APPLICATIONS DEVELOPMENT AND SUPPORT SERVICE DEFINITION

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1 Introduction

The service is offered by EUROPEAN DYNAMICS (https://www.eurodyn.com). The EUROPEAN DYNAMICS group of companies (ED, we, or the service provider) is a leading Information Technology and Telecommunications services provider with a long involvement in the delivery of IT projects and the provision of IT support services for European Institutions and other international and government organizations in the EU and worldwide. ED is headquartered in Luxembourg, with branch offices in Athens (Greece), Brussels (Belgium), London (UK), Basel (Switzerland), Berlin (Germany), Vienna (Austria) and The Hague (the Netherlands). EUROPEAN DYNAMICS UK LTD belongs to the ED group and offers all ED services in the UK in collaboration with other ED companies. All companies of the group share resources, management and infrastructure, ensuring a common customer interface.

EUROPEAN DYNAMICS has been offering applications development and support services to a wide range of public organisations at the regional, national and international level all over Europe and the world for more than two decades. In this document, the Applications Development and Support Services are outlined to provide to potential customers all necessary information required for an informed decision.

2 Description of Service

EUROPEAN DYNAMICS offers Applications Development and Support (ADS) Services for cloud-based software solutions based on a wide range of information technologies. Such services include the complete software lifecycle, which includes requirements collection, analysis and their transformation into formal technical specifications; software architecture, design, and implementation; testing; documentation and deployment; and training. The company's expertise covers mainly web environments and information systems based on Java (Java EE), Oracle, Microsoft and open source systems. The software development methodologies employed include waterfall, agile and hybrid models. EUROPEAN DYNAMICS also provides specialist cloud services, such as on- and off-boarding, content migration from previous service providers, business processes reengineering etc. All these in a well-defined contractual framework that assures quality deliverables and service monitoring based on key performance indicators.

EUROPEAN DYNAMICS expertise and experience covers web technologies and integrated information systems both proprietary and open source. EUROPEAN DYNAMICS is an open source software advocate and it is a founding member of the OW2 community (https://www.ow2.org), the open source community for infrastructure software. In addition, EUROPEAN DYNAMICS always makes use of open standards and interoperable solutions providing solutions that avoid vendor lock in.

3 Service Definition

3.1 Overview

The specialist cloud services provided by EUROPEAN DYNAMICS (ED) related to Applications Development and Support (ADS) include all services related to the creation of cloud services from inception to deployment:

- **Requirements gathering, business analysis, and transformation:** ED has extensive experience with the business requirements of public organisations of all sorts and is able to identify the underlying technical requirements that need to be addressed by the cloud service in order to comply with the business requirements presented by the customer. ED provides requirements processing services including their collection analysis and transformation to formal technical requirements (e.g., use cases or user stories).
- **System architecture and design:** The choice of software architectural principles is very important especially for cloud services that require vendor independence and easy commissioning/decommissioning. ED firmly supports the use of open standards and infrastructure agnostic designs that take advantage of the cloud fundamental strengths without becoming dependent on any specific cloud service provider.

  EUROPEAN DYNAMICS undertakes the design guiding the complete development process.
- **Cloud service development:** ED is very experienced in the augmentation or development of web applications that are either provided in the form of turn-key solutions installed on-premises or in the form of cloud services hosted and operated using ED's hosting infrastructure. The development methodology used is chosen based on the customer requirements. We aim at the best value for money for the customer, always in strict compliance with established quality metrics.
- **Service Deployment:** The deployment of cloud services is performed on ED's hosting infrastructure, which is scalable, energy efficient, fault tolerant, highly available and secure, in-line with industry standards and HMG requirements. ED's hosting services are ISO 27001:2013 certified.

ED offers the full range of support services that complement the main software development process:

- Software maintenance
- Training
- On- and off-boarding services

These services are presented in more detail, below.

3.1.1 Application Development Methodologies

There is no single general-purpose development methodology which can fit optimally all projects in the government sector. The key principles of the core methodologies used by ED are presented next. We choose the methodology addressing optimally the project's nature.

