NHSBT Data & Analytics Strategy

Board Briefing: Emerging Strategy & Progress to Date

September 2021

Contents: Data & analytics strategy for NHS Blood and Transplant

The Data Strategy Group: the cross-NHSBT team driving the business-led data and analytics strategy development

In order to ensure that the Data and Analytics Strategy is business relevant and focused a Data Strategy Group was established. This group meets every two weeks and has representation from across NHSBT. Supporting this group are *Working Groups* which focus on specific areas and quick-win opportunities such as the Industrialisation of PowerBI

Strategy & Transformation

- **Key Representatives:** Senior Strategy Manager and Strategy Manager

Blood Supply

Key Representatives: AD Planning, Performance, & Stock and the Head of Blood Supply Strategy

Plasma

Key Representatives: Lead Solution Architect
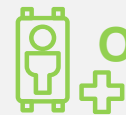
Organ & Tissue Donation and Transplantation

- **Key Representative:** OTDT Strategy Analyst

Donor Experience

- **Key Representative:** Head of Marketing Modernisation & Technology

Clinical Services

- **Key Representative:** AD Statistics & Clinical Studies

Group Services

- **Key Representatives:**
- CISO & AD Data
- Head of Data Management
- Deputy People Director
- Data Architect
- Head of Data Engineering
- Head of Specialist Services IT
- Head of Financial Systems & Business Support
- Head of Performance Management
- Head of Quality Assurance

The fourth industrial revolution: digitisation and the role of data in Health & Care

In 2016 the World Economic Forum (WEF) declared that we had entered the Fourth Industrial Revolution which represents a fundamental change in the way we live, work, and relate to one another. Advances are merging the physical, digital, and biological worlds in ways that create both huge promise (and potential peril) and all have the strategic use of data and analytics at their core. This revolution isn't just confined to the Private Sector. Indeed, the Health and Care sector globally, and within the UK, has begun to meaningfully harness the potential of this revolution. **NHSBT has the vision, need, and means to significantly benefit from the potential of the Fourth Industrial Revolution and contribute to the data revolution in Health and Care.**
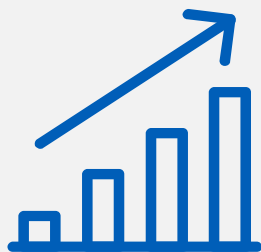
DATA IN GLOBAL HEALTH & CARE

USE OF DATA IS ON THE RISE: Use of data has increased by 1,500% since 2013 to 2.31 Zettabytes in 2020

SUPPORTING TECHNOLOGY IS MATURING: The data and analytics market for Health and Care globally is expected to grow to $50bn in 2024 from $14bn in 2019

DIGITAL MATURITY OF HEALTH & CARE ORGS ARE MATURING: 15% increase globally between 2018-2020 driven by access to data BUT hampered by interoperability and standards issues

ROLE OF DATA IN THE NHS

THE NHS IS BECOMING A TRUE WORLD-LEADER IN BIG DATA: the NHS SPINE executes over 1.5 billion transactions per month. That's 4x more than the entire UK debit & credit card system

DATA BEING USED TO ENABLE GREATER PERSONALISED CARE: with 92m+ demographic records to help healthcare professionals identify patients and match records

RISE OF USE & SHARING OF COMPLEX & LARGE CLINICAL DATA: from 42.1m images in 2016/17 to 44.9m in 2019/20 allowing for more rapid clinical diagnostics

EVOLVING ROLE OF DATA IN NHSBT

DRAMATIC INCREASE IN USE OF NHS APP AS CHANNEL FOR ODR CONSENT: From 725,000 between 2019 & 2020 to an additional 930,000 in the first month of FY 2021/22

A RISE IN REGISTERED BLOOD DONORS WITH A 3:1 CONVERSION RATE: with 1.8m new donors registered between 2016 & 2020 with 584k becoming active donors

INCREASE USE OF DATA IN RESEARCH & CLINICAL COLLABORATION: dedicated research unit looking at data-driven transfusion practice with £4m funding to improve patient outcomes

A rough estimate states that approximately 40% of all data ever created throughout human history occurred during the pandemic. That's roughly 18 zettabytes or 18,000,000,000,000,000,000,000 bytes of data. This amount of data would get the Apollo 11 Rocket to the Moon 52.9 trillion times.

