

ESco Solution Architecture Review

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ESCO ARCHITECTURE REVIEW

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1 Background

This report outlines the findings of reviewing the current technical solution architecture for ESCo, with a focus on providing recommendations for how to develop and evolve the technology solutions to address increasing competition in the platform space.

The findings represent an external perspective and have been compiled through group meetings, and 1:1 consultations with the team and key suppliers.

1.1 Risks and opportunities

The technology platforms are working well but using dated technology approaches in some cases. This has led to ‘technical debt’ which should be addressed to take ESCo forward to be

able to compete more effectively. Figure 1 considers EScO technical services from the perspective of whether they serve the business well, and whether the technology approach itself is appropriate and sustainable going forward. It is clear there are a number of systems in place that are working very well for EScO as they have had years of refinement but are running on technologies that could benefit from being upgraded.

Figure 1 shows an external assessment of the tools in use, Figure 2 shows the same exercise compiled using group feedback from the Team.

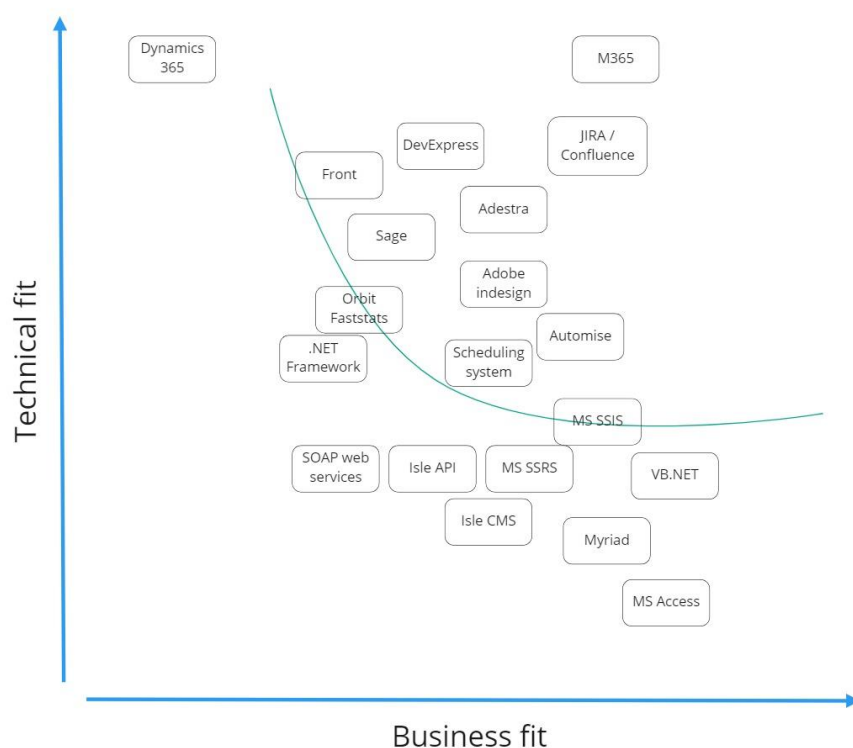
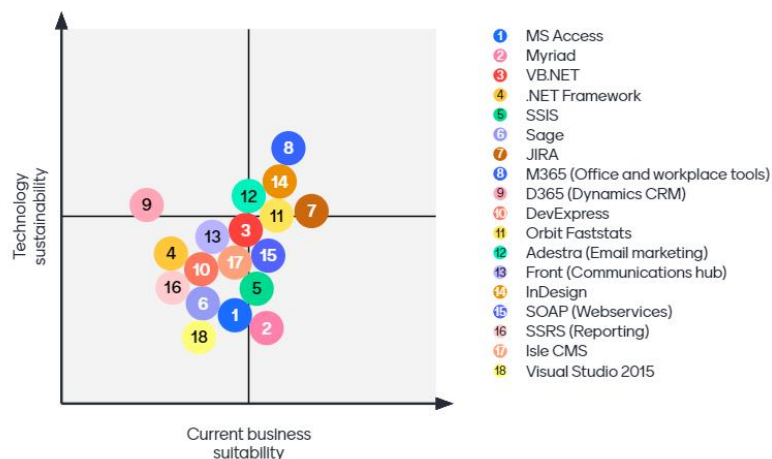


Figure 1 Technology fit vs Business fit visualisation - consultant perspective

Technical debt

Mentimeter



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Figure 2 Technology fit vs Business fit visualisation - team perspective

Figure 1 and 2 show broad similarities and highlight a few key points:

- MS dynamics 365 could do more to support the business
- Some tools (e.g., Access) are doing a fit for purpose job now but are not future-proofed
- Myriad in its current form is not future-proofed
- Other tools (e.g., SSIS, .NET Framework, SOAP etc.) are potentially becoming dated and alternatives should be moved towards

The following SWOT exercise outlines the main strengths, weaknesses, opportunities, and threats facing EScO from a technology perspective.