- **Waterfall development:** one of the oldest methodologies following a sequential approach. The project is divided in distinct phases with small overlap between them. Emphasis is placed on the planning, deadlines and budget and a tight control is maintained on the complete lifecycle. It is mainly used in projects of high budget, long duration, with stable requirements and low risk.
- **Incremental development:** an adaptation of the waterfall methodology, where multiple mini-waterfall cycles are repeated. It is mainly used in projects of low/high budgets, short/long durations, stable requirements and low/high risk.
- **Spiral development:** Combines elements from design and prototyping, being a meta-model that can be used by other models. It is mainly used for projects of high budget, long duration, unstable requirements and low/high risk.
- **Rapid application development:** Uses principles from iterative and prototyping development, focusing on delivering high quality systems at lowered cost. The project is divided into smaller segments trying to reduce inherent project risk, placing emphasis in fulfilling business needs by

lowering technological and engineering requirements. It is mainly used in projects of high budget, short duration, evolving requirements and high risk.

- **(Rational) Unified Process development (RUP):** It is based on the principles of iterative and incremental development. It is customised by ED for each specific customer and project. The business value of the project is delivered incrementally in time-boxed cross-discipline iterations. Each iteration is driven by use cases capturing functional requirements and the architecture of the project is always an important factor. The main faces of RUP are Inception, Elaboration, Construction and Transition. It is mainly used in projects of high budget, long duration, with stable requirements and high risk.
- **Agile development:** It is based on the principles of iterative and incremental methodologies focusing on projects where requirements and solutions evolve through collaboration. It promotes adaptive planning, evolutionary development and delivery in time-boxes. It uses precise routine and daily communication between team members. It is mainly used in projects of low/high budget, short duration, unstable requirements and high risk.

Adaptations and combinations of the above are possible in order to meet optimally a customer's particular needs. The choice of methodology is based on the assessment of four factors that affect the decision process: requirements, time constraints, project risks and financial assessment.

The above factors may also be affected by several additional elements, such as the size of the development team, the criticality of the system, the underlying technologies, regulations and policies, the organisation, the culture and technological experience of the customer, the physical location of teams, people and partners, the usage of external experts, etc.

During the above assessment process, ED works closely with the customer to ensure that all major factors are neither underestimated, nor overestimated.

3.1.2 Design Authority

Activities that are part of ED's end-to-end design process, are presented below:

- **Requirements analysis:** It begins with the requirements elicitation phase performed during interviews and meetings, and continues with the analysis of the captured requirements resulting in the Software Requirements Specification (SRS) document.
- **Architecture design:** It details the sub-systems constituting the final solution and the relationships between them.
- **Abstract design:** For the sub-systems identified previously, an abstract design of the services specifications, and the operational constraints is produced.
- **Interface design:** It details the human-computer interaction. The interface design specification should be precise enough to allow users interact with the sub-system without having any knowledge of its implementation details.
- **Component design:** It details the specifications of the components that implement the functionality and services of the final system.
- **Data design:** It provides the specifications of the data structures that need to be created in order to process data in the system.
- **Logic design:** It provides the specifications of algorithms, routines and functions that need to be created in order to process data and provide results by the final system.

In line with the customer requirements, ED leads and guides the implementation team through the design process providing skilful software designers that possess the vision, mandate, knowledge, leadership,

and personality necessary. ED's approach is carefully tuned to each customer's specific domain and culture. The design process results in developing several models of the system at different levels of abstraction. As the design progresses, feedback from earlier versions is incorporated allowing the customer to continuously monitor objectives becoming part of the design, thus being an active part of continuous feedback. The design phase is governed by a quality assessment model assessing three main characteristics to ensure the value of the final output:

- All explicit requirements must be part of the design and all implicit requirements should be accommodated.
- The design must be easy to read and to understand from the people responsible to create, test and support the system.
- A complete picture is provided, addressing software, data, functional and behavioural domains from an implementation perspective.

