Nottinghamshire County Council

Business Intelligence Strategy 2018

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"More data is estimated to have been created between 2013 and 2015 than in the entire previous history of the human race."

"Yet it is estimated that only 0.5% of data is ever analysed."
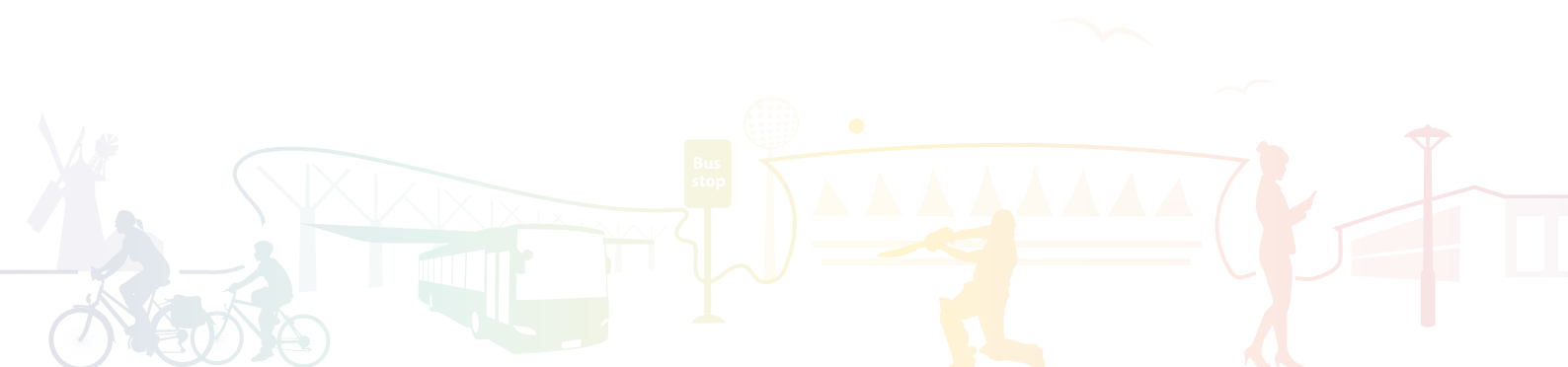
Introduction
Your Nottinghamshire, Your Future

The way we live our lives is changing at an unprecedented rate. In Nottinghamshire we see this as a fantastic opportunity to show vision and ambition and put the county at the forefront of modern Britain.

Our new Council Plan 'Your Nottinghamshire Your Future' sets out a clear and ambitious vision for the future of Nottinghamshire. A county that is a great place to bring up a family, to fulfil ambition, to enjoy later life and to start and grow a business. And our Departmental Strategies set out how we intend to achieve these ambitions.

The way we operate as a Council and our approach to change are fundamental to the delivery of these plans. As a Council, our duty is to provide a diverse range of services, to protect and shape the environment in which we live, and to create the right conditions for a strong local economy.

We must also make sure that these aims are delivered in a way that provides the best possible value for our taxpayers. The Council must provide the best possible services for local people, improve the place in which we live, and give good value for money.

Information and intelligence are vital assets to support us to deliver services in this way. This Strategy sets out how the Council will use Business Intelligence to achieve our commitments and our duty to provide the best possible services for local people, improve the place in which we live, and give good value for money.

Our Strategy focuses on how we use Business Intelligence for people, services and transformation:

BI for People	Developing our understanding of the people who live here, putting them at the heart of our plans to build a great place.
BI for Services	Having the right information and processes to make wise choices in the way that we run our services and budgets for today and the future.
BI for Transformation	Getting the most out of our data, basing our toughest choices on the strongest analysis and using data driven technology to transform our service.
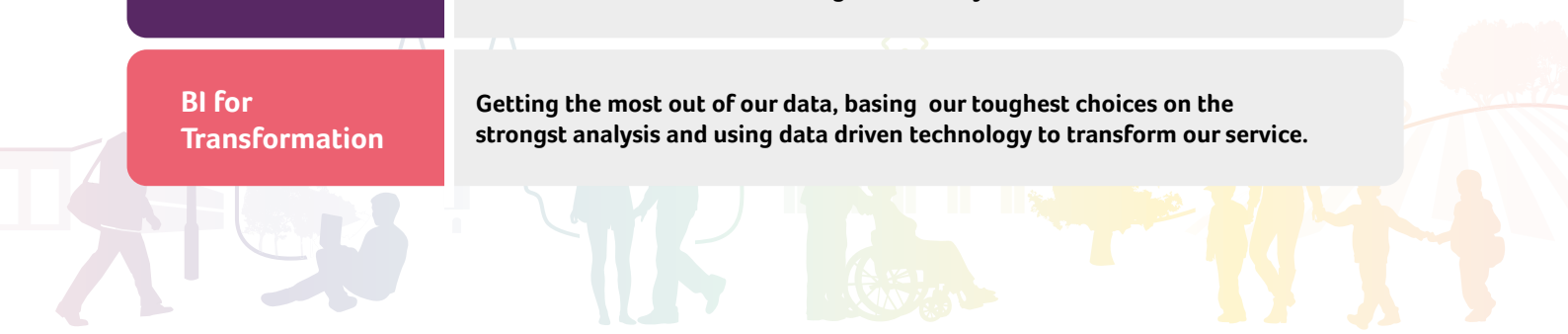
Strategic Context and Challenges

Strategic Context

It is widely acknowledged that expectations of public services are changing. With an ever increasing demand for good quality services to be delivered in a timely and efficient way, it has never been more important that we put value for money at the forefront of our thinking, ensuring that we understand our data and evidence base in order to design services in the best way.

Key to this is the development of our use of business intelligence, both in terms of how we collect, integrate, manage, analyse and present information to inform decisions, and how we manage and get maximum value from the data that we hold.

The Business Intelligence strategy has been developed in the context of the key drivers which will support the County Council in delivering its commitments as set out in the Council Plan. These business drivers fall into three main categories:

Strategic Drivers

- A sustained reduction in Central Government funding for Councils allied to increased demand and costs for children's and adults social care mean that current forecasts show a funding gap in excess of £54 million up until the financial year 2020/21. These long term financial constraints and the increased demand for services continually challenges the County Council's existing models of service delivery to remain affordable, sustainable and relevant to service users. Key to the success of any new/revised operating models will be the information and insight that the Council uses to make decisions about services.

