

ACPA 7004

MSc International Innovation Management

Assignment 2. Introduction to Industry 4.0

Jaymie Phillips – Word Count: 4854

Strategic Analysis of industry systems, identifying opportunities for improvement through utilizing Industry 4.0 enablers.



Abstract

The purpose of this essay is to evaluate different industry 4.0 enablers for a specific SME who are undergoing a paradigm change through their service offer. CUUS provides an opportunity for this Stratigraphic consultancy to future proof the Business.

Technologies; process; and management; that can support the organisation to grow and remain resilience in the rapidly changing commercial landscape will be explored. The essay will consider geopolitical actors and sustainability factors, whilst identifying any authentic cultural and workforce factors.

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1.0 Introduction

The essay will set out a case suggesting commercial success, in this century, will require the support of Industry 4.0 systems, processes and technologies. These are the enablers that will support the organisation to remain relevant, viable and competitive. But only when they are tightly integrated with the organisations goals and measured by their outcomes, financial or otherwise.

‘Increasing globalisation and deregulation of commerce have opened markets to provide for a greater volume of companies and on the demand side, customers B2B, B2C are provided with a proliferation of sophistication of choice in supply. This is characterised by a growing assertiveness in seeking out better values when selecting a product or service.’ (Hu, 2015)

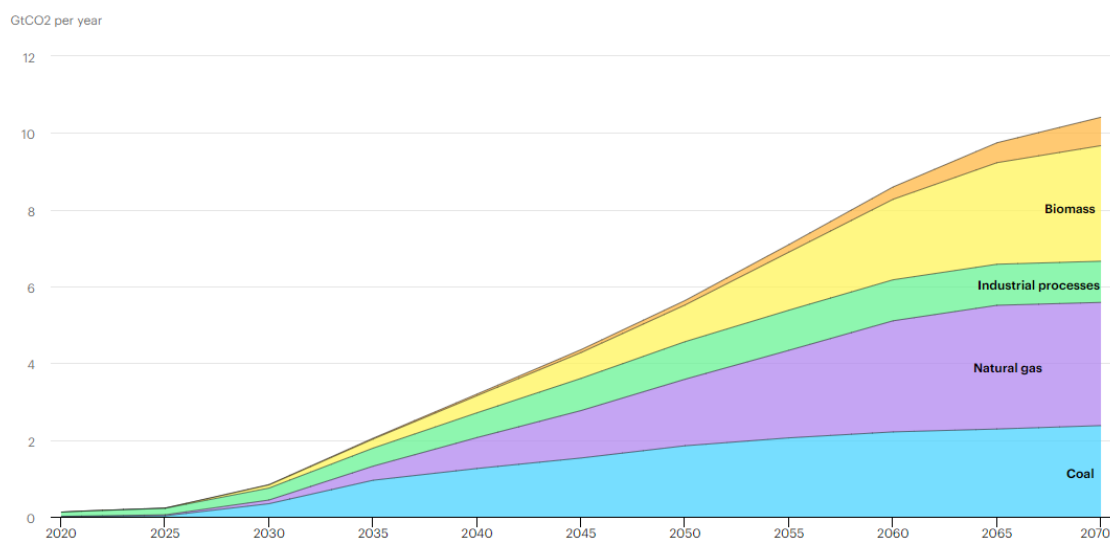
The essay will argue that for organisations to transcend their boundaries a strong vision, product and service offer is required. The business objective is then delivered through a cohesive and collaborative integrated ecosystem that links the purpose, strategy, technology, workforce, data, targets, and the customer journey.

Smart applications provide the toolkit for accelerating business opportunities, which are set out in the process of a sustainable business plan and a strong marketing strategy. Maintaining up to date knowledge and ability within the organisation are key to longevity. Which suggests a circular approach to HR processes (L & D, internal advancement, interdisciplinary thinking) and the workforce is as relevant as the tools that enable international relationships and improved efficiency.

