subiecte relevante pentru discuție	5 minute

## 5.8 Information Sessions – Presentation – English



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Planul Național  
de Redresare și Reziliență

# Market Consultation

## Cloud migration services that will be procured for the new Romanian Governmental Cloud

January 26<sup>th</sup>, 2024

**This meeting is being recorded.**



MINISTERUL CERCETĂRII,  
INOVĂRII ȘI DIGITALIZĂRII



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### Opening Remarks

Welcome and Introduction by the President of the ADR, Mr. Dragoș - Cristian Vlad



“ The Romanian Government cloud has a critical role in the end-to-end digital transformation infrastructure supporting e-government. We are aiming for a leap in the quality and cost-efficiency of public service, with cloud computing at the core of our citizen centric public digital ecosystem. We expect the advancements and best features of cloud technologies to provide flexibility, security, scalability and productivity to the Romanian administration and act as a key driver for public service innovation and effective handling of dynamic workloads.

President of the ADR, Mr. Dragoș - Cristian Vlad

”

1) Opening Remarks



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## Today's Agenda

We foresee ~30 minutes for interaction between the ADR and the economic operators

Topic
1 Opening Remarks by the President of the ADR
2 Agenda, Introduction of stakeholders & Housekeeping
3 Introduction to the Romanian Government and the role of the involved institutions in the cloud development
4 Overview of Investment 2 NRRP
5 Technical aspects and context about the selected IT systems/applications to be migrated
6 Objective of the Market Consultation
7 Timeline & Next Steps
8 Question & Answer
9 Closing remarks

2) Agenda, Introduction & Housekeeping



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## Introduction & Housekeeping

Today's aim is to enable economic operators to get a better understanding of the objectives of the Romanian government regarding the implementation of Investment 2, NRRP

- This meeting is being recorded
- Please keep your questions for the dedicated interactive slot by hand-raising or submit them in the chat
- This meeting is hosted by ADR and ADR is joined by its advisors:
  - ✓ European Investment Bank (EIB) and Gartner
  - ✓ World Bank (WB)
- ADR is hosting two market consultation meetings:
  - ✓ Thursday, January 25<sup>th</sup>, 2024: Session in Romanian
  - ✓ Friday, January 26<sup>th</sup>, 2024: Session in English
- We have the ambition to stick to the schedule to respect participants' time
- Today's meeting will have different speakers and will be coordinated by ADR
- We foresee 30 minutes for interaction between ADR and the economic operators
- Participants in this meeting will receive a copy of the slides within three working days
- We will mute the audience until the interactive part

*This presentation aims to share current insights, but information contained in this presentation is subject to change.*

2) Agenda, Introduction & Housekeeping



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## Introduction to the Romanian government & role of the involved institutions in the cloud development

To implement the Private Government Cloud (PGC), ADR, STS and SRI carry out public procurement procedures, compliant with applicable Romanian legislation.

### Ministry of Research, Innovation & Digitalization (MoRID)

- Coordinates the NRRP Component 7
- Initiates/updates the legal framework for cloud platform development, ensures availability of the required budget for its operations

### Authority for Digitalisation of Romania (ADR)

- Operational administrator of the Government Cloud
- Cloud service provider, responsible for SaaS
- Responsible for the dedicated cloud unit
- Coordinates the entire process of the IT applications/systems migration**



### Special Telecommunications Service (STS)

- Technical, operational and cybersecurity administrator of the cloud infrastructure and IaaS and PaaS provider of the internal cloud unit

### National Cyberint Center - Romanian Intelligence Service (RIS)

- Cybersecurity administrator for the SaaS services of the internal cloud unit and ensures cybersecurity regarding complex risks and vulnerabilities (eg: APT)

### Public Institutions/Authorities

- Owners of IT systems/applications

3) Introduction to the Romanian government



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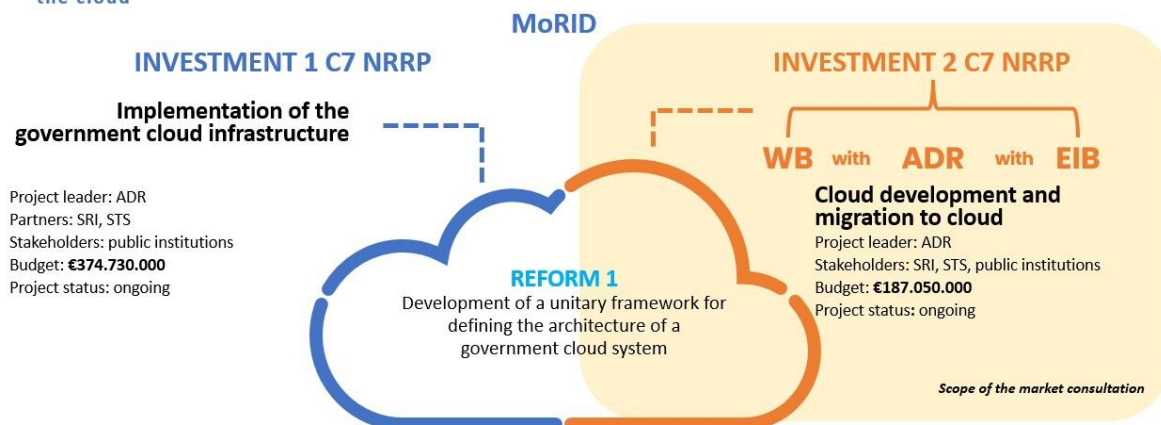
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## Introduction to the Romanian government & role of the involved institutions in the cloud development

Investment 1 is preparing the ground for Investment 2, during which applications will be migrated to the cloud

