

CASE STUDY: Zoho AND THE NMH

# How Low Code Fosters Healthy Mums and Babies

The Zoho Creator Platform Helps the National Maternity Hospital Manage Its Data and Underpins the Delivery of High-Quality and Safe Healthcare Services



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## AT A GLANCE

This case study describes the rollout of Zoho Creator for the provision of a range of apps at the National Maternity Hospital (NMH) in Dublin, Ireland, that contributes to more effective, efficient, and safe maternity service. After describing the initial challenges the NMH set out to address, the case study describes the solution and its impact on the hospital and closes with a set of tangible recommendations.

### AT A GLANCE

#### Problems

- Dynamic changes and service demands made automation challenging.
- Paper-based forms and processes provided significant opportunities for improvement in hospital services and management.

#### Solutions

- Zoho Creator as the platform for a range of service and management apps
- More than a dozen applications built in a few years

#### Benefits

- For example, there has been a 22% reduction in incident management logging effort.
- TCO is 50% lower with Zoho than with comparable industry SaaS apps.

### Business Themes



New C-Suite



Technology Optimization



Data to Decisions



Future of Work

## THE COMPANY

Located on Merrion Square in the Dublin, Ireland, city center (see Figure 1), the NMH is one of the largest maternity hospitals in Ireland, incorporating maternity, gynecology, neonatology, community midwifery services, anesthetics, fetal medicine, fertility, pathology, radiology, maternal medicine, perinatal mental health, the national neonatal transfer service, and urogynecology.

Annually, the hospital provides maternity care for more than 8,000 births and more than 1,500 babies admitted to the neonatal intensive care unit—the NMH is the recognized national referral center for complicated pregnancies, premature babies, and sick infants.

More than 10,000 women also visit the NMH for gynecological and women's health issues annually, with the treatment of gynecological cancer as one of the hospital's main subspecialties (the colposcopy service is one of the largest units in Europe for such a purpose). Urogynecology and ambulatory gynecology services are expanding annually to meet the growing need for women's health services in Ireland, and the hospital is also a designated regional hub for the development of assisted fertility services.

The NMH employs more than 1,000 staff members and has a strong reputation for undergraduate and postgraduate medical, midwifery, nursing, and allied health professional education programs, which are highly recognized nationally and internationally. The education programs are affiliated with University College Dublin and the Royal College of Surgeons of Ireland.

### National Maternity Hospital (NMH)

- **Company:** National Maternity Hospital (NMH)
- **Headquarters:** Dublin, Ireland
- **Founded:** 1894
- **Type:** Voluntary Hospital
- **2020 Revenue:** Not public
- **No. of Employees:** ~ 1,000
- **Website:** <http://www.nmh.ie/>
- **Twitter:** @\_TheNMH

Figure 1. National Maternity Hospital on Merrion Square



Source: Wikipedia

## THE CHALLENGES

Healthcare is one of the industries governed by regulations, and for good reason: When things go wrong, people can die. Staying on top of regulation, compliance, and services management demands is not trivial for healthcare enterprises. In the past, a hospital's stereotypical reaction to regulation, compliance, and service management was to develop additional paper-based documentation.

The challenge with the paper-based approach is that data quality can be unreliable, storage and administration can go wrong, and additional work is typically involved to get key data typed into an electronic system—where such a system is available!

Consequently, in recent times, healthcare and related industries are turning to software-based solutions to meet regulation, compliance, and service management needs.

## THE SOLUTION

When Luke Feeney joined the NMH as director of Risk, Audit and Safety (later evolving into the role of director of Quality, Risk and Patient Safety), in 2015, his background in healthcare IT triggered a search for software-based solutions to meet all of the NMH's regulatory compliance and service management needs.

It was clear, given the dynamic nature of the hospital's expectations and demands, that it would be essential to choose a cloud-based solution so that local platforms and infrastructures would not slow down the implementation of quality, risk, and patient safety (QRPS) solutions.

After reviewing a selection of available low-code platforms, with mixed results, Feeney found Zoho's low-code platform, Zoho Creator, in 2018. The scope of the pilot project focused on clinical incident management, and in a few days, Feeney was able to stand up a substantial prototype incorporating Zoho Creator, which was subsequently piloted for a month.