The organisation chosen for this study has been identified as an SME that is undergoing a paradigm change through their service offer. The organisation is a Stratigraphic Consultancy that provides a comprehensive suite of services to the Oil and Gas Industry. The organisation is based in North Wales and has National and International satellite offices in the UK, US, Trinidad, and Canada. They are using their existing skillset, experience, and acquisitions to future proof the business through emerging opportunities. This is due to the global targets to improve carbon capture for sustainability purposes.

Future Potential for CUUS

World captured CO₂ by source in the Sustainable Development Scenario, 2020-2070



(IEA, 2021)

The organisation has a business objective that sets out a goal, to be:

‘The World’s leading Stratigraphic Consultancy, developing new applications for key geological services.

They are Accredited with:

ISO 9001:2015 Quality Management System

ISO 45001:2018 Occupational H & S Management system

ISO 14001: 2013 Environmental Management System and are experienced in a multitude of skills and services from:

Services offered include and are not limited to:

Biostratigraphy; Micropalaeontology; Nano palaeontology; Palynology; Wellsite Biostratigraphy; Sedimentology & Reservoir Geology and Future geoscience (Integrated Services).

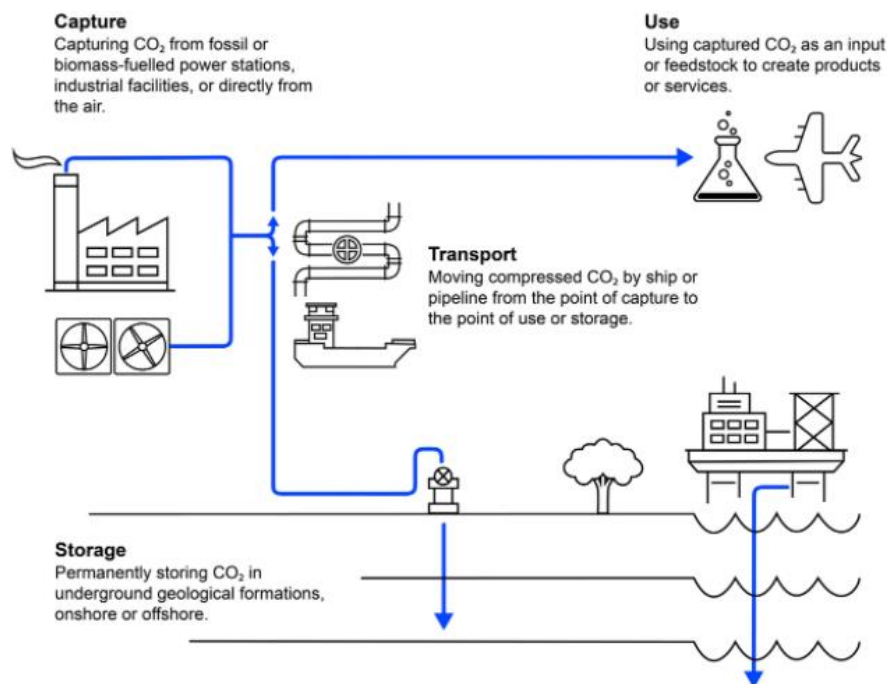
Borehole analysis; Well analysis; Outcrop analysis

Onshore and Offshore study.

The organisation has an interesting challenge ahead, to remain of value to existing clients in the oil/gas sector, whilst seeking out new business in the sustainable sector, through consultation services regarding, site suitability for carbon capture. E.g., Reservoirs.

Climate agreements suggest CCUS will be a growing and competitive sector.

CCUS (Carbon Capture Utilisation and storage) refers to a suite of technologies that involve the capture of CO₂ from large point sources, inc. power generation facilities or industrial facilities that use either fossil fuel or biomass for fuel, also from the atmosphere.



(IEA, 2021)

When CO₂ is injected into a reservoir, it flows through it, filling the pore space. The gas is usually compressed first to increase its density and the reservoir typically must be at depths greater than 800 metres to retain the CO₂ in a dense liquid-like state. The CO₂ is permanently trapped in the reservoir through several mechanisms.

