

# ConnectIQ

A Conversational AI-driven onboarding and data validation solution designed to increase patient registration on digital health portals, improve demographic data quality in patient records, and enhance digital inclusion.



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# 1. Purpose

## 1.1.

To lay the foundation for the deployment of a new patient portal and accelerate the onboarding of patients to the NHS App and local patient portals through the deployment of an intelligent, inclusive engagement solution.

## 1.2.

This solution leverages **Conversational AI** (both virtual and speech agents) enhanced by **behavioural science** to:

- Reach patients who have not yet registered, guiding them through onboarding processes and connecting them to digital access support
- To engage with patients for whom there is partial, incomplete or potentially inaccurate data held by the NHS organisation and collect the necessary information from the patient and incorporate it into the core patient administration system

### Conversational AI

Conversational AI refers to advanced virtual and speech agents capable of understanding and responding to natural human language.

Unlike scripted chatbots, these agents use Natural Language Processing, real-time sentiment detection, and contextual memory to adapt conversations dynamically making them more intuitive, human-like, and accessible, even for patients with low digital confidence.

### Behavioural Science

Behavioural Science in this context applies proven psychological principles (such as nudging, social proof, and cognitive ease) to shape patient decisions.

By tailoring tone, timing, and message structure to the user's mindset and motivation, the system significantly improves engagement, reduces friction, and increases task completion rates.

## 1.3.

Importantly, this solution also serves to **protect and enhance the value of existing investments in Patient Engagement Platforms (PEPs)**. By operating as a continuous improvement and data validation layer, it ensures the PEP remains accurate, inclusive, and effective, both pre-and post-deployment.

Rather than a one-time data gathering effort, this approach creates an ongoing mechanism to sustain digital inclusion and data quality at scale, supporting long-term patient engagement and digital transformation goals.

## 1.4.

The ultimate objective is to increase the spread and utilisation of the NHS app and digital channels within it by increasing registration, reduce reliance on paper-based communication, and ensure that digital transformation is equitable and impactful across all population groups.

## 2. Context

### 2.1.

Data quality in community and mental health provider systems—particularly regarding patient demographics and contact details—remains a significant challenge.

**Patient Administration Systems (PAS)** and **Electronic Patient Records (EPRs)** in these settings often contain incomplete, outdated, or inconsistent information, such as missing phone numbers, incorrect addresses, and blank fields for ethnicity, communication needs, or reasonable adjustments.

These issues are exacerbated by system fragmentation, manual data entry errors, and the complexity of patient populations, many of whom face digital exclusion, housing instability, or multiple service touchpoints.

National datasets like the MHSDS consistently highlight variation in data completeness, and CQC reports have identified poor demographic data as a barrier to safe, coordinated care.

### 2.2.

Deploying a patient portal without addressing this key constraint will be a significant limiting factor. Introducing conversational AI offers a scalable and inclusive solution to address these gaps.

By engaging patients directly—via voice, or digital agents—conversational AI can prompt individuals to confirm or update key information in a personalised, accessible, and non-clinical manner. This approach reduces reliance on front-line staff to chase missing data, improves data accuracy at the source, and enables better targeting of care, outreach, and digital services.

Importantly, conversational AI can adapt language, tone, and timing based on user needs, helping to overcome barriers faced by individuals with lower health literacy or digital confidence. This approach is grounded in robust global evidence demonstrating that conversational AI, when designed for inclusion and paired with behavioural science, significantly improves digital onboarding — especially among populations with low digital confidence or access.

Across sectors, completion rates for onboarding and digital forms rise by **30–45%** when guided by AI agents that adapt language, tone, and support to user needs in real time.

### 2.3.

The other key constraint in undertaking such an exercise is the administrative burden of updating patient records manually. If such an exercise was undertaken for **15,000 records** by two administrators it would take them a whole year to complete. It is critical for any approach to the scaled updating of patient records to seamlessly integrate to the core digital infrastructure.

	Yearly Saving	Assumptions
Admin hours saved	2,500	10 mins to call and update EPR
Admin staff cost saving	£ 41,375	10 mins per transaction at Band 3 and 25% oncosts (no HCAS)
Paper, printing, and postage costs	£ 15,000	1 letter per patient saved from contact confirmation process
<b>Total Saving</b>	<b>£ 56,375</b>	

## 3. Solution Overview

### 3.1. Delivery Channels:

- **Virtual Agent:** Deployed via web, NHS App, SMS, and WhatsApp
- **Speech Agent:** Deployed via inbound interactive voice response (IVR) and outbound voice calls
- **Optional Escalation:** Transfer to live agent or VCSE partner support when required

### 3.2. Key Capabilities:

- **Conversational AI (Text + Voice):** Natural language interactions that personalise onboarding journeys
- **Behavioural Science Engine:** Tailored messaging strategies that reduce friction, increase motivation, and drive action

### 3.3. Inclusion Capabilities:

- **Dynamic Literacy Adaptation** — detects and responds to patient literacy levels in real-time
- **Speech Agent: Multilingual Communication** — coverage of the most widely spoken community languages
- **Sentiment Detection** — identifies frustration, confusion or hesitation and adapts accordingly
- **User-centred design** — dialogues designed in collaboration with behavioural scientists to strengthen the conformance motivation of individuals