<i>Strengths</i> • Customer-focused solutions • Dedicated business-aware team • Strong planning and control processes • Strong test and deployment processes • Personalised customer-service	<i>Weaknesses</i> • Large number of homegrown tools • A reliance on outdated toolset • Critical knowledge with individuals • Reliance on key partnerships with Myriad and Isle • Myriad not actively being developed • Isle using bespoke systems • No straight-forward view on MIS
<i>Threats</i> • SAAS platform bureau services • Customers expecting faster feature turnarounds	<i>Opportunities</i> • Move to a cloud-first model • Upgrade and reinvigorate Myriad • Leverage the MS Power Platform • Empower and inspire staff • Integrate with other publishing systems

1.2 Myriad

The following SWOT exercise outlines the main strengths, weaknesses, opportunities, and threats concerning Myriad from a technology perspective.

<i>Strengths</i> • Robust core database model • Suitably tailored for the industry	<i>Weaknesses</i> • Separate instance per customer • Myriad not actively being developed • No modern web-based front-end • Interface technology outdated (VB.net WinForms) • Prototype Web UI technology choice (ASP.NET Web Forms) • User group dysfunctional • No shared product roadmap • On-premises hosting model • Reliant on embedded stored procedures
<i>Threats</i> • SaaS platforms	<i>Opportunities</i> • Delight and retain existing customers

• Customised platforms (e.g., MS D365)	• Fill a low-cost specialist market niche • Bring tech up to date retaining data and logic model
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The consultation has revealed that Myriad has strength in its core database structure, and that EScO adds significant value due to its unique and deep knowledge of this database and how the customers use it.

Recommendations for how to bring Myriad up to date are included in Section 3.

2 Recommendations

A number of routes have been explored and drafted - with an interim meeting to discuss some of these taking place in April 2022, and a follow up in June 2022. The following sections covers some of the thinking behind the routes pursued.

2.1 Decision factors

The following factors have been key in choosing the appropriate way forward:

- Reliance on and deep knowledge of the Myriad platform
- Maintaining the high level of customer service
- Pragmatic practical changes rather too much at once
- De-risking the technology and approach
- Expanding potential to work with wider toolsets

2.2 Solution options

The 'All-in with Microsoft' option

If EScO were starting again tomorrow, replicating the exact current model, without Myriad, it would be possible to design a full solution using only Microsoft tools and services, leveraging the full power of the D365 and Power Platform which have gone through considerable development and overhaul in recent years. Though this model is impractical at this point, it is useful to consider as a reference, to encourage creative thinking, and also to help construct future long-term operating models.