(IEA, 2021)

Reservoir suitability requires expert assessment by geological scientists for safety and suitability purposes, this skillset has been used by the fossil fuel, oil, and gas industry in the past and present.

CO₂ is compressed then transported via pipeline, truck or rail and injected into deep geological formations (inc. depleted oil and gas reservoirs or saline formations) which trap CO₂ for permanent

storage. (IEA, 2021) Since the first storage deployment R&D and innovation has shown continued growth and opportunity, showing the commercial relevance for this stratigraphic consultancy.

According to the International Energy Agency - CCUS activities could address 20% of CO₂ emissions. (Ellen McArthur Foundation, 2022)

When considering Industry 4.0 technologies, it is clear to see how monitoring the people and the processes involved in surveying and capturing CO₂ provides opportunity for improvement and development and innovative application through:

- Data Capture
- R & D
- Site Surveys
- Capturing individuals' location and movement.
- Monitoring site security
- Monitoring the logistics for CO₂ in transportation

This can be beneficial to all involved: The environment, governments, CUUS manufacturing industry and geographical science consultancies.

Benefits include:

- Knowledge Improvement/knowledge share
- Incremental and Radical Innovations of CUUS manufacturing equipment
- Improving workforce processes through monitoring, measuring, communication and collaboration
- Risk mitigation for individuals, sites, manufacturing equipment and vehicles.
- Improved efficiencies in processes. E.g., Safety, equipment maintenance, logistics, cost, data collation.

How the organisation integrates business process and industry 4.0 technologies to create advancement in this sector will set their position as either a leader or follower in the sector.

2.0 Background of the Organisation

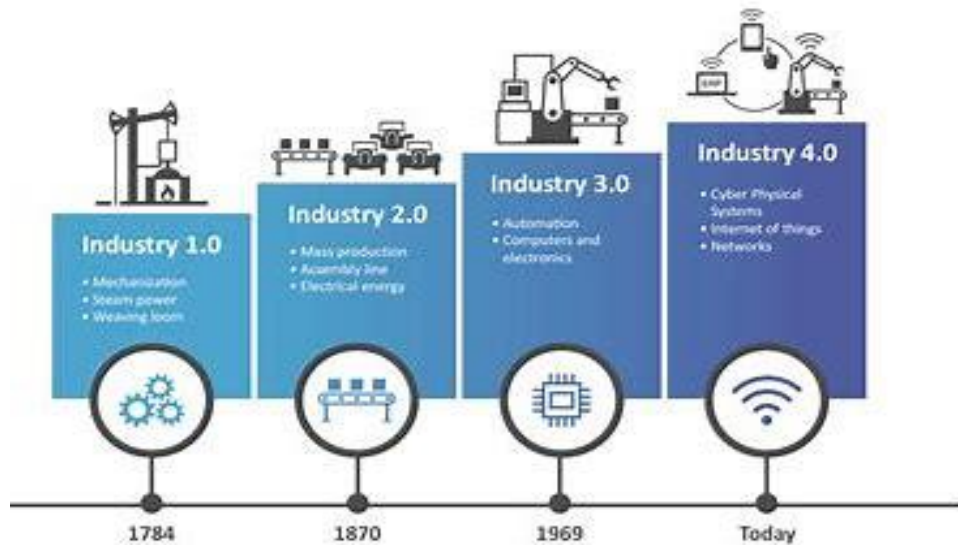
The organisation was established in 2001 and has a 98 strong team, with R & D partnerships and new acquisitions, acquired in 2021. Due to these acquisitions the organisation will expand their team to over 100 staff and 62 Geological experts in 2022.

The organisation has a clear purpose to position itself for energy transition and will endeavour to be a leader in the emerging sector of carbon capture, in addition to fully using their existing skills and services.

3.0 Industry 4.0 Overview

Industry 4.0 represents the 4th Revolution – Globally, Industry has transformed from the 1st Industrial Revolution (Mechanisation through water and steam), through phases 2nd Electrical (changing production and assembly) to the 3rd Technology & Automation (Computers, data, machine learning and A.I.). The world and business are moving into the 4th Revolution – Digitisation and IIOT (Internet

of Things), cyber physical systems and networks.