Encouraged by the results of the initial pilot, the NMH started an in-depth evaluation of Zoho—not only from a return-on-investment (ROI) and feasibility perspective but also from a cybersecurity standpoint. It was clear that NMH apps would include personally identifiable information (PII) and that both national and industrial data security standards had to be adhered to. Finding that Zoho and Zoho Creator met all the necessary requirements, NMH licensed the Zoho Creator platform.

Since then the NMH has developed approximately 20 substantial QRPS applications on the platform. The most prominent among them are the following:

- **Clinical Incident Management.** Reporting, storing, and analyzing clinical incidents was the initial trigger point for implementing Zoho Creator, and a successful pilot of the app encouraged NMH to license the Zoho platform. Consequently, this is the most mature app at the NMH. It was built in compliance with the Irish National Incident Management Framework (IMF) and the National Standards for the Conduct of Reviews of Patient Safety Incidents and conforms with the European Union's General Data Protection Regulation (GDPR) as well as meeting several additional

demands such as more efficient management of freedom-of-information requests. Most recently the NMH has expanded the app to include mortality and morbidity management. As a result, NMH clinical incident management is completely paperless and fully cloud-based.

- **Patient Feedback Management System (PFMS).** NMH patients provide feedback (compliments, complaints, general feedback) via NMH website-based feedback forms, which are stored and processed with Zoho via the PFMS application. The PFMS app is built in compliance with the national regulations for feedback systems as well as data privacy and safety.
- **Quality Improvement Registry.** Quality and quality improvement are vital in healthcare, so the NMH created a quality improvement registry to manage all aspects of quality improvement as well as the progress of approved quality improvement programs.
- **Nonregistered patient referral management.** The NMH is required to accept and care for patients referred from all parts of the country who may not be formally registered as patients. Today, with a simple, custom-designed app, nonregistered referrals, including reporting, are managed electronically on mobile devices, resulting in a significant increase in efficiency—and patient safety.
- **COVID-19 application.** The NMH decided to automate its pandemic response records to support compliance and auditability. It did so with a Zoho-based COVID-19 app. The app contributed to the NMH's response to COVID through data recording and reporting.
- **Audit scheduling and coordination.** Healthcare audit is a vital compliance evaluation method for all healthcare organizations—and the NMH is no different. Multiple ward, unit, and department audits are coordinated and summary-reported with an audit management app created for this very purpose. This contributes to improved audit management oversight and ultimately to continuous quality improvement.

- **Strategic planning.** Like many other healthcare institutions, the NMH has a five-year strategic plan. Thanks to a dedicated Zoho app, all strategic activity has been planned and is tracked as it pertains to the goals of the plan.
- **National maternity standards compliance.** Ireland (like many other countries) has national maternity standards. The NMH built an app that enables it to manage and track its compliance with these standards.
- **Environmental compliance.** The NMH is certified to ISO 14001:2015, the international evidence-based environmental management system standard. Maintaining aspects of daily compliance with the requirements of this standard is facilitated via a Zoho Creator app run on a mobile device that records environmental assessments carried out in all areas of the hospital, supporting ease-of-findings analysis, reporting, and management.
- **Emergency resuscitation equipment checking.** Like any other hospital, the NMH has multiple sets of emergency resuscitation equipment located across wards, units, and departments. The demands on this equipment in emergency situations require that it be checked on a daily and weekly basis to ensure that it is fully stocked and available when it is needed. The NMH is currently developing an app to enable the paperless, auditable management of such critical checking via mobile devices.
- **Catering department staff meal ordering.** The NMH's catering department has implemented an app to enable staff to preorder meals, and plans are in place to further develop the app to enable patients to also order meals. This app, which replaces paper/telephone ordering, contributes to improved food order management across the hospital and has quickly become a popular Zoho app.

Remarkably, the NMH built all these apps in-house, with frontline users acting as the key developers. With several self-paced training sessions, supported by in-hospital-produced prerecorded videos, staff members are able to create, support, and evolve apps for their respective areas. This is a persuasive proof point for the simplicity and ease of use of the Zoho Creator platform, which empowers staff

users with—among other capabilities—a graphical development environment that uses drag-and-drop mechanisms enabling visual development of low-code apps.

The NMH also has been a fervent supporter of the KISS (keep it simple, stupid) principle: Instead of rebuilding old, inefficient, paper-based processes in software, the NMH drives to simplify and enrich processes with the capabilities and efficiencies a software-based solution can offer.