We employ design methodologies, which can also be applied to the implementation phase of a project depending on the specific needs of a customer. These methodologies include:

- **Agile Unified Process:** an agile instantiation of Unified Process and a simplification of Rational Unified Process, suited to all kinds of projects providing artefacts in UML.
- **Dynamic System Development Method:** an ISO 9001 formalisation of Rapid Application Development, suited to projects with complex business activities, providing functional, design and enterprise business model artefacts.
- **Extreme Programming:** an agile development method that focuses on critical activities required to build software, suitable for small teams and projects with uncertain requirements, providing user stories and Class Responsibility Collaborator (CRC) cards artefacts.
- **Object Oriented Software Process:** a rigorous CMM Level 5 process, whose focus is on the development, operations, support, and maintenance of systems, suited to medium to large teams, providing UML artefacts.
- **Scrum:** An agile method, whose focus is on project management and requirements management, suited to projects of all sizes providing varying artefacts.
- **Test Driven Development:** an approach to development where tests that fail are written before functional code, suited to projects of all sizes providing test artefacts.

3.1.3 Service provider's experience in integration

EUROPEAN DYNAMICS presents below an indicative list of different types of integrations delivered in the past in different contexts, countries, and technological domains. This experience strengthens our ability to deliver integration tasks that may be requested as part of the core ADS Services, or the on-boarding process.

- Web Services (with or without an ESB solution) integration, participating in a Service Oriented Architecture (SOA), either as a data producer or as a data consumer.
- Database integration.
- Enterprise system (e.g. SAP, Siebel, PeopleSoft, Oracle, IMS, JD Edwards etc.).
- Legacy System integration, using binary data, common text formats, Excel, OAG BOD, SQL, ANSI X12 EDI, UN/EDIFACT EDI, FIX and HIPAA, or previous 'standards', such as COM and CORBA.

We have vast integration experience in:

- eID systems (e.g. Federal Belgian e-Procurement service, Maltese e-Procurement service), offering User Authentication (SAML 2.0), Electronic Signing, Single Sign On Systems (e.g. ECAS).
- Certification Authorities (OCSP), Time Stamping Authorities (e.g. CertEurope, Certum).
- Integration with systems for supplier data management (e.g. Banque-Carrefour des Entreprises en Belgique).
- Dun & Bradstreet (International Supplier Register/Credit rating, etc.).
- the NHS sid4health platform with external UK e-Sourcing systems.
- the Belgian Universal Messaging Engine and FEDICT Digital Signing Service.
- e-procurement platforms with the EU Publications Office (TED) for e-Sender accreditation.
- Integration with the Belgian, Cypriot, Maltese national publication office/gazette.
- Integration with UK's Contract Finder for centralising below-threshold procurement publications.
- Integration of e-Catalogue with FEDCOM (SAP-based invoicing/payment system used by the Belgian Government) for management and financial follow-up of orders.
- Integration with Swedish Tax office and Swedish National supplier register.
- Integration of Catalogue Content Management with PECOS (Scottish Government's "purchase to pay" system) as a punch-out request receiver.

3.1.4 Service support

We have established a dedicated **"Customer Support Centre"** which provides support to end-users (for assistance in using the System or reporting a fault). To monitor and manage incoming requests, we use ServiceNow.

The Helpdesk is accessible through the following modes:

- **Through the system**: Depending on the type of specific user, a dedicated link is offered by the system in order for users to be able to submit queries regarding the system directly from the service provider.
- **E-mail access:** Users are able to send their questions and requests by e-mail using a dedicated e-mail address publicised in the system's homepage.
- **Phone Access:** Users may call the Helpdesk using a UK **local phone** number.

Figure 1 presents the organisation of the support services structure applied for the needs of its customers. Support services are provided at three levels:

- **First** level service desk, which is directly available to end users;
- **Second** level service desk, which is directly available to the customer administrators. It also receives cases that could not be resolved by the first level.
- **Third** level service desk, which is normally accessible only to the second line of helpdesk and handles incidents related to the system or operational malfunctions that cannot be handled by the second level.

