

THE CARIBBEAN DIGITAL TRANSFORMATION INSTITUTE

# Empower your journey



Digital Transformation Series

# Data and Analytics

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*Courseware Version: 4.0*

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# PART ONE: COURSE OVERVIEW

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## COURSE OVERVIEW

This course will look at ways businesses can ethically collect data, how to analyse that data to drive decision-making as organisations embrace digital transformation, and the obligation to protect data.

## LEARNING OBJECTIVES

At the end of this workshop, participants should be able to:

- List principles of data ethics and several collection methods
- Define data analytics and describe how this can help small and medium-sized businesses
- Understand the importance of data protection and privacy

### **Learning Objectives**

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## PART TWO: DATA COLLECTION

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Businesses have a lot to gain from analysing data. But in order to use data, businesses must first collect it.

This section will review types of collection methods, as well as the principles of data ethics.

### ETHICAL DATA COLLECTION

Data collection can be a powerful practice for businesses. But first, businesses must ensure the data they are collecting is obtained legally and ethically.

As Catherine Cote writes for Harvard Business School Online, “data ethics encompasses the moral obligations of gathering, protecting, and using personally identifiable information and how it affects individuals.”

Cote suggests everyone within an organisation should be well-versed in data ethics, no matter their role, because that enables more people to detect any unethical data collection, use, or storage practices.

Cote outlines five principles of data ethics:

#### **1. Ownership**

Any personal information about a person belongs to them. That means an organisation must obtain consent to collect that information. This could consist of an individual signing a written agreement, online terms and conditions users are asked to agree to, or websites asking for permission to track cookies.

#### **2. Transparency**

Simply asking for consent to collect customer personal information is not enough. Organisations should be prepared to tell consumers what information they are collecting, how they will use it, and where it will be stored. This gives users a chance to give informed consent.

### **3. Privacy**

Having access to customer data also means organisations have a requirement to protect this data. Data privacy will be discussed in more detail later in this session, but briefly, businesses have a duty to securely store data. Cote suggests one way to protect that data is to make it anonymous and remove all identifying details.

### **4. Intention**

Those collecting data within an organisation should ask themselves why they need the information, and what is gained from it. If the intended use of the information is malicious, it is not ethical to collect it. Intentions should be considered for every piece of information collected, and only what is needed should be gathered.

### **5. Outcomes**

Cote notes even when intentions are pure, the outcomes from collecting data could still be negative or harmful. While the impacts may not be known until after the data has been collected and analysed, considering the potential outcome ahead of time could help to identify possible harmful impacts.

## COLLECTION METHODS

There are a number of ways businesses can collect data, seven of which Cote details for Harvard Business School Online.

### **1. Surveys**

Physical and digital surveys gather answers to a series of questions. Online surveys offer organisations a way to easily and cheaply reach large groups of people. Though affordable and effective in their reach, they come with risk of bias. Participant answers can be swayed by the way questions are framed, and by the knowledge that their answers are being read by a particular organisation. When creating and conducting surveys, it is necessary to keep in mind these risks.

### **2. Transactional Tracking**

This simply means collecting information from customers as they complete purchases, offering businesses the opportunity to gather insights and get to know who is buying from them.

### **3. Interviews and Focus Groups**

This method involves bringing people together face-to-face. It can offer more in-depth answers, including about new products. “Seeing them interact with your product in real-time and recording their reactions and responses to questions can provide valuable data about which product features to pursue,” Cote writes. The downsides to this method include being time-consuming and potentially costly, as well as the risk of bias.

### **4. Observation**

This means observing users interacting with a product or website, either by using a third-party tool or with a beta version of a product or website. The data collected from this method provides organisations with an opportunity to make improvements.

### **5. Online Tracking**

This refers to measuring engagement using pixels and cookies that gather information about a website user’s behaviour. Pixels are usually free, Cote writes, while cookies may come with a cost. Both are low maintenance and gather data on their own once they are set up.

### **6. Forms**

These are often used for gathering contact and demographic information, before allowing users to access content. “You can then use this data to contact people who may be interested in your product, build out demographic profiles of existing customers, and in remarketing efforts, such as email workflows and content recommendations.”

### **7. Social Media Monitoring**

Organisations have the ability to monitor their followers’ engagement with their brand and determine their interests. Social media platforms often offer this data, though third-party groups may be able to offer deeper insights.

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# PART THREE: DATA ANALYTICS AND VISUALISATIONS

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Collecting data is only one of many steps. All of that information is useless until it is processed and analysed.

In this section, data analytics will be defined, and then types of data analysis and techniques will be explored. Next, how to turn those numbers into something organisations can digest and use will be looked at.