Transforming the way we view & use data: from data-as-a-by-product to data that supports the NHS through recovery and beyond

The Data Strategy Group's analysis has shown that **48% of NHSBT's strategic objectives over the coming years are highly dependent upon the use of data & analytics.** Without a well structured, resourced, & supported data strategy the potential of achieving these objectives diminishes. In an environment of increasing regulation, media scrutiny on the use of clinical / patient data, & heightened security risks, NHSBT has to ensure that it builds its data & analytics capability from strong foundations.

THE IMPORTANCE: NHSBT is becoming more reliant on data to run its business operations and delivering its core mission of saving and improving lives and it needs to harness additional sources of data to realise its strategic objectives and long-term vision and the System want us to use more data to improve clinical outcomes and save lives

Data as a Utility for Improved Business Decisioning: helping to make more informed, accurate, and precise business decisions in a timely, demand driven manner

Data as an Enabler of Operational Improvement: using data to identify, evidence, and model operational efficiencies and enhancements across current services & operations

Data as a Driver for Increasing Patient & Clinical Outcomes: using data to answer hypothesis', innovate against new ideas & approaches, and answer "known-unknowns"

THE OPPORTUNITY: as part of our Transformation agenda NHSBT has the means from which to develop & execute against a data strategy that enhances its position across the Health and Care System while also ensuring its services continue to be world-leading. The potential to leverage data to improve our business & the outcomes of our donors, clinicians, & citizens has never been greater

Some of the Largest Data Sets in Health & Care:
- **ODR:** ~32m records
- **Active Blood Donors:** ~800k
- **Pulse HDB:** 50m records

Access to ~500 System-wide Data Collections:
- NSHBT Account for 4
- NHSE Account for 36
- NHSD Account for 152

Leading Clinical & Marketing minds in the UK:
- Nationally & Internationally Recognised SMEs
- Award-winning marketeers

An Organisational focus on Transforming the Business
- Investing ~£50m+ over 5 years
- Standing up PMM business
- Genomics potential

THE COMPLICATING FACTOR: NHSBT's current data posture is largely immature (with pockets of maturity), siloed, & representative of tactical and ad-hoc investments, initiatives, & approaches to leveraging, managing, & realising the value of data to support business objectives & clinical outcomes. This is occurring in an environment of increasing regulation & cyber risks & threats.

Governance & Policy:
- No data quality function
- No comprehensive Data Dictionary
- Incomplete Data Architecture Documentation

Process:
- No documented Data Lifecycle Process
- No documented Data Supply process
- Lack of Data Dictionary

Technology:
- Inconsistent use of Data Platform & Tools
- Unsupported platforms affecting the Data Supply Chain
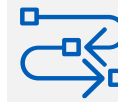
Cross-Cutting:
- Lack of Unified Data Operating Model
- Lack of value realisation from existing investments

Resourcing:
- Lack of Data Science skills
- Under-resourced in key functions
- Culture of "we've been here before"

Realising the potential: leveraging our diverse data supply-chain to enable the NHS to further improve clinical outcomes and reduce health inequalities

Below is a non-exhaustive and initial overview of the data value-chain - where we get the data from *(acquisition)* through to what we can do with it *(proposition)* and the type of benefit it will confer *(value generation)*.

DATA ACQUISITION

- Internal NHSBT Operational Data
- General Public
- Prospective Donors
- Active Donors
- Social Care Organisations
- Primary Care Organisations
- Secondary Care Organisations
- NHS Arms Length Bodies
- Dept. Health and Social Care
- International Partners
- Research Partners

DATA ANALYTICS PROPOSITION

- Management & Business Information
- Data Integration
- Data Quality
- Clinical/ Statistical Analysis
- Demand & Fulfilment Analytics
- Workforce / HR Analytics
- Marketing Analytics
- Trend Analytics
- Contract Analytics
- Finance Analytics
- Online Analytics

VALUE GENERATION

DATA & ANALYTICS AS A UTILITY TO IMPROVE BUSINESS DECISIONS

Description

Having relevant data presentable to the business in order to make more accurate, precise, & timely decisions in support of NHSBT's compliance obligations, strategic objectives & goals.