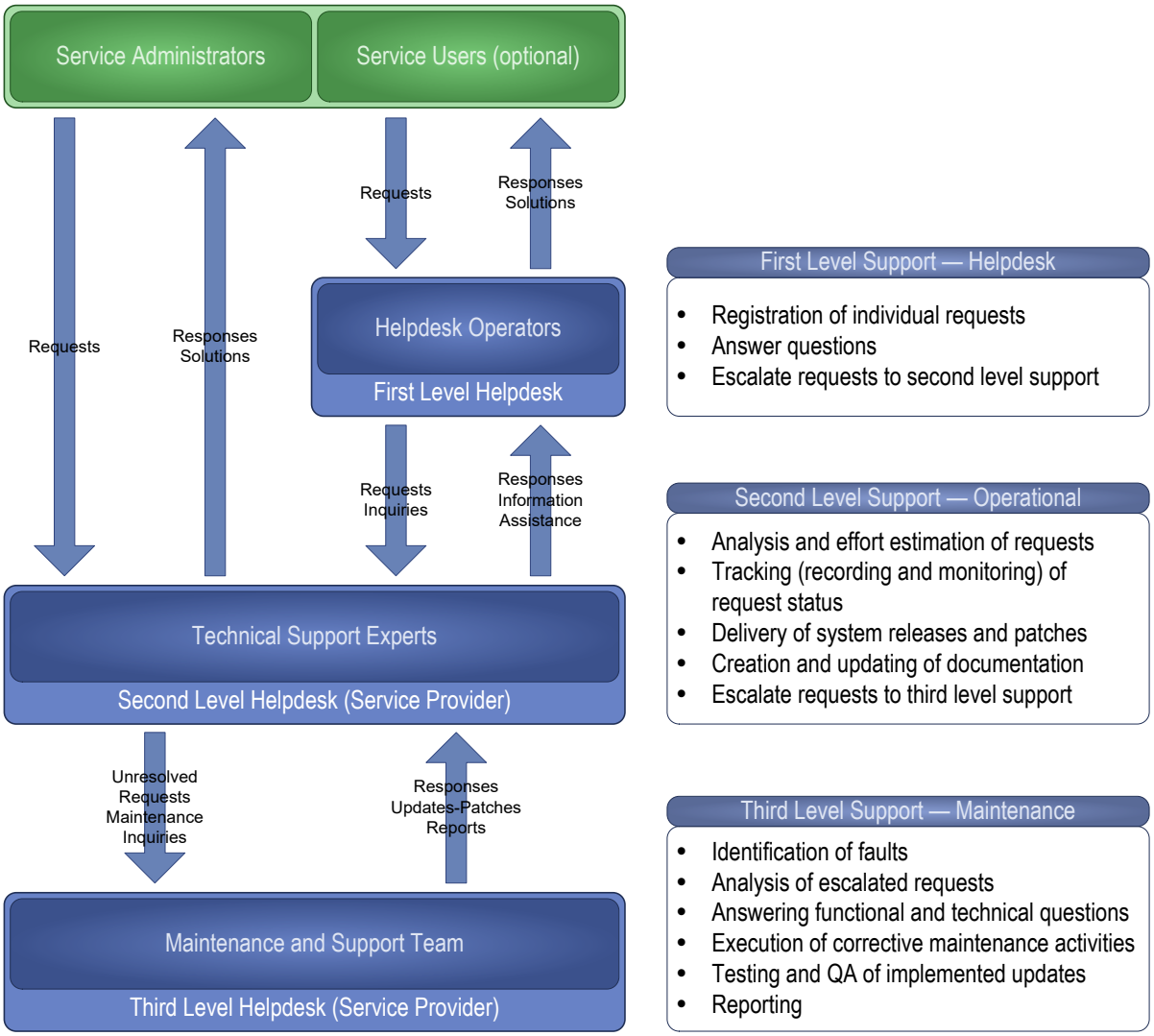

Figure 1: customer Support Centre

The quality of support services operation will be measured based on several objective quality metrics. The targets levels of the Helpdesk's service quality will be agreed and recorded in the service level agreement (SLA). As an example, typical support service performance is expected to comply with the following standards:

- At least 75% of reported issues are resolved by the 1st Level Helpdesk support;
- At least 98% of telephone calls answered within five (5) rings (during normal operating hours);
- At least 98% of Helpdesk incidents acknowledged within ten (10) minutes (during normal operating hours);
- At least 98% of "Priority 4" incidents are resolved within 30 minutes.