- Nationally driven initiatives such as the Troubled Families Programme, the Midlands Engine Local Industrial Strategy, the Sustainability and Transformation Plan (STP) and Health and Social Care integrations require evidence driven collaboration at a Regional and County level.   Local partnership priorities for Economic Growth, Health and Wellbeing and Community Safety require shared intelligence for the targeting of action and interventions.

Service Drivers

- Demand from services for more advanced intelligence to move beyond our reporting of 'what happened' to understand more analytical questions such as 'how could we prevent it happening', 'why did it happen', 'could it happen again', 'what will happen if we change xyz' and 'what else does the data tell us that we have never thought to ask'

- Increasing need for service redesign to increase productivity, meet new pressures, implement the data driven recommendations of service diagnostics carried out by Newton Europe and realise the benefits of the reconfiguration of Place and Resources Departments.
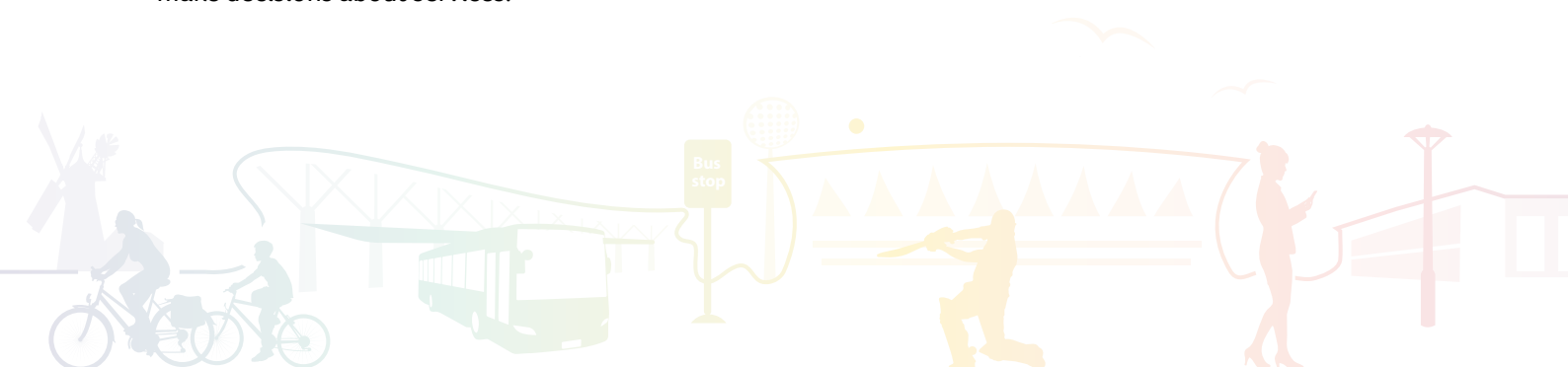
Technology Drivers

- The availability of data to learn from continues to grow at a significant pace as residents increasingly interact with social media, smart technology, voice recognition and as big data and the internet of things (IoT) become a greater part of our lives.

- Data and the technology to analyse data are being revolutionised through the development of data science, predictive analytics, data mining and cognitive processes such as machine learning and artificial intelligence (AI). Developing our uses of these techniques offers opportunities to redesign public service built around the needs of local people.

- The increasing availability of data driven technology, smart appliances, the internet of things and AI provide opportunities for the public sector to reconsider the way that some services are provided.

- The County Council has a clear direction to fully embrace off-premise (Cloud) solutions and decommission current data centre services by the end of 2019 changing where our systems and data resides.

Building on our foundations

This Strategy is intended to build on work that the Council has already undertaken to improve access to management information. Over the past year we have made great strides in developing an enterprise data warehouse – a technical store to bring together data from some of the Council's key systems.

Having this data together in the warehouse has enabled improvements to be made to reporting of information for our social care services – making it more user friendly and providing better access to support decision making. Our progress includes:

- Provision of a 'BI Hub' – a single point of access for management information

- Development of static reports of social care information derived from the data warehouse

- Completed discovery scoping work for expansion of the warehouse to include data from other core business systems

- Centralised performance, policy and reporting roles into a single service to provide resource for business intelligence. Scoped the integration of public health intelligence into the service

- Initiated a business change analytical function

- Reviewed community safety partnership analytical needs

This initial work enables the Council to explore new opportunities for using BI.

| Whats happened – Reporting | Why has it happened – Analysis | When might it happen again – Modelling | What is happening – Learning and Advising |

Our approach to Business Intelligence

Business Intelligence

Information is increasingly coming from a wider range of sources as people generate more data about their daily lives through the way they access and pay for services, through the internet, smart homes, mobile devices and social media.

It is being generated in many formats, from traditional structured data such as that from IT systems, databases and spreadsheets to more unstructured data such as text files, internet cookies, photos, and videos. The availability of data is growing and through computer learning, artificial intelligence and sophisticated data mining, software data is ever developing.

For the Council,

Business Intelligence is how we bring together data
– a vast range of facts and statistics - for analytical purposes so that we can plan and provide efficient services to the public

As a commissioner and provider of services, data is generated throughout the customer journey through our services.

Through analysis of this data and the wider sources of data that are available, the Council will seek to manage efficient services as part of our Planning and Performance Management Framework and based on:

- our understanding of customer needs
- planning services to meet needs
- managing delivery of
  - the Customer journey or service as a whole through to its outcome
  - the stages of the journey or the business processes that lead to the outcome
- learning from the Customer experience (across one or more services) to improve or transform future service delivery
- improve our understanding of future need.

Our Principles

Our principles of good business intelligence are:

1. Single version of the truth

Data will be brought together and viewed through a single, trusted Hub for business intelligence and analysis. We will seek to improve our data to provide an accurate and consistent view, particularly where services cross organisational divides.

2. Data as an asset

Data gathered and held by the Council will be used as an enabler for public services across Nottinghamshire. It will be managed as an asset - so that the development of business intelligence can help meet multiple service needs and outcomes across the whole Council.   The value of data, intelligence and analysis will be respected when storing, sharing and disposing of it, and ensuring GDPR compliance.

3. Timely and accessible intelligence

Business Intelligence will be designed and presented to meet the needs of decision makers. This means providing the right information, in the right way at the right time. We will use technology to expand visualisation (how we present information) and develop skills in business analysis, design and analytics to get the maximum value from our data. Our analysis will be interpreted and assured to a consistent standard to support our decision making.

