Requirements & Specifications Document

Call for Tender for:	**Web applications maintenance, support & Development Services**
Procedure	**Open Procedure (OJEU)**
eTenders CFT ID	**P4941 - 9239900**
Issue Date	**8th October 2026**
Closing Date for Queries	**5th November 2026 @ 14:00hrs**
Contact for Queries	**via eTenders messaging facility**
Closing Date / Time for receipt of Responses – to be submitted via www.etenders.gov.ie ONLY	**19th November 2026 @ 14:00hrs**

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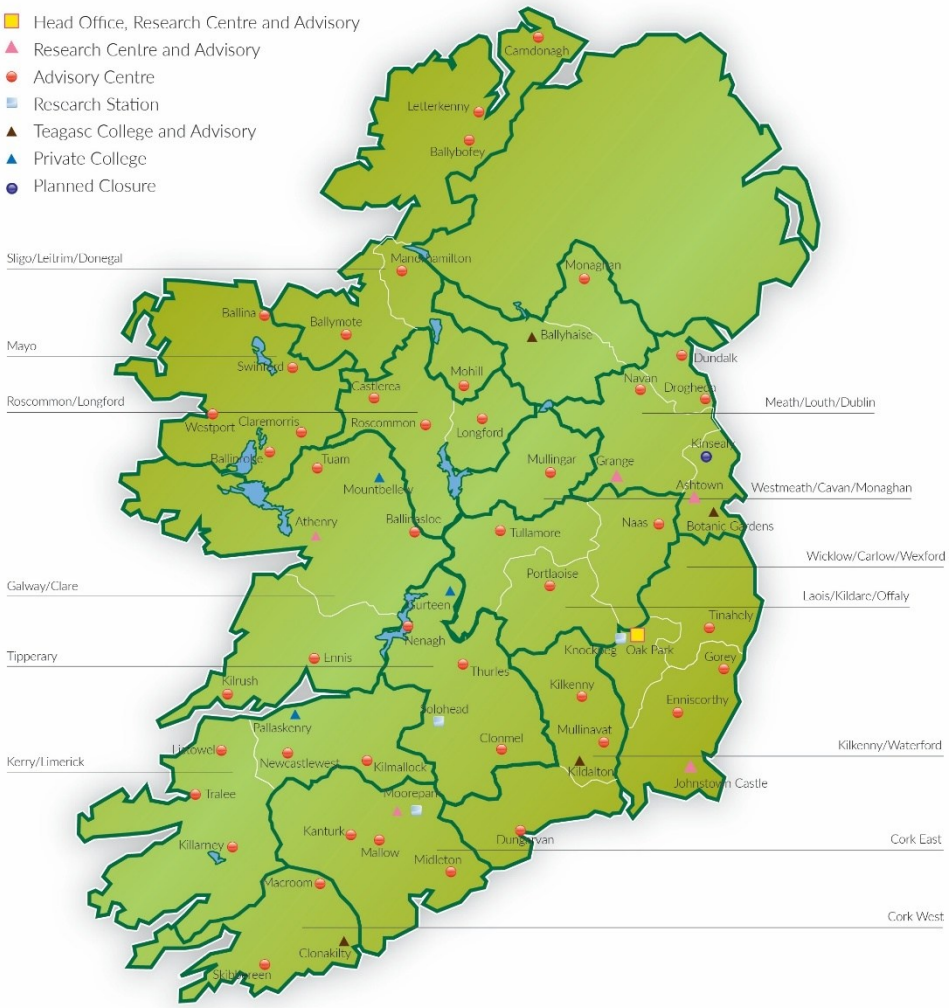
1 Introduction

Teagasc – the Agriculture and Food Development Authority, (www.teagasc.ie) is the national body responsible for providing integrated research, advisory and training services for the agriculture and food industry in Ireland. It is a semi-state organisation established under legislation enacted by the Irish government.

Teagasc is a client-based organisation and operates in partnership with all sectors of the agriculture and food industry and with rural development agencies. The organisation has approx. 1,600 staff (including contract staff), 3,500 full and part-time students, and close to 500 PhD and MSc Walsh Scholars working with research staff. Teagasc is based at over 50 locations dispersed throughout Ireland. See http://www.teagasc.ie for some background information about Teagasc



2 Requirements

2.1 Scope

Teagasc has a number of bespoke systems that have been developed by third party suppliers. These systems are key systems used by Teagasc in the supply of its services to its clients and the general public. The technology used is primarily from the Microsoft stack. These Web Applications are public facing business applications hosted by Teagasc on premises in its Demilitarized Zone, along with some associated services.

Teagasc is seeking tenders for the maintenance, support and ongoing development of web applications software.

Services required across all Lots as follows:

1. Support the Web Applications at a system level, resolving any bugs or issues with the software and ensuring its smooth day to day operation and availability
2. Supply development services for an on-going programme of development for the software.
3. Support & maintenance to cover the applications listed in both the existing test and production environments and any future project environments.

This tender competition is divided into three (3) lots under the following headings:

Lot 1: Multiple Web applications as follows:

- Profit Monitor
- User Provisioning System
- Interactive Forms
- Environmental Management Information System
- Soil Registration System
- Media Channel App & API

Lot 2: Web application – Nutrient Management Planner (NMP)

Lot 3: Web application – PastureBase Ireland (PBI)

Note: There is a separate tender response document for each of the three lots.

Tenderers must complete the relevant tender response document (TRD) provided for each Lot they are applying for.

P4941_Webapps_TRD_LOT1

P4941_Webapps_TRD_LOT2

P4941_Webapps_TRD_LOT3

Tenderers must be able to provide services for all applications listed within the Lot applied for under this tender competition. Tenderers are <u>not</u> required to apply for all Lots.

In their response(s), tenderers must clearly and comprehensively describe their proposed approach to the provision of Support and Maintenance, including the provision of upgrades, bug fixes, and other technical support necessary for staff and external users to operate the solution.

The Tenderer is invited to submit their proposals for contract management where they feel an improved service to Teagasc can be delivered.

Teagasc reserves the right to add new applications and/or remove applications that are decommissioned or replaced over the term of any awarded contract. Annual support costs will be revised to reflect any changes. Note: Where a development project results in a sizeable increase in the scale of an application, a proportionate increase in annual support costs can be considered.

2.2 Lot 1: Multiple Web applications

Includes the following web applications:

- Profit Monitor
- User Provisioning System
- Interactive Forms
- Environmental Management Information System
- Soil Registration System
- Media Channel App & API

Details on the technical elements for each application are contained in the Appendices A - F to this document and referenced below.

Software to be covered by the service as follows:

1. Profit Monitor – PM (Refer to Appendix A)
    a. PM web application and database.
    b. Data Provisioning processes from the User Provisioning system (UPS). This includes creating new clients and the update of client information where updates have been made to existing clients.
    c. Interface with Teagasc User Authentication System (GATE) to authenticate users logging into Profit Monitor.
    d. The Profit Monitor Webservice which currently interfaces with the Irish Cattle Breeders Federation (ICBF). ICBF send data to the Profit Monitor.
    e. Profit Monitor Responsive section (used from IOS and Android mobiles).
2. User Provisioning System (UPS), ETL & AAMIsc databases (Refer to Appendix B)
3. Interactive Forms (http://interactive.teagasc.ie) (Refer to Appendix C)
4. Environment Management Information System – EMIS (Refer to Appendix D)
5. Soil Registration Database (Refer to Appendix E)
6. Media Channel App & API (Refer to Appendix F)
7. Any enhancements/new functionality developed over the duration of the contract.

2.2.1 Lot 1 - Hosting

The live and test versions of Profit Monitor are hosted by Teagasc within its Web Hosting environment. This environment is in a third-party hosting centre and is managed by a separate third-party managed service provider.

The other applications in Lot 1 (Both live and test versions) are hosted in the main Teagasc domain. This environment is hosted in the same third-party hosting environment and managed by the same third-party managed service provider.

2.2.2 Current Contract expiry – Lot 1 web apps

The contract for support and development of the Web Applications under Lot 1 expires at the end of January 2027.

2.3 Lot 2: Web application – Nutrient Management Planner (NMP)

Details on the technical elements for this application are contained in Appendix G to this document

Software to be covered by the service as follows:

- Nutrient Management Planner – NMP
    - NMP web application and database
    - Mapping component in Nutrient Management Planner using ArcGIS
    - Interface with Teagasc User Authentication System (GATE) to authenticate users logging into Nutrient Management Planner.
    - Interface to external parties for Mapping requirements (OSI, EPA, DAFM)
    - Any enhancements/new functionality developed over the duration of the contract.

Note: Use of Jira for tracking the NMP application support and development is required.

2.3.1 Lot 2 - Hosting

The live and test versions of Nutrient Management Planner are hosted by Teagasc within its Web Hosting environment. This environment is in a third-party hosting centre and is managed by a separate third-party managed service provider.

2.3.2 Current Contract expiry – Lot 2 - NMP

The contract for support and development of NMP expires at the end of October 2026.

2.4 Lot 3: Web application – PastureBase Ireland (PBI)

Details on the technical elements for this application are contained in Appendix H to this document

Software to be covered by the service as follows:

- PastureBase – PBI
    - PastureBase Web Applications and Databases
    - Dedicated AS2 integration platform for data imports from several third parties
    - REST APIS
    - Reporting and notification services
    - Grass growth prediction services
    - PBI mobile app (used from IOS and Android mobiles)
    - Any enhancements/new functionality developed over the duration of the contract.

2.4.1 Lot 3 - Hosting

The live and test versions of PastureBase Ireland are hosted by Teagasc within its Web Hosting environment. This environment is in a third-party hosting centre and is managed by a separate third-party managed service provider.

2.4.2 Lot 3 – Out of hours support

On occasion, during periods of high usage, out of hours support may be required. Typically, this may be) from 1st April to 30th June for PastureBase Ireland (PBI). The level of cover required is likely to be from 6:00am to 9:00pm (Monday – Friday) and 9:00am – 05:30pm (Saturday and Sunday).

