T Level Technical Qualification in Digital Business Services

Occupational specialism assessment (OSA)

Data Technician

Task 1 - Pass

Guide standard exemplification materials

T Level Technical Qualification in Digital Business Services
Occupational specialism assessment

Guide standard exemplification materials

Data Technician

Task 1

Contents

Introduction

The material within this document relates to the Data Technician occupational specialism sample assessment. These exemplification materials are designed to give providers and students an indication of what would be expected for the lowest level of attainment required to achieve a pass or distinction grade.

The examiner commentary is provided to detail the judgements examiners will undertake when examining the student work. This is not intended to replace the information within the qualification specification and providers must refer to this for the content.

In task 1, part A, the student must research the smart-home market using valid sources of information. They must produce a written proposal to include their findings in response to the client's requirements. In part B, the student must select the most appropriate datasets and produce a written proposal explaining why they are appropriate to the needs of the client. In part C, the student must explain which parts of the data are affected by law or regulations and explain what security measures they would use when handling this data.

After each live assessment series, authentic student evidence will be published with examiner commentary across the range of achievement.

Scenario

Many businesses use data analytics to plan and organise a marketing strategy. Marketing agencies have access to a large amount of data that can be used to help these businesses plan future activities and strategies.

Work like this within a marketing agency is usually carried out by small teams, each with a team leader, who usually has a high level of experience across the agency. Tasks can include analysing existing data provided by the client and bringing this together with publicly available data from social media and demographic sources. This data and initial insights from the team are then sent on to marketing consultants who create a strategy from this information.

About you and your employer

You are a junior data technician in a marketing agency called Dynamic Marketing, which specialises in strategic advice with several high value clients in the clothing and technology sector. You work in a small team of 4 people led by your team leader, Tony Slater.

Jessica McDonald is a corporate manager at Dynamic Marketing and is responsible for monitoring the progress of projects. She does this by having regular meetings with Tony, and occasionally requesting progress reports, which contain basic information and insight to keep her updated. She will get this directly from you, or Tony from time to time.

About Dynamic Marketing's client

Your client is in the technology sector and is the manufacturer and distributor of smart home internet of things (IoT) appliances, with a focus on the consumer market. The IoT are devices that are embedded with sensors, software and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet.

The client's vision statement is: 'To connect the world through innovative and exciting technology'.

Their objectives for the coming year are:

1. Open 2 new smart-home appliance shops, one for their budget range and one for their high-end range

2. Increase sales of their 8 recently launched products

3. Increase sound system sales

4. Efficiently stock their security-based products

The brief

The client has selected Dynamic Marketing to help determine suitable locations to open new stores. They have a range of products which have been proven to appeal to different audiences.

As a data technician, you will provide the client with information to help them succeed in meeting their business objectives. This is done by sourcing and selecting the most appropriate data available, including some research into the current smart-home market and IoT devices, with a focus on devices for the consumer market, along with some selected datasets.

The client is keen to see a proposal before commencing with the project. They are concerned about data sharing, especially as they have offices around the world including Europe, USA and India. They particularly want to maintain a competitive edge and want to avoid information falling into competitors' hands.

They require insight and a set of recommendations to help them decide their approach, based on research.

The client has told you the following things about their business:

- their products are not very popular with people over 55 years of age

- their sound systems are more popular with the under 30's

- customers with larger houses usually buy more products

The client has provided you with a list of their products. Use this list of products, the business objectives and what the client has told you about their business to justify your decisions throughout the project.

Your role

This project requires you to collect and classify data from various sources and of varying types, identify the useful data, and bring together selected data into combined datasets in line with the client's business objectives and their target market for this particular project. Often the original datasets are not structured correctly or contain errors and will require correcting (cleaning) before they can be used by you for the client's purposes.

You must keep in mind all the client's business objectives, even though not all of them will be relevant to every task. This will ensure the work you produce is useful to the client in helping them make these important strategic decisions for the success of their future business.

A large part of your role is to identify patterns and trends in the data supplied, using statistics and logical queries, while checking for errors. Once this is complete, the results can be presented in a summarised dashboard form.

Throughout this process you must keep a log of decisions that you have made, such as when you have had to format different data types, what security measures you had to consider (in line with current relevant legislation), and your chosen methods for verifying and validating your data. The reasons behind your insights and recommendations will be important for the client to help them understand the rationale that sits behind these decisions, which should be data driven.

Task 1:

Time limit and marks available

Maximum time allowed = 5 hours (you can use this time how you want during each session, but task 1 must be completed within this time limit).

(40 marks)

Instructions for students

Part A

You are to research the current smart-home market, considering the demographics of the people that buy them, and how they use them, ensuring you use valid sources for this research.