The classification of incident severity (recorded in the SLA) will be used for the prioritisation of case handling.

3.1.5 Maintenance

We commit to support and update/upgrade the provided services as appropriate, in order to remain in-line with the customer requirements. Objectives for future developments relate to changes in legal

provisions/regulations and latest industry standards, future developments to enhance existing functionality and adding new functionality, so that the service may become even more functional.

ED follows a general maintenance strategy for cloud solutions, through the release of:

- System updates every month (except when an upgrade is due);
- System minor upgrades every 4 months (except when a major upgrade is due);
- System major upgrades every year;

3.1.6 Training of service users

EUROPEAN DYNAMICS offers training services that will support customers in their efficient use of cloud services. The training plan is designed based on ED's experience and feedback received on previous trainings for the same or similar services.

The basic training schedule includes training for the customer staff that intends to operate the service; additional training for third parties can also be provided, as well as "Train the trainer" programmes.

EUROPEAN DYNAMICS adapts its training schedules to customer requirements. The training material is suitable for each type of trainees, their background and training needs.

Training activities assume that:

- Trainees have identified roles that the training will address.
- For live training sessions, the customer will provide training facilities. No special requirements exist for remote sessions.
- The training will be performed in English.

3.1.7 On-boarding

If case a customer wishes to use cloud services maintained by the service provider and additional ADS services are needed, an on-boarding process is initiated. The services are configured, adapted and possibly extended in order to address specific customer requirements. Such configurations/ adaptations can range from simple changes (e.g. different GUI colours) to quite complex ones (e.g. integration with external services). ED has developed an adaptation/ customisation process for cloud services comprising the following steps:

- Upon receipt of the purchase order we immediately make available to the customer the basic version of the service for experimentation.
- We organise a face-to-face kick-off meeting with the customer.
- During the kick-off meeting, apart from discussing project management/organisation aspects, a adequately long time slot is dedicated to the in-depth demonstration of the default operation of the service so that specific discussion takes place on particular, client-specific configuration. This exercise results to deviations from the default system operation.
- After the kick-off, all findings/decisions are summarised in the minutes, and further analysis may be completed before concluding the configuration specifications.
- All final specifications for the configurations are documented in the "Configuration Specifications" deliverable, which is subject to review by stakeholders.
- Upon approval and finalisation of the specifications, we commence the configuration work for the delivery of the particular service instance, fully configured to function in-line with the specific customer needs.

The configuration of any client-specific deviations requires time, depending on the extent of deviations. The time for such client-specific configurations may range from 2 weeks to 4 months. Then, factory acceptance testing, installation and user acceptance testing is carried out, before the system is accepted for operation.

The timing of the complete process is agreed with the customer as part of the outcomes of the kick-off meeting. In parallel to the customisation activities, ED is able to offer other support services to the customer including hands-on, classroom or remote training on the platform. It may also include the migration of data, should this be required for the customer.

Immediately after the deployment of the services in the production environment ED will be responsible for the following operations:

- Monitoring (collection of key performance indicators) and reporting of services to identify problems and take appropriate countermeasures as soon as possible.
- Managing the service agreement and the SLA for the entire contract. This involves analysis of performance metrics and development of recommendations, which are given as feedback to the team in view of process improvements.