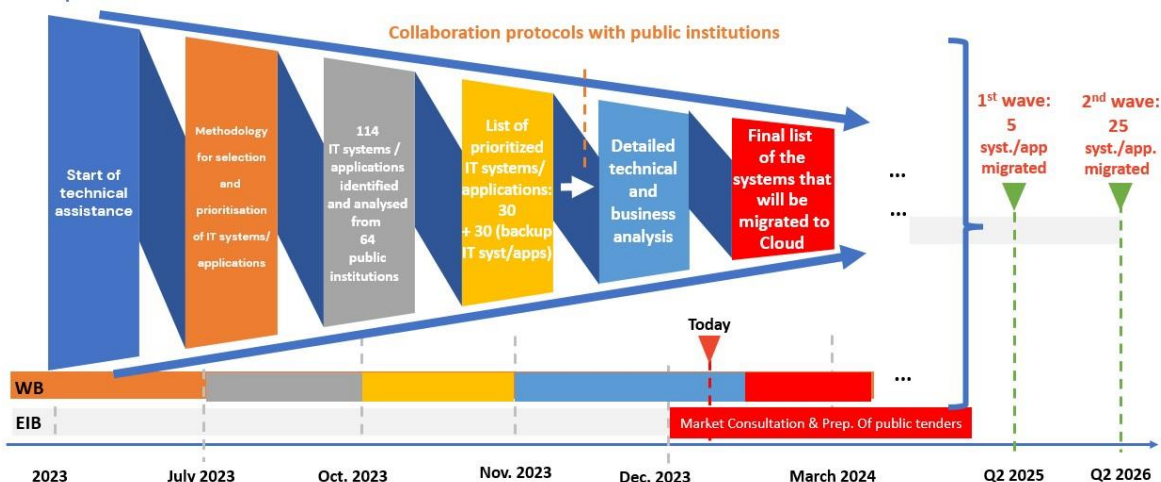


3) Introduction to the Romanian government



## Overview of Investment 2 NRRP

### Implementation timeline & milestones



4) Overview of Investment 2 NRRP

## Technical aspects and context about the selected IT systems/applications to be migrated

In this section we will provide insight into the technical aspects of the upcoming cloud migration.

### Background of the Private Government Cloud set-up in Investment 1



### Key technical information on selected and prioritised IT systems/applications



### Forecasted Migration Strategies



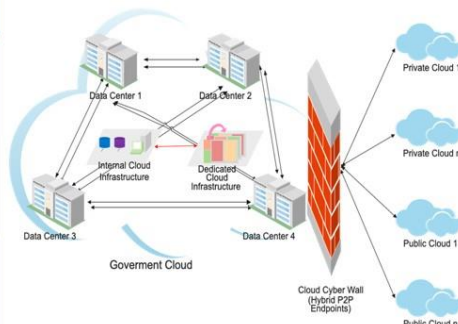
Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects

## Technical aspects and context about the selected IT systems/applications to be migrated

The Private Government Cloud will consist of an (i) internal and (ii) dedicated cloud unit.

Internal Cloud Unit Related to Level 1 described in NRRP	Dedicated Cloud Unit Related to Level 2 described in NRRP
Will be made up of distinct node clusters for the provision of <b>IaaS and PaaS</b> services	<b>The Dedicated Cloud</b> will consist of <b>complete cloud units (IaaS/PaaS/SaaS)</b> provided on –premise by a hyperscaler
The 2 cloud units will be integrated at the service level for the purpose of interoperability/portability at the data level between the systems that will be hosted in the PGC	
The Internal Cloud unit of the PGC is interconnected with the Dedicated cloud unit at service level and with other public cloud or private cloud services in the platform. According to the Government Ordinance <b>no. 89/2022</b>	



Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects

## Technical aspects and context about the selected IT systems/applications to be migrated

Overview of the pool of selected IT systems/applications

### Scope of research:

80 central public institutions visited from Aug. – Oct. 2023

114 IT systems/applications analysed from 64 institutions

### Prerequisites:

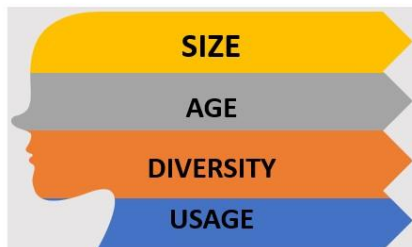
1. Providing public services to citizens and companies.
2. Avoiding double funding for hardware purchase / avoiding sustainability constraints
3. Migration timeline to comply with NRRP milestones (5 by Q2 2025 / 25 by Q2 2026)

### Forecasted migration strategies

Re-hosting

Re-platforming (Revise)

Re-architecture



### GENERAL FINDINGS

1. WIDE RANGE OF SYSTEMS' DIMENSIONS
2. WIDE RANGE OF SYSTEMS' AGE
3. LARGE TECHNOLOGICAL DIVERSITY
4. PUBLIC SERVICES

Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects

## Technical aspects and context about the selected IT systems/applications to be migrated

Overview of the pool of selected IT systems/applications, considered for migration in both waves

### NUMBER OF IT SYSTEMS/APPLICATIONS

**30 IT systems/applications**



### TYPE OF IT&C SYSTEMS/APPLICATIONS

Web-based client-server  
applications/systems that use  
virtualization technologies



### ARCHITECTURAL MODEL OF IT&C SYSTEMS/APPLICATIONS

Service-oriented: ~ 22%  
Modular: ~ 44%  
Monolith: ~ 25%  
Microservices: ~ 9%



Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects

## Technical aspects and context about the selected IT systems/applications to be migrated

Overview of the pool of selected IT systems/applications, as considered for migration in both waves

### Hardware information



#### No. of virtual entities (= VMs or containers)

1. < 10: 59%
2. 11 - 20: 19%
3. > 20: 22%



#### No. of processing units (= cores)

1. < 20: 44%
2. 21 - 50: 16%
3. > 50: 40%



#### RAM size

1. < 64 Gb: 31%
2. 64 Gb - 128 Gb: 28%
3. > 128 Gb: 41%



### Software information



#### Operating systems\*

1. Microsoft Windows Server: 69%
2. Linux (various distributions): 63%



#### Databases\*

1. Oracle Database: 19%
2. Microsoft SQL Server: 47%
3. Open source databases (MySQL, PostgreSQL, etc): 56%
4. NoSQL database: 6%



#### Development stack\*

1. .Net Framework: 41%
2. Java: 47%
3. PHP: 47%
4. Python: 6%
5. Other programming languages (C++, JS, etc): 9%

\* One IT system/application may use one or more types of OS/DB/dev. stack

Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects



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## Technical aspects and context about the selected IT systems/applications to be migrated

Overview of the pool of selected IT systems/applications, considered for migration in the 1<sup>st</sup> wave

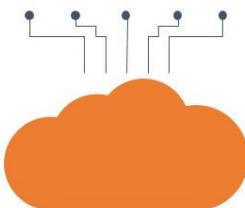
### NUMBER OF IT SYSTEMS/APPLICATIONS

12 IT systems/applications



### TYPE OF IT&C SYSTEMS/APPLICATIONS

Web-based client-server  
applications/systems that use  
virtualization technologies



### ARCHITECTURAL MODEL OF IT&C SYSTEMS/APPLICATIONS

Service-oriented: ~ **42%**  
Modular: ~ **42%**  
Monolith: ~ **8%**  
Microservices: ~ **8%**



Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects



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## Technical aspects and context about the selected IT systems/applications to be migrated

Overview of the pool of selected IT systems/applications, as considered for migration in the 1<sup>st</sup> wave

### Hardware information



No. of virtual entities (= VMs or containers)

1. < 10: 66%
2. 11 - 20: 17%
3. > 20: 17%



No. of processing units (= cores)

1. < 20: 50%
2. 21 - 50: 25%
3. > 50: 25%



RAM size

1. < 64 Gb: 50%
2. 64 Gb - 128 Gb: 17%
3. > 128 Gb: 33%



### Software information



Operating systems\*

1. Microsoft Windows Server: 92%
2. Linux (various distributions): 25%



Databases\*

1. Oracle Database: 17%
2. Microsoft SQL Server: 67%
3. Open source databases (MySQL, PostgreSQL, etc): 33%



Development stack\*

1. .Net Framework: 67%
2. PHP: 25%
3. Python: 8%

\* One IT system/application may use one or more types of OS/DB/dev. stack

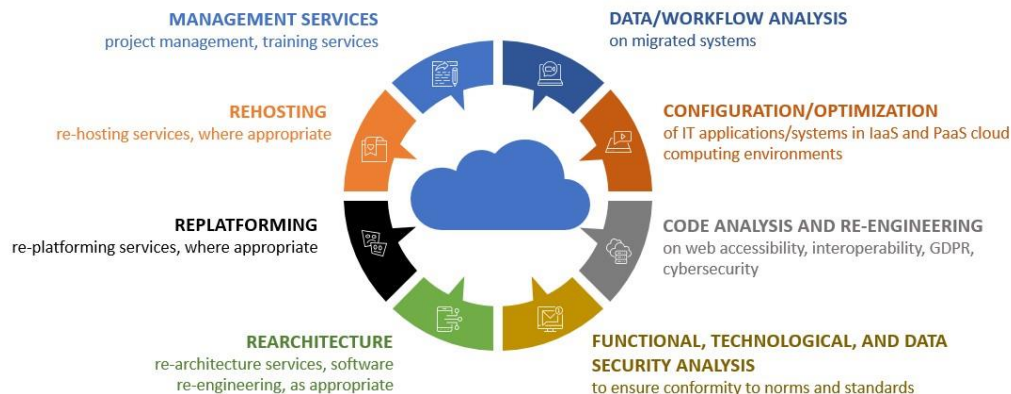
Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects



## Technical aspects and context about the selected IT systems/applications to be migrated

We assume the following expertise and services will be required for the migration process(es).



Please note that after the in-depth technical analysis, the list of IT systems/applications might be adjusted

5) Technical Aspects

## Technical aspects and context about the selected IT systems/applications to be migrated

Each application is being documented using structured templates, ensuring consistency in the tender documentation

General presentation of system	General presentation of PCG services
<p> Name, purpose, involved entities, main logical components of system, main functionalities of system, general system performance available documentation</p> <p> Description of functional model of system (workflows, users and roles, UI)</p> <p> Description of system architecture, model and installation procedures*</p> <p> Technological stack description (programming languages, databases, frameworks, middleware products, enterprise platforms); list of currently used licences; Maintenance arrangements; General description of system data (nature of data processed by system, types, formats and data warehouses, data security measures)</p> <p> Description of system's interrelation with other systems (interrelation of third - party systems with the analysed system, interrelation of analysed system with third party systems)</p>	<p> List of PGC services</p> <p> Database as a Service (DBaaS) description</p> <p> Monitoring as a Service (MOaaS) description</p> <p> Security Incident and Event Management as a Service (SIEMaaS) description</p>

\* Installation procedures: procedures of system, model components, hardware resources, software resources, resources allocation and release model, security measures, scalability measures, HA measures, monitoring and journalize measures, tools and practices: DevOps and CI/CD, system hosting environment)

Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects

## Technical aspects and context about the selected IT systems/applications to be migrated

The expectations for each application are being documented using structured templates, ensuring consistency in the tender documentation

### General presentation of system

- ✓ Vision on the migration of system, migration process organization
- ✓ Pre-migration requirements
- ✓ Migration requirements (re-architecture requirements and technology stack, functionalities requirements, performance requirements, accessibility requirements, containerization requirements, migration to DBaaS requirements)
- ✓ Installation of system in PGC (component installation, monitoring requirements, journalize requirements)
- ✓ Data migration
- ✓ System security
- ✓ Migration of system testing

TO BE Section

### General presentation of PCG services

- ✓ System continuity insurance (backup policy requirements, DR requirements)
- ✓ Technical support (SLAs, escalation procedures)
- ✓ Support and maintenance
- ✓ Annexes (eg. Risk management)

Please note that after the in-depth technical analysis the list of IT systems/applications might be adjusted

5) Technical Aspects

## Objective of the Market Consultation

Your input will help ADR assess the different go-to-market options, while also increasing the attractiveness of the upcoming tender(s) for interested economic operators

- 1

**Ensure sufficient and correct information of the market**

ADR wants to have an exhaustive view of the market capabilities in the cloud application migration space and to capture best practices and success stories in this space.
- 2

**Improve the overall tendering process**

The end goal of the market consultation is to serve as input for creation of a tendering package that includes the required technical information and that can be delivered within the timelines prescribed by ADR.
- 3

**Assess options for the go-to-market (bundling)**

ADR aims to finetune the structuring of the tendering into logical sets of applications that are most attractive for the market in order to increase the success chances of the migration.

6) Objective of the Market Consultation



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## Objective of the Market Consultation – focus on the questionnaire

The market consultation document includes the consultation questionnaire and responses can be recorded directly in the Microsoft Word format document.