You are required to create a written proposal to meet the client's requirements, which must include tables or charts which show relevant data related to your research on smart home demographics, such as:

- the forecast of the smart-home device market
- the internet of things (IoT) industry, with a focus on devices for the consumer market
- the popularity of smart-home devices by age
- the most popular smart-home devices

Part B

Tony Slater and the client have provided you with some data from various sources. Not all of it will be relevant to the project brief, and some may have errors or need cleaning in order to be useful and reflect the client's requirements.

You are required to:

- select the most appropriate datasets from this selection (which will be given to you by your provider from NCFE)
- discuss, in the form of a written proposal, your choice of datasets and why they are appropriate to the needs of the client and the agency including why you would, or would not use them

Part C

Tony has reminded you to consider relevant laws, regulations and security principles in relation to the client's data.

Explain, in a separate section of your proposal, which parts of the data are affected by GDPR and the Data Protection Act 2018.

You should also explain the key principles of data security and also explain what security measures you would put in place when handling this data.

Resources

You will have access to the following resources for all parts of the task, plus the original brief:

- the internet, for research purposes in part A
- task 1 data sets (provided by NCFE):
    - ages_sctr
    - ann
    - client_data_finance
    - client_data_personal
    - client_data_sales
    - client_product_list
    - homeC
    - number_of_bedrooms
    - number_of_rooms
    - population
    - raw data
    - REFIT_BUILDING_SURVEY
    - UK postcodes
- software applications to select and organise data (Microsoft or Google)
- word processing software (Microsoft or Google)

Evidence required for submission to NCFE

- selected datasets relevant to the project brief
- a single written proposal covering all 3 parts of task 1 (parts A, B and C) which includes the information described in the instructions

Note: you will have access to the internet during this task for the research elements you are required to undertake.

Student evidence

Part A

There are a few reasons for the growth of the internet of things (IoT) industry. These range from cheaper components, to a larger reliance on digital technologies and increasing internet speeds. It is predicted that there will be more than 481 million homes with smart devices worldwide by 2025 (Statista).

In addition, industry experts predicted there would be up to 100 billion internet devices by 2020 (figure 1 below). This growth in devices is significant because it points to more demand for these products, which would mean that Dynamic Marketing would be able to achieve their objective to sell more of their new products and launch their store. This is because there is a large growing demand for these types of products showing that they have plenty of room to enter the market.
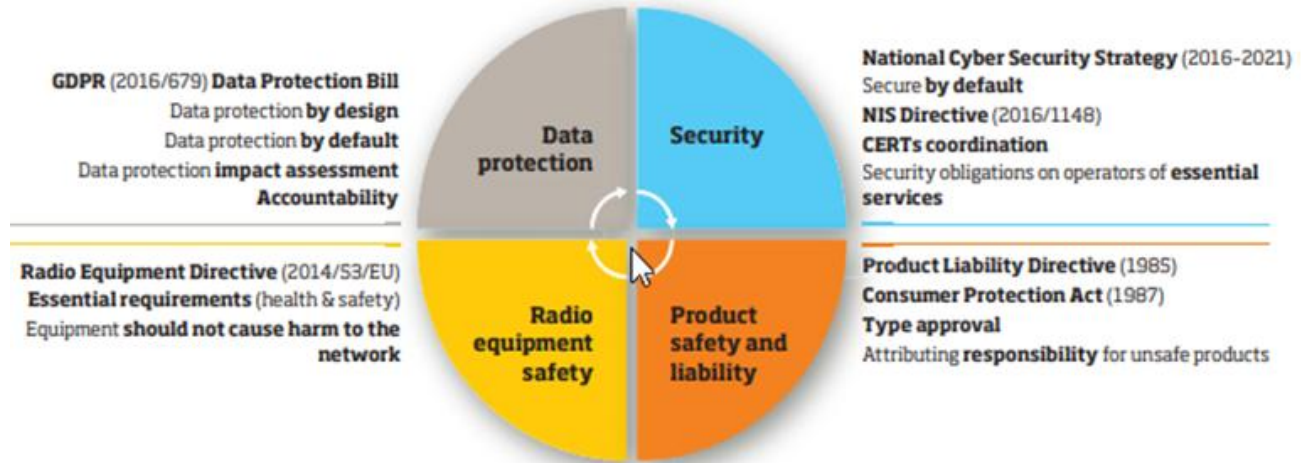
Figure 1