2.4.3 Current Contract expiry – Lot 3 – PastureBase Ireland

The contract for support and development of PastureBase Ireland expires at the end of March 2027.

2.5 Requirements applicable to all tender Lots (Lots 1, 2 & 3)

2.5.1 Take-On Services

At the start of the service the Tenderer will be required to take on the existing software and to establish and verify a development environment, capable of being used to make updates to the software. This will involve the Tenderer:

- Gaining a full understanding of the functionality of the existing software;
- Gaining a full understanding of the existing software and software design;
- Establishing their own development environment with the tools required to develop and test the software and package it for distribution;
- Establishing source and document control facilities to properly manage the software source code and associated artefacts including documentation;
- Working with Teagasc to test this environment to ensure it is correct and the baseline of code matches that in production;

- Making a release of the software into the Teagasc test environment to validate the packaging and distribution approach;

The tenderer will be responsible for ensuring their development environment is fully licenced. The tenderer will be expected to work with the incumbent supplier as part of the take on, and will have a limited and fixed period, not to exceed 20 days per Lot, in which to perform the take on.

The Tenderer should submit a take-on project plan which must be based on a sound project management strategy and a sound project approach. It must

- be realistic;
- clearly show the timescales, deliverables and resources involved in the project;
- identify the resources that will be assigned by skill set;
- clearly show the inputs required from Teagasc for the project;

2.5.2 Software Handover

Towards the end/termination of the contract the Tenderer is obliged to provide a handover to the next contractor, using staff familiar with the components. The duration of that handover may be specified by Teagasc and will be agreed between Teagasc and the Tenderer and will depend on the successor to the current Tenderer and what effort they might require to ensure a successful handover. The tasks and effort associated with the Handover will be managed through a Change Request process. The Tenderer must agree that it will make the necessary staff available for any such handover subject to payment of the charges as per the agreed Change Request. The handover will not exceed 15 days of effort per lot.

The terms of the Change Request for this additional work will include an obligation from the Tenderer to ensure adequate and appropriate resourcing is employed to ensure a smooth handover to the successor at the end of the contract. This includes the provision of training, the supply of system documentation, and the handing over of incident history details.

Tenderers should submit a proposal detailing how they would complete a hand-over at the end of the contract period, should this prove necessary. The proposal must identify the resources that will be assigned by skill set and per diem cost, the hand-over duration proposed and the methodology to be employed.

Handover to the successor will comprise the following activities:

- Supply of the most current version of all source code and other artefacts required to install the software and bring it to a fully operational state.
- Familiarisation with the components and review of documentation available to the new contractor
- Support for installation and set-up of the components in the new contractor's development and/or test environments
- Review of installation and set-up processes

- Review of system maintenance procedures.
- Following completion and sign off of the handover, all code and components should be removed from the Tenderers servers

The Tenderer agrees to maintain the components and documentation in a condition that will facilitate the handover process.

The Services will be provided for Teagasc from the Tenderer's offices or where the Tenderer considers it necessary, at Teagasc's offices or another agreed premises.

The Tenderer will, upon request, be provided with VPN access to the Client's systems to facilitate the maintenance and support service.

2.5.3 Documentation

All documentation must be kept up to date to a standard where it can be transferred to the next supplier to maintain the system. This should occur after any system change but at a minimum system design documentation should be reviewed annually and updated where required.

2.5.4 Intellectual Property Rights

Teagasc will retain all Intellectual Property Rights over the software and documentation for these applications. This includes all pre-existing software, including all outputs developed and paid for by Teagasc during the term of any awarded contract. As part of the go-live process for changes, Teagasc will be provided with a source copy of the software and all associated documentation.

2.5.5 Ongoing Maintenance and Support

The Tenderer will provide the software maintenance and support services covering the software in each Lot, comprising the following activities:

- Maintenance and support of the application and mobile apps
- Live and test instances of this system will be supported (including interfaces to other systems (GATE, PBI - AS2 and the PM webservice))
- The support contract must cover the rectification of all web application, web services, mobile apps, and database issues found. Resolution of all faults identified, includes the installation of any required Software updates and the correction of any data corrupted by Software faults. The support should cover fix on fail of any functionality within the systems covered. It does not include the development of new functionality within the systems which will be covered under Development Services.
- Issues found which relate to the implementation of Windows patching must be covered. Critical and Security patches will be applied monthly via automated process, first to the test environment and subsequently to the production environment. The Tenderer must also apply operating system patches to the Tenderer's development and test environments.

- All prerequisite components above the operating system level which are required for the running of the software must be supported.
- When Web Application users identify an issue, it will first be raised with the Contracting Authority's support/service desk (level 1 support). Level 2 support is provided by the ICT Applications Analysts (for ICT issues). Level 3 support will be supplied by the successful Tenderer. All issues will be raised with the successful Tenderer by those in the Contracting Authority providing Level 1 or Level 2 support (approx. 10 people only for the 8 applications).
- A telephone and email service desk, which logs and monitors all incidents raised by the Client. An on-line, self-service Service Desk will also be provided via the Tenderer's support portal.
- Delivery of telephone, email and portal support for the components, covering fault diagnosis and assistance in the use of the components. This support will be provided during the Standard Hours as detailed in section 'Hours of Coverage'. The support service will be delivered from the Tenderer's offices and will be the main point of contact for the Client in relation to software support required.
- A mechanism to monitor the status and progress of all issues and change requests, including any issues directed to third parties. The Client will have access to details of incidents and change requests via the Tenderer's support portal.
- Onsite support for fault resolution and correction of any data corrupted by Software faults, where the Tenderer determines that the work cannot be carried out online/remotely.
- Delivery to the Client of a monthly service level report, which includes a log of all incidents raised, and provides a statistical breakdown of incident resolution times by severity level and system. This report should also outline the effort (in days) expended by the Tenderer in delivering the service.
- Delivery to the Client of an annual technical lifecycle and roadmap review of each application included in the Section 2.1. Scope. This report should provide information on the key software components used in each application, detailing their current versions, support status and upgrade recommendations.
- Holding of a quarterly review between Tenderer and Client, following delivery of the service level report.

2.5.5.1 Hours of Coverage

The hours of coverage ("Standard Hours") for the Services are 08:30 – 17:00 Monday to Friday excluding Republic of Ireland bank and public holidays.

On occasion, during periods of high usage, out of hours support may be required.

2.5.5.2 Severity Levels

When logging an incident with the helpdesk, a severity level must be assigned, based on the impact of the incident. The following table can be used as a guideline for assigning severity levels. It is not exhaustive.

Severity Level	Incident Impact
1	• Issues on a live system where: ○ System performance is severely degraded, or ○ Material restriction on a critical function, or ○ Data corruption has occurred, or ○ System or Operating system requires repeated restarting ○ Issue is raised by a person on agreed VIP list (maximum 20)
2	• Material restriction on an important but non-critical function, or • Performance of important but non-critical function is degraded
3	• Restriction on a minor function, or • Performance of minor function is degraded
4	• Advice, query on how to perform and action or cosmetic fault or documentation error

Table 1 Severity Levels

2.5.5.3 Response Times

The following table describes the service level provided by the Tenderer. This is based on the incident severity level assigned.

Severity Level	Initial Response	Target Resolution	Formal Resolution
1	1 hour	1 working day	2 working days
2	4 hours	2 working days	5 working days
3	4 hours	5 working days	10 working days
4	4 hours	10 working days	20 working days

Table 2 Response Times

These service level targets will only apply during the Standard Hours.

The calculation of all time periods starts when a call/ticket is logged. This information will be recorded in the Tenderer's Self-service service desk. Teagasc will have access to this information.

The "Initial Response" period is the maximum length of time within which the Tenderer will revert to the caller with a plan for resolving the call.

The Tenderer will make best endeavours to resolve the call within the "Target Resolution" time.

The 'Formal Resolution' time is the worst-case time to resolve the call to the satisfaction of the caller.

If a call is not resolved to the caller's satisfaction within the "Formal Resolution" period, an escalation or penalties will apply. For the purpose of charging penalties, the time taken by the caller to respond to queries from the Tenderer will not be counted.

The Tenderer will not be held liable for any delays in meeting the Target or Formal Resolution times due to issues over which they have no control.

2.5.5.4 Escalation / Penalty Model

The following table shows how an incident is escalated if not dealt with within the Target Resolution Time

Severity Level	Escalation Path	Communication
1	Incident qualifies for penalties, as described below.	Teagasc Head of ICT and Tenderer Senior Management Contact Informed
2	Incident is escalated to Severity Level 1 (unless it was originally level 3 or 4)	Teagasc and Tenderer Service Delivery Manager Informed
3	Incident is escalated to Severity Level 2	Teagasc and Tenderer Supervisor Informed
4	Incident is escalated to Severity Level 3	Teagasc and Tenderer Supervisor Informed

Table 3 Escalation/Penalty Model

The Tenderer's proposal must clearly state how these escalations will be tracked and managed.

2.5.5.5 Description of Penalties

From the time an incident qualifies for penalties, a penalty of 1% of the annual maintenance cost applies for each day the incident remains unresolved up to a maximum of 10% of the annual support cost.

Penalties shall not apply to the extent that any failure to meet the Formal Resolution Time is attributable to:

- Force majeure events;
- Failure of the Client or a third party to the Client to perform any of the Client Obligations or any other act or omission of the Client;
- Scheduled downtime;
- Those areas noted in section 'Response Time';

Penalties will apply automatically unless mutually agreed between the Tenderer and the Client.

Penalty refunds by the Tenderer are due in the same billing period as the associated costs.

2.5.5.6 Communications

While an incident remains open, the Tenderer must communicate its status to the caller on a regular basis. The following minimum standard applies:

Severity Level	Update Frequency	Mechanism
1	2 hours	Phone / e-mail
2	1 day	Phone / e-mail
3	Weekly	e-mail
4	Monthly	e-mail

Table 4 Communications

2.5.5.7 Service Management

The Tenderer will appoint a Service Delivery Manager ('SDM') who will have overall responsibility to Teagasc for the Tenderer's performance on this contract. The SDM's focus is to ensure compliance to service levels, act as an escalation point and ensure that collaboration exists to build a flexible and partnership-based relationship.