## INTRODUCTION TO DATA ANALYTICS

As covered in a previous course, data is incredibly useful for businesses when making decisions. According to Investopedia, data analytics refers to the science of analysing raw data to make conclusions about that information. Organisations can use these insights to guide their strategic planning as it relates to digital transformation.

The Harvard Business School Online's e-book *A Beginner's Guide to Data and Analytics* notes that companies use it for such things as budgeting and forecasting, risk management, marketing and sales, and research and development.

There are four types of analytics:

1. **Descriptive** – examines data to describe what has happened
2. **Diagnostic** – tries to get to the bottom of what has happened
3. **Predictive** – uses historical data to attempt to predict what will happen in the future
4. **Prescriptive** – suggests next steps for people or organisations in order to meet goals

In an explainer for financial news outlet Investopedia, Jake Frankenfield goes over some popular analysis techniques:

- **Regression analysis** – involves examining dependent variables to ascertain if a change in one would impact another



- **Factor analysis** – involves separating a large data set into smaller sets in order to discover insights that otherwise would have been hard to find
- **Cohort analysis** – involves mining a data set for related groups, and dividing that data into cohorts that possess similar characteristics
- **Monte Carlo simulations** – involves modeling the likelihood of particular outcomes
- **Time series analysis** – involves tracking data over time

There are also many technological tools that help process data, including tools such as Microsoft Excel or programming languages such as Python and R. Platforms such as SAS help with mining data, while tools such as Apache Spark assist with processing large amounts of data. Software programs such as Tableau and Power BI are useful for data visualisation and reports.

## DATA VISUALISATION

Data visualisation involves taking the numbers and using them to create a graphic that is easier to understand and from which to draw meaning.

A **pie chart** is one of the more familiar examples, showing percentages and other values in an accessible format, but it may not be useful for complex ideas.

Another commonly used technique is the **bar graph**, which shows categories measured against values, for comparison purposes. Though visually useful and digestible, the bar graph also may not be the best technique for showing more complex information.

**Histograms** are visually similar to bar graphs, but instead show data over a period of time. “Histograms are especially useful for showing the frequency of a particular occurrence. For instance, if you’d like to show how many clicks your website received each day over the last week, you can use a histogram. From this visualisation, you can quickly determine which days your website saw the greatest and fewest number of clicks,” writes Kelsey Miller for Harvard Business School Online.

Tools such as **heat maps**, which use colors to show differences in data, are often used by retail businesses to illustrate such things as foot traffic in a store at a particular time and peak sales. This might help with tasks such as scheduling shifts.

These are only a few examples of visualisation techniques that can be used to depict the data. The right type to use depends on the data set being illustrated, and its intended audience.

“For example, if you’re presenting financial data to a team that works in an unrelated department, you’ll want to choose a fairly simple illustration. On the other hand, if you’re presenting financial data to a team of finance experts, it’s likely you can safely include more complex information,” Miller writes.

## TURNING DATA ANALYSIS AND INSIGHTS INTO ACTIONS

One key part of gaining insights from data means collecting it with a question in mind.

After organising, and creating visualisation of that data, businesses may then start to interpret it, draw conclusions, and make predictions in order to answer their initial problem or question.

Harvard Business School professor Jan Hammond suggests in an article on the school’s blog that data analysts should ask what they can learn from the results, and how it either reinforces or negates assumptions they held beforehand.

“Every analysis should be a feedback loop that deepens your learning.”

## CASE STUDY: POINT DEFIANCE ZOO

Read the section about Point Defiance Zoo in the link below:

<https://www.inc.com/magazine/201407/kevin-kelleher/how-small-businesses-can-mine-big-data.html>

**How did collecting and analysing data help the organization? Can you think of any industries or businesses in the Caribbean that may be able to benefit from using data analysis in a similar fashion?**

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## PART FOUR: DATA PRIVACY

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When customers trust businesses with their information, there is an expectation it will be protected.

In this section, topics include data privacy for businesses, the obligations organisations have to uphold it, and how to create a privacy policy.

### UNDERSTANDING DATA PRIVACY

Data privacy is about managing who has authorised access to the information an organisation holds. If an individual has given consent to store their billing information and this is given to another company to use without the individual's permission, this is a data privacy violation. Using that same information within a company but for another non-consenting (and therefore unauthorised) process is also a violation.

#### **What is personal information?**

Personal information is defined as any "information about an identifiable individual." This includes information such as:

- Name
- Email address
- Phone number
- Banking information, credit/debit card data, purchases, loan reports
- Identification numbers (Social Security, Social Insurance, National Insurance, etc.)
- Race, ethnic origin, religion, education or income level
- Age, height, blood type, medical records

#### **Why is Data Privacy So Important Anyway?**

- Customer Service and Experience

Keeping the private information of customers protected, and upholding their personal rights, is a good way to ensure customers have confidence in and are comfortable with the company. By demonstrating that their data is protected, and working with them on any privacy concerns or requests, organisations show that data privacy is important to them, and that they can be trusted with personal information.