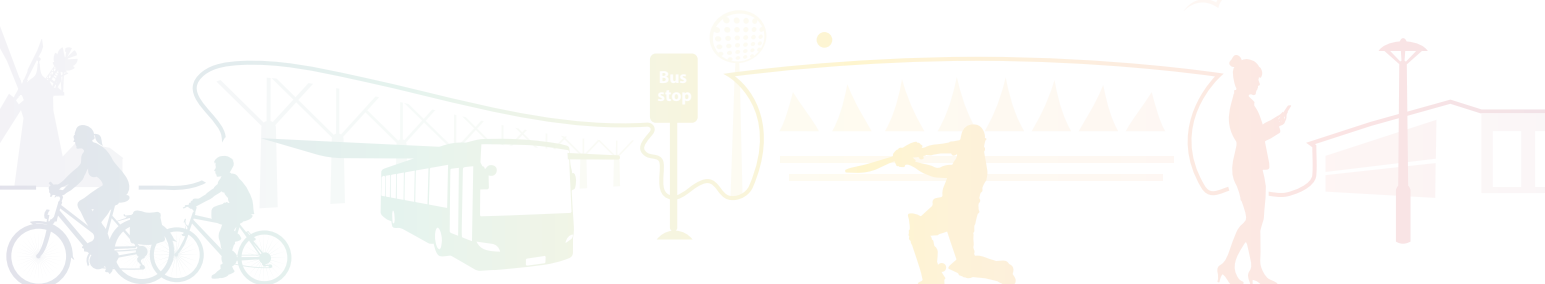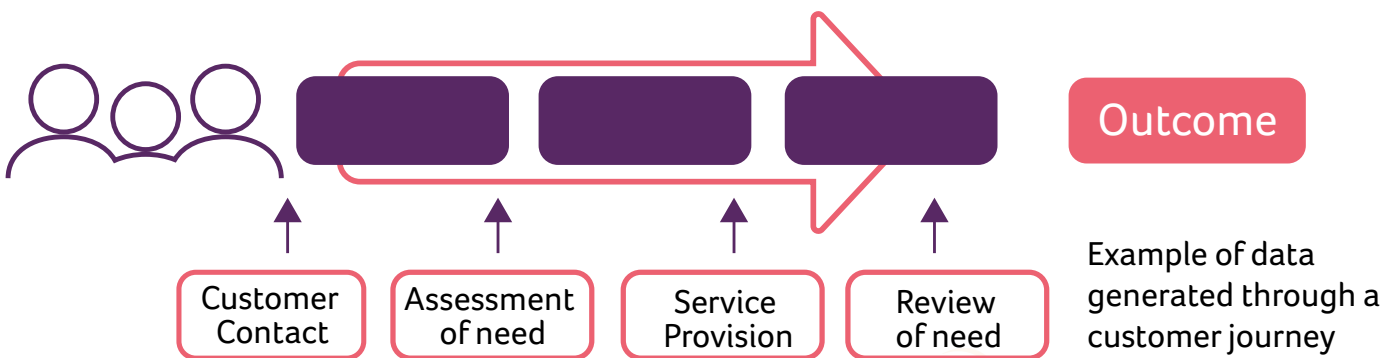### 4. Customer focused intelligence

Business intelligence will be shaped and designed around outcomes for our customers, their journey through our services and the stages that make up that journey – our business processes. We will seek to bring together different views of that journey from the perspectives of the customer, outcome, quality, cost, time and risk.

5. Structured data and intelligence

Business Intelligence will be underpinned by good design choices in the way that we organise our data. We will transform the way that the Council's major repositories of data are structured and managed to provide a data warehouse and linked data repositories across the Council. Analytical 'layers' on top of our data will enable the development of dashboards and querying by our analysts. We will bring consistency to our data and manage change across our data sources to protect the integrity of our data and intelligence architecture.

6. Integrating analysis and insight

Analysis and data science will increasingly inform our service choices in the future. We will integrate cognitive BI, automation and data driven technology into our decision making. We will seek to expand data science (how we turn data into insight through BI and technology) and analytical capability across the Council.

Customer Contact — Assessment of need — Service Provision — Review of need — Outcome

Example of data generated through a customer journey

Priorities and key actions

Using BI for people

A strong understanding of Nottinghamshire and the people who live here is important to be able to plan and deliver our services.

The Council want to put local people at the heart of everything we do and so it is important that we have a consistent understanding of those local people that can be used across our services.

By bringing together statistics and data about people such as demographics, economic activity, wellbeing and deprivation we will develop a single Council wide view of Nottinghamshire.

We bring together address, property and spatial data to link these characteristics to places to offer interactive mapping and spatial analysis across the Council.

The Council operates in a wider environment supporting and working with many different organisations. Our relationship with these partners also benefits when we work from a single evidence base and a shared understanding of our communities.

This work is often based on the findings of a needs assessment, used to identify gaps between the current and desired health and condition of local people. We will share appropriate intelligence with our partners and our single view of Nottinghamshire will form the basis for the Council's contribution to the assessments of need.

How will we use this:

The Council is committed to using business intelligence to achieve:

A shared view of need

Putting our understanding of local people at the heart of our plans and strategies and how we measure our successes.

To put local people at the heart of everything we do the Council needs to translate our understanding of people into action by reflecting it in our plans. Starting with the measures of success set out in our Council Plan we will use BI to identify and follow the key characteristics and changes in our community.

We will use BI to pursue the progress of our plans through performance management of Core Data Sets - a hierarchy of measures linked together by technology – and follow performance through to see how services are helping our achievement. Where further progress is needed we will follow the hierarchy of measures to identify the source of problems or reverse it to understand the potential impact of emerging challenges.

A shared view of demand

Identifying future demand for services and where people may need an intervention or different service.

The Council continues to see rising demand for many of its services and Business Intelligence provides an opportunity to model this in advance to enable the Council to take long term decisions about service delivery.

We will build on our understanding of people by gathering and analysing data about customers. We will bring together customer data including their perceptions and satisfaction to develop our customer insight and a Council view of demand.