The SDM will manage the Tenderer's service performance by:

- Agreeing with Teagasc the service requirements
- Agreeing with Teagasc suitable service measurements and levels
- Designing and implementing measurement and reporting in terms of service levels, resources and costs
- Representing the Tenderer in Service Management discussions with Teagasc
- Representing Teagasc's interests within the Tenderer's organisation
- Ensuring the timely delivery of reporting and billing.

2.5.5.8 Service Reporting

The Tenderer will supply Teagasc with a monthly service level report, which includes a log of all calls raised, and provides a statistical breakdown of call resolution times by severity level. This report should also outline the effort (in days) expended by the Tenderer in delivering the service.

This report will contain at a minimum the following information

- Application Name
- Unique call identifier
- Date/Time Issue Logged
- Date/Time Issue Resolved
- Time to resolve (hours)
- Summary of Issue
- Summary of Fix
- Reporter
- Priority
- Severity
- System which had the issue
- SLA achieved indicator
    - if SLA not achieved state number of hours outside of SLA.

2.5.5.9 Service Review

A quarterly formal review of the support service will be conducted between the Tenderer and Teagasc, led by the Tenderer's Service Delivery Manager. The purpose of the review will be to assess the effectiveness of the service over the period. The service reports will form the basis of these discussions.

At each quarterly review the Tenderer will conduct an analysis of the volume of calls coming through on a monthly basis.

2.5.5.10 Support and Maintenance Service Performance Indicators

The following indicators will be used as input to the service review:

- The system is available 99% of the time[1]
- Service level Resolution rates met 98% of the time.

2.5.5.11 Technical Lifecycle Review Document

The Tenderer will supply Teagasc with an annual Technical Lifecycle and Roadmap review of each application included in Section 2.1 Scope. The review should provide Teagasc with information on the software components used in each application to ensure Teagasc has visibility of technology lifecycles, support status, technical debt and upcoming risks.

This report will contain at a minimum the following information

- List all Software Components per application
- Current version installed
- Support Status on s/w version
- Latest available release version and release date (of all s/w components)
- Upgrade Recommendation
- Guideline estimate (no of days) effort to upgrade
- Licence implications

2.5.6 Development Project Services

The successful Tenderer will undertake application development projects with Teagasc during the period of the contract should Teagasc choose to undertake any projects/make any enhancements to the Web Apps software (including web application, mobile applications and all interfaces). The successful Tenderer must have the required expertise in all necessary technologies as set out in Appendix Section (Appendix A to Appendix H inclusive). Developments if undertaken will be handled through a change control process. Changes may be proposed either by Teagasc or by the Tenderer

2.5.6.1 Project Approach and Deliverables

The Tenderer will provide development and enhancement services governed by a change control process.

The Tenderer will provide fixed daily rates for development and enhancement work and for any additional work such as user training, skills transfer to Teagasc and knowledge transfer/management. The applicable daily rates must be provided in the Pricing section of the tender response document. Development work will be carried out by way of fixed price projects established and agreed under a change control process.

[1] This rate is required during the hours of service outlined in this document. Down time is measured based on the time between a call first being raised and the resumption of service.

These projects will be formally established by issuing a change request (CR). The process will be as follows:

- Teagasc or the Tenderer shall raise a change request by completing a change request form
- The Tenderer shall update the change request document with details of the proposed solution and shall provide a fixed price quotation which includes a breakdown in days of the effort and resource types required, and a proposed payment schedule. There will be no charge for this quotation
- The Tenderer will provide a quotation free of charge for each CR raised by Teagasc with a payment schedule consistent with the principles outlined in the Pricing Schedule in this Tender
- Teagasc shall review the updated change request and if approved, provide formal sign off to the Tenderer
- Teagasc shall provide a purchase order to the value documented in the Change Request and include a reference to the change request number
- The Tenderer shall invoice against the purchase order according to the payment schedule agreed for the change order
- User acceptance testing on changes will be performed by Teagasc in the Teagasc test environment.
- Change Request quotations will be provided by the Tenderer within 15 days of request
- For any small development Change Request (i.e. below 20 days effort), quotations will be provided by the Tenderer within 5 days of request.
- The tenderer will provide access to a bug tracking system to manage bugs identified during development projects.
- Change Request delivery will commence within 3 months of formal sign-off of the quotation from Teagasc.
- For any small development Change Request (i.e. below 20 days effort), delivery will commence within 1 month of formal sign-off of the quotation from Teagasc.

The Tenderer needs to propose an approach to software development. Teagasc typically uses a waterfall development model, however an agile dev model has also been adopted on the NMP system in particular. The following is an example list of project deliverables. Note the level of documentation required will relate to the size of project.

Design

- Functional & Non-Functional Specification
- High Level Design
- System Architecture Specification
- Technical Design

Environment

- Documentation covering patching, monitoring and backup/restore

Build

- Source Code
- Installation Scripts/Packages
- Installation verification checklist
- Package Configuration
- Inter-instance migration scripts (e.g. copy live data to test or v.v.)
- Inter-instance migration instructions
- Inter-instance migration checklist
- Fully functioning software

Testing

- System Test Cases
- System Test Report
- Functioning test system
- Test plan
- Test data
- Test cases
- Test log
- Security Test Results
- Incident Log
- UAT Completion Report
- Performance & Stress Test Report
- Disaster Recovery Plan
- Backup Schedules
- Test Completion Report (Recovery Test)
- System Monitoring

User Training & Docs

- Training Schedule
- User Manual
- Successful training

Implementation

- Standard Operating Procedures document
- Go Live Authorisation (in Teagasc ticketing system - ATS)

The Tenderer may use this approach or if the Tenderer feels an alternative development approach would be more successful this may be suggested and described in their tender.

2.5.6.2 Project Management

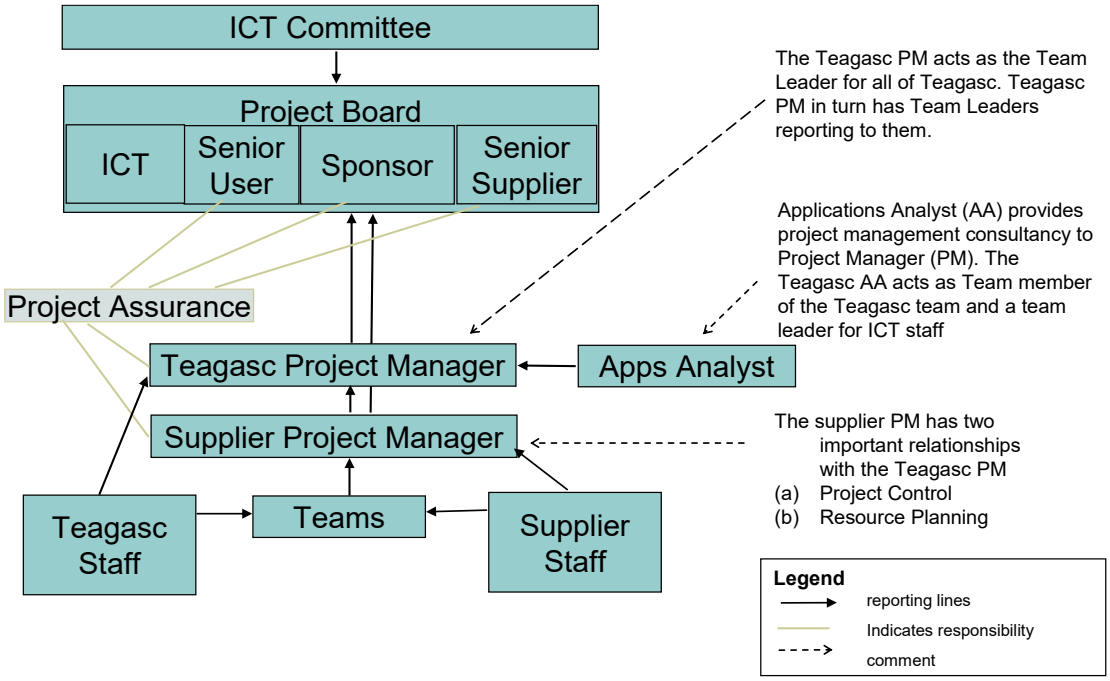
Teagasc project board will oversee the programme of Web Application developments. The contractor will be invited to participate on this board. Attendance on the board will form part of the fixed charge and will not be separately chargeable.

Teagasc will appoint a Project Manager who will manage the project.

The contractor must nominate a Project Manager who will manage the Tenderer's resource on the project and assist the Teagasc Project Manager. The role of the Tenderer's project manager will be:

- Plan in detail all aspects of the project involving the Tenderer's and Teagasc's resource
- Work with Teagasc Project Manager to agree overall project plan
- Assign tasks to team members and ensure they are carried out on time
- Ensure Tenderer's deliverables are delivered on time
- Ensure Tenderer's deliverables are to specification
- Manage project risks and issues
- Report to the Teagasc Project Manager on project performance and escalate appropriate issues
- Ensure the project is successfully completed to budget and schedule

The following diagram describes the project management environment within Teagasc



The project should be managed using a recognised project management methodology. Each tenderer must provide details of the project management methodology/tools to be used by his/her company. The Teagasc project methodology is Prince 2.

2.5.6.3 Warranty & Support Commitment

The deliverables produced as a result of a project are included in the Support and Maintenance Service from the date of project completion.

The deliverables produced as a result of the project are warranted for a minimum period of 90 days from the date of project completion.

During the warranty term, the Tenderer will repair issues reported by the Client concerning the deliverables where the functionality or performance does not match the project documentation. The Support and Maintenance Services described in the **Error! Reference source not found.** section are included in the warranty.

The Contractor guarantees to offer an annual Support and Maintenance Service for the deliverables for a minimum of 3 years from the date of warranty expiry. The annual cost for this Support and Maintenance Service will not be increased annually by more than the official Consumer Price Index (CPI) in Ireland.

