

E4



TIME-PERIOD BILLING AND REWINDABLE TRANSACTIONS ENGINE

NHS DIGITAL

NORTH EAST AND YORKSHIRE



FOR INFORMATION ON THE
INNOVATION PROGRAMME
[CLICK HERE](#)

THE INNOVATORS

Martin has a wealth of financial experience covering 30+ years in the public and private sector, working in education, healthcare, insurance and the IT industry. He is a qualified finance professional (ACCA), has a keen interest in cloud-based systems and a passionate learning technologist. While working in the education sector he was responsible for developing over 250 digital mobile assets.

THE PROBLEM

NHS Digital needed a cost-effective invoicing billing engine to handle the complex billing of procurements for GP software solutions in 6,500 practices, from 70 suppliers and 200 product lines, with ever changing monthly patient count and ongoing service activations and cessations.

By developing a systems solution, we would avoid the risks of manual processing. The risks are errors caused by the sheer volume of dynamic data that needs to be managed, which creates delays of payment and budgeting and can create additional costs to the NHS, meaning reduced funds going to front line services where they are needed most.

THE CHALLENGES

- How might we deliver a low fidelity finance systems solution that is designed with the finance user in mind giving them high levels of confidence to use it?
- How might we find a way to reduce the recurrent costs traditionally associated with financial systems without compromising on quality?
- How might we move away from high level dependency on manual excel spreadsheets?
- How might we maintain the flexibility to adapt and innovate with changes across the NHS estate?
- How might we build a system able to flexibly accommodate changes so that we can meet our evolving needs over time?
- How might we obtain a system capable of easily integrating with other business systems and to ingest data without costly or time-consuming development overheads or the requirement for specialist knowledge?
- How might we be able to access financial data in real-time to provide bespoke reports for management insight while avoiding the human errors often associated with spreadsheet reporting?
- How might we provide automated billing schedules attached to emails for global distribution?
- How might we deliver the necessary automation of processes so that we can increase staff productivity?
- How can we ensure user experience is positive and flexibility enables higher adoption?
- How might we obtain a system that delivers a community marketplace of freely distributable add-ons to increase functionality without significant investment?
- How can we obtain a system that is capable of covering the business requirements and not be limited in business scope coverage?

THE INNOVATION

To deliver the invoicing billing engine we partnered with an open source supplier whose values mirrored our own and with a track record of delivering cost-effective bespoke systems to the NHS.

Combining the open source Odoo finance application with our integrated billing application provided out-of-the-box functionality with a modern and intuitive interface. With the core platform in place, the configuration and development of additional functionality enabled delivery of a minimum viable product (MVP) within six months. The application was designed as the calculations engine to sit behind a larger dynamic purchasing platform for the GPIT Futures Programme. Imagine the front-end being an Amazon-style platform so integrated care boards (ICBs) can quickly purchase and move from one GP system to another with less friction, more choice and better prices.

This ensures suppliers (software providers) and customers (ICB buyers) receive the most accurate information in a timely manner to enable robust budgeting and a faster payment process while achieving value for money in terms of staff time. The engine's mechanics provide advanced estimates of payments for the following month, adjusts for changes in monthly GP patient data, registers software activations and de-activations and then adjusts every quarter to output 'true-up' schedules.

Due to the open source nature of the system, we were able to configure the system to meet our specific requirements then safely and sustainably develop bespoke functionality. Notable developments are set out below.

Time period billing

Billing periods are recognised as an actual time period and not just a unit of measurement in order to ensure integrity and truly reflect real life. To illustrate the importance of this approach, consider that half-January is not equal to half-February and a service that spans this period cannot be accurately valued if the month is considered a unit.

Rewindable transactions

Real time adjustments that auto-calculate values into the next available payment schedule. Rewind/ replay transactions at the push of one button. This allows accurate pre- and post-transaction adjustments and is enabled by the accurate period time billing.