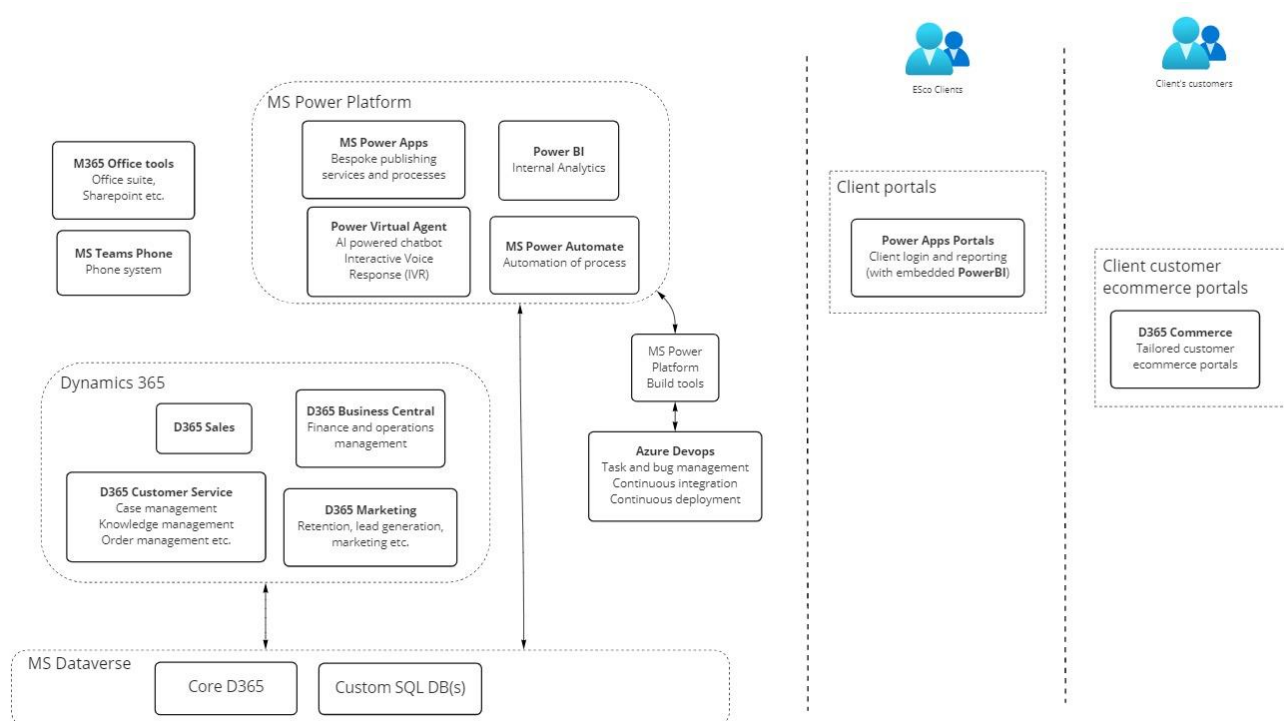


Figure 3 Microsoft centric

Figure 2 presents a high-level view of an architecture making full use of the Microsoft Dynamics 365 and Power Platform solutions. The disruption to achieve this would be significant and knowledge would need to be rebuilt. This model also only deals with a solution where EScO own and manage all the technology, whereas a more useful solution is one where EScO can facilitate and integrate with a range of technologies, reflecting the changes in the market. For these reasons this option is discounted.

2.3 Principles

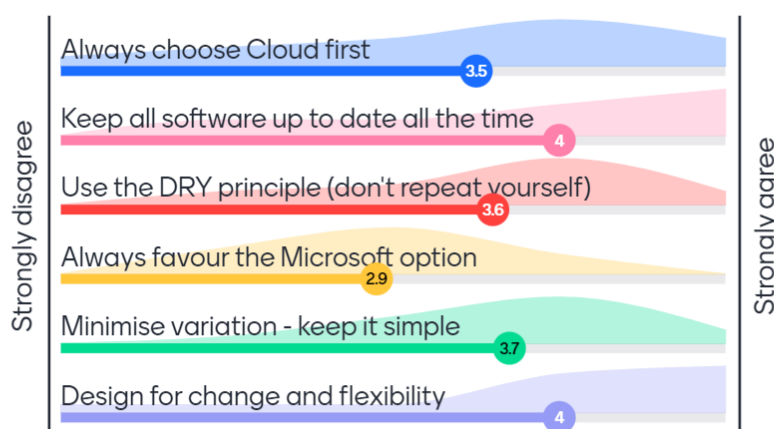
It is recommended core technology principles are adopted to guide decisions and to hold fast to the vision. For example:

- *Design for the cloud*
 - It is noted that there have been previous concerns about moving to the Cloud in general; it is recommended these are reviewed and revisited
- *Keep everything up to date*
 - It is a false economy to try to save money by staying on old versions of things, and is a key principle to stay secure and compliant
- *DRY principle*
 - Don't repeat yourself (e.g., multiple Myriad instances)
- *Favour Microsoft option first*
 - When faced with technology choices, choose the MS option where you can

- *Keep it simple*
 - Prioritise simplicity and maintainability over complexity and bespoke solutions
- *Design for change*
 - Expect and welcome future change

Principles for tech change (suggested)

Mentimeter



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Figure 4 Team feedback on guiding principles

As part of any change programme, it is recommended a set of principles is agreed via a workshop with the technology team - they must be owned by the team for them to be effective. Figure 4 gives examples only, and also highlights variation in agreement. The final set of principles will be key in driving change so once agreed, should be followed closely.