2.5.6.4 Intellectual Property Rights

The conditions set out in section 2.5.4 also apply to projects.

2.5.6.5 Disaster Recovery

If Teagasc requires assistance with Disaster Recovery this will be raised as a Change Request. The Tenderer will engage on an emergency basis. The Service Delivery Manger will raise a Change Request to manage any associated costs and will be responsible for ensuring resources are made available as soon as is reasonably possible.

2.5.7 Business Continuity

The tenderer must provide a copy of their business continuity plan and procedures in place to maintain continuity of services as part of their tender response.

2.5.8 Right to runner-up clause

If for any reason it is not possible to award the contract to the designated successful tenderer for a specified Lot, emerging from this competitive process, or if having awarded the contract on, Teagasc considers that the successful tenderer has not met its obligations, Teagasc reserves the right to award the contract to the next highest scoring tenderer for that Lot on the basis of the terms advertised, at any time during the tender validity period. This shall be without prejudice to the right of Teagasc to cancel this competitive process and/or initiate a new contract award procedure at its sole discretion.

2.5.9 Data Processing Agreement

All data for Teagasc clients will be hosted by Teagasc and the Tenderer will have no rights to access or retain that data except as required, and agreed, for development, support, test and backup

purposes and in any event will have no right to retain any such data after the termination of any contract resulting from this Tender.

For the awarded Tenderer, a Data Processing Impact Assessment (DPIA) must be completed. Following this a clear understanding of Service Providers obligations in terms of data processing and protection of Teagasc's data should be clear, comprehensive and to include: pseudonymisation & encryption of personal data, if applicable, availability and resilience of data processing form designer applications and services and procedures to deal with a data breach (including incident response processes, notification timelines and incident resolution plans). Service providers are also responsible for sub-processor data processing compliance. Further data protection engagement will take place with awarded Tenderer.

2.5.10 Health & Safety, Risk Assessments and Method Statements

To comply with all applicable H&S legislation, Teagasc has an online Contractor Management System called Flex. Teagasc is committed to providing a safe place of work for everybody and managing contractors on site plays an important role. Contractors are required to provide the required resources, training and expertise to conduct their activities safely on site.

The Flex system used by Teagasc requires some input from the Contractor and is designed so that the Contractor can upload the necessary health and safety documentation (e.g. Safety Statement, Insurance Certificates etc.) when needed and will generate notifications if required, e.g. expiring insurance certificates. To be granted access to Teagasc sites, the successful applicant must comply with and maintain the online Teagasc Contractor Management System (Flex). The following details must be provided/ or made available on request and confirmed prior to work commencing:

• Safety Statement;

• Valid Insurance Certificates confirming adequate Public Liability & Employer's Liability cover and any other Insurance cover as specified;

• Health & Safety Training (e.g. CSCS Cards, Manual Handling, safe pass, etc.);

• Online Induction (all personnel (including subcontractors) attending a Teagasc Site must complete the Teagasc online health & safety induction and any other deemed applicable by Teagasc);

• A Method Statement for any scheduled works (submitted in advance), outlining the personnel involved, the sequence of works and applicable risk assessments;

• Any other relevant safety documentation, e.g. disposal licences

The successful Contractor must commit to updating documents on the Flex System in a timely manner.

2.5.11 Invoicing

All invoices must quote a valid Teagasc PO number provided by the local Teagasc point of contact for each site. Invoices should be issued in a timely manner and within 30 days for services being

completed. All invoices/credits/statements are to be submitted electronically to accounts.payable@teagasc.ie

Invoices not quoting a valid PO number will be returned unpaid. All invoices should provide clear details of services provided to include Qty/No of hours (where applicable) , description of service provided etc

2.5.12 Environmental and Sustainability Requirements

Teagasc is fully committed to adhering to both national and European Union policies regarding Green Public Procurement (GPP) and sustainable procurement practices.

The Contractor is expected to demonstrate environmental awareness and cooperate fully with Teagasc staff to uphold the Contracting Authority's sustainability commitments

2.6 Pricing Requirements

Tenderers must complete the pricing section in full for each separate Lot tendered in the relevant TRD for that Lot.

Tenderers must submit a fixed price quotation for the following services

a) Take On costs
b) Handover costs
c) Annual software maintenance and support (for a total of 9 years)
d) Fixed rates for Development Project services.
e) Out of hours support

The annual software maintenance & support costs must be completed in full for each calendar year (Years 1-9)

Note:

- All prices must be quoted in euro
- All prices should be quoted with and without VAT. Please state all VAT rates applicable.

In order to make the comparisons of tenders, viable tenderers must ensure that their contingency costs are separately identified.

Any assumptions used in the calculation of costs should be stated. Such assumptions will be examined and factored into the evaluation of costs

The evaluation will be based on replies submitted in response to the Pricing Schedule section of the TRD. The evaluation will be based on a total lifetime cost for the proposed solution based on the requirements outlined, so it will also take into account any cost considerations arising from the overall context of the tender response.

Costs will be assessed using the following sub-components:

(i) Support and Maintenance Services Costs

(ii) Take on costs

(iii) Handover costs

(iv) Support outside of normal business hours

(v) Development services based on a notional project

Less any discounts details in B4.6 of the response document

The labour rates being proposed in respect of Development Project Services. This will be based on a notional amount of project work and there will be no obligation on Teagasc to proceed with any project work. The following notional project work will be used for evaluation purposes only.

Role	**Number of days**
Project Manager	30
Senior Developer	130
Junior Developer	240
Mobile App Developer	50
Security Specialist	20
Database Administrator	20
Senior Tester	30
Junior Tester	100
Systems Analyst	20
Business Analyst	20
Server Administrator	20
Network Administrator	20

The use of the notional figures above is not in any way intended to indicate likely usage volumes. The volumes are not in any way guaranteed and may vary very considerably from those used for evaluation purposes and may be zero. The drawdown of days is at Teagasc's sole discretion and Teagasc makes no commitment whatsoever to drawing down development days.

2.6.1 Payment Schedule

The tenderer must provide a proposed payment schedule for take on costs & delivery of projects consistent with the following principles:

2.6.1.1 Payment Principles

- No up-front payments will be made.
- Payments in the schedule will be linked to the sign off of major deliverables linked to Teagasc milestones, typically at the end of a development phase (e.g., Design documentation complete and signed off, User Acceptance Test sign-off etc).
- At least 30% of the overall amount will be linked to the successful sign off of user acceptance testing
- At least 20% of the overall project amount will be linked to the final sign off of system go-live
- 10% of the overall project amount will be paid 60 days after system go-live.
- Annual on-going support and maintenance to be paid quarterly in arrears.
- Teagasc requires a flat rate quotation for daily rates & hourly rates which apply to once off requests for out of hours support under the support and maintenance service.

3 Tender Response Document

Please Note: There is a separate tender response document for each of the three lots as follows:

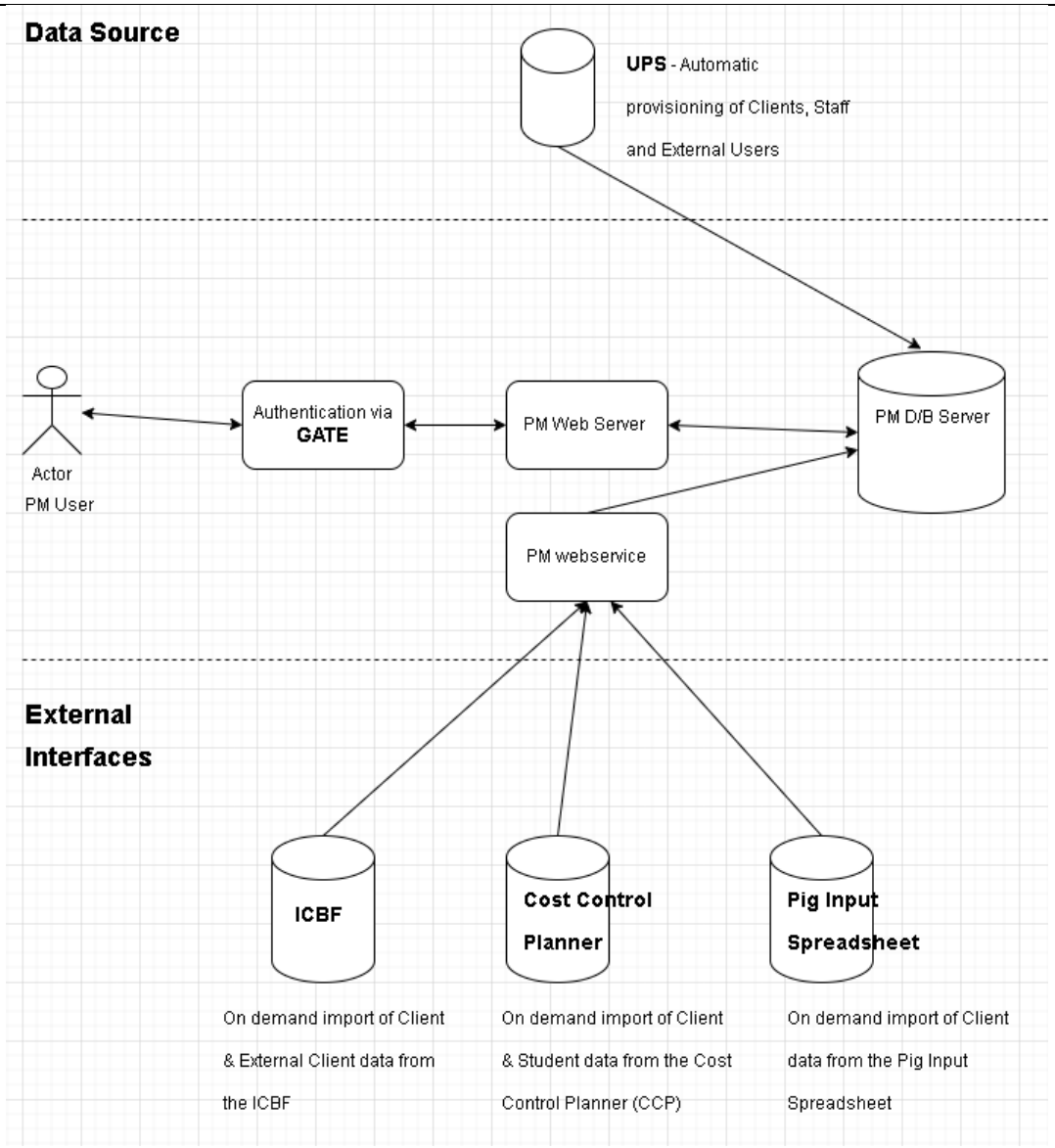
- P4941_Webapps_TRD_LOT1
- P4941_Webapps_TRD_LOT2
- P4941_Webapps_TRD_LOT3

Tenderers must complete the relevant tender response document (TRD) provided for each Lot they are applying for. All sections for the TRD are to be completed in full. No alterations are to be made to the TRD.