The market consultation captures 5 types of data:

- **Section 1: Organisation profile**  
Detailed organizational sizing and delivery experience for application cloud migration
- **Section 2: Market and operations**  
Capturing market input toward improving the tendering package and better understanding current practices in the cloud application migration market
- **Section 3: Budgeting**  
Information to better inform the costing and pricing aspects of the tendering package
- **Section 4: Scope of the contract with ADR**  
Overall tender package attractiveness deep-dive and detailed experiences in system/application migration
- **Section 5: Participation in consultation meetings**  
Indication of interest to participate in bi-lateral consultation meetings and language preference  
(submitting the questionnaire is a pre-requisite to participate)

Responses are expected no later than 23:59 (Romania time) on the 4th February 2024 to [achizitii@adr.gov.ro](mailto:achizitii@adr.gov.ro)

6) Objective of the Market Consultation



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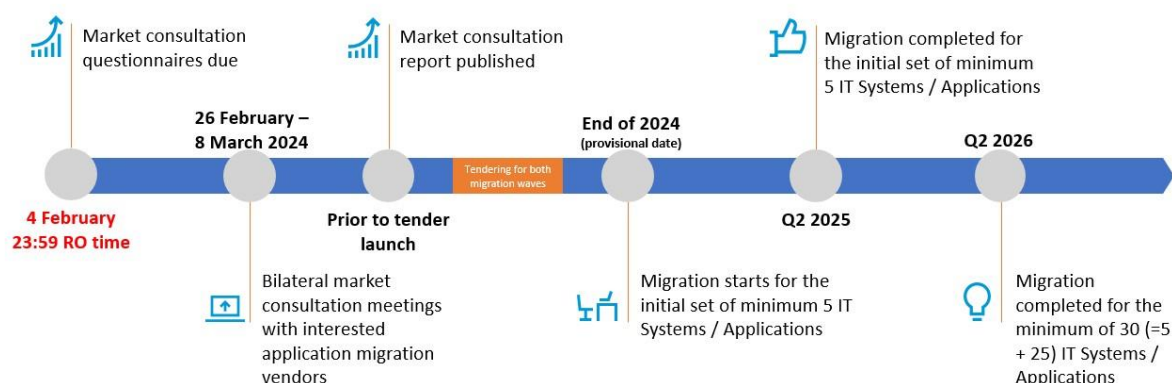
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## Timeline & Next Steps

It is crucial that the application migration follows a strict schedule after the market consultation



7) Timeline & Next Steps



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8) Q&A



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### Closing Remarks

Thank you all for dedicating your valuable time to participate in today's meeting.  
Your engagement is crucial as we collectively contribute to an important initiative for the  
Romanian government, positively impacting our nation's future.

**Your commitment is truly appreciated.**



We are looking forward to your feedback and submission of the  
questionnaire at [achizitii@adr.gov.ro](mailto:achizitii@adr.gov.ro).

9) Closing Remarks



# Thank you

Authority for Digitalisation of Romania



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[contact@adr.gov.ro](mailto:contact@adr.gov.ro)



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## Technical aspects and context about the selected IT systems/applications to be migrated

Outline of forecasted migration strategies: Rehost, Replatform and Rearchitect



### Rehost

In this alternative, you “lift and shift” your application from its current physical or virtual environment onto a cloud infrastructure as a service (IaaS) or container as a service (CaaS) platform. While doing so, you avoid any modifications to the system other than those required to adapt to the hosting environment itself. Although this is the least-ambitious and least-beneficial alternative, it is also the quickest to implement to “get to the cloud.” However, the application will not be cloud-native.



### Replatform (Revise)

In this alternative, you modify your application so that it can begin to take advantage of cloud capabilities for elasticity and minimized resource use. This strategy is focused on reducing operational overhead through the use of managed cloud services (e.g., database PaaS). You might opt to use IaaS or CaaS for the application, but at this stage, you could also choose certain platform as a service (PaaS) capabilities.






### Rearchitect

In this alternative, you materially alter the application so that you can shift it to a cloud-optimized architecture, making heavy use of cloud-native capabilities. The rearchitect alternative is an in-depth undertaking requiring changes to culture, technology, people, processes and platforms. Rearchitect is appropriate for migration projects targeting cloud-native application platforms with a choice of PaaS, PaaS and serverless.



## Technical aspects and context about the selected IT systems/applications to be migrated

### Comparison of the migration strategies

			
Domain	Rehost	Replatform (Revise)	Rearchitect
Programming Language	No change	No change	No change
Source Code	No change	Lightly updated	Updated / new
Application Configuration / Metadata	No change / updated	Extended	Extended
System Configuration	No change / updated	Updated / new	Transformed
Build, Packaging and Configuration Scripts	No change / new	Updated / new	Transformed
Frameworks	No change	No change	No change / new
Runtime Environment	No change	No change	No change / new
Application Data	No change	No change / transformed	No change / transformed
Hosting Hardware	New	New	New

## 5.9 Information Sessions – Presentation – Romanian



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# Consultare a pieței

## Achiziționarea de servicii de migrare în cloud pentru migrarea sistemelor/aplicațiilor IT în Cloud-ul Guvernamental al României

25 ianuarie 2024

**Această întâlnire este înregistrată.**



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### Cuvânt de deschidere

Bun - venit și introducere din partea Președintelui ADR, DI. Dragoș - Cristian Vlad



“ Cloud-ul Guvernamental al României are un rol critic în procesul de transformare digitală care sprijină e-guvernarea. Ne propunem un salt în ceea ce privește calitatea și eficiența costurilor serviciilor publice, având cloud-ul guvernamental în centrul ecosistemului nostru digital public orientat spre cetățeni.

Ne așteptăm ca cele mai noi tehnologii de cloud să ofere flexibilitate, securitate, scalabilitate și productivitate administrației publice române și să acționeze ca un stimulent pentru inovarea serviciilor publice și gestionarea eficientă și în mod dinamic a fluxurilor de lucru și a resurselor.

Președintele ADR, DI. Dragoș - Cristian Vlad

”

1) Cuvânt de deschidere



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## Agenda de astăzi

Prevedem ~30 de minute pentru interacțiunea dintre ADR și operatorii economici

Subiect
1 Cuvântul de deschidere al președintelui ADR
2 Agendă, introducerea participanților și a regulilor de desfășurare a întâlnirii
3 Prezentarea rolului instituțiilor implicate în dezvoltarea cloud-ului guvernamental
4 Prezentare generală a investiției 2 PNRR
5 Aspecte tehnice și de context despre sistemele/aplicațiile IT selectate pentru migrarea în cloud
6 Obiectivele consultării pieței
7 Calendar și etape următoare
8 Întrebări & răspunsuri
9 Cuvânt de încheiere

2) Agendă, introducerea participanților și a regulilor de desfășurare a întâlnirii



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## Introducerea participanților și a regulilor de desfășurare a întâlnirii

Scopul întâlnirii de astăzi este de a prezenta operatorilor economici obiectivele Guvernului României în ceea ce privește implementarea Investiției 2, PNRR

