



Complexity costs lives

Augmenting and evolving
Healthcare IT Systems

A Pega Point of View

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Seeing modern health care from the other side, I can say that it is clearly not set up for the patient. It is frequently a poor arrangement for doctors as well, but that does not mitigate how little the system accounts for the patient's best interest.

Just when you are at your weakest and least able to make all the phone calls and plead for health-care referrals is that one time when you have to – your life may depend on it.

Ross Donaldson

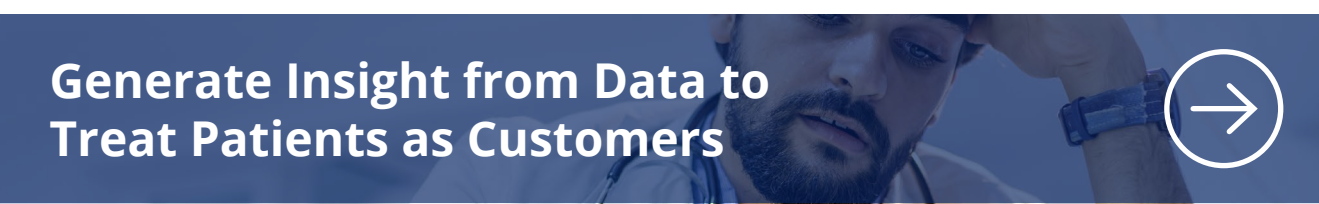
The Lassa Ward: One Man's Fight Against One of the World's Deadliest Diseases



Background



Identify and Embrace Legacy Investment Value



Generate Insight from Data to Treat Patients as Customers



Manage Patient Journeys across Channels and Functions



Conclusion





Background

The concept of an electronic record that curates the history of an individual's interactions with the UK healthcare system has been a central plank of Digital Strategy, Planning and Investment within the National Health Service for many years.

It's recognised that the complexity of the existing systems and processes in patient journeys is creating time, cost and risk issues. These can have a profound effect on patient outcomes, with consequences that can, sadly, lead to unnecessary deaths. Delays, miscommunication and lack of information also add uncertainty and anxiety to people who already have health concerns.

This has understandably led to significant investment in technologies that create a central patient record, often referred to as Electronic Patient Record (EPR), Electronic Health Record (EHR) and Patient Administration System (PAS).

The Evolution of EPR/PAS/EHR

These terms are often assumed to be interchangeable, but there are some important differentiations that reflect the fragmentation of patient data:

EPR – Tends to describe a record of episodic care provided by one institution, typically acute, specialist or mental health.

EHR – Tends to describe a more longitudinal record of multiple episodic elements, and conventional wisdom is that this generally resides in Primary Care settings.

PAS – Tends, as the name suggests, to cover management and recording of primary information (key data), generally not directly clinical related such as admissions, bookings and discharges.

In common with many organisations where large and complex IT landscapes are a factor, there is still an unresolved debate in the NHS on the case for a “Big Box” or “Best of Breed” approach to maintaining patient data. Both of these approaches have their pros and cons, but ultimately either focused on exclusively will have fundamental real world barriers to overall success.

This is shown most often in large mature organisations where significant sunk cost and contractual liabilities make it impractical to pursue any fundamental consolidation of IT provision in a sufficiently risk free, time and cost effective way. But maintaining a fully diverse approach to key functions becomes exponentially harder to manage – from the point of view of IT growth, technology integration, maintenance, contractual issues, and risk.

Nevertheless, in federated organisation models it is essential to create connective tissue throughout the elements of the people, process and data landscape, to ensure coherent customer service. This is as true in healthcare settings as in any other human-facing service organisation. However, this requires a hybrid approach to the “Big Box/Best of Breed” debate – which has driven the emergence and evolution of the “Unified Platform” concept.

It’s no surprise that the description of a unified platform “bringing people, systems and data together to form a collaborative, efficient and effective ecosystem” has the feel of both a “Big Box” and “Best of Breed” approach. This is because the concept is deliberately positioned to bridge the gap between disparate systems of record and disparate systems of work. This provides a unifying layer that digitally consolidates key people, process and data on demand across complex ecosystems, rather than relying on a single monolithic system.