2.4 Architectural target model

The key components of a recommended architecture are:

- Maintaining an evolved Myriad core database
- The phasing out of legacy on-premises tools in favour of modern Microsoft development and data manipulation tools and platforms
- An opening up of processes to integrate with other systems

A potential future

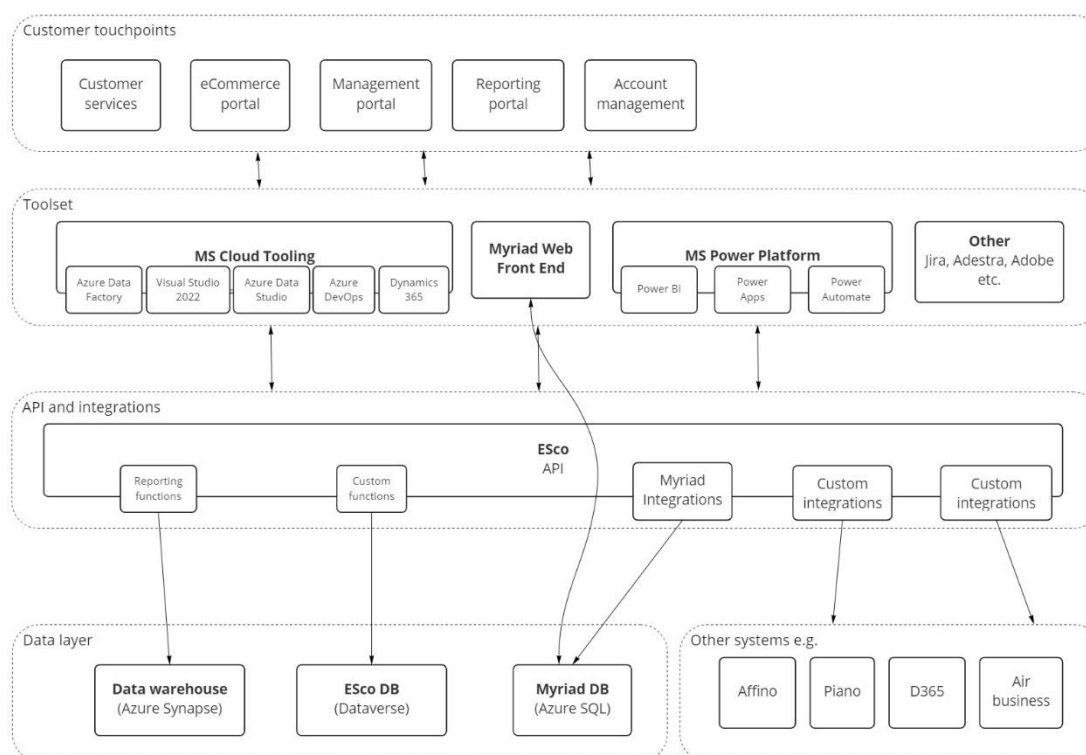


Figure 5 Upgraded approach high level model

Figure 5 outlines a high-level description of the architecture, annotated below:

Myriad - upgraded as per Section 3 with web interface and cloud data management

Cloud - infrastructure and services cloud based where possible

ESco API layer - abstracted to encompass Myriad API functions and connections to other systems over time

Esco tooling - Access based on premise tools upgraded to making use of Azure and Power Platform cloud-based tools

Customer touch points - ecommerce, reporting, and management applications running from Cloud SaaS services and/or MS Power Platform tooling.

Please note the ecommerce portals have not been changed specifically in this model, though ESco should plan to move away from Isle's bespoke CMS over time, decoupling the Myriad/Isle integration into a more flexible architecture.

3 Roadmap

Any change to the current working model is significant. Changes as outlined in Figure 5 are substantial and could not be achieved in one leap.

In order to move towards this model, it is important ESco and the technology team explore and buy into certain aspects of the vision and seek to migrate systems forward in the following areas:

- Managed infrastructure -> software as a service (Cloud)
- Stored procedures -> an embedded logic model
- Replicated systems (e.g., Myriad for each client) -> centralised master
- Moving away from Access DB -> Power Platform tools
- SOAP-based APIs -> REST, MS Graph, GraphQL etc.
- VB.NET .NET Framework -> .NET 5/6 and C#
- SSRS -> PowerBI
- SSIS -> Azure Data Factory
- Customer portals -> MS Power Pages
- SQL Server -> Dataverse or Azure SQL

This list may not be exhaustive, and it won't be practical to address all at once.

3.1 Development environments

ESco should consider moving to .NET Core (.NET 5 or 6) and using C# instead of VB.NET. This is a non-trivial change, but the .NET ecosystem is moving forward and risks leaving VB.NET behind in the long term. Related to this is using the latest version of Visual Studio, and the Azure Devops tools.