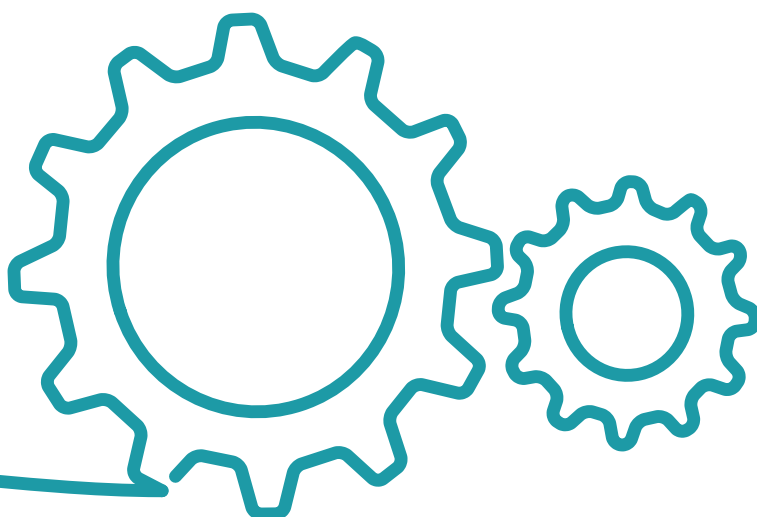
Development was enhanced by the existence of Odoo's community marketplace, where thousands of pre-developed applications are downloadable with no or minimal one-off fees to immediately attain desired functionality or speed up development and delivery.

The system joined-up a nationwide snapshot of ICB IT purchasing operations, meaning users have an holistic view of all financial and purchasing data in real-time, enabling rapid delivery of information to buyers and suppliers.

Requiring minimal manual intervention with an emphasis on automation eliminates human error while increasing staff productivity, with more time available to complete higher-value activities.

Working with open source technology, we avoided recurrent costs associated with proprietary licence fees while realising a unique system built on freely-available technology.

NHS Digital owns this system in perpetuity with unencumbered and unlimited access, which can be updated as required to meet changing regulatory and internal needs. Open source technology ensures this system is freely available to every NHS organisation to adopt, use and improve as they desire. This is an example of the open digital approach and critical to achieving increased value for money from NHS investments.



THE LESSONS LEARNT

As with any complex software development and implementation, we have learnt lessons as we've progressed.

- We would not tolerate inaccurate data to be loaded into the system because it is much more effective to have the data corrected at source before any processing is done. Users can get into the habit of submitting erroneous data and then expect the GP IT finance team to rectify issues, where the finance team do not have all of the information of the transaction.
- We would not design a system to cater for legacy processes because the technology becomes complex and hard to understand and maintain, to work around process-debt.
- We would not over-develop the MVP because it is helpful to test functionality incrementally in order to optimise functionality and better understand user needs.
- We learnt how to approach discovery of underlying needs by cutting back the process and working out what work was being carried out as workarounds to previous processes and systems and/ or specifically to meet the requirements of previous contractual arrangements that were no longer relevant to the new GPIT framework. As a result, we can simplify future development and ensure that what we build is maintainable and sustainable.
- We learnt to better engage with exploratory testing (ET) which allows the tester to learn more about system behaviour when sprint times are short. Test ideation is created through ET.
- We learnt to focus on developing sustainable, scalable digital tools that are closely aligned with NHS open source policy, by working with an open source supplier who was capable of demonstrating the way this technology can meet complex needs. As a result, we were able to realise an alternative vision for delivering IT and finance initiatives that also reflects the altruistic values of the NHS.

THE OUTPUTS

The tangible outputs that came from our innovation are:

- sustainable and maintainable software
- real-time reporting and access to data
- low-effort and sustainable operations
- opening up the supplier market for innovation and reducing costs
- Odoo open source and billing application proven for NHS use.

THE OUTCOMES

As a result of this project, NHS Digital realised the following:

- the opening-up of the supplier market for increased innovation and reducing costs
- a way of managing complex financial operations via a digital system available in perpetuity
- cost savings on licence fees by switching from proprietary technology and opting for a free and open source solution
- thousands of staff hours saved by automating basic adjustment processing, enabling better use of staff time, letting software do the heavy lifting
- increased staff productivity as a result of having aligned, accurate data and departments requiring less manual administration and communicating through spreadsheets
- opportunities for iterative improvement to the system whenever required
- reusable existing digital building blocks.