The Digital Aspirant community has, up to a point, recognised the importance of consolidating people, process and data in this way, and a growing number of trusts are combining their funding under this initiative to prioritise projects that can be replicated throughout a health economy. However, digital aspirant trusts are identifying traditional EPR systems as the main area of investment. This is shown in the launch of a “digital aspirant +” workstream within the NHS digitisation programme, focused on helping aspirant trusts select and implement an EPR.

The reality is that the funding granted to aspirant trusts is unlikely to be enough to fully implement a common transformed EPR across their ultimate ICS construct. This is leading some to prioritise spending to either prepare business cases or to fund added functionality for existing EPR systems. Consequently, as the ICS landscape matures it’s likely that larger trusts will look to influence other providers within their ICS to secure either the same (or compatible) EPR functions, and to improve collaboration. However there’s still the issue of significant sunk cost and contractual liabilities making this impractical.

So the challenge is how to ensure consistent people, process and data operation across IT landscapes without relying on individual EPRs, while delivering the levels of transformation the individual organisation needs in a cost effective manner. Inevitably, this is most realistically achieved by exploiting Unified Platform technology.



Let us look at the Integrated Care System concept. This is fundamentally a good compromise on Federated Model granularity, though it still comprises a large operational and administrative challenge simply through the number of employees/patients, the size of eco-system, and the breadth of operational activities. All these factors require an increasing complexity of coordination and communication across a diverse hierarchy to manage, with an increasing inter-relation/overlap of roles. But, most importantly, there is a particular challenge in supporting creativity, speed, and accountability across the ecosystem.

A recent McKinsey survey found that organisations that make decisions quickly are twice as likely to make high-quality decisions, and outperform their peers. However, to achieve quality and speed requires a system that properly allocates tasks and decisions to the right managers, teams, individuals and even algorithms.

Wider ecosystems need to be seen as an extension of individual organisations – in a people, process and data sense, where there are porous boundaries and high levels of trust and mutual dependence to share value. This calls for a way to share tasks, decisions and data bi-directionally, recognising that there are disparate IT Systems used across these partner organisations.

This whitepaper has been produced to raise and discuss these challenges, and to illustrate the need to think about the hybrid IT model that can deliver the optimum mix of both “Big Box” and “Best of Breed” by putting existing specialist EPR/EHR products and approaches into the context of Unifying Layers. This will enable ICS organisations to digitally transform in a meaningful and connected way for their patients, taking out the risks of complexity, and creating a more personal and responsive patient journey.

We do this by considering 3 key themes that are important in addressing ICS Digital Strategy and IT System evolution, and which form a core contribution to sustainable transformation of patient services:

1. Identify and Embrace Legacy Investment Value
2. Generate Insight from Data to Treat Patients as Customers.
3. Manage Patient Journeys across Channels and Functions.





Identify and Embrace Legacy Investment Value

Large mature organisations always have extensive legacy IT estates, with a range of age, complexity, serviceability, functional utility and future desirability. Clearly, across this continuum there are systems, services and technologies that should and will be replaced in the short to medium term. But there are also performant systems and services with sunk investment that it would be desirable to continue to exploit.

Transformation visions must contain some recognition of the need to get the best out of 'sunset' systems. Building on that to deliver sustainable IT transformation along a long-term strategy, while being realistic about where, what, and how much to start with – and how to balance pace of change with risk and cost. Equally, there is always a need to realise initial value quickly and continue to iterate that value throughout. So transformation should naturally be a pragmatic evolution over time, leveraging old and new, rather than a big bang event.

At Pega we passionately believe in a “wrap and renew” approach to transformation, and think of it in terms of three phases (which fit well with a number of Public Sector service scenarios):

Orchestrate – Quickly connect to existing systems, focusing on managing the work by leveraging automation to reduce mundane tasks, removing complexity and normalising the data through a single new aggregating platform.

Renovate – With orchestration in place, returns on investment can be realised earlier – while ongoing decisions and strategies to replace and retire can be worked on progressively.

Evolve – Constant evolution should be the norm, deepening capabilities, automation & application reach, along with empowering personnel to take ownership of solutions.