### 3.4. Digital Enablement Support:

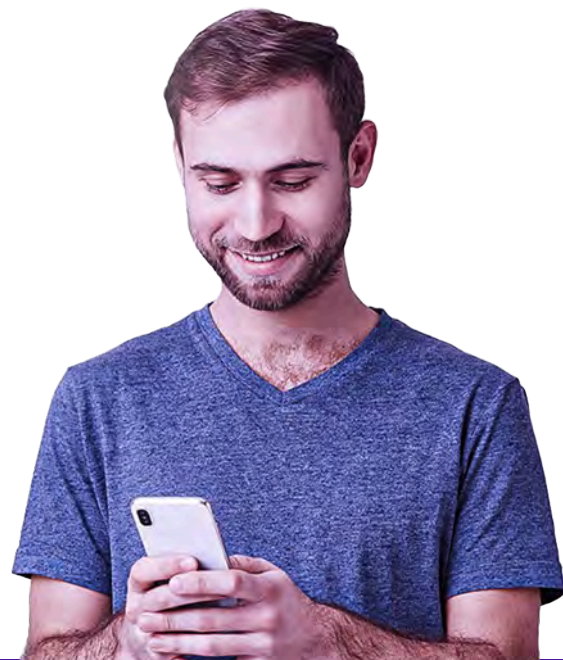
- **Step-by-step** support for downloading and registering on the NHS App or local portals
- **Signposting** to local digital inclusion initiatives (training, devices, free data)

### 3.5. Real-time validation of:

- **Contact details**
- **GP registrations**
- **Demographic accuracy**

### 3.6. System Integration:

- Compatible with **RIO EPR** and via RPA with other major **EPR**, **PAS**, and **patient portal platforms**
- Bi-directional data integration via **NHS-standard interfaces** (DN: FHIR, HL7)





## 4. Use Cases

### 4.1. Proactive Outreach

Uses EPR/PAS data to identify unregistered patients and initiates contact via preferred channel

### 4.2. Onboarding Assistant

Walks users through downloading, registering, and using patient portals

### 4.3. Data Validation

Confirms and corrects patient contact and demographic details

### 4.4. Access Signposting

Guides users to nearby digital skills hubs, device access schemes, or data subsidy offers

### 4.5. Personalised Nudges

Adapts scripts and channels for specific cohorts (e.g., elderly, carers, deprived areas)

### 4.6. Paper Opt-Out Drive

Supports informed decision-making about digital-first communication, increasing opt-outs from paper

### 4.7. Feedback & Sentiment Insights

Provides data back to system leaders on barriers, drop-off points, and engagement trends

## 5. Clinical Safety & Information Governance

The solution adheres to **NHS-mandated clinical safety standards**, including DCB0129/0160, and is accompanied by a Clinical Safety Case signed off by an accredited Clinical Safety Officer (CSO). All data flows are subject to DPIA and IG reviews to ensure lawful processing, transparency, and patient consent.

Built-in safeguards such as escalation to human agents (if necessary), restricted response logic and audit trails ensure accountability and minimise clinical and reputational risk.

EBO's platform has been externally assessed for cybersecurity resilience and conforms to NHS Digital's DTAC framework, is ISO 2701 certified, and Cyber Essentials Plus certified, enabling safe deployment across complex care settings.



## 6. Key Benefits

### 6.1. Higher Engagement and Completion Rates:

Research across multiple sectors shows that conversational AI—when combined with behavioural design—significantly improves onboarding and task completion rates. Virtual agents offer a scalable, non-judgemental way to engage patients at their convenience, often outperforming traditional campaigns.

### 6.2. Increased Portal Uptake:

Conversational assistants proactively reach out, explain, and guide portal registration in a step-by-step and user-friendly manner.

### 6.3. Enhanced Inclusion and Equity:

Dynamic literacy adaptation ensures language and complexity are tailored to each user. Multilingual voice agents overcome literacy, accessibility and linguistic barriers. These techniques have been shown to double user registration, with cost per new user dropping by **up to 60%** in some applications. Real-time sentiment detection enables emotionally intelligent responses, reducing abandonment among anxious or frustrated users.

### 6.4. Reduction in Paper Dependency:

Encourages digital-first communications and supports patients to opt out of paper-based correspondence. Improves timeliness, cost-efficiency, and sustainability.

### 6.5. Improved Data Quality:

Validates and updates contact and demographic data during interactions, strengthening data quality for all patient communications.

### 6.6. Reduced administrative burden:

Avoid administrators having to undertake routine and avoidable activities.

Improve accuracy of patient details improving success of Trust outreach initiatives and portal communications without the additional administrative burden

Improve patient engagement with portals increasing the benefits they deliver such as reductions in DNAs

Improve digital inclusion by supporting patients to access their portal by breaking down registration process into digestible chunks and supporting through the process

## Conclusion

This proposition offers a high-impact, inclusive, and scalable solution to one of the NHS's most pressing digital adoption challenges. By meeting patients where they are—through **language, voice, and behaviourally aware design**—we can unlock the full potential of patient portals and digital-first healthcare. Global evidence clearly shows that these methods not only boost engagement and completion rates, but also actively reduce digital and data inequalities.

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