Tenderers must be able to provide services for all applications listed within the Lot applied for under this tender competition.

Appendix A – Profit Monitor - Technical Overview

Item	Description
Overview	The Profit Monitor is a web application that allows Farmers and Agricultural Advisors perform financial analysis of farm businesses. It is very much a management accounting type analysis, and this facilitates farmers assess the financial performance of their business and helps identify areas for improvement when assessed against their peers. There are approximately 5k Profit Monitors completed annually. The Profit Monitor was initially developed in 2003 and has undergone many development projects since its inception. The Profit Monitor is a responsive application with a cut-down version of the application available on mobile phones. This allows farmers access to their key financial figures at local or national Farm Advisory events.

Profit Monitor - Architecture Diagram	

Architecture
 	
/Hosting
	The Web and database components reside on separate servers in the same location hosted by Teagasc in a web domain which is separate to the main Teagasc domain.
	
	Web Server:
	
	• OS – Microsoft Windows Server 2019 Standard
	• Required Software / Features
	  ○ IIS 10.0.17763.1
	  ○ VB.Net version 4.7.2
	• GATE (using MS Azure EntraExternal ID technology) is used for User Authentication See Interfaces Section below for details.
	• Profit Monitor reports are produced using SSRS.
	
	Database Server:
	
	• OS – Microsoft Windows Server 2019 Standard
	• Required Software / Features
	  ○ SQL Server 2022 Standard Edition including SSRS

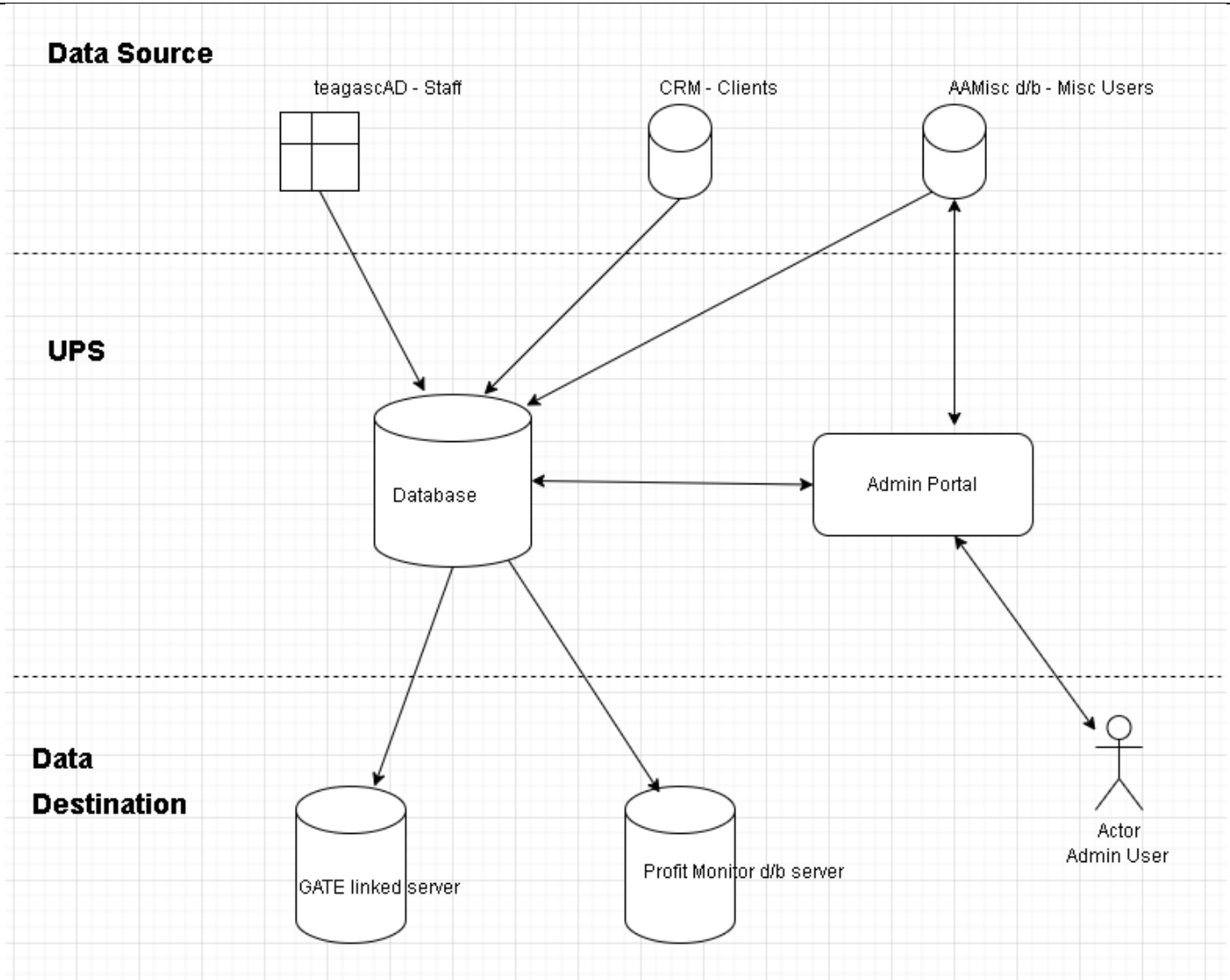
Interfaces	**GATE (Gateway for Access to Teagasc Environments):** Interface with Teagasc User Authentication System (GATE) to authenticate users logging into Profit Monitor. The interaction between Profit Monitor and GATE is based on claims-based authentication. It allows Profit Monitor to authenticate against MS Azure Entra External ID by releasing the following information in the claim: • Unique ID (email) • User Name **Irish Cattle Breeding Federation (ICBF):** The Profit Monitor has an associated Web Service that accepts an XML file in pre-defined format from a recognized source. Once validated the contents are written to the Profit Monitor database. An external agency called ICBF use this webservice to transfer data to the Profit Monitor. Two internal spreadsheet programs (Cost Control Planner and the Pig Input spreadsheet), produce xml files that are consumed by the Profit Monitor webservice also. **User Provisioning System (UPS):** Integration of the Profit Monitor with the UPS via a SQL Linked Server, facilitates provision of new clients, staff and externals into the Profit Monitor. The role each user has within the Profit Monitor is passed to PM from the UPS. The UPS gathers all user types from source systems.
Functionality	The Profit Monitor is web application that allows farmers to monitor their farms financial performance. Financial data such as Variable Costs, Fixed Costs, Sales, Asset values etc are input to the system on a yearly basis and the system produces management accounting type reports. Various reports are available that allow the farmer to access the farm profitability and to benchmark farm financial performance against other farms of similar enterprise, size etc. Farm performance from year to

	year can be benchmarked on several different variables such as costs per Ha, Costs per Kilogram of Beef produced, costs per Litre of Milk produced etc. There are five different user roles on the Profit Monitor which facilitates different levels of access for the following user types: Teagasc Advisors and Administrators, Private Agency Advisors and their Farmer Clients, Teagasc Farmer Clients, Teagasc Lecturers and Students Farmers and Students can only see their own data, Advisors and Lecturers can see the data of their associated Farmers and Students. Only Teagasc Administrators have access to the full set of Admin features.
User Access	5 levels of user: • Administrator (Access to all Admin functions) • Specialist (Access to all Client data and Specialist functions) • Unit Advisor (access to specific reports at Unit Level) • Advisor/Lecturer (Access to all associated Client & Student data and Advisor functions) • Farmer/Student (Access their own data)
Authentication	Users are authenticated using the Teagasc GATE system. Known users register with the GATE system using their email address and 2FA via an SMS to their mobile phone. As set out in the Interfaces section above the interaction with GATE is based on claims-based authentication. Authorisation is managed within the Profit Monitor application based on roles passed from the UPS.
Size	The Profit Monitor database is called Teagasc eProfit and contains approximately 270 tables.

No. of Support Calls	The approximate number of Profit Monitor annual support calls is 32. Note: this data is provided for information purposes only and is not an indication of the number of future issues.
Development days	The approximate average number of development days for 2022, 2023, 2024 and 2025 was 60 man days. Note: this data is provided for information purposes only and is not an indication of future development.

Appendix B – User Provisioning System - Technical Overview

Item	Description
Overview	The User Provisioning System (UPS) is a system that pulls user details (Teagasc Staff, Clients, Teagasc Students and externals) from various source Systems and collates them is a standard format so that they can be provisioned to various downstream systems. This cuts down on the same data being entered in multiple systems. It allows automatic provisioning of users to downstream systems. The UPS also filters out records that do not conform to validation required in downstream systems, and assists catching data issues at an early stage in the overall data flow processes.

Architecture Diagram	

Architecture
 	
/Hosting
	The Web and database components reside on separate servers in the same location hosted by Teagasc on the main Teagasc domain.
	