With these phases in mind, there are three considerations that we recommend should guide a wrap and renew approach to Digital Transformation, these are:

→ **Don't underestimate Time, Cost and Risk**

Complex, distributed and siloed systems, accumulated through (in some cases) decades of tactical decisions on scaling and business service maintenance, lead to high interdependency and a disconnected experience for all users.

Unravelling this during a digital transformation programme is complex and time consuming. Hence the need to think about a more pragmatic approach, where you progressively abstract function into a new overarching platform and orchestrate process over the top of legacy systems, in order to achieve desired business and operational outcomes demanded by users.

→ **Don't decide too much detail upfront**

Trying to decide whether to replace, upgrade and/or retire systems, as part of a transformation, normally means a wealth of requirements gathering, understanding all the interdependencies, establishing the commercials and managing multiple vendors simultaneously (not to mention the non-incumbent vendors looking for opportunities).

As with all the topics we discuss, we believe it is best to start modestly and iterate, based around known and understood process journeys and their current issues. People play a huge part in understanding what's required to transform an operational/business process, so allow them to be part of the transformation process to achieve real value quickly.

→ **"Pave over, not Paper over the Cracks"**

In wrap and renew transformations, risk is most effectively managed by overlaying the IT landscape with another enterprise-wide application – essentially paving rather than papering over the cracks – addressing problem areas by augmenting processing to harden and add value to process journeys and flows.

Once the paving commences, rationalisation, complexity and end state of processes and systems can be quickly tackled at your own pace to achieve the right levels of transformation demanded.





Generate Insight from Data to Treat Patients as Customers

We are strong advocates of the better use of data and intelligent automation across all patient related interactions, because a growing number of public healthcare services (whether primary, secondary, screening, immunisation or other preventative programmes) contain significant backlogs that can only be addressed by better curation of all underlying data and assets.

The advantage of using what you know about patients to better drive service provision has many similarities to the approaches used every day by commercial organisations such as banks, insurance companies, telcos and utilities – i.e., how to Find, Increase the Value of, Expand the Account of and Retain their customers.

Bringing these sales techniques together – in effect Client Lifecycle Management (CLM) – has distinct benefits in Healthcare Settings, because they relate not only to sales but also to the way customers are served. In essence the CLM concept is the glue that brings sales techniques together, typically using sophisticated Customer Engagement Platform software.

Applying this thinking to a health programme, for example – where there is still without doubt a value associated to the “customers” or “prospects” of that programme – is completely analogous to commercial organisations, where the more the programme is sold the greater the value outcome driven by it. Furthermore, just like commercial organisations, success can usually be measured in health programmes by the degree to which the programme can “Know Your Customer” (KYC). Because the more you know, the more you can target the right fit for your service, as well as drive behaviour toward “up-sell” and “cross-sell”.

For instance, in a health programme paradigm this could be about who you prioritise to engage in a more sophisticated screening and/or when to widen a specific person’s engagement into other health programmes. The interesting thing is that NHS generally already has the data needed for many of these “sales” techniques, which can allow it to quickly qualify its leads into specific prospects. Furthermore, it generally has a good deal of KYC/CLM data to confidently drive many other techniques.

All that's missing is the ability to bring this together in the sophisticated way that commercial sales organisations do to gain competitive advantage in their own market sectors. With this in mind, we believe there are four major data considerations that should guide how patients are more dynamically engaged in all healthcare settings:

Exploit Research Data – To help with a more refined approach to prioritising patient backlogs.

Use Demographic Data – To reflect where research understanding meets the UK people landscape to further refine backlog priorities – especially wider determinants of health.

Respond to Situational Data – Where backlog priorities change dynamically in response to threat vectors in the context of research, demographics and unique circumstances that surface over time.

Blend People data – Where local priorities are refined with local understanding, and ultimate outcomes inform the virtuous circle of research to outcome and back.

Ultimately bringing these datasets together in an intelligent way is a requirement for creating **“1:1 patient engagement”**, and to be able to start thinking differently about how people are engaged in healthcare settings. A further prerequisite for success is to establish a unifying component to guide process journeys across the many IT systems involved.