DATA & ANALYTICS AS AN ENABLER TO IMPROVE OPERATIONS

Description

Having relevant data available to solve specific business / operational problems that are known and identify business / operational opportunities for enhancement and efficiency gains

DATA & ANALYTICS AS A DRIVER FOR INCREASING PATIENT & CLINICAL OUTCOMES

Description

Having the right analytical tools and capabilities to provide new opportunities, insights, patterns, and new business questions to NHSBT.

The potential value that can be generated from NHSBT's data supply chain can only be realised if two conditions are met, namely; the value needs to be created, and the value needs to be received. As such the Data Strategy Group have been working across NHSBT to generate a shared understanding of the value propositions and how these map to specific corporate objectives

Realising the potential: directly supporting NHSBT's strategic vision and corporate objectives

The Data Strategy Group have worked to understand how propositions map to Directorate Objectives and Directorate Priorities. It demonstrates that in order for NHSBT to achieve the majority of its objectives we need to "get the basics right" to make more informed decisions and enhance our current operations.

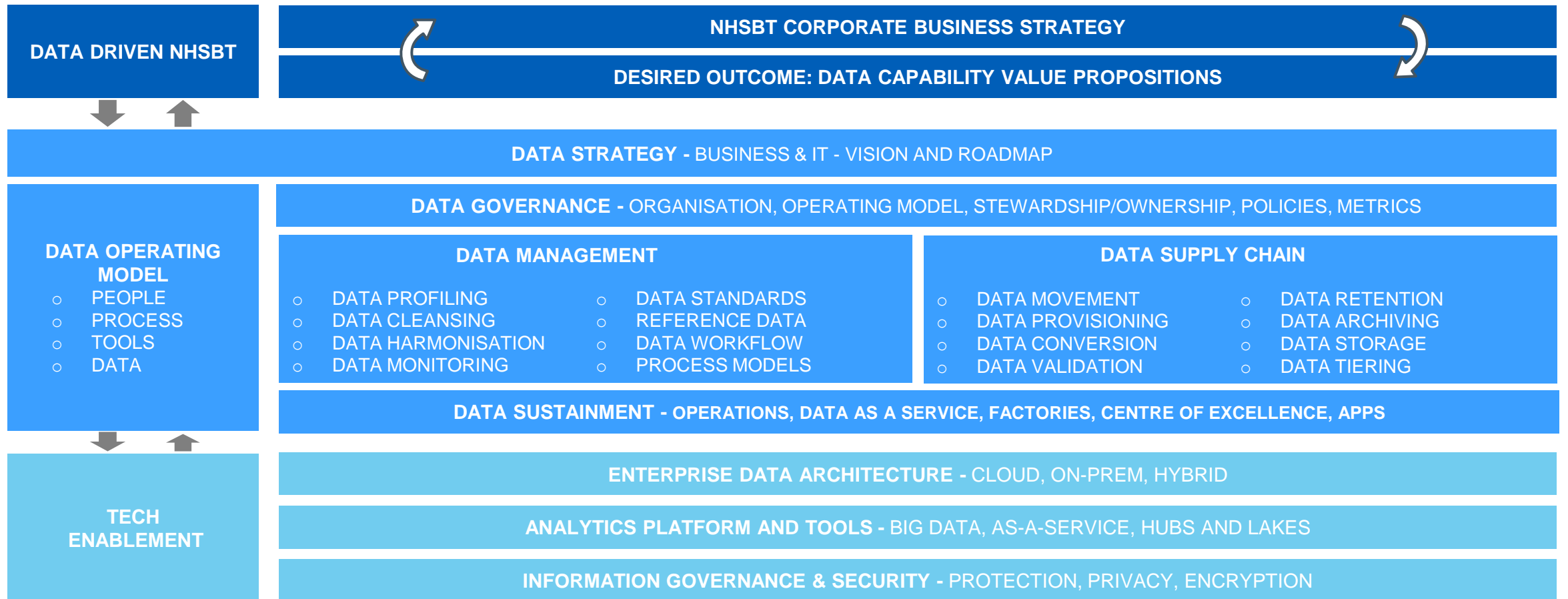| VALUE GENERATION	NHSBT INDICATIVE BUSINESS EXAMPLE	NHSBT INDICATIVE CLINICAL OUTCOME EXAMPLE
DATA & ANALYTICS AS A UTILITY TO IMPROVE BUSINESS DECISIONS **Description** *Having relevant data presentable to the business in order to make more accurate, precise, & timely decisions in support of NHSBT's compliance obligations, strategic objectives & goals.*	**AN EXAMPLE USE-CASE FOR NHSBT:** Strategy and Transformation having access to business performance (financial, performance against objective etc.) data on an "as needed basis". That's analytical output is in an understandable and tailorable dashboard / format to identify trends, "pain points", and provide regular reporting for the Executive Team	**AN EXAMPLE USE-CASE FOR NHSBT:** OTDT having access to hub and hospital utilisation and capacity data to ensure that appropriate resources are planned and allocated as well as understanding and managing any downwards trends in utilisation of available organs as part of the offer and matching process
DATA & ANALYTICS AS AN ENABLER TO IMPROVE OPERATIONS **Description** *Having relevant data available to solve specific business / operational problems that are known and identify business / operational opportunities for enhancement and efficiency gains*	**AN EXAMPLE USE-CASE FOR NHSBT:** Donor Experience having access to all relevant data to our donors from all sources to provide a 360 view of a donor, and applicable analytics so that appropriate, personalised, and timely engagement approaches can be made and campaigns can be devised and modelled	**AN EXAMPLE USE-CASE FOR NHSBT:** Blood Supply and Donor Experience being able to match blood group demand requirements with targeted communications to relevant populations and "market segments" e.g. being able to actively market to Black active and prospective donors for RO in a timely and targeted and personalised manner
DATA & ANALYTICS AS A DRIVER FOR INCREASING PATIENT & CLINICAL OUTCOMES **Description** *Having the right analytical tools and capabilities to provide new opportunities, insights, patterns, and new business questions to NHSBT.*	**AN EXAMPLE USE-CASE FOR NHSBT:** Statistics and Clinical Studies having access to relevant data sets so as to perform advanced analytics relating to patient transfusions in order to identify new insights / confirm hypothesis that lead to improving clinical insights, capabilities, and services offered by NHSBT that ultimately improve patient and clinical outcomes	**AN EXAMPLE USE-CASE FOR NHSBT:** Clinical Services and OTDT being able to develop complex, multi-variable predictive models relating to genetic variants and traits with transplantation outcomes to allow for more targeted, accurate, and precise allocation of organs to donors