Industry estimates for connected devices (billions) in 2020[2]
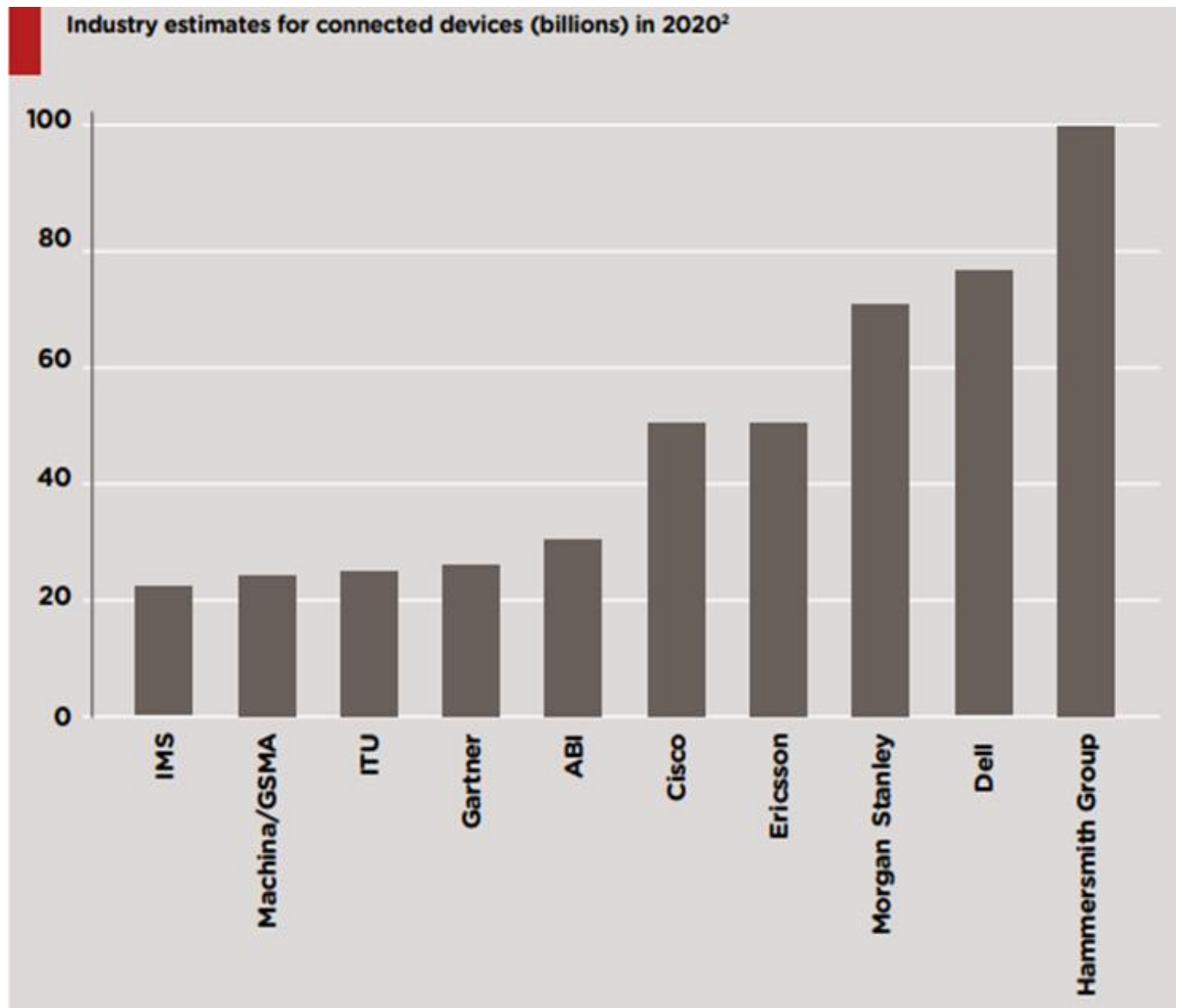
Changes in regulations in the smart home market

There are a lot of regulations and legislation that have to be considered within the IoT sector. They are summarised in figure 2 which is from a report by the Institute of Engineers.

Figure 2

It is important for Dynamic Marketing to make sure they adhere to this legislation and regulations as it will make sure that any data they collect and process is used within the law. This will prevent any complications in the future and allow them to continue to grow and sell more products. This will also help them achieve their goal to open more stores because without being able to show that they comply with laws and regulations, customers will not have the confidence to buy the equipment that they are selling.

Internet of things market in the UK

The IoT is being used in a number of ways in UK homes and by businesses. Figure 3 shows a map of the different types of IoT projects in the UK.