This is essential to guiding healthcare professionals' actions by connecting the experience of the patient with wider data, and so into more precise pathways. This is probably a perfect personification of a Customer Relationship Management platform in a healthcare setting, which – allied to strong underlying Case Management to drive the CLM aspect – provides the tools that underpin the most successful customer facing organisations we see operating today.





Manage Patient Journeys across Channels and Functions

To put patients at the centre of service provision requires design thinking to fundamentally start from the point of view of the journey, not the channel or data sources. And to ensure that the key CDDO principal of working towards creating a service that solves one whole problem for users, collaborating across organisational boundaries is followed.

Building on this, it's essential to have the ability to enrich journeys to further drive efficiency and effectiveness. Especially by adopting a number of automation techniques that drive intelligent end-to-end outcomes within the overall design:

Routing work – Driven by situationally aware rules, routing work to the right people; matching tasks with the most suitable resource; and prioritising and moving items in and out of queues to improve efficiency.

Guiding actions – Leveraging big data, historical data, and event streams to suggest the right action, with relevant contextual information in real-time across all channels.

Automating tasks – Resolving work automatically wherever possible using rules and processes, and intelligently surfacing action where human involvement is required.

Providing context – Automatically tailoring applications to the healthcare setting context, making it easier to re-use policies and procedures.

Simplifying management – Adapting case/process flows to organise work according to goals, stages, and steps rather than transactions and processes; structuring work in ways that everyone can easily understand.

End to End Integration – Applying a range of techniques to integrate with relevant data sources; consolidate, normalise and re-imagine their use to bridge legacy system and process silos.

All of these techniques should be powered by AI, utilising intelligence to apply real-time adaptive decisioning, combined with an ability to Integrate across wider eco-systems. Ultimately, the aim is to bond a single patient service and case management environment with the wider external toolsets and systems of record necessary for end-to-end automated fulfilment.

This can be progressively achieved over time while still driving value from sunk investment, driven by four design principles:

- **A big bang approach** to change carries too much cost, risk and service displacement. So it is imperative to think about technology products that have the most potential to bond onto your current IT Estate, processes and data sources; to add immediate point value; to integrate through a variety of methods, including RPA; and to be able to continue to expand and, if needed, progressively displace legacy systems.
- **Technology choices should** be grounded, not in loosely stitched products, but as a well-designed and integrated product suite, because this makes for a successful and risk mitigating Wrap and Renew strategy, as opposed to Rip and Replace. The preferred choice should be products that are grounded in the definition of micro-journeys – distinct stages and steps that can be consolidated to deliver a patient outcome, while accommodating process variation.
- **The most successful transformation projects** are the ones where business stakeholders work closely with the IT Department, typically using a model-driven design process. Products that support this, and which can implement functionality and subsequent changes through well governed low/no code models, are not only quick to deliver, but allow some aspects of the platform to be controlled safely by business stakeholders themselves – dramatically lowering the speed of change and overall TCO.
- **Speed of response to change** is imperative. An ability to cope with volume and changing operating models (in whatever form that takes) is likely to be key. So platforms should be preferred that have strong automation capabilities woven throughout their DNA – with an ability to understand variations of customer need, whether fully automated or augmenting a human operator.





Conclusion

Everyone in healthcare is there because they believe in its ability to help transform people's lives for the better. However, the complex systems and process that have built up over time are now getting in the way of creating faster, safer end-to-end patient journeys, and of making every patient feel that they are at the heart of everything the NHS does.

Many individual parts of the wider NHS currently have EPR/EHR/PAS technology (and have done for a considerable time), building their delivery models around this investment. What is clear, however, is that despite the investment in inter-operability over the last 10 years – through initiatives such as NHS Spine – there is still very little ability to share records in a way that a properly functioning ICS construct will ultimately need for success.

There is also little evidence of anything more than rudimentary work management available in the investments so far, and certainly not the kind of wider eco-systemic approach that the ICS model ultimately demands.

Current and future technology funding, contractual opportunity and risk appetite is unlikely to support large scale renewal and consolidation of EPR/EHR/PAS platforms, despite some of the functional gaps that continue to exist. So the time is right to take a different approach to connecting people, process and data elements intelligently, productively and reliably.