	Web Server:
	
	• OS – Microsoft Windows Server 2019 Standard
	• Required Software / Features
	  ○ IIS
	  ○ ASP.Net version
	
	Database Server:
	
	• OS – Microsoft Windows Server 2019 Standard
	• Required Software / Features
	  ○ SQL Server 2019 Standard Edition including SSRS
	• Two databases named ETL and AAMisc

Interfaces	• *SQL based integration with teagascAD for retrieving Staff data.*
	• *SQL based integration with CRMIntegration d/b using the aacrm d/b user account*
	  ○ *AA_Clients view – Main Client details*
	  ○ *Group_Advisor_ID – Client – Discussion Group Advisor association*
	• *SQL based integration to Profit Monitor d/b to push out user details*
	• *SQL based integration to GATE. To allow GATE extract user details*

Functionality	The User Provisioning System (UPS), retrieves user details for three main user types. Staff are retrieved from Teagasc Active Directory, Clients are retrieved from the Client Mgt System and Miscellaneous Users are entered on the UPS admin interface. These users and their details are cleaned and presented to other systems (such as GATE and profit Monitor) for automatic user provisioning.
User Access	The frontend is used internally only for a small number of Teagasc Admin users
Authentication	Authentication is controlled via teagascAD group membership
Size	25 tables in the ETL database and 5 tables in the AAMisc database
No. of Support Calls	The approximate number of UPS annual support calls is 70. Note: this data is provided for information purposes only and is not an indication of the number of future issues.
Development days	The approximate average number of development days in 2025 was 40 man days. Note: this data is provided for information purposes only and is not an indication of future development.

Appendix C – Interactive Forms - Technical Overview

Interactive Forms (IF) is a collection of unrelated bespoke ASP .Net forms (http://interactive.teagasc.ie). They server various functions from initiating contact to Teagasc department to technical calculators. There is no database behind the forms, all calculators are “fire-and-forget”. It is hosted within the Teagasc DMZ (similar to the Profit Monitor). There is only a production instance of the application.

Item	Description
Architecture/Hosting	The website is hosted on a Windows 2019 server running IIS.
Code	The site is implemented using ASP.NET MVC 4 with the ASP.NET WebForms controls and .aspx pages for views. The application is running on .NET Framework 4.5
Database	N/A
Interfaces	SMTP
Functionality	There are 10 ASP .Net MVC forms using a master page.
User Access	All users have the same access level.
Authentication	There is no authentication, anonymous browsing is allowed.
No. of Support Calls	The approximate number of annual support calls in 2025 was 5. Note: this data is provided for information purposes only and is not an indication of the number of future issues.
Development Days	The approximate average number of development days in 2025 was 10 man days. Note: this data is provided for information purposes only and is not an indication of future development.

No.	Form Name	Description	Components
1	Job Alerts	Subscribe / Unsubscribe for Job alerts	Code location : /Views/JobAlerts (Index and Thank you pages)
2	Feed Checker Calculator	Grass silage calculator for next winter, calculate total grass silage required including reserve, total grass silage available and overall position	Code location : /Views/FeedChecker (Index and Print pages)
3	Relative values of Feeds for High/Medium Protein Diet	Calculate value of feeds relative to barley and soy	Code location : /Views/FeedStuffs (Index Page)
4	Seeding Rate	Calculator for estimated seed rate	Code location : /Views/SeedingRate (Index Page)
5	Feed Stuffs Beef	Calculate relative values of feeds for low protein diet generated using barley and distillers grains	Code location : /Views/FeedStuffsBeef(Index Page)
6	Household Budget Calculator	Calculate total yearly,monthly income based on yearly off-farm income, other income sources. Calculate total yearly, monthly expenses based on farm, cost of off-farm job, household, regular bills, family transport, household insurance, finance,education,other expenses, income tax and levies	Code location : /Views/HouseholdBudget(Index Page)

7	Relative Value of Fertilisesr (Using CAN)	Compare the relative value of fertilizers at any one time based on the price of three of the main fertilisers on the market. This program calculates the relative cost of a unit of nitrogen, phosphorous and potassium and using this information calculates the value of compound fertilizers, depending on the proportion of each component in it.	Code location : /Views/RelativeValueFertCAN(Index Page)
8	Relative Value of Fertilisers(Using Urea)	Compare the relative value of fertilizers at any one time based on the price of three of the main fertilizers on the market. Urea, 00:07:30 and 00:10:20 are the basis for the relative values and must be updated with the current price.	Code location :/Views/RelativeValueFertUrea
9	Estimation of Repayment Capacity	This calculator allows the calculation of free business cash for meeting new loan repayments.	Code location :/Views/RepaymentCapacity(Index and View Instructions pages)
10	Forest Carbon Tool (FCT)	The Forest Carbon Tool provides indicative carbon sequestration values associated with forest planting options.	Code location :/Views/ForestryCarbon(Index and main and print pages).Files needed: Annual CO2, Grant & Premium Categories and Approved Species Data,Methodology,Site CO2, HWP, ENERGY,Agricultural emissions and CAP values from table:

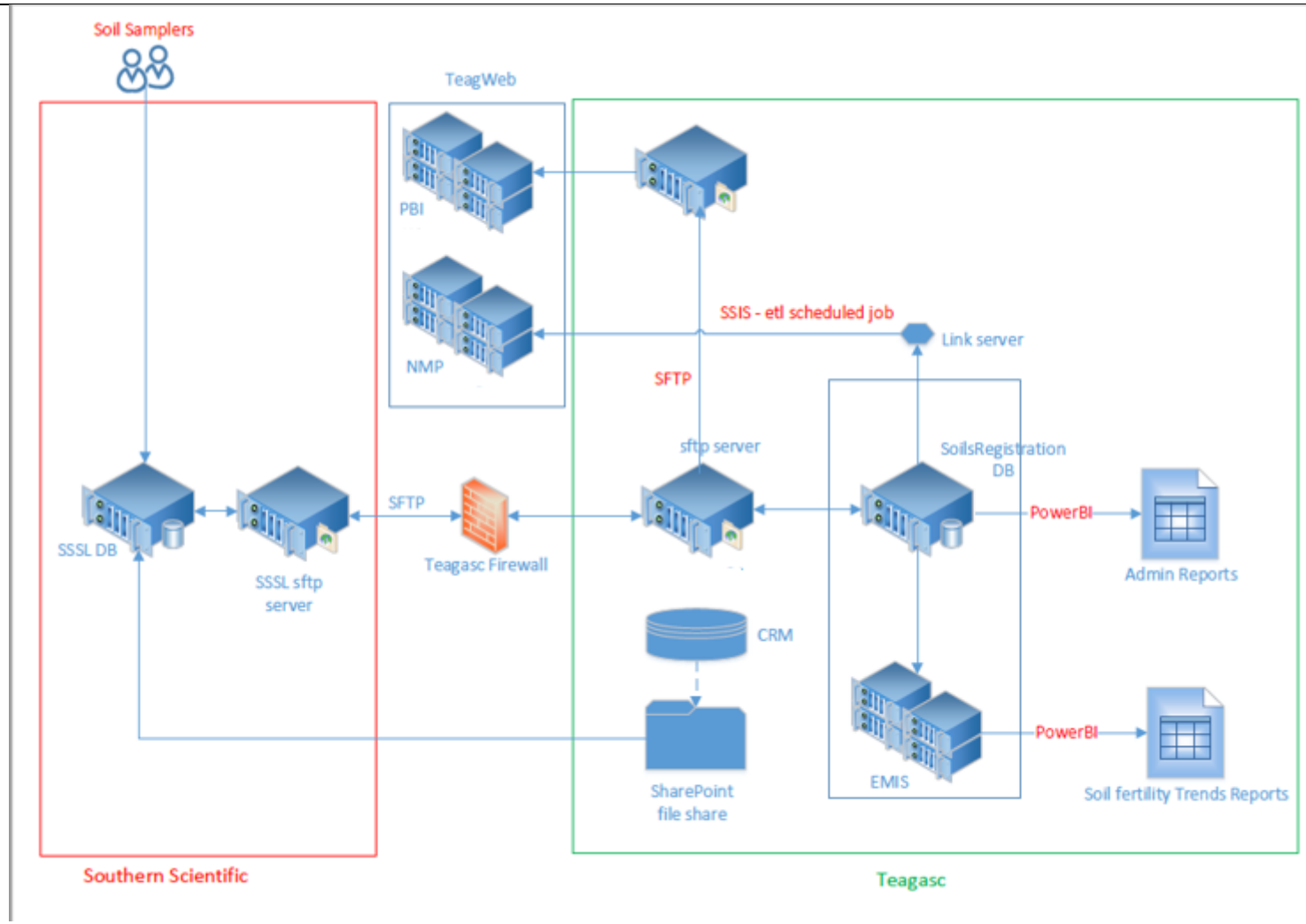
Appendix D – Environmental Management Information System - Technical Overview

Item	Description
Overview	EMIS is the Environmental Management Information System is a database that stores data from Met Eireann weather data and soil sample results from the soil sample laboratory.
Architecture Diagram	The system resides on one Win 2019 server on live
Architecture/Hosting	MS SQL 2019 db, Windows server 2019, sftp server
Interfaces	SFTP, SSIS – ETL schedule job
Functionality	This is a database system that pulls in Soil results and met Eireann weather data from external systems and presents this data for use in other systems.
User Access	User access via MS Access
Authentication	Teagasc AD
Size	70 database tables
No. of Support Calls	The approximate number of support calls in 2025 was 4 Note: this data is provided for information purposes only and is not an indication of the number of future issues.

Development days	The approximate average number of development days for recent years is 1 man day. Note: this data is provided for information purposes only and is not an indication of future development.