Figure 3
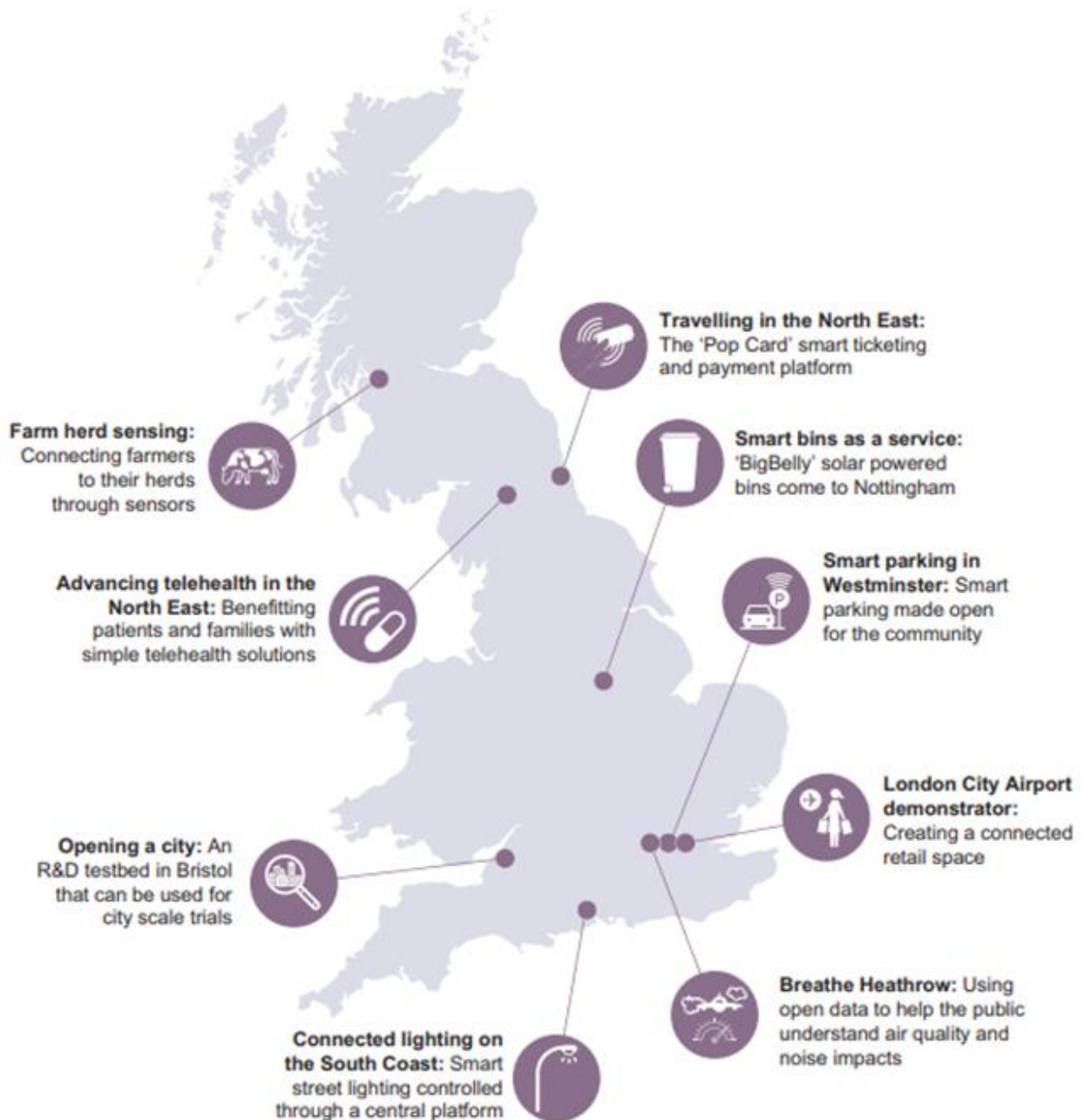
This indicates that the range of products Dynamic Marketing could sell could increase into these new markets. Their current customers that have bought products may be interested in these new products. It also shows that the IoTs industry is growing which is important for the business objectives of Dynamic Marketing. It will help them to achieve their goal to open a new shop because more growth in the market will mean more customers and more sales for the shop, making it a success.

Growth of the Internet of things sector

According to Ofcom, the IoT sector is going to grow. In figure 4, they show that they expect the number of IoT devices to increase a large amount by 2024. This is something that they think is important for the UK economy as this quotation shows, 'However, given the potential for significant consumer benefits, we are keen to take the right steps to ensure the UK plays a leading role in developing the internet of things. Working with industry and Government, we will continue to create a regulatory environment which fosters investment and innovation in IoT.'

This is a strong indicator from a valid source that the market will continue to grow. Ofcom are the regulators for the market so their analysis is made by experts and can be trusted. There is a lot of devices forecast to grow and this is important to the objectives for the Dynamic Marketing who will want to open more shops. So, if the number of devices grow then their shop will be able to get more customers by selling more devices.