- Legislation

Organisations also have a legal requirement to protect the personal data of their customers and employees.

Breaking the law can lead to a variety of negative consequences, including complaints, investigations, audits, and fines.

## DATA PROTECTION IN THE CARIBBEAN

In the Caribbean, several countries have approved legislation surrounding data protection that will soon be or is already in effect. Jamaica, Barbados, and the Cayman Islands have laws that closely align with the European Union's General Data Protection Regulation, which sets a high standard for protection and considers the privacy of data to be a human right.

Even though the GDPR is a regulation for the European Union, its scope includes any business that processes the personal data of citizens of the European Union, even if they do not physically operate in the EU.

It outlines six principles to govern the protection of data. According to the GDPR, personal data must be:

- Processed lawfully, fairly, and transparently.
- Adequate, relevant, and limited to what is necessary for processing.
- Accurate and kept up-to-date.
- Kept in a form such that the data subject can be identified only as long as is necessary for processing.
- Processed in a manner that ensures its security.
- And, can only be collected for specified, explicit, and legitimate purposes.

All citizens of the European Union are granted certain rights under the GDPR in relation to their personal information:

- The right to be informed
- The right of access
- The right to rectification
- The right to erasure
- The right to restrict processing
- The right to data portability
- The right to object
- Rights in relation to automated decision making and profiling

An organisation has the responsibility to ensure that these rights are upheld.

In FOCUS, a magazine published by the United Nations' Caribbean Development and Cooperation Committee and the Economic Commission for Latin America and the Caribbean (ECLAC), it is suggested that legislation that mirrors the GDPR would be beneficial for any organisations interested in data flows with EU countries and other major trading countries.

## ESTABLISHING DATA PRIVACY POLICIES

A Data Security Policy outlines the overall security management framework for an organisation. A good data security policy will help protect the personal information organisations hold, and will help prevent a data breach. Proper data security relies on good practices on both an organisational level, and on a day-to-day operational level. The policy should cover both levels.

The data security policy should include details of the following:

- Who has responsibility for data security in the organisation: is it the IT manager, or Operational Officer, etc.
- Guidelines on the staff usage of computers or information storage tools, including use of work computers, control and monitoring, usage restrictions, and consequences for non-compliance.
- Where the organisation backs up its online data, and how often this is done.

- The security measures that are in place in the organisation, including any encryption, firewalls, anti-virus, secured servers, etc.

The cornerstone document of the data privacy plan is the Personal Data Protection Policy.

This overarching policy describes how personal data is collected, handled, and stored to meet both the internal standard of the organisation, as well as the rules of privacy laws. The successful implementation of a personal data protection policy goes a long way towards advancing good privacy practices in an organisation.

The policy should include an overview, a defined purpose, a summary of applicable data privacy laws, and a specific scope in relation to the organisation.

### **Contents of the Personal Data Protection Policy**

General staff guidelines – rules that should be followed by all employees in the course of their work:

- How data should be handled (no unauthorised access/disclosure)
- How data should be properly disposed of
- Training requirements

Proper data storage expectations:

- Where physical documents should be stored
- Where electronic documents should be stored (for example, on a work computer or external hard drive)
- How often, and in what way, data should be backed up
- Other data security features that are in place

## Responsibilities for Privacy

Everyone in the company has responsibilities for privacy. Certain key roles (such as CEO, IT Manager, Privacy Officer, etc.) will have more specific responsibilities, but all employees have a responsibility to ensure and uphold the privacy of the personal data they work with, and should report any concerns to the appropriate members of the organisation. The specification of responsibility should be reflected in the personal data protection policy.

## CASE STUDY: HOW WELL DO CARIBBEAN DATA PROTECTION LAWS ALIGN WITH THE GDPR?

On page 5 of the January-March 2020 issue of FOCUS, Amelia Bleeker of ECLAC charts how legislation in different countries matches up with the EU laws.

Review the chart and take note of any takeaways.

Source:

<https://repositorio.cepal.org/bitstream/handle/11362/47155/1/FOCUSIssue1Jan-Mar2020.pdf>



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# ASSIGNMENT ANSWER KEY

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## PART THREE: DATA ANALYTICS AND VISUALISATIONS

### **Case Study: Point Defiance Zoo**

**How did collecting and analysing data help the organization? Can you think of any industries or businesses in the Caribbean that may be able to benefit from using data analysis in a similar fashion?**

Possible Answers:

- To compare historical attendance records against local weather data in order to predict future attendance and schedule appropriately
- To analyse zip codes of frequent visitors to target them for discounts and boost membership
- Using website data to determine the time of day online tickets are most frequently sold and creating limited-time sales to further boost those numbers

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