This calls for a more pragmatic way to address people, process and data unification across the scale of the eco-system, while taking account of the real-time critical nature of work and the breadth of activities to support the ICS Model. We would argue that this forms the case for a more pervasive case management approach, underpinned by a feature-rich unified platform.

A unified platform is able to overlay existing systems of record across an ICS. In effect allowing the creation of the equivalent of the Customer Engagement Platforms used to such great effect in other “customer facing” industries. This ensures the ability to place patients more effectively on the right pathway to get the right treatment at the right time, applying a 1:1 focus but in the wider context of total workload, backlog and prioritisation.

Adopting this approach to digital transformation can avoid significant cost, operational and people risk (which tends to limit transformation ambition) by embracing some key design principles:

Start Fast and Scale – By designing from the centre-out, structuring pathways as micro-journeys. By transforming one pathway at a time, while building E2E outcomes, it is possible to deploy value-add capability within weeks, and continue to exponentially scale both horizontally and vertically in any IT landscape.

Connect Across Silos – The integration capabilities of Unified Platforms should be able to eliminate gaps in your organisation, automating patient journeys to a conclusive outcome by interacting with systems across the IT landscape, through a variety of integration methods.

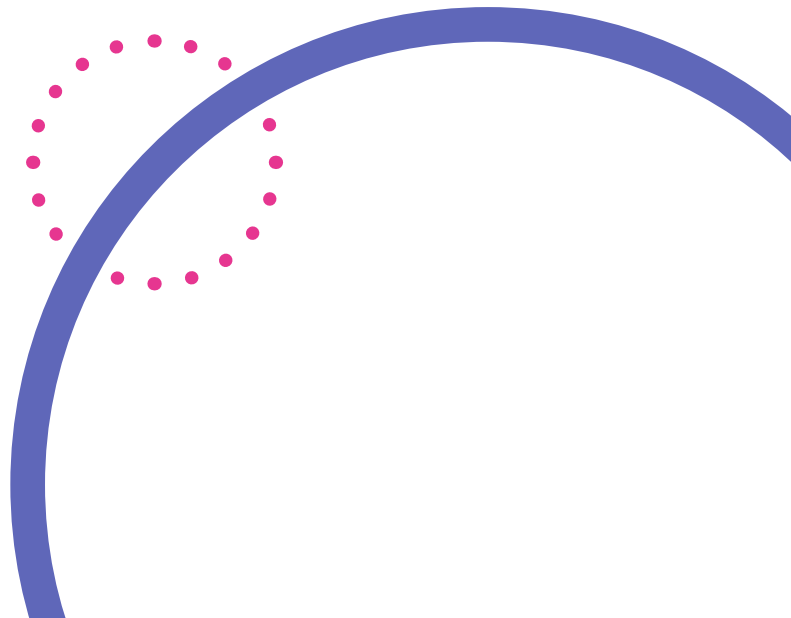
Omni-Channel with Ease – Unified Platforms should provide consistent and contextual experience across mobile, the web or even chatbot – with relevant process, context or sentiment managed according to the situational needs.

Scale across the Organisation – Unified Platforms should reuse and specialise across any and all patient-facing or internal processes.

Transformed Experiences – These require a combination of: modelling process stages and steps that can work seamlessly on all channels, effortless accounting for variation, application of intelligent automation, and integration with modern or legacy systems to complete end-to-end user outcomes.

Finally, in terms of grounding your technology choices and product selection, the considerations we discuss in this paper are crucial when thinking about the kind of engagement platform needed to meaningfully and realistically transform the patient experience, and to optimise healthcare provision.

With that in mind we would welcome further discourse on any of the points covered, and of course would be delighted to discuss or clarify any aspect.



About Pegasystems

Pegasystems (NASDAQ: PEGA) develops strategic applications for sales, marketing, service, and operations.

Pega applications streamline critical business operations, connect enterprises to their customers seamlessly in real-time across channels, and adapt to meet rapidly changing requirements. Our Global 500 customers include the world's largest and most sophisticated enterprises.

Pega applications, available on-premises or in the cloud, are built on the unified Pega Infinity © platform, which uses visual tools to easily extend and change applications to meet clients' strategic business needs.

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