Figure 4
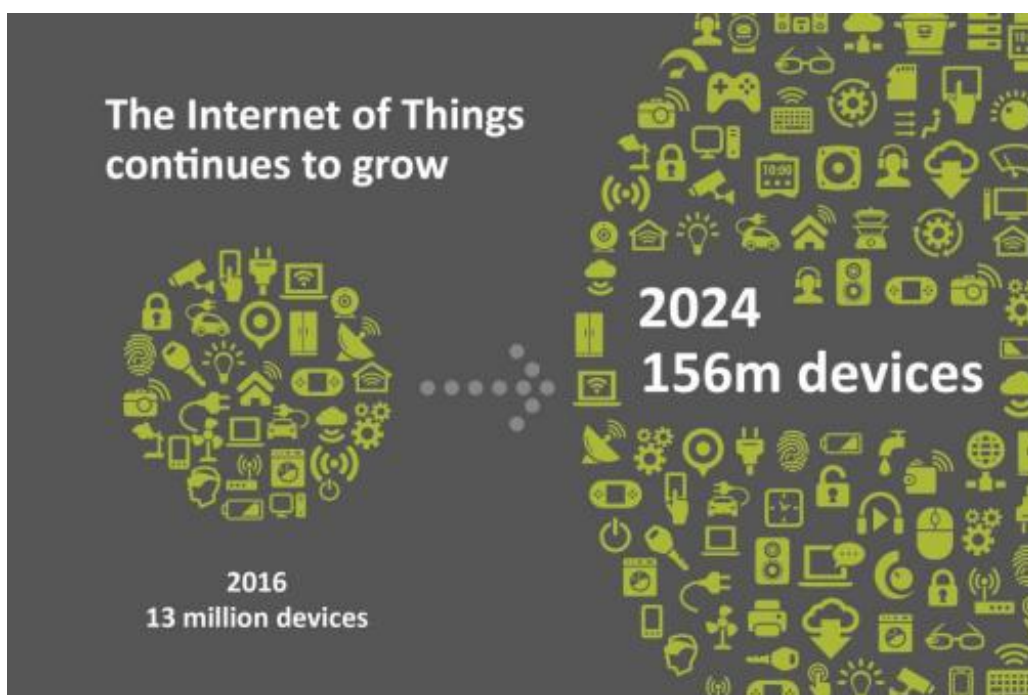
The forecast of the smart home device market

According to Statista, this will be worth $4.611 million in 2020. This is a 4.8% year over year increase. They also predict 7.1 million smart homes by that year. This is valid and reliable information because it is from professional market researchers and it is up to date. This links to the objective for the business to open new shops and will mean there are more possible customers to sell to based on the increase in the amount of money being spent and will make the store more profitable.

According to PwC (PricewaterhouseCoopers), £10.8 billion will be spent on smart home devices in 2019 and the people who buy them will upgrade in 2 years. They also say that 20% of people will not buy these products if they think that their personal data will be at risk. This is important for the business objective of opening a new shop for smart devices because it shows that they will not sell well if there is not a reason for customers to feel safe in buying them.

The popularity of smart home devices by age

Smart phones are the most widely used smart device and are also used to control smart devices within the home. This table shows the popularity of smart phones by people of different age groups over time. There is a clear pattern for older people to have less ownership of these and younger people to have more ownership. Ownership has clearly gone up over time, as Statista proves in the table below. This is important for the objective of opening a shop because it will allow the business to be able to focus on selling more goods to all age groups because they are all increasing their interest in the smart home devices. The more people who own smartphones, the more people who are likely to be interested in owning smart home devices.

	Aged 16-24	Aged 25-34	Aged 35-44	Aged 45-54	Aged 55-64
2012	86%	75%	71%	46%	9%
2013	90%	88%	78%	66%	40%
2014	84%	88%	84%	74%	49%
2015	93%	92%	85%	80%	56%
2016	93%	90%	86%	85%	59%
2017	93%	91%	89%	85%	64%
2018	96%	98%	94%	87%	71%
2019	98%	98%	95%	95%	80%

The most popular smart home devices

YouGov have reports on which smart home devices have been most popular and they have visualised this as an infographic.