The realisation of the value and benefit of data and analytics to NHSBT cannot and does not come purely from the adoption of more technology. There is a need to develop, fund, and roll-out a data operating model that supports, governs, and manages the use of data from acquisition of data through to disposal.

What good looks like: a structured and resourced Data Operating Model

In order for the NHSBT Data and Analytics strategy to be successful there is a need to ensure that it is supported, governed, and managed by a comprehensive Data Operating Model. This will not only ensure that Data and Analytics is resourced and funded appropriately, but also that risk exposure is minimised from a financial, security, compliance, and integrity perspectives. Currently, NHSBT's Data Operating Model operates in silos, has key roles / functions missing, and is not realising the value of existing assets.

DATA DRIVEN NHSBT

NHSBT CORPORATE BUSINESS STRATEGY

DESIRED OUTCOME: DATA CAPABILITY VALUE PROPOSITIONS

DATA STRATEGY - BUSINESS & IT - VISION AND ROADMAP

DATA GOVERNANCE - ORGANISATION, OPERATING MODEL, STEWARDSHIP/OWNERSHIP, POLICIES, METRICS

DATA OPERATING MODEL
- PEOPLE
- PROCESS
- TOOLS
- DATA

DATA MANAGEMENT
- DATA PROFILING
- DATA CLEANSING
- DATA HARMONISATION
- DATA MONITORING
- DATA STANDARDS
- REFERENCE DATA
- DATA WORKFLOW
- PROCESS MODELS

DATA SUPPLY CHAIN
- DATA MOVEMENT
- DATA PROVISIONING
- DATA CONVERSION
- DATA VALIDATION
- DATA RETENTION
- DATA ARCHIVING
- DATA STORAGE
- DATA TIERING

DATA SUSTAINMENT - OPERATIONS, DATA AS A SERVICE, FACTORIES, CENTRE OF EXCELLENCE, APPS

TECH ENABLEMENT

ENTERPRISE DATA ARCHITECTURE - CLOUD, ON-PREM, HYBRID

ANALYTICS PLATFORM AND TOOLS - BIG DATA, AS-A-SERVICE, HUBS AND LAKES

INFORMATION GOVERNANCE & SECURITY - PROTECTION, PRIVACY, ENCRYPTION

Before we can detail the specifics of an Operating Model we need to decide how "defensive" or "offensive" we want our Data Strategy and posture to be. This decision will directly influence the development of the Operating Model as well as the risk appetite of the Data Value Propositions that it supports, manages, and operates.