3.2 Cloud

By moving the technical operations to a cloud-first model, ESco can benefit from greater robustness, interoperability, maintainability, and predictable cost models. Small steps may include:

- Looking at SQL as a service rather than hosted VMs
- Exploring Cloud based data management tools

3.2 MS Access data manipulation tooling

ESco have been using an older version of Access (Access 2003) due to preferences in the way application deals with macro scripting which is beneficial in some of the complex Access routines. This creates a security risk and IT management overhead. Work is underway to upgrade to a more recent version of Access.

ESco should begin to explore using other tools to manage similar data management processes - e.g., Power Automate and Power Apps. Many interim and incremental approaches could be taken to explore, for example:

- Connecting existing Access DB process to Azure SQL or Dataverse data sources
- Creating a Power App that connects to an Access data table
- Trigger a Power Automate data flow from an Access DB operation
- Etc.

3.3 Myriad

For Myriad to remain competitive long-term, it should:

- Move the backend DB to Cloud hosting
 - E.g., Azure SQL
 - Have all its primary keys added and clustered indexes etc. (to enable the cloud move)
 - Refactor database design to allow proper customer segmentation
 - So that all customers can run from one instance
- Rebuild the front-end interfaces
 - Use modern web technologies (e.g., MVC, React or suitable JS Framework)
 - Using user-centred design to identify feature priority
 - Can work in parallel with existing UI
 - With a view to retiring on-prem desktop UI over time
- Upgrade the API from SOAP to REST or GraphQL
 - Where appropriate

These things have to happen for the product to remain viable and competitive in the future. They won't be easy or quick. To get there would need:

- An agreed vision
- Roadmap to get there
- Product backlog
- Delivery process and resources

3.4 Business impact

This section considers the proposed direction from the perspective of the main business service areas.

3.3.1 Renewals and Comms

A lot of this could be managed with Dynamics 365, which would abstract it from the Myriad system specifically, enabling a broader approach to which platforms EScO supports.

3.3.2 Customer Service and Finance

Maintaining a high level of customer service is vital, and these processes should have minimum disruption. If new Myriad interfaces are developed the CS team should be fully involved as key users. These teams may require training on additional systems as needed. EScO could use Dynamics 365 to manage finance processes to abstract these from Myriad.

3.3.3 Fulfilment and production

Changes here would be dependent on process changes within new adopted platforms.

3.3.4 Analytics and Insight

For EScO to provide aggregated reporting services to customers, Analytics and insight should be standardised using platforms that promote self-service (e.g., PowerBI). Data sources (e.g., data warehouse) should be abstracted so that the EScO reporting platform is not tightly coupled to Myriad.

3.3.5 eCommerce

EScO should be able to support white-label ecommerce solutions without tight reliance on Myriad integrations. In the long-term this would be more achievable if the Myriad API is abstracted into a generic EScO API which could in turn be integrated with standard ecommerce solutions. This would enable moving away from Isle's custom CMS.

3.3.6 Single Customer View

The single customer view is critical, and a 'Master Data' management model is required to achieve this. This would need to be considered carefully in any architectural change. Key decision would be to establish if EScO should maintain the 'master' record for a customer which then links to the related systems, or the master customer record would remain in the 3rd party platform (e.g., Myriad, or another).

3.3.7 Web Content Creation & Control

Web content creation needs to be standardised, ultimately using off the shelf tools not Isle's bespoke CMS.

3.3.8 Integration & API

These areas would need to grow using a modern toolset and be managed and nurtured, becoming a more significant component of the value offered.

3.4 Potential risks

<i>Potential risk</i>	<i>Impact</i>	<i>Likelihood</i>	<i>Mitigation</i>
Myriad is not saveable	High	Medium	Scrutinise roadmap, do due diligence on G&G
Resistance to change	Medium	Medium	Keep communicating, take time to align
Transformation costs and efforts too great	High	Medium	Work iteratively to reach value milestones, continually review strategy
ESco loses its personal touch with customers	High	Low	Prioritise customer service layer still functioning independently of architecture changes
Change is not rapid enough to maintain competitive advantage	High	Medium	Work iteratively to reach value milestones, continually review strategy

4. Training and development

To steer a team through any significant change and it will be important to manage a programme of training and development. ESco should review and enhance their technical knowledge and skills portfolio in order to:

- Ensure technology is robust and fit for purpose
- Improve replaceability of systems
- Improve ability to recruit and retain staff
- Futureproof against future vendor decisions (e.g., Access or VB.NET being discontinued)
- Maintain an engaged and inspired team
- Develop current staff careers
- Have access to the cutting edge of functionality and performance
- Compete with competition

ESco should consider the tech teams skills as an asset the organisation and the individuals hold. Benchmarking tools such as <https://www.itjobswatch.co.uk/> help understand the value of these skills, and also highlight the benefits of upskilling.