THE QUICK WINS

- Set out what you want to make happen at the outset so you can measure your goals.
- Options appraisal should consider all choices of software to use, including both open source and proprietary options.
- If opting for open source, consider which professional open source implementer with experience of both technology and the NHS needs to use.
- Consider the expected alignment from your project and from your provider with aspects like values and culture, capabilities, locality.
- Acknowledge risks and plan how you will monitor and mitigate them from the start.
- When the development is part of a bigger piece of work or application, ensure you have subject matter experts (finance) embedded in your team(s) to get a full finance end-to-end perspective and oversight.
- Time spent developing a detailed test and implementation plan is seldom wasted.
- Define the level of freedom required to use, develop or customise your solution, and ability to change supplier during or after implementation (positively avoid lock-in).
- Invest time in developing a simple MVP with documented real life user stories.
- Start early with superuser training to share the knowledge within the team providing depth of cover and preventing single point of failure.
- Define non-functional outcomes (such as business objectives, IPR, performance, security) as well as functional.

THE REVIEWERS SAID

“IDENTIFIED A NEED AND DESIGNED A DIGITAL SOLUTION, RECOGNISING THE STRENGTH OF A DIGITAL PARTNER TO SUPPORT.”

“I THINK THIS IS AN EXCITING APPROACH TO INNOVATION. OPEN SOURCE SOFTWARE CAN OFFER A COST EFFECTIVE APPROACH TO DEVELOPMENT.”

“I BELIEVE THIS INNOVATION DEMONSTRATES FINANCE TRANSFORMATION THROUGH THE ADOPTION OF OPEN-SOURCE TECHNOLOGY, ENABLING THE AUTOMATION OF ADJUSTMENTS TO REDUCE PROCESSING TIME, IMPROVE BILLING ACCURACY AND QUALITY WHILST DELIVERING COST SIGNIFICANT IMPROVEMENT.”



WHAT YOU CAN DO NOW

SUBMIT INNOVATION

If you recognise the problem stated and have implemented your own innovation to overcome it please submit this innovation to the programme and give others more examples to learn from.

REGISTER INTEREST

If you recognise the problem stated and would like to know more details about this innovation in particular, we will be hosting showcase and workshop sessions throughout the year, so all interested staff can gain ideas and inspiration from innovators in a manageable one-to-many format.

SUBMIT PROBLEM

If you have a problem but don't currently know of a solution to it, then please submit it here and in 2022 the Forum intends to crowdsource solutions to problems that don't currently have known innovations.

LEARN MORE

If you would like to learn more about about the innovation programme please click for more details.

ENDORSEMENT DISCLAIMER

The Finance Innovation Forum's Innovation Programme asks NHS Finance peer reviewers whether the "Innovation overcomes, successfully addresses, or solves the problem identified". The programme does not endorse, recommend or provide any assurance of software used or mentioned in any of the published innovations. If you think a published innovation is being used to falsely validate a commercial product or company please contact finance.innovation@nhs.net



WHAT ARE WE DOING

- A national Innovation Programme for NHS Finance staff to submit their innovations for peer review. Successful innovations will be published and accessible to all on the One NHS Finance website
- Software Skills is a network of likeminded NHS Finance staff which exists to help its members see what's possible when using accessible software to its full potential.
- An 'Art of the Possible' briefing which explains two new technologies AI & Blockchain and discusses the opportunity for NHS Finance
- We helped develop a Provider Finance Return (PFR) Automation Project tool, to save NHS Finance teams excessive manual time in their monthly returns.

WHAT YOU CAN DO NOW

- Submit your innovations for peer review
- Sign up to be an innovation peer reviewer
- Share you problems and ideas with us
- Join the Software Skills network
- Register your interest in R&D and automation

**Innovation
Programme**

**Software
Skills**

**Automation
sign up**

**Be a peer
reviewer**

**Art of the
Possible**



FURTHER INFORMATION

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One NHS Finance brings together the Future-Focused Finance, National Finance Academy, and the Finance Innovation Forum programmes and networks to make sure that everyone working in NHS Finance has access to skills, knowledge, methods, and opportunities to influence and enhance patient services.



An NHS Finance platform for the discovery and development of problems, ideas and innovations.