Some of the Council's services are aimed at reducing or preventing future demand for often more expensive services – or the whole county cost of receiving services from multiple public sector agencies. The Council targets these services based on a detailed understanding of need, often in partnership with other public sector organisations. We will work with partners to integrate and analyse data that enables us to target service delivery and interventions such as the work with vulnerable people through the Safer Nottinghamshire Board Integrated Working Project.
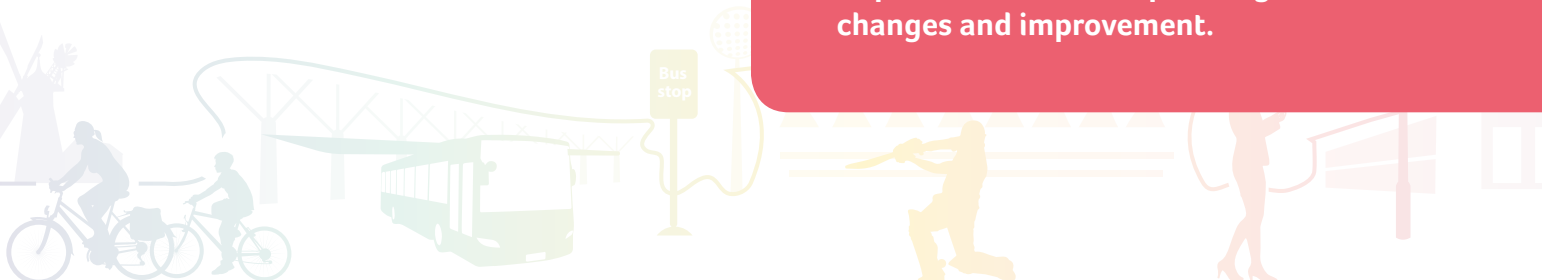
Benefit for people

Creating opportunities for others to use our Business Intelligence to benefit people and the economy.

Our Business Intelligence has the potential for wider use in Nottinghamshire to bring benefits for local people through the actions of our partners and entrepreneurs such as those working in the digital economy. We will share non-personal data and our BI about place where it can appropriately be used to help unlock external resources and funding from partners such as our work with the sporting community. Where appropriate we will license BI as open data to provide opportunities for it to be used creatively.

We will also use our understanding of place to support the commercial operations of the Council including growth in our services and by exploring the market for selling BI services.

To deliver the Strategy we will:

- pilot changes to our service planning process to map the customer journey through our services and the key data and metrics required to manage it

- work with managers to develop service datasets and provide dashboards and maps that bring together information about people, place, activity, finance, assets and staff

- embed a cycle of continuous service improvement into the delivery of services to support the Adult and Public Health and Children and Young People Strategies

- identify data opportunities, new data sources and transition services to the use of master records

- build the identification of future BI requirements into the planning of service changes and improvement.

Priorities and key actions

Using BI for Services

The way we make decisions and manage our services affects our ability to deliver on our ambitions for Nottinghamshire. The decisions that we make in service delivery rely on the information available when they are taken to support our service to spend money wisely.

The Council wants to make best use of resources by adopting creative and innovative ways of working that deliver value for money for our residents.

By bringing together data from our different systems we can ensure that our managers have the right information available to them to make decisions both now and for the future. By sharing our single view of Nottinghamshire we can help connect our services to the changes in our communities and use BI to manage the delivery of our commitments to them.

How will we use this:

The Council is committed to using business intelligence to:

**Understand service delivery**

Mapping business processes to data to build a common understanding of the customer journey through our services.

As a commissioner and provider of services, data is generated throughout the customer journey through our services. We will work with our services to deconstruct and map these journeys and identify the data held across the Council and how it can be compared or benchmarked with other services.

Our understanding of business processes and data will inform the review of our performance measures so that their importance in supporting management of each of our services can be understood. We will strengthen understanding of the way that our services are provided by creating a service dataset of the key measures of the customer journey from the perspectives of the customer, outcome, quality, cost, time and risk.

We will also identify data opportunities to:

- bring in new or master datasets to support management of the service

- use BI to learn from the data that our services hold and move towards predictive BI

- use service data to improve the efficiency and effectiveness of other services across the Council.
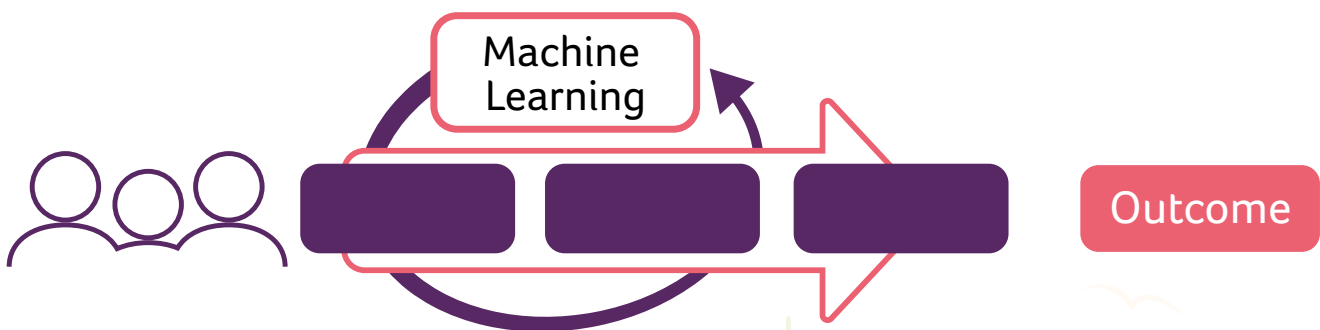
Information from the service is used to identify unknown or suspected problems through machine learning.

Improve service delivery

Visualising service data to support day to day decisions and continuous improvement as part of the management of our services.

Everyday decisions in our services impact on customers, public finances and service provision. We will provide managers with the tools and opportunities to make decisions to lead improvement and change at a service level.
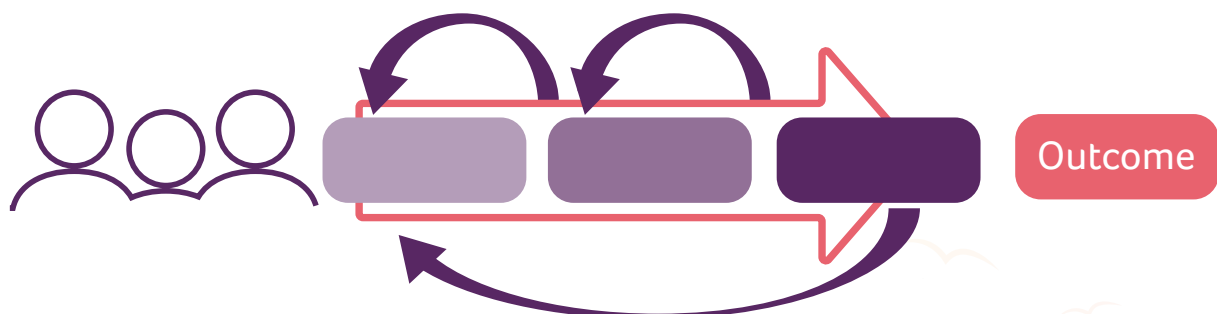
We will use business intelligence to bring together data about our services to ensure that managers have the right information available to them – their service dataset. We will move away from spreadsheets and static reports of activity to use interactive dashboards that bring together information about the service and its processes - linked through to the detailed data that sits behind it.