4.1 Routes to skills development

A number of routes to technical training should be considered as follows:

<i>Route</i>	<i>Advantages</i>	<i>Disadvantages</i>	<i>Recommendation</i>
'Formal' training (e.g., 5-day offsite MS courses)	Industry recognised, standardised, good chance to meet others	Expensive, time-draining, can be disconnected from day job	Use only when absolutely necessary
Self-learning with MS Learn	Free, comprehensive, same quality as paid courses, time-flexible, 'gamified' (points)	Need to ringfence time to complete, needs self-motivation	A good option
Certification through MS certification routes (typically multi-step)	Industry recognised, empowering, confidence building	Requires effort through formal or self-learning	All staff should have a personal development plan with a chosen certification path
Organised internal activities (e.g., 'Hack-day' to explore Power Automate)	Can be inspiring, insightful, team-bonding, relevant to real work tasks	Requires coordination and facilitation, and protection from BAU distractions	Plan around a key project
Conferences and events (e.g., MS Build and MS Ignite)	Inspiring, eye-opening, good networking opportunity	Can be costly, requires time away from office	Use online ones where useful, but occasional real attendance can be inspirational. Ensure there is a knowledge sharing follow up.
Knowledge sharing sessions e.g., monthly, each team member takes turn to show and tell (this also gives a forum for 'guest' speakers)	Team bonding, facilitates new insight and discussion, promotes good learning and sharing culture	Needs leadership and coordination to make it happen.	Start small and schedule as regular event
Get active in the communities (e.g., online and the conference scene) blogs, talks, forums etc.	Confidence building, eye-opening, supportive	Can be harder for some to engage confidently this way	Support these behaviours where possible
Videos (e.g., YouTube experts)	Quick, easy, infinite supply	Some of it outdated, opinionated, or just wrong!	Use only to support other learning tools

5. Making progress

5.1 High level-approach

Prerequisites:

- Make an informed and appropriate Myriad decision
 - Review and confirm overall ongoing business objectives and strategy
-
- 1) Crystalise and distil vision collaboratively, align teams
 - 2) Make business case for change and make it an executive team priority
 - 3) Assign roles, budgets, and resources to fuel the change
 - 4) Get going and keep reviewing
 - a. Break into small achievable chunks and stages
 - b. Identify 'quick wins' to build momentum and enthusiasm
 - c. Use Agile principles of experimentation and learning from mistakes etc.
 - d. Run training and development in parallel

5.2 Roles required

Programme management - overall oversight - holding and communicating the vision - ensuring the benefits are met

Delivery management - making sure there is a cadence of progress - ringfencing and supporting resources to get things done, and managing Agile process etc.

Coaching and mentoring - individual care and guidance through the change and support with training and development and new skills integration

Champions from within the team - e.g., everyone needs to be bought in, everyone should have a role in the change and know their contribution and value.

6. Additional references and links

The following list is not exhaustive or representative of all the aspects of the research. It is included of interest.

General

<https://www.comparitech.com/net-admin/microsoft-access/>
<https://www.gartner.com/en/documents/3764376>
<https://docs.microsoft.com/en-us/power-apps/maker/data-platform/migrate-access-to-dataverse>
<https://www.youtube.com/watch?v=0CKNBbNKgaI> (Power Apps Desktop for Access Developers)
<https://www.clearpeaks.com/leverage-your-power-platform-solutions-using-microsoft-dataverse/>
<https://medium.com/swlh/i-said-goodbye-to-stored-procedures-539d56350486>

Training (Examples)

<https://docs.microsoft.com/en-us/learn/>
<https://docs.microsoft.com/en-us/learn/certifications/>
<https://docs.microsoft.com/en-us/learn/powerplatform/>
<https://techcommunity.microsoft.com/t5/microsoft-learn-blog/new-microsoft-power-platform-and-dynamics-365-training-january/ba-p/2827955>
<https://docs.microsoft.com/en-us/learn/tv/>
https://www.youtube.com/watch?v=5_YQX5xqsi4

Communities

<https://powerusers.microsoft.com/>
<https://myignite.microsoft.com/home>