Figure 6
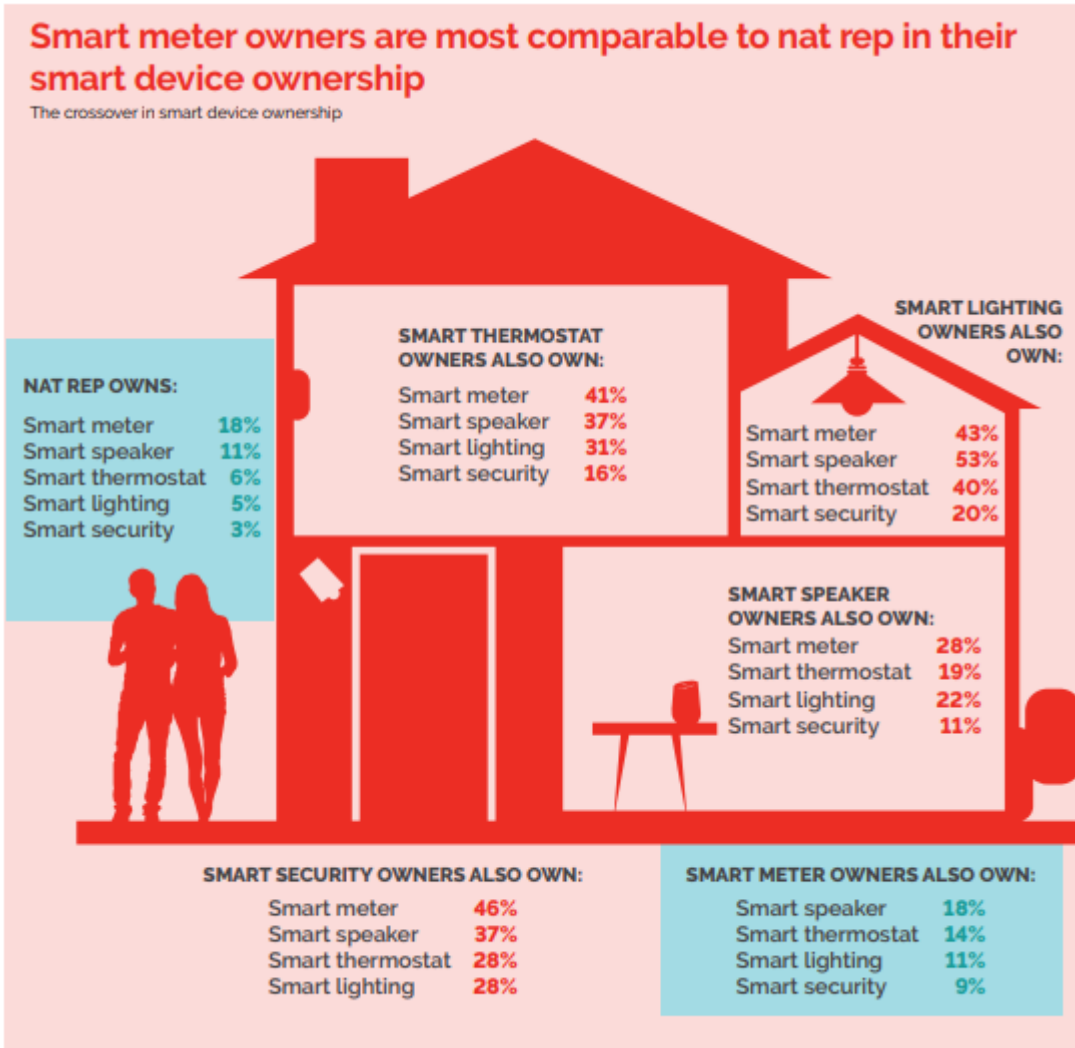
As the data above shows, people tend to own more than one device. Meaning that if groups of people can be identified that own a smart device, the client could target them with suggestions of additional smart devices. This will support the objective of opening a shop because the business will have all these options for selling different devices to different groups.

Proposal to clients

Further research is needed into the market to make sure that the client is targeting its current demographic. The secondary data that has been collected here could be cross referenced with the client's existing customer data to identify possible new products that may be of interest to its current customers. This will be an important step to opening the new shop for the businesses objectives because they need to triangulate the data from every source.

Secondary data shows that the popularity of the devices is growing over all age groups and there is some evidence that the most popular devices are thermostats, speakers, security and lights. The primary data that the client collects should be collected to see if there are other popular devices or any niches that might expand. The data collected is important to the objective of opening a new store because it helps the business to decide what should be stocked in the store.

This growth in markets does show that there is potential in the smart home market the client wants to expand into. It also shows that the age range for devices such as smart speakers is growing. Both support the client's business objectives because they show that opening a new shop for their smart products is possible because the amount of money spent on them is growing, making the goal more realistic.