<https://www.btelligent.com/en/portfolio/industry-40/>

4.0 Policy and Public Sector -Energy Revolution and Geopolitical Factors.

Politics and policy are strong influencers for Global organisations. A process of monitoring Economic, Environment and Trade policy is key to understanding Global change. Building in R & D and regular intelligence gathering, to identify gaps in the market and maintain competitive difference to ensure pain and gain differentiators for the B2B consumer, as a fundamental process of business, can guide commercial strategy and support a strong value proposition, as the organisation steps in with a new service offer.

Global Climate Agreements include:

At Cop26 'The Glasgow Climate Pact' saw over 100 countries sign up to the Global Methane Pledge which is a commitment to reduce global methane emissions by 30% by 2030, most methane emissions come from oil, gas, waste, and agriculture. (This included 6 of the world's top methane emitters: US, Brazil, EU, Indonesia, Pakistan, and Argentina). COP26 mitigation issue in which: 'Steps and commitments were set out for all parties to accelerate efforts to reduce emissions – to keep 1.5°C in reach.

Actions agreed included:

Phasing down unabated coal power and inefficient fossil fuel subsidies, as well as 2050, net zero. This language has never been included in UN text before.' (Anon., 2021)

According to: Energy Revolution – A Global Outlook. (Drax.com, 2022) report by Drax in conjunction with Imperial College of London and E4tech, as a contribution to COP24, the report provides information surrounding the debate on decarbonising the Global Energy system, which identifies emerging opportunities within the sector of Geographical/Stratigraphy consultancy services.

5.0 Carbon Capture and storage: Sustainability Factors

Sufficient storage capacity has been identified for global CCS (Carbon Capture Solutions). Currently, large scale CO₂ Capture only exists in 6 countries.

Map showing some of the Current CCUS projects around the world.



IEA (2021), About CCUS, IEA, Paris <https://www.iea.org/reports/about-ccus>

Worldwide 5KG of CO₂ can be captured per person per year. The planned pipeline of CCS facilities will double this, but a much greater scale up is needed, to put this in perspective, the global average per person, carbon footprint is 5 tonnes per year. (IEA, 2021)

Fossil Fuel subsidy changes show that the oil/gas industry is very much alive for now, with some countries increasing support between 2007 -2016 e.g., Russia/Norway. Whilst others decreased fossil fuel support (some of this relating to oil price). Denmark reduced fossil fuel support by almost 90% and Mexico implemented an excise tax (IEPS) towards elimination of gasoline and diesel fuel support. Other countries have conducted peer reviews based upon identification of inefficient fossil fuel subsidies. E.g., China, Argentina, Canada. (Drax.com, 2022)

The organisation has experience of working in many of the above locations and has satellite offices in several. As an international consultancy with a skillset that will benefit the growth in CCUS that in turn will benefit global sustainability action plans, they are also logistically well placed to capture new commercial opportunities. How the organisation maintains a connected workforce during the transition to a new service, will impact upon lead generation and new and old client relationships. There are many IIOT tools available to support this development E.g., CRM, Project Management, Conferencing Platforms, Automated contact forms. System providers include: HubSpot, Sales Force or Microsoft Dynamics.

To maintain global warming to below 2°C deployment of carbon capture is required. Current capture rates are .1% of total worldwide emissions. 18 countries operate capture facilities worldwide. (Carbon Brief, 2018)

Country QTY	Total Capacity – MtCO ₂ p.a.
6 have total capacity	Totalling 32 p.a.
3 countries have 5 facilities in construction	Totalling 7 p.a.
US has greatest absolute capture	Totalling over 20 p.a.

The COP26 summit brought parties together from across the globe to accelerate the goals of the Paris Agreement and the UN Framework Convention on Climate Change. Agreements were made to

scale up actions to keep the target of 1.5°C alive. Committing governments to actions that include getting finance flowing and boosting adaption. (Carbon Brief, 2018)

Politics, Finance and Trade agreements are factors that influence the growth of facilities. (E.g., US tax credits for geological storage since 2018). (IEA, 2021)

China has plans in place to develop CCS, with the largest number of pilot/demonstration plants.