Across the apps, the NMH found that user interactions exceeded those with the paper-based systems. But an increase in reporting was especially noteworthy, evidently enabled by the ease of use of Zoho-based apps.

From a data-protection, GDPR-compliance, and backup-requirement perspective, the NMH can fully operate the apps with the standards and services provided by Zoho's cloud.

Finally, the value of something is often fully realized only when it is taken away. This happened unexpectedly during a recent callous cyberattack on Ireland's healthcare system,<sup>1</sup> which denied access to many national healthcare networks. This denial of access also affected access to the hospital's Zoho apps. This drove home the tremendous advantages of the electronic system over earlier paper-based systems to which the hospital was forced to return due to the cyberattack. However, the NMH figured out a way to safely access its Zoho apps via the hospital's segregated public Wi-Fi network, which had been maintained for safe operation, before the national networks were restored.

*“Empowering our staff with low-code tools has turned out to be a key strategy to allow us to get on top of our quality, risk, and patient safety needs in the fast-moving hospital environment.”*

— Luke Feeney, Director of Quality, Risk, Audit, and Safety, NMH

## THE IMPACT

The obvious impact from using Zoho Creator at the NMH is not just the creation of numerous apps that put staff members in charge of how they manage information and compliance and that thereby underpin services. Additionally, it provides staff members the peace of mind that they have a proven tool in their toolbox for addressing current and upcoming information, compliance, management, and automation needs as they arise.

### The Technologies

- Zoho Creator Platform
- Zoho Cloud

The NMH has not undertaken a *formal* ROI review of its apps in play right now but plans to do so in 2022. Nonetheless, here are some specific impacts:

- **Form-input time is reduced by more than 75%.** The NMH measured the average time needed to manage a paper-based clinical incident form received and found that incident-form management time went down from nine minutes (paper) to two minutes (with Zoho). Needless to say, there are more ROI savings from an electronic capture: Not only is the mandatory dataset entered accurately but that data also is immediately available for reporting, analysis, and other demands.
- **Zoho apps beat software-as-a-service (SaaS) apps by 50% in cost.** The NMH compared its internal cost for creation and operation of the Zoho-based incident management app with a SaaS-delivered standard software application from a reputable software vendor and found that Zoho was 50% less expensive than that SaaS vendor's offering.
- **Zoho apps' total cost of ownership (TCO) is significantly lower than other industry apps'.** Recently the NMH had to get approval to expand its Zoho footprint. When comparing Zoho's TCO (with 100% uptime, secure access, backup, no need for local installs, and so forth) with the TCO of its other healthcare apps, Zoho's cost came out more than 50% lower, reducing the license expansion to a no-brainer exercise.

# THE TAKEAWAYS

## Lessons Learned

The NMH has developed a few key lessons learned from building low-code apps with Zoho Creator, including (but not necessarily limited to!):

- **Begin with the end in mind.** All too often, apps are built to mimic existing paper-based processes one-to-one. Instead, enterprises should focus on the outcome—the end result of the process—and then design the process in such a way that it supports/facilitates the outcome.
- **An app will be only as good as the underlying process.** If the underlying process of an app turns out to be inefficient, or even counterproductive, the app will fail. Make sure the processes are right.
- **Know what data you need, and why.** Data collection and analysis can be sensitive. Plan for what data is needed before building the app, and be ready to justify why it is needed.
- **Autonomy is the biggest motivator for creating low-code apps.** End users are busy creating the value that is required from them and their teams. They quickly realize the opportunity offered by a low-code tool: autonomy that enables them to dictate their own automation destiny.
- **Sandboxes are key enablers of low-code apps.** Naturally, business users approach their first low-code projects with caution. Give them a sandbox where they can learn, try, and experiment with no real impact on the business.

## ROI

As stated earlier, the NMH has not done any formal ROI study on the Zoho apps it has built but plans to start formal ROI review during 2022. In the meantime, though, the NMH can share the following key performance indicators (KPIs) and TCO numbers:

- **Electronic form input is down to 22% of paper effort.** The NMH saw efforts necessary for logging clinical incidents reduced by 22% in the Zoho app, compared with the paper process. And entries were of higher quality, because users had to go through validation rules.
- **Zoho apps have a 50% lower TCO than comparable SaaS apps.** When the NMH compared the cost of its in-house-built clinical incident management app with the cost of commercial apps, it found that the Zoho-based app cost only half as much as a comparable industry SaaS app.
- **Zoho apps cost 50% less than apps from healthcare software vendors.** Comparing the holistic TCO of the Zoho Creator-based apps with its apps from other healthcare vendors, the hospital found that the Zoho apps cost 50% less than its other systems to operate and maintain.