Part B

In order to meet the needs of our client, I have used these criteria to pick datasets:

- must help identify where customers are likely to be under 55 and under 30
- must help identify customers with big houses

I have selected the following datasets for use:

- **ages_sctr.csv –** this data set could be used to target postcodes where there is a high number of under 30s, who may want to buy smart speakers - this is relevant because it is the target market, and it contains data that can be used to allow it to be merged with other data sets
- **number_of_bedrooms.csv –** this data set could be used to target people who have large houses and would be more likely to buy more smart home products - this is relevant because it allows the business to work out the wealthiest areas and it contains fields that can be used to merge it with other datasets
- **number_of_rooms.csv –** this data set could also be used to target people who have bigger houses and would be more likely to buy more smart home products - this is a relevant data set because it allows for greater targeting of the main markets and making estimates of where the richest people are, and the data has fields that can be matched to other data sets to make it suitable for a merged set to run more sophisticated queries
- **CLIENT_DATA_PERSONAL.csv –** if this data set was joined with the above data sets it would allow Dynamic Marketing to target certain customers that live in the postcodes with more people under 30 years old or bigger houses
- **CLIENT_DATA_SALES.csv –** this data sets allows the client to see what products have been bought before and they could then recommend similar products to the client based on these past purchases

The following data sets have not been selected due to them being inappropriate for the business objectives, or due to them containing irrelevant data.

- **ann.txt** – data is irrelevant to business objectives because it does not contain any information that can be linked to other data sets and none of it is relevant to the market for smart homes.
- **homeC.csv** – data is irrelevant to business objectives; it is not possible to identify the purpose of this data and it cannot be used to do anything useful
- **population.csv** – other data sets selected help identify postcodes to target better than this one - there is no extra data that is not covered better in other files.
- **ukpostcodes.csv** – not useful to business objectives because it does not help identify potential customers
- **rawdata.txt** – not relevant to objectives, data is formatted badly and cannot be merged with other data to make a usable data set
- **REFIT_BUILDING_SURVEY.csv** – data is irrelevant to business objectives of the client because it tells us details of houses that are not relevant to the running of a smart home
- **CLIENT_DATA_FINANCE.csv** – data is irrelevant to business objectives of the client because it is personal and too specific to individual people
- **CLIENT_PRODUCT_LIST.csv** – this is just a list of products and does not help identify possible customers which is why it is not relevant

Part C

The following legislation, regulations and security principles should be considered when completing this work.

GDPR and Data Protections

All data sets that contain personal information would need to be stored and processed in line with GDPR and the Data Protection Act 2018. This would mean that the client would need specific permission to use the data. They must be transparent about what they are going to use the data for when gaining permission.

They must also store it securely and only use it for the original purpose they gained permission for. They could not give the data to anyone else or sell it to another company. They should also make sure all the data is kept up to date and accurate. This could be done through asking customers to regularly update any personal details.

Data security principles.

I will follow the key points of CIA (confidentially, integrity and availability).

Anything with personal information will be anonymised so that it cannot be recognised by people who should not have access to the data.

The integrity of the data will come from effective processing that will make sure that it is accurate and up to date and only complete records will be stored.

All data should be stored securely with appropriate access controls put in place. This could be based on a person's role within the company. Access to the data will be restricted for those who do not need to use it as part of their job.

All data will be stored appropriately and securely on secure systems. Data will be encrypted where possible to make it more secure.

Sources

- Government report
  www.hassets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/409774/14-1230-internet-of-things-review.pdf

- Institute of Engineers report

  www.raeng.org.uk/publications/reports/internet-of-things-realising-the-potential-of-a-tr

- RAND report

  www.rand.org/content/dam/rand/pubs/research_reports/RR1400/RR1492/RAND_RR1492.pdf

- Connected Nations report

  www.ofcom.org.uk/__data/assets/pdf_file/0020/108515/connected-nations-internet-things-2017.pdf

- Statista report
  www.statista.com/outlook/279/156/smart home/united-kingdom#market-globalRevenue

- PwC report

  www.pwc.co.uk/industries/power-utilities/insights/connected-home.html

- Statista report
  www.statista.com/statistics/300402/smartphone-usage-in-the-uk-by-age/

- YouGov report
  https://commercial.yougov.com/rs/464-VHH-988/images/UK-Smart-homes.pdf?mkt_tok=eyJpIjoiTmpVNE5HWXdOMk5oWkRBMyIsInQiOiJJYWdvOTRrSTVaeFJmRWk4S0x6UjFlXC9oU1ppa0wwZ2tKU3laRlJhNzhBNFNCKzl1ZFpDdG9KOHd1NGdvMkI1Ris3STN3ek5LdEd0T1UxTzFreVJ6MWhPekpYYmttV2pLR2RyMTF5b2lPbUduZ3BPekdVOTVjczhDDT3YyXC9oN2FiIn0%3D

Examiner commentary

In part A, the student has identified relevant data from a range of sources, although the sources selected by the student are not always the most appropriate pieces of data, but overall, enough data has been provided from credible sources to justify placing the work within the pass boundary.