Other policy measures that indirectly influence are Carbon taxes (Japan/Norway) and emission performance standards (U.K.) and trading schemes e.g., EU ETS in Europe. (IEA, 2021)

Resources for storage are not a barrier to CSS. The IEA estimates that 100 billion tonnes must be stored by 2060, to limit temperature rise to 2°C. 1/6th of this will come from CSS. The US has storage capacity of over 10 trillion tonnes and the UK estimate capacity potential at 70 billion tonnes. (IEA, 2021)

The organisation will be one of many identifying the opportunity to be gained by collaborating with stakeholders to manage carbon capture, through site opportunity, scientific suitability, and safety.

6.0 Critical Analysis of Technology, systems and processes that can enable growth.

When critically analysing systems that will enable growth, it is crucial to consider the organisations business strategy and the purpose for the introduction of IIoT (Industrial, Internet of Things)

Considerations of cost vs benefit apply to any introduction of new systems and processes.

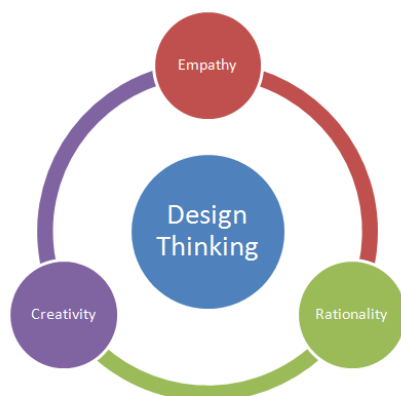
What will be the ROI and the added value to the organisation, process, and people?

6.1 Consumer Driven Processes, Big Data and IIOT.

The organisations' objective is:

To be 'The World's leading Stratigraphic Consultancy, developing new applications for key geological services. (Petrostrat, 2022)

Strategic consideration to how the organisation is perceived by the B2B consumer, governments and sustainable organisations is fundamental to achieving this goal. Designing the value proposition to clearly stand out from competitors, that has Design Thinking at the core, is a significant challenge that can be supported by IIOT.



'Undertaking a process to design NPD products or services with the B2B customer at the forefront of thinking' (Trott, 2012)

'The world of business suggests new services could potentially deliver more significant change than new products.

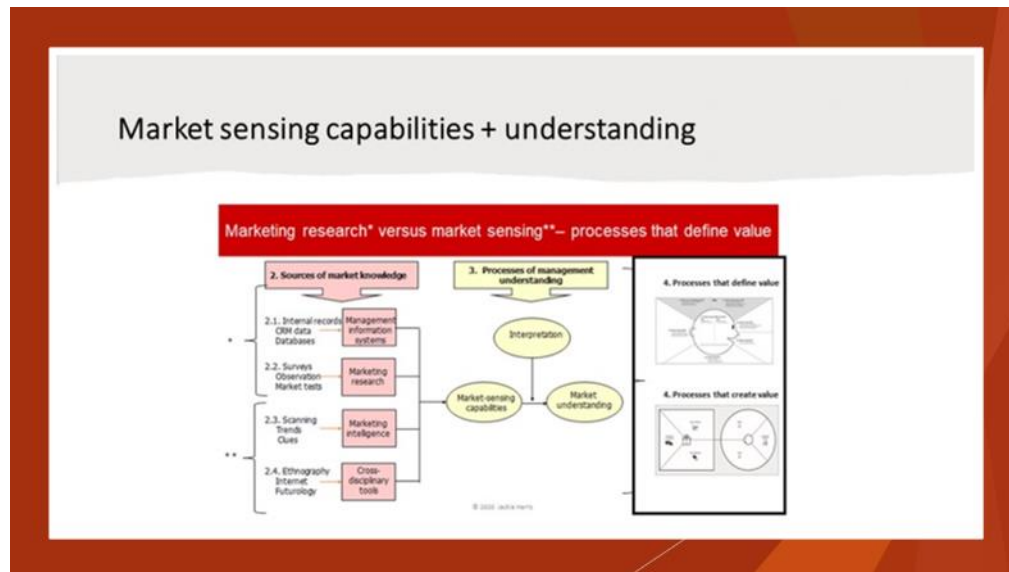
Services account for 85% of employment in the U.K. and the United States. Yet much innovation theory has been developed around products and science.' (Trott, 2012) The organisation is at the forefront of geological scientific services.