- Această întâlnire este înregistrată
- Întrebările pot fi adresate prin chat pe toată durata întâlnirii și/sau prin ridicarea mâinii în intervalul interactiv dedicat
- ✓ Această întâlnire este găzduită de ADR, iar ADR este însoțită de consultanții săi:
  - ✓ Banca Europeană de Investiții (BEI) și Gartner
  - ✓ Banca Mondială (BM)
- ✓ ADR găzduiește două întâlniri de informare a pieței:
  - ✓ Joi, 25 ianuarie 2024: Sesiune în limba română
  - ✓ Vineri, 26 ianuarie 2024: Sesiune în limba engleză
- Vom menține cu strictețe programul pentru a respecta timpul participanților
- Preconizăm 30 de minute pentru interacțiunea dintre ADR și operatorii economici
- În termen de trei zile lucrătoare de la data prezentei întâlniri, participanții vor primi prezentarea
- Audiența va putea interveni în partea interactivă dedicată

*Această prezentare conține informații la zi, dar care pot suferi unele modificări până la data lansării procedurilor de atribuire*

2) Agendă, introducerea participanților și a regulilor de desfășurare a întâlnirii



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## Prezentarea rolului instituțiilor implicate în dezvoltarea cloud-ului guvernamental

Pentru implementarea Cloud-ului Privat Guvernamental (CPG), ADR, STS și SRI desfășoară proceduri de achiziții publice, în conformitate cu legislația română aplicabilă.

### Ministerul Cercetării, Inovării și Digitalizării (MCID)

- Coordonează componenta 7 a PNRR
- Inițiază/actualizează cadrul legislativ pentru dezvoltarea platformei cloud, asigură disponibilitatea bugetului necesar operațiunilor acestuia

### Autoritatea pentru Digitalizarea României (ADR)

- Administrator operațional al Cloud-ului Guvernamental
- Furnizor de servicii cloud, responsabil pentru SaaS
- Responsabil pentru unitatea de cloud dedicat
- **Coordonează întregul proces de migrare a aplicațiilor/sistemelor IT**



### Serviciul de Telecomunicații Speciale (STS)

- Administrator tehnic, operațional și de securitate cibernetică al infrastructurii de cloud și furnizor IaaS și PaaS al unității de cloud intern

### Centrul Național Cyberint - Serviciul Român de Informații (SRI)

- Administrator de securitate cibernetică pentru serviciile SaaS ale unității de cloud intern și asigură securitatea cibernetică a CPG în ceea ce privește riscuri și vulnerabilități complexe (de exemplu: APT)

### Instituții/Autorități Publice

- Dețin sistemele/aplicațiile informatice

3) Prezentarea rolului instituțiilor implicate în dezvoltarea cloud-ului guvernamental



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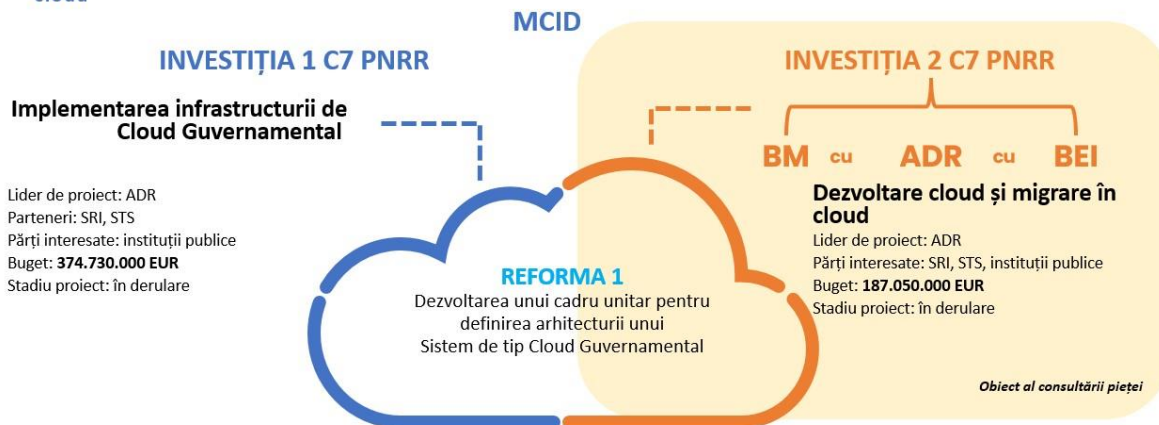
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## Prezentarea rolului instituțiilor implicate în dezvoltarea cloud-ului guvernamental

Investiția 1 pregătește infrastructura pentru Investiția 2 în cadrul căreia aplicațiile vor fi migrate în cloud

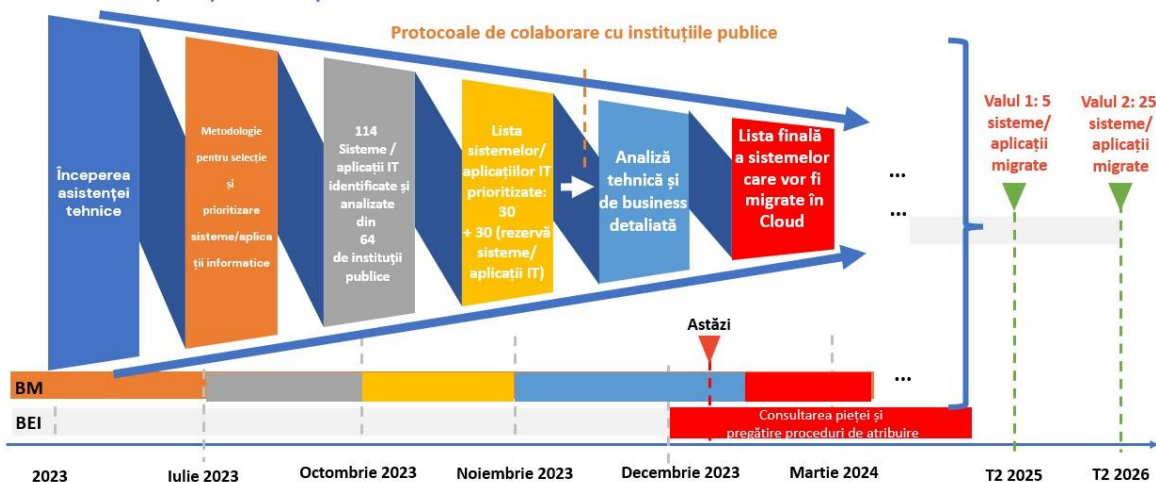


3) Prezentarea rolului instituțiilor implicate în dezvoltarea cloud-ului guvernamental



## Prezentare generală a investiției 2 PNRR

### Calendarul și etapele de implementare



4) Prezentare generală a investiției 2 PNRR

## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

În această secțiune vom oferi o perspectivă asupra aspectelor tehnice ale viitorului proces de migrare în cloud.