There has been no manipulation of the data by the student, although they have made some comments about interpreting the data. The data is largely sufficient for the needs of the business, meeting some of its requirements and with links shown to the objectives of the business. On occasion, they have selected data that is not entirely relevant, for example, instead of selecting data on smart home devices by age, they have included data on the popularity of smartphones by age. At the pass boundary, students may occasionally select data that is not entirely appropriate. They have chosen a reasonable variety of sources. A wider range of sources may have helped the student to better analyse the market and make more suggestions to support the business objectives. Suggestions made by the student are largely focussed on one of the objectives of the business. This is sufficient basic analysis to place the work within the pass boundary.

In part B, the student has selected data sources that are appropriate to the needs of the business, whilst they have not identified all of the relevant dataset, their choices are sufficient. Their explanation of choices makes limited references to the needs of the business and its objectives, focussing mainly on one objective, but this is sufficient evidence of analysis to place the work within the pass boundary as it gives an adequate account of the link between the data and client goals. There is no understanding of patterns and trends in the data shown in their work, although this is not required for the work to meet the needs of the pass boundary.

In part C, the student has shown some understanding of the security requirements for the data that they have collected and has been able to make basic points about GDPR and data protection law, demonstrating their ability to state key principals, which is sufficient for the requirements of the pass boundary.

They have also made some reference to data security principles, outlining the rules of CIA and suggesting basic security measures. The explanations are brief but demonstrate sufficient understanding of key principles to justify placing his work in the pass boundary. There is evidence of adequate identification of most suitable data handling regulations some of which are in context. There is sufficient understanding of data handling principles generally and this places the work at the pass boundary.

Grade descriptors

The performance outcomes form the basis of the overall grading descriptors for pass and distinction grades.

These grading descriptors have been developed to reflect the appropriate level of demand for students of other level 3 qualifications and the threshold competence requirements of the role and have been validated with employers within the sector to describe achievement appropriate to the role.

Grade	Demonstration of attainment
Pass	The evidence is logical and displays the basic knowledge and skills expected of an employee in this sector in the context of the set brief.
	The student demonstrates theoretical knowledge of the sources, foundations, usage and quality of data that is used for analysis. They are able to carry out routine administrative and analytical tasks using simple datasets.
	The student demonstrates an understanding of data blending techniques and is able to carry out routine data blending tasks.
	The student is able to give a simple explanation of how and why data is analysed by a business. They are able to follow the data process in order to build and test a dataset.
	The student is able to demonstrate understanding of visualisation and communication techniques. They are able to provide evidence of communicating data which is relevant to stated business objectives.
	The student is able to state legal and professional principles that are relevant to the manipulation of data. They are able to carry out routine tasks using data in a way that complies with relevant laws and professional standards.
	The student is able to explain how appropriate sources of information can be selected and evaluated. They are able to search for relevant information and can assess the reliability of the knowledge that they generate.
Distinction	The evidence produced in response to the brief is precise and logical, displaying a secure grasp of the knowledge and skills that would be expected of a new recruit in the industry.
	The student demonstrates a thorough understanding of the sources, foundations, usage and quality of data that is used for analysis. They are able to carry out complex and non-routine administrative and analytical tasks with minimal supervision, using both simple and complex datasets.
	The student demonstrates a secure understanding of a range of data blending techniques and is able to carry out both routine and non-routine data blending tasks competently.
	The student is able to demonstrate a detailed understanding of the reasons why a range of businesses might analyse data. They are able to use their own initiative to follow the data process with minimal supervision in order to build and test a complex dataset in response to a specified business problem.
	The student is able to demonstrate a detailed understanding of a range of visualisation and communication techniques that might be appropriate to a range of organisational needs. They are able to work collaboratively to communicate and visualise data, showing links to business objectives in the materials that they produce.

	The student is able to explain the legal and professional principles that are relevant to a range of different data manipulation tasks. They are able to consistently carry out both routine and non-routine tasks in a way that complies with legal requirements and professional standards.
	The student is able to give a detailed explanation of how to select and evaluate a range of different sources of information for a specific task. They are able to search for data that is appropriate to a given task and can corroborate their findings using appropriate methods to evaluate the suitability of data and making appropriate recommendations for improvements in the collation of data for future tasks.

Document information

The T Level Technical Qualification is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.

Copyright in this document belongs to, and is used under licence from, the Institute for Apprenticeships and Technical Education, © 2020-2021.

'T-LEVELS' is a registered trade mark of the Department for Education.

'T Level' is a registered trade mark of the Institute for Apprenticeships and Technical Education.

'Institute for Apprenticeships & Technical Education' and logo are registered trade marks of the Institute for Apprenticeships and Technical Education.

Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Published final version.		May 2021
v1.1	NCFE rebrand		September 2021