Digital disruption brings with it a consumer (B2B/B2C) with more choice, and businesses vying to provide for them. Design thinking is a methodology/process, that places consumers at the forefront of Business and Marketing strategy. (Piercy, 2016)

(Piercy, 2009) stated in his book Market Led Change that it is '**the superior understanding of customers**', not just the techniques of market research that are influential in the success of NPD and positive commercial outcomes for organizations.

In order use design thinking methodology, intelligence gathering is required as a regular process of business. IOT offers a plethora of cloud-based software integration's that support market intelligence gathering. Failure to collect data and have smart processes for interpretation, leave the

organisation at risk of not creating a solid value proposition. Many large businesses have failed due to subjective opinion and a 'Do what we have always done' attitude to business. E.g., Blockbuster video. digital.hbs.edu/platform-digit/submission/blockbuster-its-failure-and-lessons-to-... (Digital.hbs.edu, 2017)



(Piercy, 2009)

Research and critical evaluation are required to find the software that will most accurately provide the intelligence required. Cost and interpretation skills within the workforce are factors that will influence the ROI. External consultancy may be required to interpret data if the skillset doesn't exist in the business. Recruitment offers another course of action.

Contemporary life and instant connectivity are part of the modern landscape, consumer attention spans have lowered significantly with consumers frequently multi-tasking, whilst interacting online. This includes B2B procurers, who have specific objectives.

B2B sectors typically have a smaller target audience in comparison to B2C consumers, restricting the opportunity to hundreds rather than tens of thousands of potential customers. In comparison B2B consumers are typically influenced by budget, service, quality, and value alignment as opposed to whims and peer group behaviour. (B2binternational.com, 2022) This means relationships and networks are paramount to ensure knowledge of DMU's.

Expectations include:

- Customer service anytime, anywhere across various channels.
 - Automation to streamline the multiple support channels under one platform.
- (B2binternational.com, 2022)



Target audiences for B2B communications are amorphous, made up of groups of constantly changing individuals with different interests and motivations. (B2binternational.com, 2022)

Failure to manage this business process effectively risks losing business to competitors. Integration of software has the potential to build strong relationships and commercial success. Through influencing the DMU (Decision Making Unit) through networks, trust, and collaboration.

Cost, integration, and alignment with existing systems, plus functionality against requirements and real time support are factors when choosing systems. Workforce training will influence, how well the process is managed, software does not mitigate the need for effective use.

There is evidence, of software being adopted by organisations to manage consumer interactions and failing miserably. This is particularly evident with utility providers e.g., 'Scottish power, who have the highest level of complaints. (Ofgem, 2022) Offering chat boxes and automated contact forms are good additions for a business, but they are only as good as the timely response and managed customer expectation. Some organisations use automation to save on the labour, not to improve service, this is not a recommended strategy.

This example demonstrates how adopting AI and IIOT without sufficient management and planning can be detrimental to a business – Using technology to save money and not offer a quality service will lead to loss of business, even when an audience is perceived as captive.

6.2 Data

IIOT can enable physical devices to connect and exchange data through the internet through collecting strategic information, creating opportunities for companies to become more knowledgeable about their consumer and to become more efficient and responsive to the end user. Automation can be used to build forms, files, journey logs and patterns relating to consumer preferences, this can provide an analytical insight, to create sales and promotional marketing, which can be used to engage the consumer and generate leads and sales conversion.