Developing a sustainable Data & Analytics Strategy: striking the proportionate balance between defence and offence
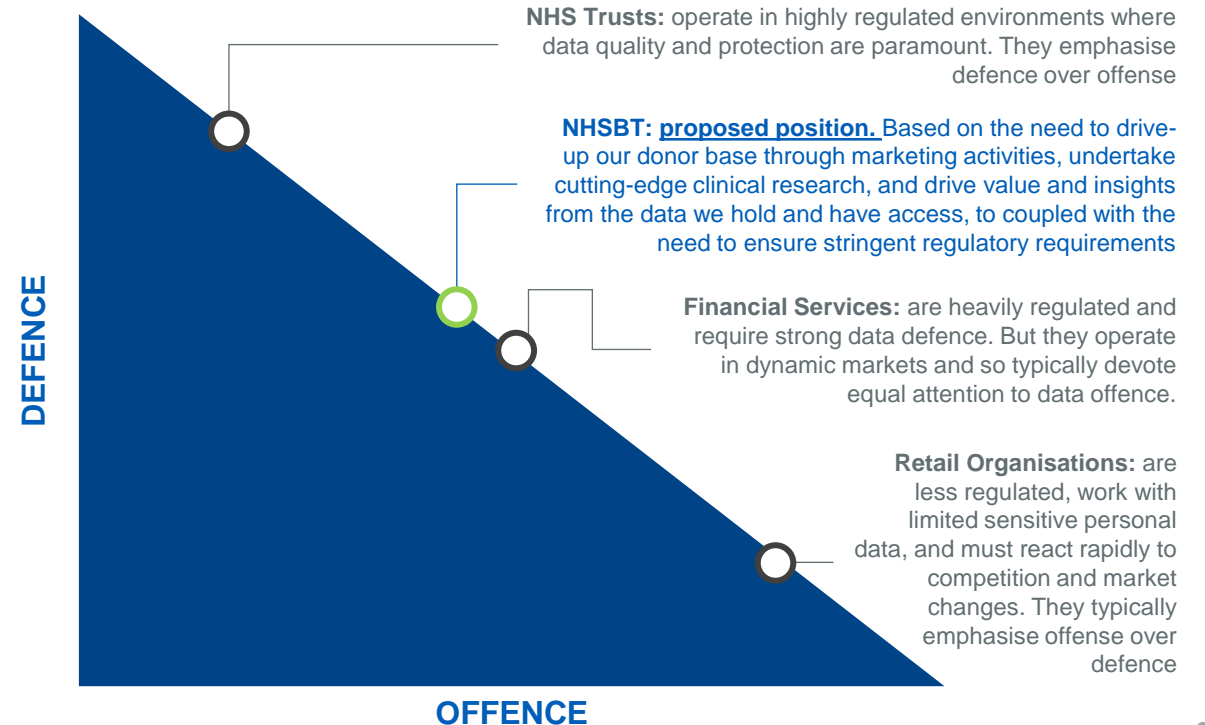
One of the keys to a successful data and analytics strategic is deciding where NHSBT is willing to sit on the Data-Strategy spectrum – at one end is a conservative and defensive posture and at the other is a risky and offensive posture. Where NHSBT will operate on this spectrum will be informed by our regulatory obligations, business objectives, and current data operational capabilities. Below is an initial view as to where NHSBT could reasonably position itself

BALANCING TWO CORE CONCEPTS

DEFINITIONS

1 **"DEFENSIVE" DATA**

Key Objectives	Ensures NHSBT uses data for security, privacy, integrity, quality, governance & compliance purposes
Core Activities	Optimise data extraction, standardisation, storage, and access of NHSBT data to ensure a "compliance first" posture
Data Mgmt Orientation	Control
Enabling Architecture	Single Source of Truth (SSOT)