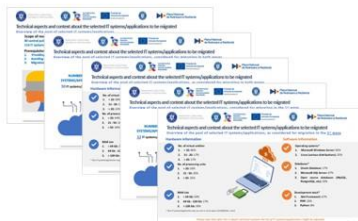
### Configurația Cloud-ului Privat Guvernamental în Investiția 1

1



### Informații tehnice esențiale privind sistemele/aplicațiile IT selectate și prioritizate

2



### Strategii de migrare preconizate

3



Vă rugăm să rețineți că, după analiză tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



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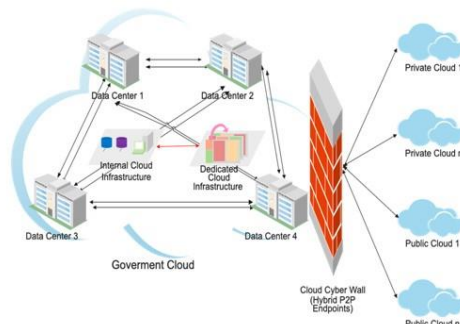


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## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Cloud-ul Privat Guvernamental va fi format din: (i) o unitate de cloud intern și (ii) o unitate de cloud dedicat.

Unitate de Cloud Intern Conform Nivel 1 descris în PNRR	Unitate de Cloud Dedicat Conform Nivel 2 descris în PNRR
Va fi alcătuită din clustere distincte de noduri pentru furnizarea de servicii IaaS și PaaS	Cloud-ul dedicat va consta în unități cloud complete (IaaS / PaaS / SaaS) on - premise furnizate de un hyperscaler.
Unitățile de cloud vor fi integrate la nivel de servicii în scopul interoperabilității / portabilității la nivel de date între sistemele care vor fi găzduite în CPG.	
Unitatea de cloud intern este interconectată la nivel de servicii cu unitatea de cloud dedicat și cu alte cloud-uri publice sau private din platformă. Conform Ordonanței Guvernului nr. 89/2022, cu modificările și completările ulterioare	



Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



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## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Prezentare generală a grupului de sisteme/aplicații informatice selectate

### Dimensiunea analizei:

80 de instituții publice centrale vizitate în perioada august – octombrie 2023

114 sisteme/aplicații informatice analizate de la 64 de instituții

### Condiții de eligibilitate în vederea prioritizării în procesul de migrare:

1. Prestarea de servicii publice cetățenilor și companiilor
2. Evitarea dublei finanțări pentru achiziționarea de hardware / evitarea constrângerilor de sustenabilitate
3. Calendarul migrării pentru respectarea jaloanelor PNRR (5 până în T2 2025 / 25 până în T2 2026)

### Strategii de migrare preconizate

- Re-hosting
- Re-platforming (Revise)
- Re-architecturing



### CONSTATARI GENERALE

1. GAMĂ LARGĂ DE DIMENSIUNI ALE SISTEMELOR
2. GAMĂ VARIATĂ A DURATEI DE UTILIZARE A SISTEMELOR
3. DIVERSITATE TEHNOLOGICĂ EXTINSĂ
4. SERVICII PUBLICE

Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



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## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Prezentare generală a grupului de sisteme/aplicații informatice selectate, luate în considerare pentru migrarea în ambele valuri

### NUMĂRUL DE SISTEME/APLICAȚII IT

30 Sisteme/aplicații IT



### TIPUL SISTEMELOR/APLICAȚIILOR IT&C

Aplicații/sisteme client-server bazate  
pe web care utilizează tehnologii de  
virtualizare



### MODEL ARHITECTURAL SISTEME/APLICAȚII IT&C

Orientat spre servicii: ~ 22%  
Modular: ~ 44%  
Monolit: ~ 25%  
Microservicii: ~ 9%



Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



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## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Prezentare generală a grupului de sisteme/aplicații informatice selectate, luate în considerare pentru migrarea în ambele valuri

### Informații hardware

- Nr. entități virtuale (=Mașini Virtuale sau containere)**
1. < 10: 59%
  2. 11 - 20: 19%
  3. > 20: 22%

- Nr. unități centrale de procesare (=nuclee)**
1. < 20: 44%
  2. 21 - 50: 16%
  3. > 50: 40%

- Dimensiune memorie RAM**
1. < 64 Gb: 31%
  2. 64 GB - 128 Gb: 28%
  3. > 128 Gb: 41%

\* Un sistem/aplicație IT poate utiliza unul sau mai multe tipuri de SO/BD/ limbaje programare/platf. dezvolt.



### Informații software

- Sisteme de operare\***
1. Microsoft Windows Server: 69%
  2. Linux (diverse distribuții): 63%

- Baze de date\***
1. Oracle Database: 19%
  2. Microsoft SQL Server: 47%
  3. Baze de date open source (MySQL, PostgreSQL etc.): 56%
  4. Bază de date NoSQL: 6%

- Limbaje de programare/platforme de dezvoltare\***
1. .NET Framework: 41%
  2. Java: 47%
  3. PHP: 47%
  4. Python: 6%
  5. Alte limbaje de programare (C++, JS, etc): 9%

Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice





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## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Prezentare generală a grupului de sisteme/aplicații informatice selectate, luate în considerare pentru migrarea în primul val

### NUMĂRUL DE SISTEME/APLICAȚII IT

**12** Sisteme/aplicații IT



### TIPUL SISTEMELOR/APLICAȚIILOR IT&C

Aplicații/sisteme client-server bazate  
pe web care utilizează tehnologii de  
virtualizare



### MODEL ARHITECTURAL SISTEME/APLICAȚII IT&C

Orientat spre servicii: ~ 42%  
Modular: ~ 42%  
Monolit: ~ 8%  
Microservicii: ~ 8%



Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



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## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Prezentare generală a grupului de sisteme/aplicații informatice selectate, luate în considerare pentru migrarea în primul val

### Informații hardware

Nr. entități virtuale (= Mașini Virtuale sau  
containere)

- 1. < 10: 66%
- 2. 11 - 20: 17%
- 3. > 20: 17%

Nr. unități centrale de procesare (=nuclee)

- 1. < 20: 50%
- 2. 21 - 50: 25%
- 3. > 50: 25%

Dimensiune memorie RAM

- 1. < 64 Gb: 50%
- 2. 64 Gb - 128 Gb: 17%
- 3. > 128 Gb: 33%



### Informații software

Sisteme de operare\*

- 1. Microsoft Windows Server: 92%
- 2. Linux (diverse distribuții): 25%

Baze de date\*

- 1. Oracle Database : 17%
- 2. Microsoft SQL Server: 67%
- 3. Baze de date open source (MySQL, PostgreSQL etc.): 33%