We will work with managers to identify the key measures that they need to manage to maintain a high standard of service delivery and to drive forward improvement. Managers will be supported to review these metrics at set intervals to form a cycle of continuous improvement. These improvement cycles will be defined through our service plans and reported through our Planning and Performance Management Cycle.

When the need for service change is identified, BI and analytics will be used alongside qualitative information from our staff and customers to develop our plans for change. We will also consider future BI requirements as an integral part of service change and support managers to use the new BI through the transition in service delivery.

To deliver the Strategy we will:

- **pilot changes to our service planning process to map the customer journey through our services and the key data and metrics required to manage it**

- **work with managers to develop service datasets and provide dashboards and maps that bring together information about people, place, activity, finance, assets and staff**

- **embed a cycle of continuous service improvement into the delivery of services to support the Adult and Public Health and Children and Young People Strategies**

- **identify data opportunities, new data sources and transition services to the use of master records**

- **build the identification of future BI requirements into the planning of service changes and improvement.**

Outcome

Information about a whole service and its processes is reviewed to ensure efficiency and effectiveness.

Priorities and key actions

Using BI for transformation

With sustained changes in funding, increased demand for services and technology playing an increasing role in everyday life, the way that we provide our services must also continue to evolve.

The Council wants to be creative and work in new ways to reflect the digital age that is transforming the way that we live, do business and spend our leisure time. These transformations in our lives will inevitably lead to transformation in the way that we deliver services.

Our strong understanding of need, demand and our services will provide a foundation for BI to contribute to three stages of transformation:

- Identifying and analysing transformation opportunities

- Transforming processes and services

- Embedding change within our services

How will we use this:

The Council is committed to using business intelligence to:
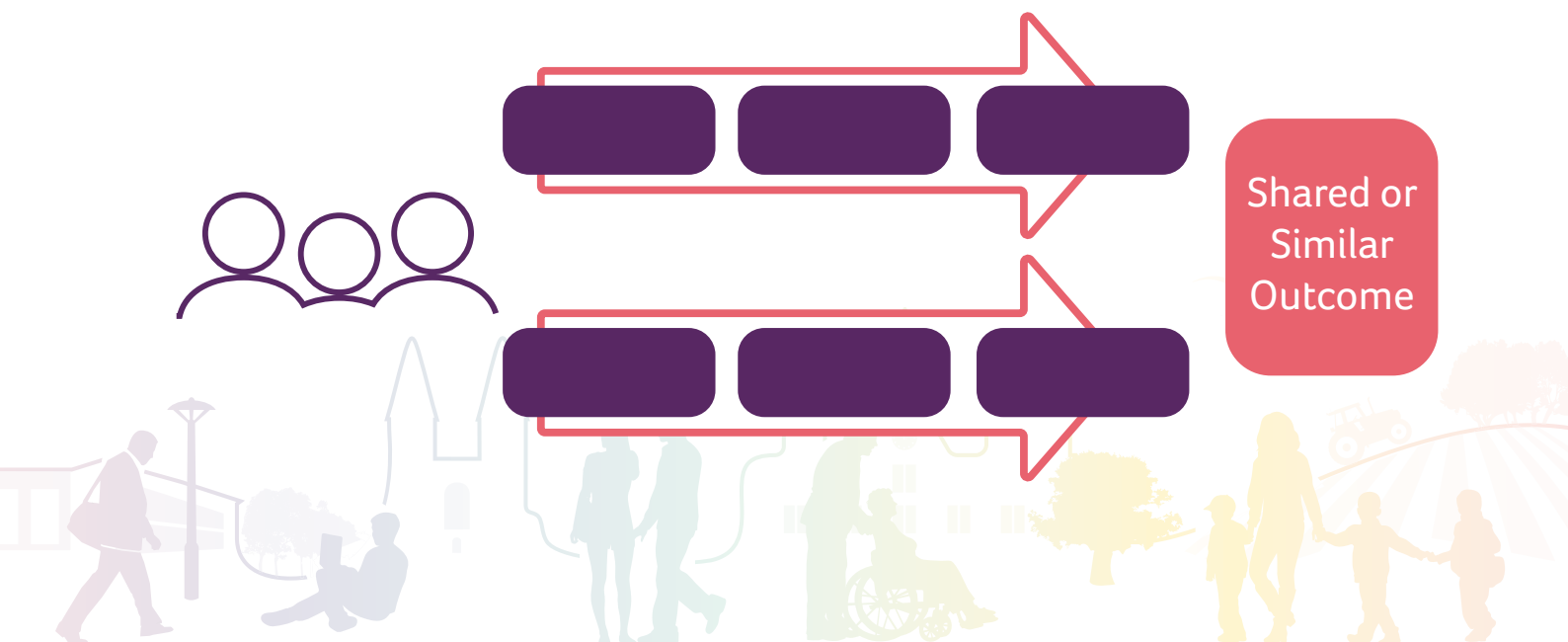
Analyse opportunities

Providing insight and analysis to inform the Council's major transformation portfolios.

Big changes to services start with an understanding of how they are working and then require the right intelligence to ensure that potential changes can be modelled, costed and tested before they are implemented.

We will develop our data and analytical capabilities to inform our transformation choices. By providing a single source of BI analysis for transformation we will be able to assure data and analysis through our BI service, so that decision makers can have increased trust in the information and insight that they receive. By moving access to analysis to our BI hub, decision makers will know that it is up to date and that the data that it is based on is protected, supporting our compliance with the GDPR requirements.

We will use advances in BI to identify and gather new data and insight to improve services and outcomes and bring forward new transformation opportunities across one or more customer journeys.

Transformation should also look at the journey through multiple services that could be integrated.

Shared or Similar Outcome

Transform services

Using technology to improve services and processes and by reducing the need for manual contact, data calculations and decision making.

Our ambition is to make the best use of the opportunities offered by the ever-changing world of business intelligence and data driven technology. We will take advantage of new tools and techniques to design and develop services focused on the customer that will address council pressures and drive efficiency.

We will look to use automation to deliver our repetitive business processes, particularly those of our back office services and use AI to provide capacity in our interactions with customers. In some cases AI may be used to manage the entirety of these customer interactions.