## Best Practices

The NMH identified two key strategies for achieving success with a low-code platform:

1. **Continuous user communication.** It is vital to have continuous communication with the staff users who are implementing the low-code apps—not only to find potential challenges and how to overcome them or to address the learning demands but, most importantly, also to ensure that the desired outcome and improved process are embodied in the design of the apps.
2. **Proactive work with IT.** IT needs to make sure an enterprise adheres to standards and can safely scale. A low-code platform champion needs to proactively engage IT and move potential concerns and showstoppers out of the path of projects.

## What to Avoid

Finally, here are some key situations to avoid:

- **Lack of involvement and hence commitment.** Low-code projects succeed only when the staff users are fully involved and committed to the project. Stay away from halfhearted users.
- **Replicating old processes.** If the process was cumbersome on paper and it gets rebuilt in software 100% the same way, it is likely to be cumbersome in software as well. Keep the desired outcome in mind.
- **Collecting data just for data's sake.** All too often, central functions create high burdens on their staff users by requiring them to provide more and more data. Avoid creating those burdens, when possible, by asking beforehand: Is this requirement for data really necessary?
- **Failing to make it a team sport.** Low-code success involves many functions and people to succeed. Overexposing one function or leader is counterproductive.
- **Not asking for help and support.** Enterprises should not be shy and need to involve their low-code platform vendor in processes. The NMH team found that Zoho Support was not only very impressive and helpful but also made it feel valued as a customer and partner.

## THE RECOMMENDATIONS

Here are the key recommendations for low-code success:

- **Involve the end users.** Low-code apps stand and fall with end user adoption. Involve users early and often, and make sure they are comfortable and ultimately successful with the low-code platform and the consequent transformation of their service processes.

- **Make training easy.** Find staff users who bring the right mix of service savvy and tech ability to make the first projects a success. Staff members are busy, and they often develop low-code apps in addition to doing their day job, so make the learning processes as easy and smooth as possible. “Fun learning!”
- **Keep IT happy.** Nothing is worse than a bunch of successful low-code apps that are stopped because they are noncompliant with IT standards. As a low-code-platform sponsor, make sure IT is aware and involved and does not become a showstopper during platform adoption.
- **Process improvement is key.** Make sure staff members are creative and empowered to improve the processes they want to automate. A one-to-one copy and paste of the old system is unlikely to result in process improvement.
- **Put the users in the driver’s seat, and make them own their automation destiny.** Make it clear to the users that low-code platforms enable them to build their own automation tools—based on how they want to run their services. The opportunity to be less dependent on central functions such as IT and to be in the driver’s seat for their services automation destiny is highly motivating and empowering for business users.
- **Comply with enterprise standards.** Enterprise standards matter, and low-code apps need to adhere to them, if they are applicable. Make sure that the enterprise is creating apps that are compatible with enterprise standards and therefore are viable solutions.

## ENDNOTES

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<sup>1</sup> For more, see: [“Irish cyber-attack: Hackers bail out Irish health service for free,” BBC News, May 21, 2021.](#)

## ANALYST BIO

# Holger Mueller

Vice President and Principal Analyst

Holger Mueller is a vice president and principal analyst at Constellation Research. He provides guidance for the fundamental enablers of the cloud, IaaS, and PaaS, with forays up the tech stack into big data, analytics, and SaaS. Mueller provides strategy and counsel to key clients, including chief information officers, chief technology officers, chief product officers, investment analysts, venture capitalists, sell-side firms, and technology buyers.

Prior to joining Constellation Research, Mueller was VP of products for NorthgateArinso, a KKR company. He led the transformation of products to the cloud and laid the foundation for new business-process-as-a-service (BPaaS) capabilities. Previously he was the chief application architect with SAP and was also VP of products for FICO. Before that he worked for Oracle in various management functions—on both the application development (CRM, Fusion) and business development sides. Mueller started his career with Kiefer & Veitinger, which he helped grow from a startup to Europe's largest CRM vendor from 1995 onward. Mueller has a Diplom-Kaufmann degree from the University of Mannheim, with a focus on information science, marketing, international management, and chemical technology. A native European, Mueller speaks six languages.

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