2 **"OFFENSIVE" DATA**

Key Objectives	Improve conversation rates of prospective to active donors, value generation of clinical and patient outcomes for NHSBT
Core Activities	Optimise data analytics, modelling, visualisation, transformation, & enrichment for clinical & donor experience
Data Mgmt Orientation	Flexibility
Enabling Architecture	Multiple Versions of Truth (MVOT)

DATA STRATEGY SPECTRUM

DEFENCE / **OFFENCE**

NHS Trusts: operate in highly regulated environments where data quality and protection are paramount. They emphasise defence over offense

NHSBT: proposed position. Based on the need to drive-up our donor base through marketing activities, undertake cutting-edge clinical research, and drive value and insights from the data we hold and have access, to coupled with the need to ensure stringent regulatory requirements

Financial Services: are heavily regulated and require strong data defence. But they operate in dynamic markets and so typically devote equal attention to data offence.

Retail Organisations: are less regulated, work with limited sensitive personal data, and must react rapidly to competition and market changes. They typically emphasise offense over defence

Source: Harvard Business Review

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A structured approach to building a sustainable strategy: learning from past challenges and delivering an ambitious and achievable data and analytics agenda

In order to structure and devise a sustainable and comprehensive data and analytics strategy, the team has leveraged the Gartner *"creating a modern Data and Analytics strategy"* toolkit. This toolkit is broken down into three core areas namely; **Strategy, Gap Analysis**, and **Operating Model.** Currently, the data strategy has focused on achieving buy-in, agreement, and alignment on the dark-blue hexagons. Work is currently underway on the gap analysis ahead of developing the artefacts outlined in the light-blue hexagons in 2021.

Data and Analytics Strategy: defines, identifies and structures what NHSBT needs and wants and how this supports our mission
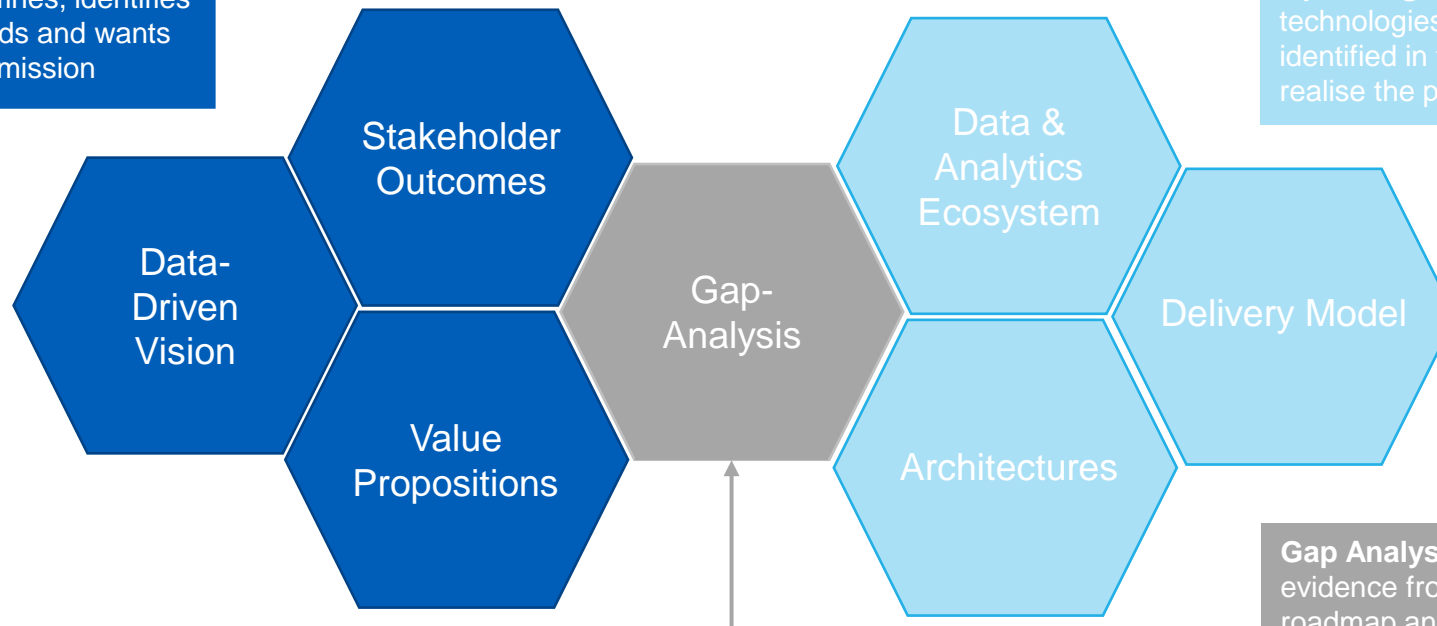
Operating Model: delivers the structures, technologies, policies, processes, and people identified in the Gap-Analysis that is required to realise the potential of the strategy