Limbaje de programare/platforme de dezvoltare\*

- 1. .Net Framework: 67%
- 2. PHP: 25%
- 3. Python: 8%

\* Un sistem/aplicație IT poate utiliza unul sau mai multe tipuri de SO/BD / limbaje programare/platf. dezvoltare

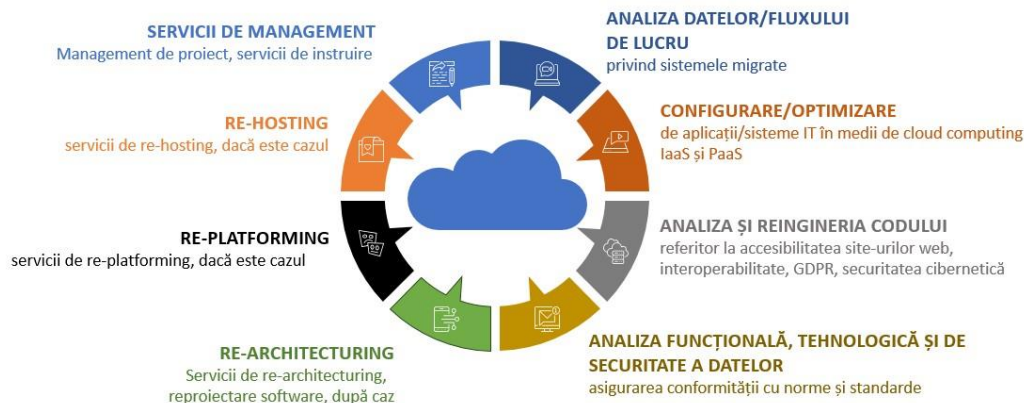
Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Anticipăm că următoarele tipuri de expertiză și servicii vor fi necesare pentru procesul (procesele) de migrare.



Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Informațiile referitoare la fiecare aplicație sunt documentate cu ajutorul unor modele structurate care asigură coerența documentațiilor de atribuire

### Prezentarea generală a sistemului

- ✓ Denumirea, scopul, entitățile implicate, principalele componente logice ale sistemului, principalele funcționalități ale sistemului, performanța generală a sistemului din documentația disponibilă
- ✓ Descrierea modelului funcțional al sistemului (fluxuri de lucru, utilizatori și roluri, UI)
- ✓ Descrierea arhitecturii sistemului, a modelului și a procedurilor de instalare\*
- ✓ Descrierea stivei tehnologice (limbaje de programare, baze de date, framework-uri, produse middleware, platforme enterprise); lista licențelor utilizate în prezent; aranjamente priv. mentenanță; Descrierea generală a datelor sistemului (natura datelor prelucrate de sistem, tipuri, formate și depozite de date, măsuri de asigurare a securității datelor)
- ✓ Descrierea interdependenței sistemului cu alte sisteme (dependența sistemelor terțe de sistemul analizat, dependențe ale sistemului analizat cu alte sisteme)

### Situația actuală

### Prezentarea generală a serviciilor CPG

- ✓ Lista serviciilor CPG
- ✓ Descriere Database as a Service (DBaaS)
- ✓ Descriere Monitoring as a Service (MOaaS)
- ✓ Descriere Security Incident and Event Management as a Service (SIEAMaaS)

\* Proceduri de instalare: proceduri de sistem, componente model, resurse hardware, resurse software, modalitatea de alocare și eliberare a resurselor, măsuri de securitate, măsuri de scalabilitate, măsuri HA, tehnici de monitorizare și jurnalizare, instrumente și practici: DevOps și CI / CD, mediu de găzduire a sistemului

Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



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## Aspecte tehnice și context despre sisteme/aplicațiile IT selectate pentru migrare

Informațiile referitoare la fiecare aplicație sunt documentate cu ajutorul unor modele structurate care asigură coerență documentațiilor de atribuire

### Prezentarea generală a sistemului



Viziune asupra migrării sistemului, organizarea procesului de migrare



Cerințe privind măsurile pre- migrare



Cerințe executarea migrării (cerințe de re-arhitectură și stivă tehnologică, cerințe privind funcționalitățile, cerințe de performanță, cerințe privind accesibilitatea, cerințe privind containerizarea, cerințe privind migrarea către DBaaS)



Instalarea sistemului în CPG (instalarea componentelor, cerințe de monitorizare, cerințe de jurnalizare)



Migrarea datelor



Securitatea sistemului



Testarea migrării sistemului

### Situația viitoare

### Prezentarea generală a serviciilor CPG



Asigurarea continuității sistemului (cerințe privind politica de backup, cerințe DR)



Suport tehnic (niveluri de servicii agreeate, proceduri de escaladare)



Suport și mentenanță



Anexe (de exemplu Managementul riscului)

Vă rugăm să rețineți că, după analiza tehnică aprofundată, lista sistemelor/aplicațiilor informatice poate fi ajustată.

5) Aspecte tehnice



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## Obiectivele consultării pieței

Contribuțiile dumneavoastră vor ajuta ADR să evalueze diferitele opțiuni de proiectare a viitoarelor proceduri de atribuire, sporind în același timp atractivitatea lor pentru operatorii economici interesați

1

### Obținerea unor informații suficiente și corecte despre piață

ADR dorește să își formeze o viziune exhaustivă asupra capacităților pieței în domeniul migrării aplicațiilor în cloud și să se informeze despre bunele practici și poveștile de succes din acest domeniu.

2

### Îmbunătățirea procedurilor de atribuire

Scopul final al consultării pieței este de a servi drept contribuție la crearea unui pachet de proceduri de atribuire care să includă informațiile tehnice necesare și care să poată fi derulat în termenele prevăzute de ADR.

3

### Evaluarea opțiunilor pentru organizarea procedurilor de atribuire (grupare)

ADR își propune să organizeze procedurile de atribuire în funcție de seturi logice de aplicații cât mai atractive pentru piață în vederea creșterii șanselor de succes al migrării.

6) Obiectivele consultării pieței





## Obiectivele consultării pieței – accent pe chestionar

Documentul de consultare a pieței include un chestionar iar răspunsurile pot fi consemnate direct în documentul în format Microsoft Word.