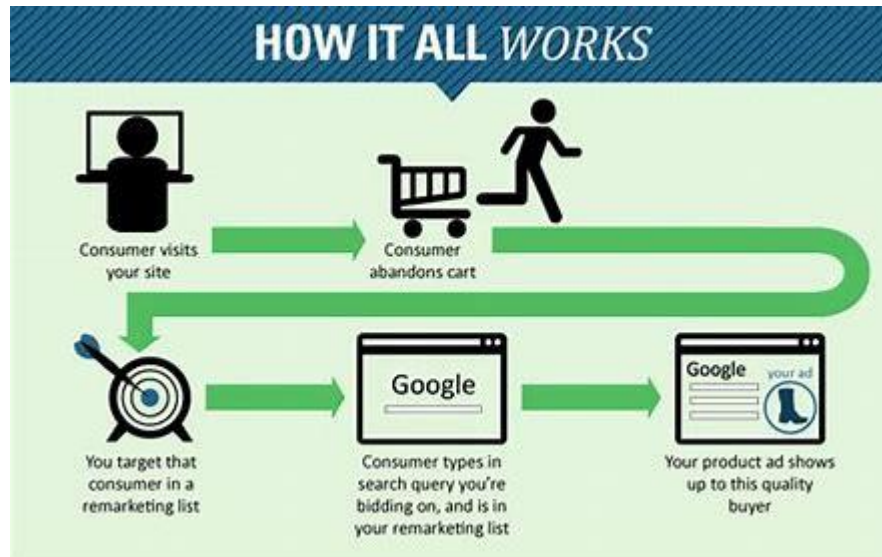
This relates to the collection of intelligence Business intelligence (BI) helps organizations analyse historical and current data, so they can quickly uncover actionable insights for making strategic decisions. Business intelligence tools make this possible by processing large data sets across multiple sources and presenting findings in visual formats that are easy to understand and share. (Microsoft.com, 2022)

Evaluating suitable software against company goals is a key factor for effectiveness and ROI.

Big data advancements are creating opportunities for organisations to exploit. Big data provides novel approaches to observe human behaviour and exploit business opportunities. (Schwab, 2016)

E.g., Digitally, capturing activities when a consumer visits a website, through analytics can provide the organisation with opportunity improve web content, converting visitors into customers. Alternately, it can provide information that shows a consumer has disengaged with the website and at what point, allowing for analysis, evaluation, and improvement. (Analytics Google, 2022)

Analytics works through grouping website traffic into distinct categories.



Google analytics offers free courses to learn how to gain the best from analytical reporting. (Analytics Google, 2022) This offers potential to integrate this into L & D programmes for relevant individuals in the workforce.

Implementation of Industry 4.0 technologies can provide an opportunity to collect and store large amounts of data, this brings with it opportunity and risk. Implementing cyber security systematically through the integration process can mitigate security fallout.