3.1.8 Off-boarding

The "off boarding" or "hand over" phase of the service comprise the following actions:

- Access rights: ensure that all access rights are revoked or restored to the state before the service commenced.
- Customer-supplied data: ensure that all information uploaded or stored with the system is handled in-line with the customer requirements (deleted or returned to the customer).
- Third party-uploaded information: ensure that all information of third parties is managed in-line with the contractual and legal requirements in effect.
- System-generated data: ensure that all information related to the customer is made available for retrieval. Such information may include audit trails, usage statistics, etc.

The ADS off-boarding services offer the possibility to archive and download all information that may be possibly needed for the migration of the service to another service provider. Such information includes user information, complete data for service objects and audit trail reports. All exported files are formatted according to widely used file formats.

In addition to the above, the service provider includes as an option the possibility to create a complete data set as required by the customer.

Note that the service provider may not be in position to provide encrypted data in their original form, as this may be impossible with passwords. The customer will be made aware of such restrictions.

3.2 Information Assurance

EUROPEAN DYNAMICS has an information security management system (ISMS) certified according to ISO 27001:2013 for its hosting facilities. We have in place all the required ISMS documentation set, security policies and procedures for keeping all the information in a secure and confidential manner within our data centre. The security procedures and respective documentation updates are reviewed including the annual IT Health Check by certified auditors who visit our primary site for this purpose.

3.3 Adherence to EU Code of Conduct

ED's primary data centre operations are co-located in TI SPARKLE GREECE SA Tier III data centre facilities, which fully comply with the EU's Code for Energy Efficient Datacentres. The newest TI SPARKLE DATA centre (MMII) in which ED's infrastructure is co-located has a Green Building Certification by LEED (Gold), and is powered solely by renewable sources.

The data centre has an ISO14001 Certification for Environmental Management, makes use of Efficient UPS with Li-ion batteries and uses LED lighting.

ED's ICT infrastructure is deployed within an APC Eco-Aisle cold-aisle containment system which manages airflow efficiently and prevents the mixing of hot and cold air, thereby enhancing cooling effectiveness and reducing energy consumption.

The data-centre provider deploys high efficiency Evaporative Free Cooling (EFC) units to cool the data-centre load, and in "free cooling" mode (when outdoor conditions permit) the units utilize ambient air for cooling without the need for mechanical refrigeration, further reducing energy consumption.

3.4 Backup/restore and disaster recovery

EUROPEAN DYNAMICS has a Business Continuity Plan and associated Disaster Recovery (DR) Plan (collectively the BCDR Plan) that covers its own and hosted operations. The BCDR documents proactive/reactive actions ensuring that EUROPEAN DYNAMICS Hosting Services (EDHS) are continuously provided with minimum interruption for end-users in the event of a serious damage or catastrophe. Full network, hardware, power redundancy, and a physically separate DR site provide resilience, regular and securely handled backup/restore operations in place. The plan is subject to ED's change management procedures with all changes logged; it is tested and revised biannually, regularly audited, and checked for compliance according to ISO27001:2013 guidelines regarding physical, personnel, procedural security and DR effectiveness of the EDHS system.

3.5 Service Management details

The management of the services described in 3.1 above is performed using a client-centric methodology ensuring service quality and efficiency. This methodology is based on the following principles:

- **Satisfying clients**. The company's organisation focuses on improving the level of client satisfaction considering:
  - ◊ customer needs, expectations and priorities;
  - ◊ the level of client satisfaction; and
  - ◊ available resources.

  Involving employees. Employees have a clear view about how their work is structured and carried out. They are in a better position than anyone else to see how to improve the quality of services. They use their own discretion and respond creatively to the particular needs of the customer.
- **Continuous improvement/adaptation/change**. Regardless of the current level of customer satisfaction, improvement is an ongoing task, because changes occur continuously.

Service management addresses all types of services provided to the customer taking care of the provisioning of the necessary resourcing, gathering customer satisfaction feedback and using this feedback for the improvement of services.

In addition to the quality management procedures stipulated by ISO 9001, ED applies specific procedures ensuring that:

- the service management teams comply with the standards set by the customer and ED;

- the service management teams have established adequate communication with the customer and any third parties involved;
- reporting to the customer is sufficient;
- the service management teams are backed up by ED's pool of resources.