Appendix E – Soil Registration System - Technical Overview

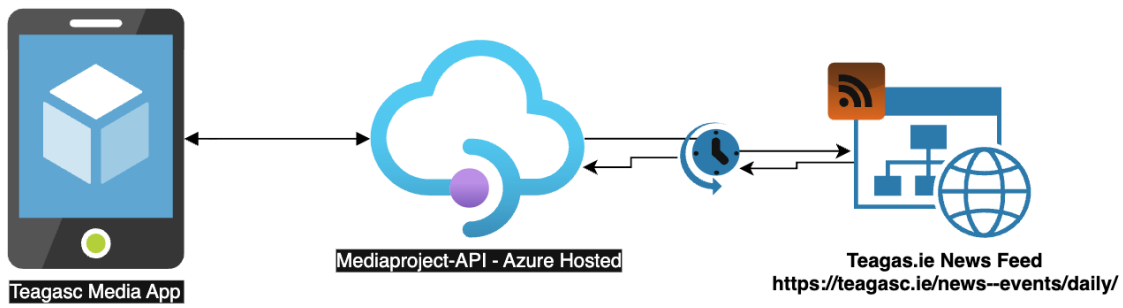
Item	Description
Overview	Southern Scientific Services Laboratories (SSSL) files integration with Teagasc's Soil Registration, EMIS, NMP and PBI applications
Architecture Diagram	The system resides on one Win 2019 server on live



Architecture/Hosting	MS SQL 2019 db, Windows server 2019, sftp server

Interfaces	SFTP, SSIS – etl schedule job
Functionality	Soil sample report transfer from SSSL to Teagasc
User Access	User access via MS Access
Authentication	Teagasc AD
Size	9 database tables
No. of Support Calls	20
Development days	0 as deployed in Jan 2026

Appendix F – Media Channel App & API - Technical Overview

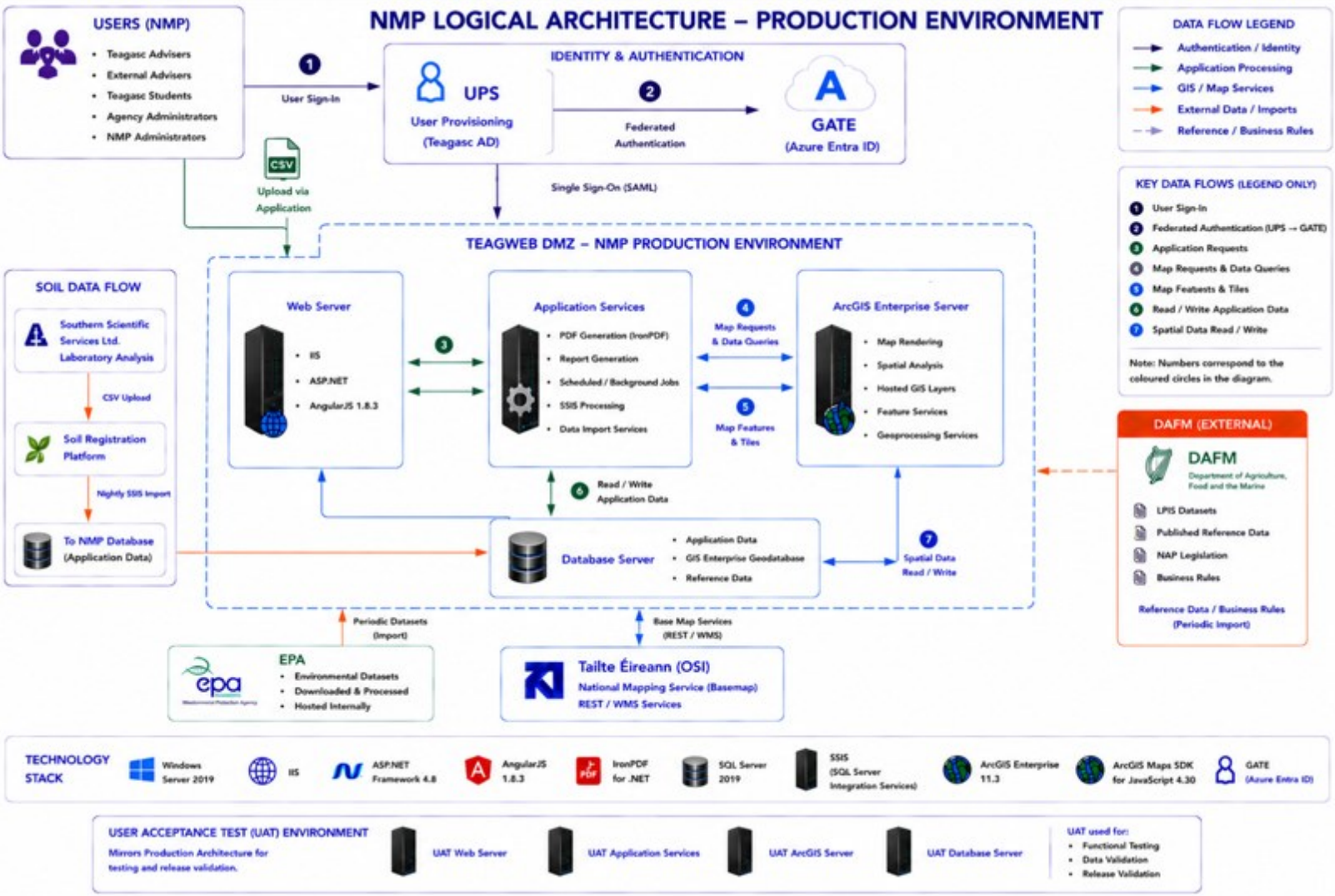
Item	Description
Overview	At present Teagasc offer a series of daily articles for farmers based on a set of categorisations including Dairy, Beef, Sheep, Crops, Grassland, Environment, Forestry, Farm Business, Other. The purpose of the Media Channel app is to allow the users on their mobile device to set up a series of categories and the content types that they are interested in receiving articles for and then these articles are downloaded to their device when they are online, to be able to read when online or offline. The articles are presented in a default interface with standard text and graphics presented.
Architecture Diagram	
Architecture	The Media App project consists of 2 components:

/Hosting	1. The Mediaproject API – this is a Dotnet Core 3.1 WebApi project exposing 2 endpoints that handle fetching the latest articles from the teagasc.ie website news feed and preparing the articles from XML Feed format into proper json objects to be sent to the mobile App The Mediaproject API is hosted on Microsoft Azure – Platform App Service plan. 2. The Media APP – This is the mobile application built using Xamarin 5.0.0.2196 running on .Net Standard 2.0 using SQLite as a client store for saving the articles offline. The Xamarin application builds two clients – the iOS and Android one. Both clients are published in their respective stores (Google Play and Apple App Store), currently version 1.5.6 is the latest one.
Functionality	When the user opens the application on their device, the application will update the relevant content, assuming they have an Internet connection. If there is new content meeting the requirements of the user, the new content will be downloaded. New articles are added to the listing if it is currently showing. If the user is reading an article, then the option to download content is available but new content is not shown in the list until the user returns to the listing by closing the current article. The user has the option to: o View the list of articles – this the default view with the most recent on the top of the list o Reorder the current list by date, type (selection option for categories at the top) o Update Content Option o View an article o Return to the List o Access and Save Settings o Copy Article text for pasting into other applications (native mobile functionality) o View push notifications – these are presented using the standard native app notification settings. The content will be updated when the user opens the app (if online), comes online for any reason or interacts in any manner with the opened app.
User Access	IOS: 9650 first time downloads ANDROID: 5486 first time downloads
Authentication	The application does not require users to log in. User preferences (font size/theme) are saved at the device level.

	The Media app (client) authenticates against the Mediaproject-API using a unique API Key that is sent in the headers of the requests.
Size	Media App APK bundle ±40MB Mediaproject DLLS publish package ±4.13MB
No. of Support Calls	Year 2025 support calls: 6. Monthly usage monitoring is reported to Teagasc.
Development days	Year 2025: 0

Appendix G – Nutrient Management Planner (NMP) - Technical Overview

Item	Description
Overview	The Nutrient Management Planning (NMP) system is a web application used by Teagasc Advisers and external agricultural advisers to prepare nutrient management plans for Irish farms. The application enables users to assess soil fertility, calculate nutrient requirements and fertiliser allowances, produce nutrient management plans and generate PDF reports with supporting maps. The system supports compliance with the Nitrates Action Programme (NAP) Regulations and is updated annually to implement legislative and business rule changes issued by the Department of Agriculture, Food and the Marine (DAFM). The platform incorporates extensive Geographic Information System (GIS) functionality using ArcGIS Enterprise and OSI mapping services. In addition to farm mapping, the application provides a wide range of environmental, hydrological and regulatory mapping layers that support nutrient management planning, water quality initiatives and other Teagasc advisory programmes, including ASSAP. The GIS platform is actively maintained and enhanced to support new mapping layers, environmental datasets and evolving business requirements. The application integrates with several internal systems and external services to support authentication, soil sample processing, GIS mapping and legislative compliance.

NMP - Architecture Diagram	

Architecture /Hosting	NMP has a multi-tier architecture, hosted across four servers in the same location hosted by Teagasc in a web domain which is separate to the main Teagasc domain. Separate live and test environments exist. There are four separate servers as follows: **Web Server:** • Operating System – Microsoft Windows Server 2019 Standard • IIS Web Server • Microsoft ASP.NET Framework 4.8 • AngularJS 1.8.3 **Application Server:** • Operating System – Microsoft Windows Server 2019 Standard • Microsoft ASP.NET Framework 4.8 • PDF generation via IronPDF **ArcGIS Server:** • Operating System – Microsoft Windows Server 2019 Standard • GIS Platform - ArcGIS Enterprise 11.3 • GIS SDK - ArcGIS Maps SDK for JavaScript 4.3 **Database Server:** • Operating System – Microsoft Windows Server 2019 Standard • Microsoft SQL Server 2019 • Microsoft SQL Server Reporting Services (SSRS)