We will also explore the opportunities for BI to prioritise service delivery following contact from a potential customer, particularly for our Place Services.

New technology is bringing new opportunities to transform service delivery. The Internet of Things and devices that learn from user activity such as Alexa, Hive and Nest are entering more homes and are being used to control a range of appliances such as entertainment, lighting and heating. These devices use and generate data and can also be used to provide information or services to users. Structuring and managing data for this technology will be key to getting maximum value as we explore the benefits of its use for our customers and service users.

To deliver the Strategy we will:

- **expand our advanced analytics offer to model change and transformation activity**

- **develop our approach to machine learning and AI to support the Resources Strategy including piloting automation for some processes and customer access**

- **develop our approach to analysing sensor data to support the Place Strategy including piloting data prioritisation for some service processes**

- **provide advanced analytics to identify transformation opportunities for preventative or targeted services**

- **provide advanced analytics to analyse cross service and agency customer journeys and support wider public sector reform such as the STP.**
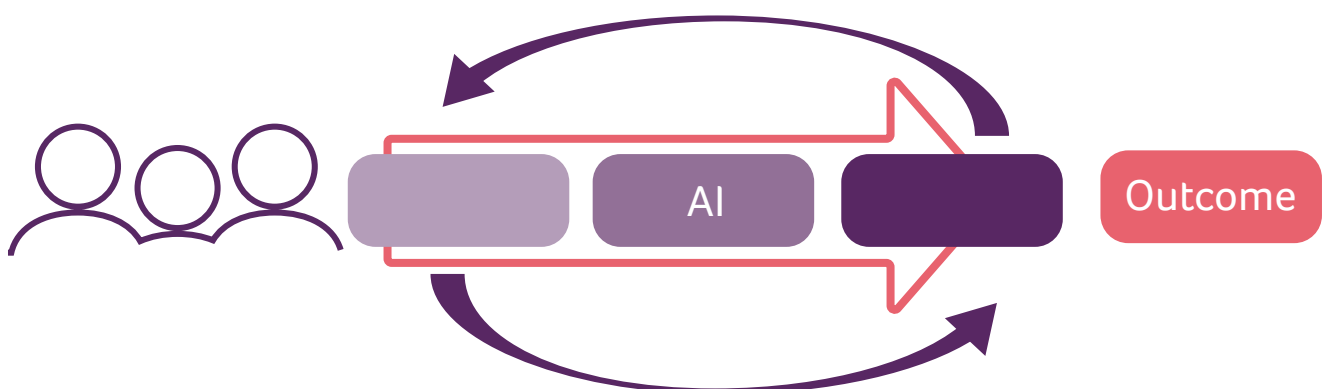
Artificial intelligence or AI uses information about customers to prioritise delivery of services – or in some cases deliver a service. Information from the transaction is processed to inform the next customer interaction.
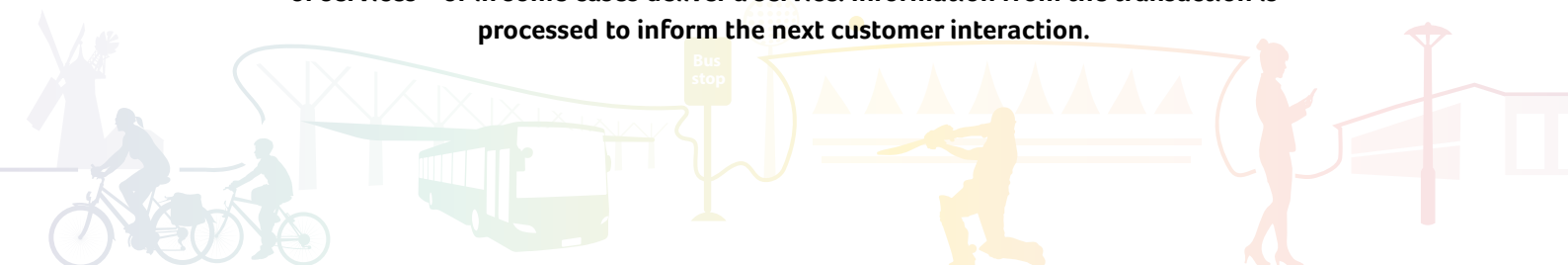
Developing Business Intelligence

Managing BI

Our focus on BI for people, services and transformation, will be underpinned by how we approach the development of business intelligence across the Council.

Improvements to the way that we develop Business Intelligence will enable us to deliver for the future. Our approach to BI will include changes to the way that we:

Capture requirements

Many Council services use business intelligence reports to get data as part of a business process but do not go on to make full use of the technology available. We will explore opportunities to use BI software to transform business processes by improving our requirement gathering to promote maximum use of Business Intelligence and analytics within our services and encourage a move away from spreadsheets and static reports of activity.

Develop BI

We will be creative and work in new ways with business intelligence by following experimental, innovative and incremental approaches to development that help grow our business intelligence skills in data design and data science.

To manage the increasing demand for BI we will seek to automate the supply of regular BI so that resource can be deployed to deliver new BI requirements. Our development of new BI capabilities will be delivered in three phases:

- **Diagnostic and pilot** – we will create an overall design for each new capability that fits with the Council's BI architecture and pilot capabilities with one or more of our services.

- **Build** – we will deliver each new BI capability across additional services and implement Council wide processes for maintenance and use prior to roll out to services.

- **Embed and enhance** – we will support use of the new capability, learn from feedback and deliver enhanced functionality where there is a business case to do so.

Where the Council's needs exceed the BI or analytical skills available we will commission external expertise through the BI service and seek to learn from the services that they provide.

Add new capabilities

Providing BI is dependent upon our ability to access data and structure it in a logical, sustainable way. We will continue to develop our data warehouse to bring together data from our major systems, partners, big data and new data sources.