In all ADS Services, ED will assign a Project Manager that ensure quality of service. In particular, the Project Manager will:

- review formal reports in order to assess the performance of the project teams with respect to service levels and identify problems that require further actions;
- hold meetings with all the members of the project team in order to gain a better understanding of difficulties, particularities and progress, and identify problems affecting the delivery of the service before they occur;
- monitor the provision of support by the service team;
- maintain a communication path with the customer;
- determine actions to tackle problems and delays regarding the delivery of service.

As the ADS Services are provided on bespoke cloud services managed by ED, all service management details are recorded in the service documentation collaboratively constructed with the customer.

3.6 Service Constraints

Not generally applicable. Depending on the specific requirements of the customer, we will notify any constraints or assumptions identified to the customer before commencement of the services.

3.7 Service Levels

Different types of service levels are defined depending on the nature and scope of the applications development and support services. The service levels are monitored and measured on objective performance indicators as follows:

Table 1: Typical factors for service levels

Type of service	***Service parameters that define the service levels***
Requirements gathering, analysis, and transformation	Quality of deliverables; timeliness; number of review cycles; customer acceptance.
System architecture and design	Quality of deliverables; timeliness; number of review cycles; customer acceptance.
Cloud service development	Quality of deliverables; timeliness; number of review cycles; customer acceptance; testing results.
Service documentation	Quality of deliverables; timeliness; number of review cycles; customer acceptance.
Service deployment	Service conformance to specifications; service availability
Service support	Adherence to key performance indicators: support availability, effectiveness, timeliness

Type of service	*Service parameters that define the service levels*
Service maintenance	Adherence to key performance indicators: service maintenance availability, effectiveness, timeliness
Training of service users	Trainee review scores; training quality
On-boarding	Quality and timeliness characteristics of ordered tasks
Off-boarding	Quality and timeliness characteristics of ordered tasks

3.8 Ordering and invoicing

Customers wishing to use our services shall follow the ordering process outlined in the G-Cloud framework agreement.

Prior to submitting the order form, we shall enter into a dialogue with the customer to determine which elements of the service will be provided. We shall prepare a preliminary analysis of requirements, which shall form the basis of the quotation. The quotation shall include a detailed list of activities and deliverables and shall associate each tasks with a fixed price based on anticipated effort and our rates.

The quotation shall include a payment schedule which will be closely related to acceptance of deliverables.

Payments shall be due thirty (30) after issuance of the invoice.

3.9 Termination of the service

Apart from the terms of the G-Cloud Framework Agreement the following shall apply:

3.9.1 Termination by customers

The customer shall have the right to terminate the call-off agreement at any time by giving at least thirty (30) working days of written notice to the service provider.

3.9.2 Termination by the service provider

If the customer fails to pay the service provider undisputed sums of money when due, the service provider shall notify the customer in writing of such failure. If the customer fails to pay undisputed amount, the service provider may terminate the call-off agreement giving a written notice of at least ninety (90) working days following the date of the written notice.

4 Additional Information

EUROPEAN DYNAMICS has access to agreements with international leaders in ICT. These agreements allow us to support in Europe and worldwide hardware and software products and deliver high quality services in a timely and efficient manner. They also allow us to efficiently organise training to our key IT personnel, resulting in professional certifications from major ICT vendors.

As part of the cloud service design, we may implement various user management technologies, in line with the actual business and technical requirements of the customer. We have extensive experience in

providing user management services in systems that need to support role-based access control, external user data sources, hierarchical user management, etc. For more information, please refer to section 3.1.

We have extensive experience in the design and implementation of systems and managed services based on enterprise architectures for customers that include the European Commission, the Belgian Federal Government and public authorities worldwide.

We have an ISO-9001 certified quality management system, covering project and programme management processes, which are based on PRINCE 2, provide a measurable, accountable, and auditable framework ensuring compliance to the project plan, timely risk assessment and mitigation and improved efficiency to the benefit of the customer.

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