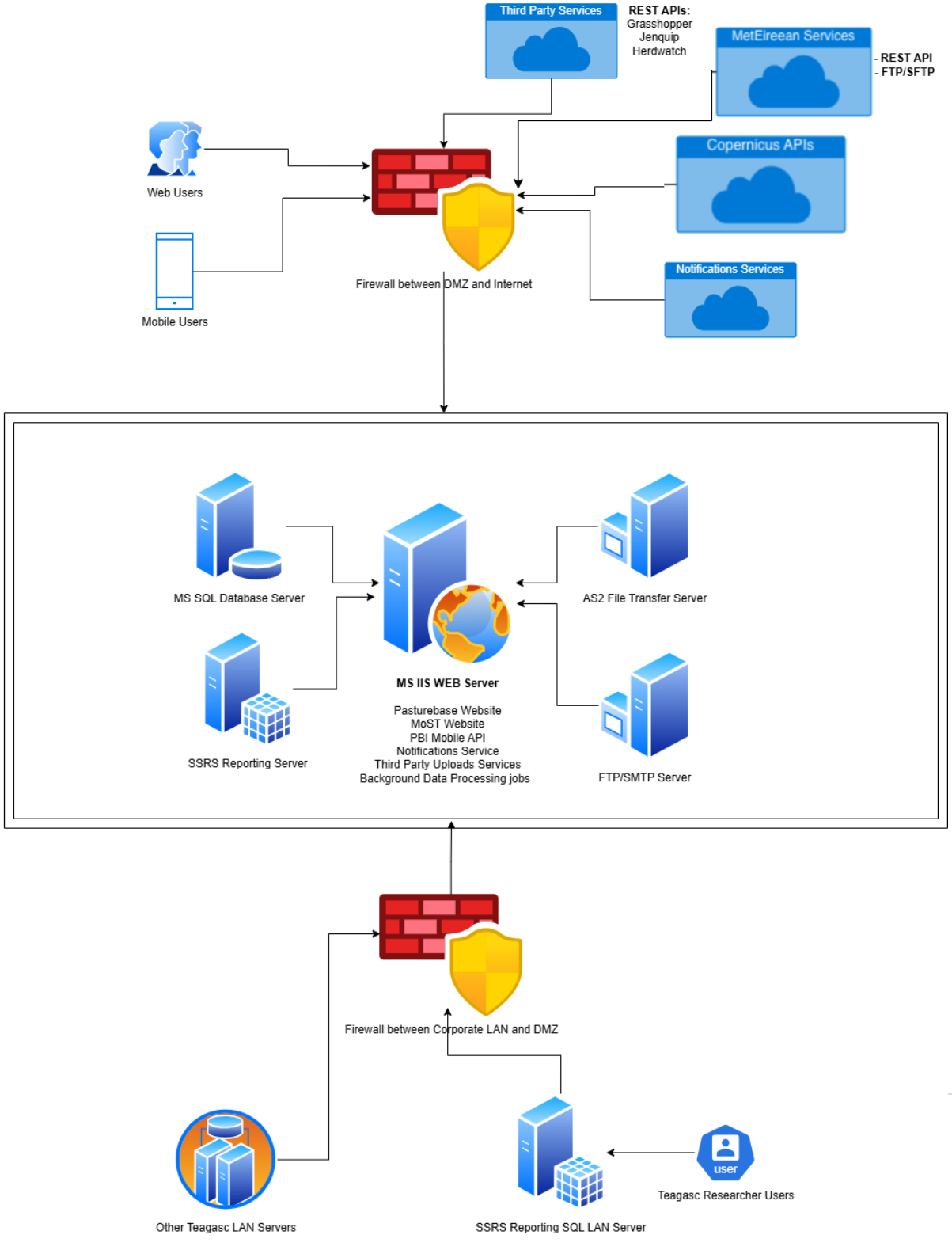
Interfaces	**GATE (Gateway for Access to Teagasc Environments):** Interface with Teagasc User Authentication System (GATE) to authenticate users logging into NMP. The interaction between NMP and GATE is based on claims-based authentication. It allows NMP to authenticate against MS Azure Entra External ID by releasing the following information in the claim: • Unique ID (email) • User Name **Teagasc Soil Registration System** There is a SQL Server linked Server connection between the NMP database and the Soil registration System database, which facilitates scheduled importation of (Soli analysis results) data into the NMP database. External Interfaces exist to: • Tailte Éireann MapGenie services (national basemap and selected live mapping services) •
Functionality	Nutrient Management Planning is a web application that facilitates farmers manage nutrient use on their farms. Nutrients are a combination of bought in chemical fertilizers and manures produced on farm, from Livestock. NMP calculates the recommended nutrient application level per plot and overall farm nutrient limits taking several factors into account. These being the current soil fertility levels, the crop to be grown and stocking rate. A nutrient management plan is produced annually for each farmer. Having a nutrient management plan is a legal requirement for farmers who avail of a derogation to stock their farms at higher levels. See https://teagasc.ie/environment/schemes-regulations/nitrates-derogation/ for background information Nitrates Derogation.
User Access	4 levels of user: • Administrator (Access to all Admin functions)

	• Agency Owner • Agency Admin • Advisor
Authentication	Users are authenticated using the Teagasc GATE system. Known users register with the GATE system using their email address and 2FA via an SMS to their mobile phone. As set out in the Interfaces section above the interaction with GATE is based on claims-based authentication. Authorisation is managed within the NMP application.
Size	The NMP database contains approximately 250 tables. There are approximately 100 pages in the NMP web application.
No. of Support Calls	The approximate average number of days spent on support in recent years is 70 man days per year. Note: this data is provided for information purposes only and is not an indication of the number of future issues.
Development days	The approximate average number of development days for recent years is 140 man days. Note: this data is provided for information purposes only and is not an indication of future development.

Appendix H – PastureBase Ireland (PBI) - Technical Overview

Item	Description
Overview	PastureBase Ireland (PBI) is a web-based and mobile-enabled grassland management application developed by Teagasc to support Irish farmers, agricultural advisors, researchers and students. The application provides real-time decision support for grassland management while simultaneously collecting and storing grassland production data. The platform supports dairy, beef and sheep farming enterprises and enables benchmarking, agricultural research, innovation and policy development. The system enables users to record and analyse paddock information, grass measurements, grazing events, fertiliser applications, soil test results, milk production and weather data. It also provides reporting, analytics and mobile access to support day-to-day farm management. PastureBase Ireland comprises a suite of integrated applications including the PastureBase web application, mobile applications (Android and iOS), REST APIs, reporting services, notification services, grass growth prediction services (MoSt), background processing services, a dedicated AS2 integration platform and integrations with several external organisations and data providers. There is also a separate, replica instance of PastureBase Ireland called PastureBaseEurope The MoSt GG PBI application is a model output statistics application. It incorporates objective weather forecasting techniques which consist of determining a statistical relationship between a predicted and variables forecast by a numerical model at some projection time (s). The PBI MoSt GG model comprises of a responsive frontend, a service-oriented backend, an SQL Server database, secure user authentication, RESTful communications, a statistical model written in R language, a data export functionality, digital mapping, and comprehensive application logging. PastureBase Europe is an additional, separate instance of the PastureBase application. It is essentially a second instance of the same application code, hosted as a separate application instance. It provides the same functionality with its own database. It has a much smaller dataset and does not use the AS2 integrated platforms or have access to the PBI mobile applications. It has its own reporting server.

PBI - Architecture Diagram



Architecture /Hosting	The Web and database components reside on separate servers in the same location hosted by Teagasc in a web domain which is separate to the main Teagasc domain. Separate live and test environments exist. **Web Server:** • Operating System – Microsoft Windows Server 2022 Standard • IIS Web Server • Microsoft .NET 8 • ASP.NET Core Razor Pages • ASP.NET Core Web API • Python and R components supporting analytical functionality • SSL secured HTTPS endpoints **Database Server:** • Operating System – Microsoft Windows Server 2022 Standard • Microsoft SQL Server 2022 • Microsoft SQL Server Reporting Services (SSRS) **AS2 Integration Server:** • Operating System – Microsoft Windows Server 2019 Standard • Mendelson AS2 Server (Commercial Edition) • Dedicated secure B2B messaging server supporting electronic data interchange (EDI) • Supports secure data exchange with external milk processors and soil laboratories

	MoST Application: • Operating System – Microsoft Windows Server 2022 Standard • Frontend: ASP.NET Core Razor Pages, jQuery, Bootstrap, DataTables, Fancybox, R language, Digital Mapping, CSV and PDF output files. • Backend: ASP.NET Core Web API following Repository + Service Layer pattern, Phyton console applications. • Data Layer: Entity Framework Core 7.0.5 with SQL Server • Communication: RESTful HTTP API • Authentication: Uses ASP.NET Core Identity with SQL Server storage and with cookie-based authentication: • Logging: Serilog
Interfaces	**AS2** The dedicated AS2 Integration Server provides secure electronic data interchange (EDI) services using the AS2 protocol. It manages encrypted communications, digital certificates and automated file exchange with milk processors and soil laboratories. **REST APIs** The solution also provides dedicated REST APIs supporting the mobile application and secure interfaces for trusted third-party systems.

Functionality	PastureBase Ireland is web application that allows farmers to track grass growth on their farms and accurately budget feed for the herd. It is mostly used by Dairy Farmers to allow them to accurately assess the amount of Grass on farm and the predicted levels over the short to medium term. This facilitates feed management decision making.
User Access	5 levels of user: • Administrator (Access to all Admin functions) • Researcher • Advisor • Farmer/Student (Access their own data)
Authentication	User authentication is managed within the PBI application. Secure HTTPS communication and SSL certificates are used to protect all web services, APIs and third-party integrations.
Size	PastureBase Ireland comprises multiple integrated components including: • Web Application • Mobile Applications (Android and iOS) • REST APIs • Mobile API • Notification API • MoSt Application • SQL Server Databases including SSRS • Dedicated AS2 Integration Server • Background Processing Services • Windows Scheduled Tasks

	• SQL Server Agent Jobs The solution operates dedicated Production and User Acceptance Testing (UAT) environments comprising web, database and reporting servers together with a dedicated AS2 integration server. The application integrates with numerous external organisations including milk processors, soil laboratories, weather data providers and other trusted third-party systems through secure APIs, AS2 messaging and automated background processing. The PastureBase Ireland database contains approximately 250 tables. There are approximately 130 pages in the PastureBase web application and 10 pages in MoSt. PastureBase Europe is a replica of PBI, so it has the same number of d/b tables and the same code base.
No. of Support Calls	The approximate number of support calls in 2025 was 500 Note: this data is provided for information purposes only and is not an indication of the number of future issues.
Development days	The approximate average number of development days for recent years is 290 man days. Note: this data is provided for information purposes only and is not an indication of future development.

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