We will design this to industry best practices, ensuring that it is well documented and low maintenance. We will provide an 'analytical layer' on top of our warehouse to enable the development of dashboards and ad-hoc querying by our analysts.
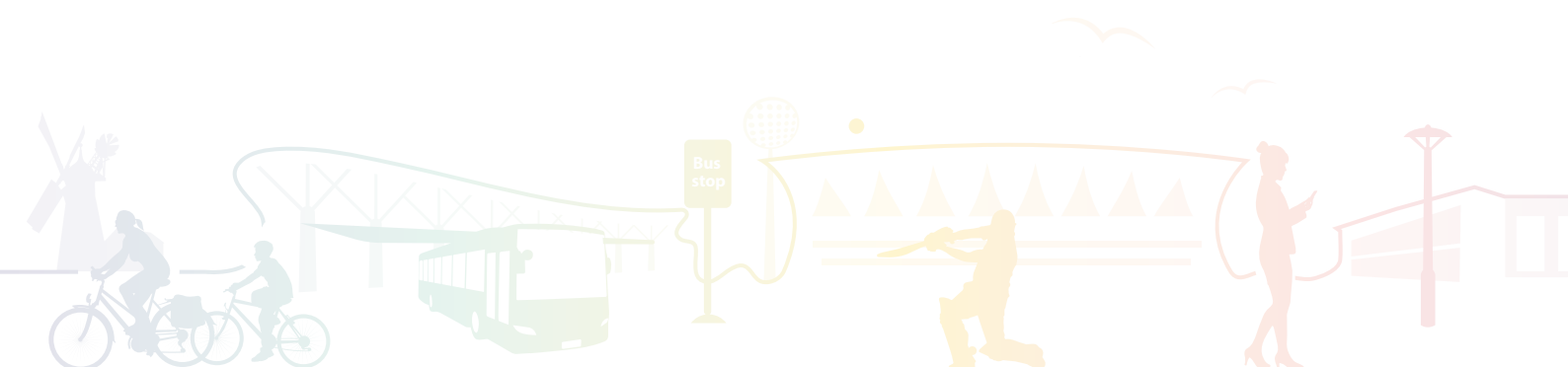
Explore and learn from data

As the availability of data continues to grow through everyday interactions with data driven technology and smart devices so will the importance in being able to analyse and trial new uses through BI. Our approach to data science techniques such as machine learning, data mining and artificial intelligence – where systems learn responses to customers based on data from past experiences – will shape how we respond to new opportunities to use data.

We will plan how we explore new approaches to use data creatively in service delivery and to work in new ways such as through intelligent automation. This includes using BI to define appropriate approaches to data science, AI and machine learning.

We will build capacity to explore this work and identity the requirements for advanced analytics – such as a data development environment that allow us to bring together and explore a wider pool of data without impacting on our trusted BI provision.

Govern BI

Defining the processes to make best use of BI and manage data effectively

When our services change so can the way that they gather data. Improvements to the way that we deliver services can also have an unexpected impact on existing uses for data, particularly when this has multiple or wider uses across the Council or a partnership. We will develop common standards to support our BI including:

- data formats, storage, master records and unique identifiers, data licencing, data management and data quality.

- inputting records, data and performance and for providers of contract data.

- analysis, presenting or visualising data commissioning of external analysis and assurance of analysis.

- recording progress against plans, strategies and projects.

We will also strengthen data integrity by introducing new arrangements for data held outside of our systems (such as in spreadsheets) to be stored in a secure central repository such as Microsoft SharePoint to support its use in BI.

To deliver the Strategy we will:

- **link data in our major systems to our data warehouse and expand our BI capabilities**

- **define the processes, standards and governance required to make best use of BI and manage system change effectively**

- **align and improve system development and BI requirement gathering processes**

- **establish approaches for our BI Service to develop data science and analytics including new skills and technology**

- **create a data development environment for experimentation and piloting of new approaches to BI and automation**

- **update our BI tools to keep pace with changes in technology and our move to the Cloud.**

Embedding and Evaluating Change

Our Culture

Our focus on BI for people, services and transformation, will be underpinned by developing a culture that values its use.

Evidence based decision making can only be as good as the information that is available to the decision maker. The majority of the Council's Business Intelligence will be based on the information gathered through the processes and systems that make up our customer journeys. The quality of our BI will therefore be reliant upon the data from those processes and systems being up to date and accurate.

Promoting the value of Business Intelligence is not only important for embedding the use of BI for people, services and transformation, but also for explaining the importance of good record keeping and data quality that underpins our BI.

Our approach to embedding BI in our culture will involve:

Embedding BI in our work

Defining the roles, processes and competencies of managers and staff in using BI in our work

A successful Business Intelligence Strategy is about more than just the provision of information it's about the way that it is used. Our goal is that high quality business intelligence should be shaped by mature business processes and a culture that values its use.

Like many organisations the Council uses 'competencies' to link individual performance to the goals of the organisation.

To ensure that the Council embeds an intelligence led culture, Business Intelligence will be integrated into the Council's competencies with staff supported in its use through their own personal development reviews and learning plans.

We will provide the learning and training packages that our staff and managers require to support development of BI across the Council and to understand their responsibility for its quality and use.

Supporting BI in our work

Ensuring that our BI and analytical support evolves as our use of BI matures

As the Council changes the way that it uses BI it should be matched with a change in the skills and resources available to manage and innovate our use.

The Council has already started this transition by using temporary contracts to increase capacity in BI reporting and warehouse development – including upskilling some of our BI specialists as part of the business reporting and management information project.

To secure the Council's BI culture we will bring together a range of existing roles and resources to provide consistent support and leadership for innovation in BI. We will move away from traditional performance roles to provide a dedicated BI and Analysis service based on our existing data, reporting, intelligence, policy, change, public health and performance analysts.

We will look to the Service to provide specialist advice on opportunities to develop BI for People, Services and Transformation and support our services with the implementation of our BI Strategy.

Our new service will need to provide capacity for data science, innovation and delivery of the BI Strategy. By automating the supply of regular BI we will release resource to deliver our new BI requirements.

Sharing BI in our successes

Improving the communication of performance and success. Using BI in a campaign showing achievements against the Council's Plans

To develop an understanding of the value of Business Intelligence the Council will change the way that it communicates about data.

The most visible part of business intelligence is where it connects with performance and the interpretation of how well the Council is doing. The Council Plan sets the standards for the Council to achieve – our measures of success - which we will link to a visible campaign and branding about how we are making Nottinghamshire a great place.

The campaign will have a strong internal focus on sharing success and developing understanding of the people and place based on our BI and the actions of our services.

Through the campaign we will seek to show the relevance of data and BI to our service delivery. We will communicate our uses of data driven technology and BI to transform service, to stimulate ideas and suggestions for how we further its use and innovate in Nottinghamshire.