Consultarea pieței vizează 5 tipuri de informații:

- **Secțiunea 1: Profilul organizației**  
Dimensiunea detaliată a organizației și experiența în migrarea aplicațiilor în cloud
- **Secțiunea 2: Piața și operațiunile**  
Opiniile pieței pentru îmbunătățirea pachetului de proceduri de atribuire și o mai bună înțelegere a practicilor actuale pe piața migrării aplicațiilor în cloud
- **Secțiunea 3: Buget**  
Informații pentru o mai bună înțelegere a aspectelor legate de costuri și prețuri pentru viitoarele proceduri de atribuire
- **Secțiunea 4: Aria de cuprindere a contractului/contractelor cu ADR**  
Atractivitatea generală a pachetului de proceduri de atribuire, experiențe specifice în migrarea sistemelor/aplicațiilor
- **Secțiunea 5: Participarea la întâlnirile de consultare**  
Manifestarea interesului de a participa la întâlnirile bilaterale de consultare și preferința față de limba de lucru  
(**trimiterea chestionarului reprezintă o condiție prealabilă pentru participare**)

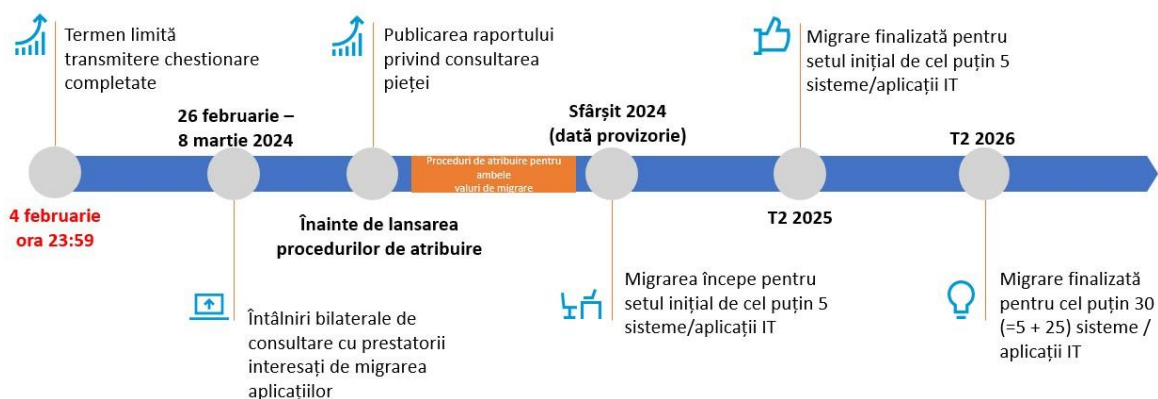
Răspunsurile sunt așteptate până cel târziu la ora 23:59 (ora României) pe 4 februarie 2024 la adresa de email [achizitii@adr.gov.ro](mailto:achizitii@adr.gov.ro)

### 6) Obiectivele consultării pieței



## Calendar și etape următoare

Este esențial ca migrarea aplicațiilor să urmeze un calendar strict după consultarea pieței



### 7) Calendar și etape următoare



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## Întrebări și răspunsuri

8) Întrebări și răspunsuri



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### Cuvânt de încheiere

Vă mulțumim tuturor pentru că ați dedicat timp prețios participării la întâlnirea de astăzi. Aportul dumneavoastră este crucial deoarece contribuim colectiv la o inițiativă importantă pentru Guvernul României, cu impact pozitiv asupra viitorului societății și economiei românești.

**Angajamentul dumneavoastră este cu adevărat apreciat.**



**Așteptăm sugestiile/opiniile dvs. și trimiterea chestionarului completat la adresa de e-mail [achizitii@adr.gov.ro](mailto:achizitii@adr.gov.ro).**

9) Cuvânt de încheiere

# Vă mulțumim

Autoritatea pentru Digitalizarea României



[www.adr.gov.ro](http://www.adr.gov.ro)  
[contact@adr.gov.ro](mailto:contact@adr.gov.ro)



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## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

Vedere de ansamblu a strategiilor de migrare prevăzute: Rehost, Replatform și Rearchitect



### Rehost

În această alternativă, „ridicați și mutați” (en. Lift and shift) aplicația din mediul său fizic sau virtual curent pe o platformă IaaS (Infrastructure as a Service) sau CaaS (Container as a Service). În timp ce faceți acest lucru, evitați orice modificări ale sistemului, altele decât cele necesare pentru a vă adapta la mediul de găzduire în sine. Deși aceasta este alternativa cea mai puțin ambițioasă și mai puțin benefică, este, de asemenea, cea mai rapid de implementat pentru a „ajunge în cloud”. Cu toate acestea, aplicația nu va fi nativă în cloud.



### Replatform (Revise)

În această alternativă, modificați aplicația astfel încât să poată începe să profite de capacitățile cloud pentru elasticitate și utilizare minimizată a resurselor. Această strategie se concentrează pe reducerea cheltuielilor operaționale prin utilizarea serviciilor cloud gestionate (de exemplu, baza de date PaaS). Puteți opta să utilizați IaaS sau CaaS pentru aplicație, dar în această etapă, puteți alege și anumite capacități de PaaS (Platform as a Service).



### Rearchitect

În această alternativă, modificați semnificativ aplicația, astfel încât să o puteți trece la o arhitectură optimizată pentru cloud, utilizând intens capacitățile native în cloud. Alternativa de rearchitectură este un efort aprofundat care necesită schimbări în cultură, tehnologie, oameni, procese și platforme. Rearchitect este potrivit pentru proiectele de migrare care vizează platforme de aplicații native în cloud, cu posibilitatea de a alege între PaaS, PaaS și serverless.



## Aspecte tehnice și context despre sistemele/aplicațiile IT selectate pentru migrare

### Comparația strategiilor de migrare



Domeniu	Rehost	Replatform (Revise)	Rearchitect
Limbaaj de programare	Nicio schimbare	Nicio schimbare	Nicio schimbare
Codul sursă	Nicio schimbare	Ușor actualizat	Actualizat / nou
Configurarea aplicației / Metadata	Nicio schimbare / actualizat	Extins	Extins
Configurația sistemului	Nicio schimbare / actualizat	Nicio schimbare / nou	Transformat
Scripturi pentru Build, Packaging și Configurare	Nicio schimbare / nou	Actualizat / nou	Transformat
Framework-uri	Nicio schimbare	Nicio schimbare	Nicio schimbare / nou
Mediu de rulare	Nicio schimbare	Nicio schimbare	Nicio schimbare / nou
Date Aplicație	Nicio schimbare	Nicio schimbare / transformat	Nicio schimbare / transformat
Hardware de găzduire	Nou	Nou	Nou