Stakeholder Outcomes

Data-Driven Vision

Value Propositions

Gap-Analysis

Data & Analytics Ecosystem

Architectures

Delivery Model

Gap Analysis: provides the *current state* evidence from which to build an enhancement roadmap and business case to fund the Operating Model required to achieve the strategic objectives

Progress to date: meaningful but steady, laying the foundations for increased investment in 2022/23

As mentioned earlier a Data Strategy Group has been established to drive the strategy forwards while ensuring continued business alignment, buy-in, and involvement in shaping requirements and outcomes. The group has representation from; Strategy & Transformation, DDTS, Quality, Finance, Clinical Services, Donor Experience, Blood Supply, OTDT, and People and meets on a fortnightly basis. Working groups are also being established to drive through quick wins and proof of concepts.

VISION STATEMENT

Based on the NHS's long-term plan, tech-vision, the NHSX Data Alliance Partnership, NHSBT's corporate strategy, and its directorate objectives the Data Strategy Working Group have agreed a working vision statement:

"We will contribute to saving and improving even more lives, by controlling and transforming high quality data, into accessible information and knowledge, enabling innovation and driving actionable insight for everyone"

This statement is iterative and will evolve as the strategy solidifies and becomes more stable.

Data-Driven Vision

Stakeholder Outcomes

Value Propositions
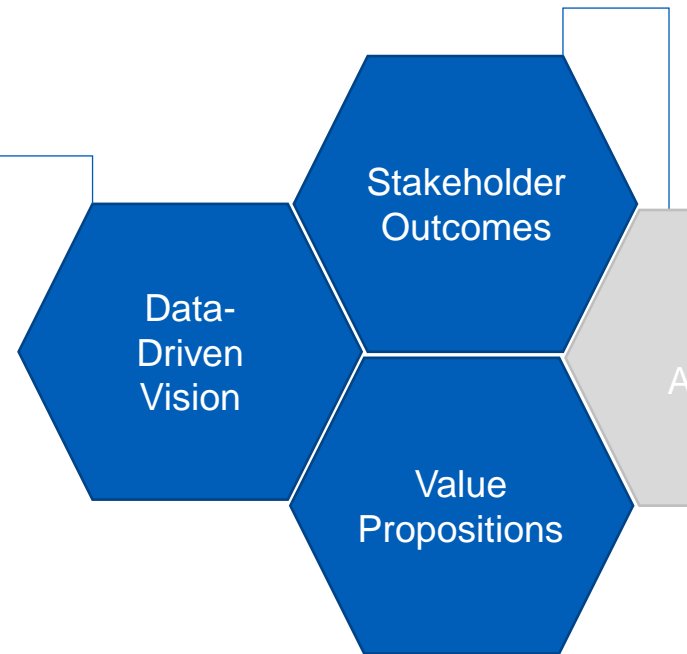
STAKEHOLDER OUTCOMES

Based on NHSBT's corporate objectives, directorate objectives, and directorate priorities an analysis of how data & analytics will help those stakeholders achieve those goals has been undertaken. Each stakeholder ranked (via a High, Medium, and Low rating) the importance of data to achieving specific objectives and priorities and provided a justification for the assessment. These were then reviewed by NHSBT Data SME's to ensure consistency and challenge and refine where necessary.

This exercise ensures that we have and maintain traceability from NHSBT's core mission and objectives through to the business and operational layers and ultimately the value propositions that will be delivered to support and enable the realising of said objectives and priorities.

These stakeholder outcomes will further be challenged, refined, and enhanced through a series of design workshops that are being carried out with each area. These sessions will provide more robust detail as to intended and desired outcomes for which the value propositions will serve.