To deliver the Strategy we will:

- **define the roles, processes and competencies of managers and staff in using BI in our work**

- **identify and develop organisational learning and development to support the use of BI**

- **bring together data, intelligence, change, public health and performance analysts and rebalance these with new skills in a dedicated BI service**

- **use BI in a campaign showing achievements against the Council's Plans and improve the communication of BI, performance and successes.**

Glossary

Glossary of key terms used in the BI Strategy and across the Council:

- Data - a vast range of facts and statistics
- Business Intelligence (BI) - how we bring together data for analytical purposes so that we can plan and provide efficient services to the public
- Data Visualisation - the presentation of data in a pictorial or graphical format to communicate significant or complex information or identify new patterns

Data

- Big Data - an evolving term that describes a large volume of structured, semi-structured and unstructured data that has the potential to be mined for information. Big Data is often too vast to be interpreted using traditional analysis techniques
- Open Data – a standard for data that anyone can access, use and share
- Master Data – core data used across an organisation or multiple services to provide a single record or identifier eg a master record of people
- Data Cleansing – the action of identifying and removing or amending data that is incorrect, incomplete or duplicated.

Tools and Processes

- **Data Warehouse** – an organised and structured store of data brought together from multiple sources
- **Cubes** – are a method for organising and applying common rules to a group of datasets from a warehouse for analytical and presentational uses
- **ETL** – extract, transform and load, the process of copying data from a system into a warehouse.
- **Reports** – a means of presenting data, from a warehouse or ICT system. Typically shown as static content and developed using coding language (sql)
- **Dashboard** - is a data visualisation tool that is

used to track a group of related metrics, activity and other key data points relevant to a process, service or organisation

Analytics and Approaches

- **Data Science** - methods, processes, algorithms and systems to extract knowledge or insights from data in various forms
- **Machine Learning** - a field of computer science that gives systems the ability to "learn" or progressively improve performance on a task using data rather than being explicitly programmed
- **Artificial Intelligence (AI)**- when a machine mimics functions associated with human minds, such as learning and problem solving
- **Automation** – a technique of making a process, or a system operate automatically.
- **Data mining** - using software to look for patterns in large data sets to identify patterns and establish relationships to solve problems through data analysis
- **Fuzzy logic** – a method of matching data by assessing variables using logic that approximates human reasoning.
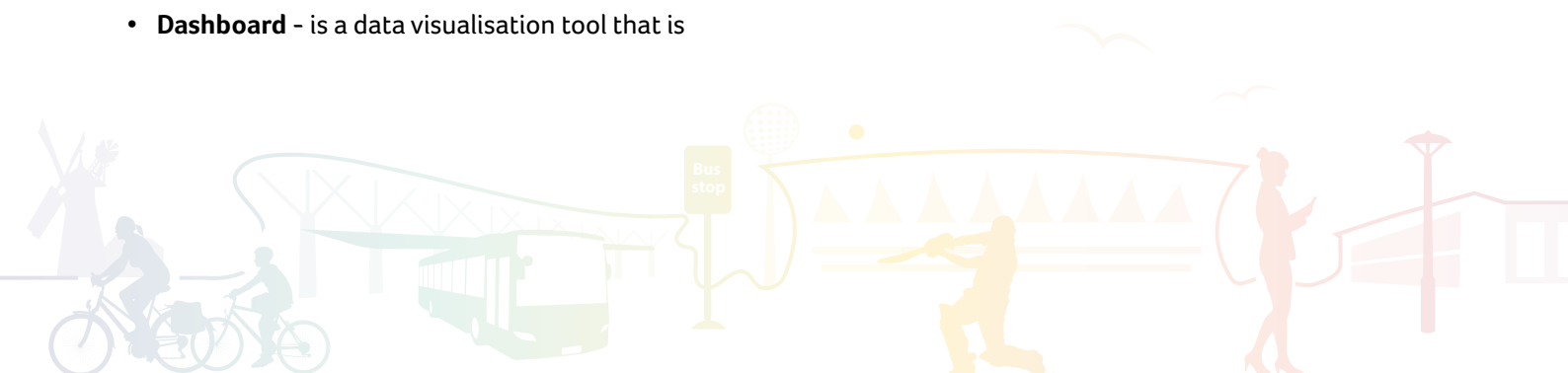
BI for People
Developing our understanding of the people who live here, putting them at the heart of our work to build a great place

- Bring together our data and statistics about people and places to create a single view of Nottinghamshire and a platform for BI.
- Align our needs assessments to provide a single evidence base for our key strategies and partnership activity
- Apply a hierarchy to our performance measures and core datasets to link need to outcomes and to activity
- Establish a Council wide mapping system (GIS) to support services and the key activities of the Place Departmental Strategy
- Bring together our data about customers to model current and future demand across our services
- Provide specialist business intelligence services across Nottinghamshire to support income generation and the Adult and Public Health Improvement Portfolio
- Explore opportunities to publish open data to enable innovation and entrepreneurship

BI for Services
Having the right information and processes to make wise choices in the way that we run our se

- Pilot changes to our service planning process to map the customer journey through our services and the key data and metrics required to manage it.
- Work with managers to develop service datasets and provide dashboards and maps that bring together information about people, place, activity, finance, assets and staff.
- Embed a cycle of continuous service improvement into the delivery of services to support the Adult and Public Health and Children and Young People Strategies
- Identify data opportunities, new data sources and transition services to the use of master records
- Build the identification of future BI requirements into the planning of service changes and improvement

BI for Transformation
Getting the most out of our data, basing our toughest choices on the strongest analysis and using data driven technology to transform our services

- Expand our advanced analytics offer to model change and transformation activity
- Develop our approach to machine learning and AI to support the Resources Strategy including piloting automation for some processes and customer access
- Develop our approach to analysing sensor data to support the Place Strategy including piloting data prioritisation for some service processes
- Provide advanced analytics to identify transformation opportunities for preventative or targeted services
- Provide advanced analytics to analyse cross service and agency customer journeys and support wider public sector reform such as the STP.

BI Development
Governing, developing and exploring opportunities for data and analytics

- Link data in our major systems to our data warehouse and expand our BI capabilities
- Define the processes, standards and governance required to make best use of BI and manage system change effectively
- Align and improve system development and BI requirement gathering processes
- Establish approaches for our BI Service to develop data science and analytics including new skills and technology
- Create a data development environment for experimentation and piloting of new approaches to BI and automation
- Update our BI tools to keep pace with changes in technology and support our move to the Cloud

Embedding a BI Culture
Business intelligence shaped by business processes and a culture that values its use

- Define the roles, processes and competencies of managers and staff in using BI in our work
- Identify and develop organisational learning and development to support the use of BI
- Bring together data, intelligence, change, public health and performance analysts and rebalance these with new skills in a dedicated BI service
- Use BI in a campaign showing achievements against the Council's Plans and improve the communication of BI, performance and successes