VALUE PROPOSITIONS

Based on the initial findings from the Stakeholder Outcomes phase a set of initial Value Propositions have been defined. Value Propositions are the services or capabilities that enable the generation of the benefit required to achieve stated objectives.

As part of the design workshops these Value Propositions will evolve, be expanded upon, or discarded, based on the findings and agreements made with business stakeholders.

Once each Value Proposition has been agreed upon in principle then an additional benefits definition and realisation exercise will be undertaken along with an initial conceptual design. These will then feed into the gap analysis to help shape, understand, and quantify the delta between our current position and the intended desired state.

Quick wins: generating value and insight while strategic analysis continues

During the development phase of the Data and Analytics Strategy a number of *quick win* opportunities have been identified and are being progressed to varying degrees. Depending on the appetite of the board there are also additional opportunities to develop

LIGHTHOUSE CUSTOMER: Performance Mangement and Reporting
WHAT IS IT?: working with performance management to use PowerBI to improve ET reporting dashboards
WHAT'S THE BENEFIT?: provide near-term benefit to ET while also enabling discovery of the data supply chain which will feed into enhancement roadmap

INDUSTRIALISING EXISTING INVESTMENT: PowerBI working Group
WHAT IS IT?: a dedicated Task & Finish group to sustainably roll-out NHSBT's existing investment in PowerBI that is supported by a Data Working Group
WHAT'S THE BENEFIT?: will enable the satisfaction of some of the MI priorities in the near-to-medium term identified by the Objectives Analysis

SHAPING THE EXTERNAL ENVIRONMENT: Extending NHSBT's Involvement in the Cross-System Data Alliance Partnership (DAP)
WHAT IS IT?: now involved in all Groups designed to make the sharing of data easier & more coordinated while reducing collection burden on the front line
WHAT'S THE BENEFIT?: ensures NHSBT's needs are heard and helping to position NHSBT as a leader in the use of data at the system level

UNDERSTANDING A POTENTIAL GAME CHANGER: Initial Exploration of the NHS Digital Secondary Uses Service (SUS)
WHAT IS IT?: a single repository for healthcare data in England which enables a range of analysis to support and inform the delivery of healthcare services
WHAT'S THE BENEFIT?: provides NHSBT with patient level detail regarding their treatment to support initiatives such as the Transfusion 2024 initiative

TESTING THE ART OF THE POSSIBLE: Solving an innovative problem with a commercial partner
WHAT IS IT?: the opportunity to proactively engage with market leaders to show-case their capability while solving a "problem"/hypothesis for NHSBT
WHAT'S THE BENEFIT?: gain tangible benefit for a specific problem while testing the market and the supplier/s are able to show-case their capabilities

Next Steps and Focus Areas: driving towards a defined, evidenced, and supported investment case for 2022/23 and beyond

During Summer 2021 the team has socialized the approach, principles, and stakeholder outcomes of the Data & Analytics strategy across NHSBT's Directorate SMTs, and ET, to achieve and cement input, buy-in, and support. In parallel, we will not only be executing against the quick-wins, but we'll also be conducting the gap-analysis and developing the draft enhancement and transformation plan that will ultimately form the basis of the Data and Analytics Business / Investment Case.

1 **Gaining the insights and priorities of the Executive Team and the Directorates:** throughout the summer and early autumn focused sessions were held to further inform and shape the structure & objectives of the strategy

2 **Data Proposition Refinement:** based on additional insight and research the initial propositions will be enhanced, developed, and sized in greater detail to ensure that they will satisfy the "to-be" intentions of NHSBTs data ambitions

3 **Completion of the *as-is* and Gap-Analysis:** to understand NHSBT's current position and maturity with regards to the use of data across the organisation and identifying the required areas of improvement to achieve its ambitions

4 **Target Operating Model Design Draft:** that will underpin the organisational, talent and skills composition, governance, policy, and technology structures and capabilities that NHSBT requires in order to achieve its data objectives

5 **Drafting and Sign-off of the Strategy and Business Case documentation:** a qualified, evidenced, and robust strategy that is supported by a scoped, deliverable, and costed (with options) case for investment

Note: the level of investment in the data strategy will be assessed against other investment cases as part of the 2022/23 portfolio build process which is currently in flight