6.3 Cyber Security - GDPR – Data Protection.

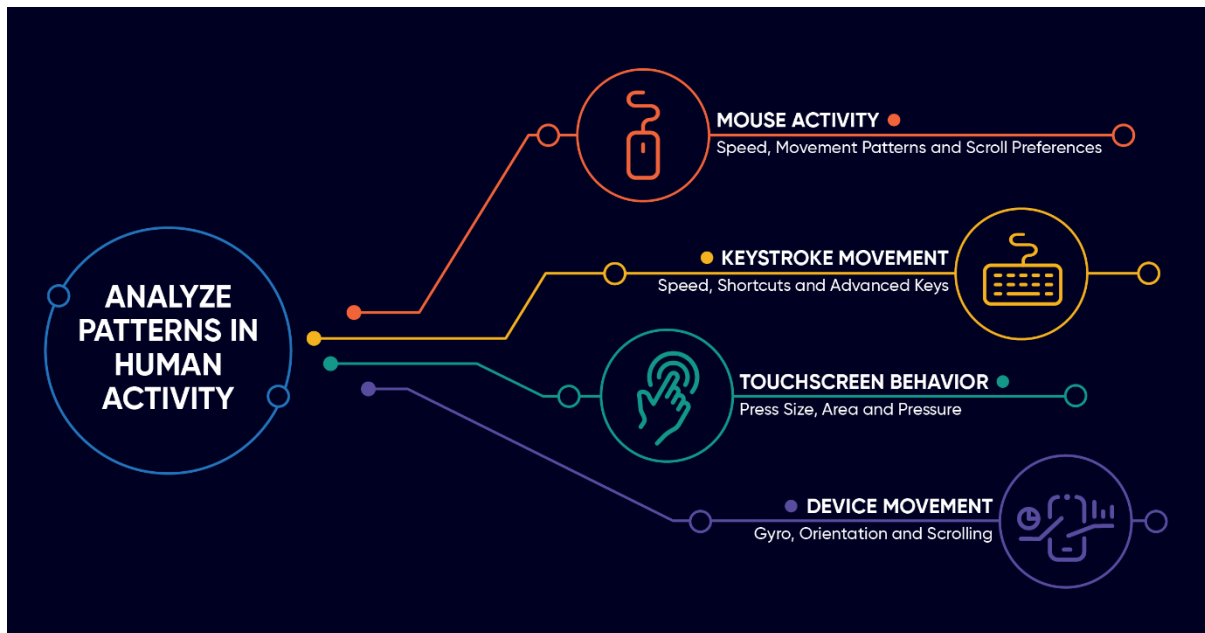
Collecting data for industry and stakeholder use offers opportunity to be a 'Go To' organisation for R & D. Integrating software and smart systems to capture big data that includes:

- R & D
- Site Surveys
- Capturing individuals' location and movement.
- Monitoring site security
- Monitoring the logistics for CO2 in transportation

Adding security processes through ISO certification will be a significant factor in gaining trust, which can be supported by adding specific software to maintain the management of secure systems.

Biometrics also has a role to play in B2B security John Callahan, Chief Technology Officer at Veridium, spoke with *eWeek UK* and believes the rise of password less authentication is the "primary motivator" for biometrics remaining prominent in the B2B sector.

He explains: "The cost of passwords, the torrent of breaches (primarily of credentials), and the complexity of password management to the user and organisation is unsustainable and increasingly fails to offer the protections it used to provide. Biometrics offer a better path forward, but privacy and usability are obstacles to progress." (eweekuk.com, 2021)



(Biocatch.com, 2022)

Maintaining secure systems has implications upon the organisation requiring IT skills and workforce development. Everyone within the workforce supports the integrity of IT systems. Adaption to T & C's and Corporate policies are factors that impact success or failure, in addition to software and hard technology costs.

7.0 Industry 4.0 Recommendations to support growth and resilience

7.1 Become a hub for industry data in the oil/gas sector and the CUUS sector.

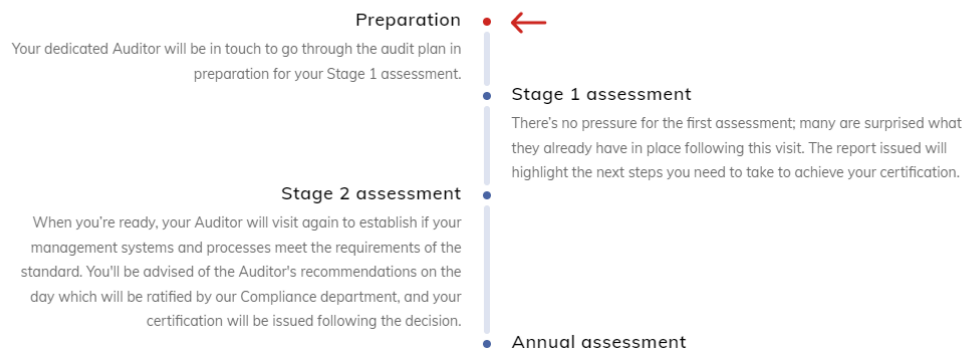
Historically, the inability to store the vast quantities of data produced in the oil/gas sector meant it was discarded. In the new era of Big Data and IOT there is an opportunity to integrate data storage for both CUUS reservoirs and oil/gas wells, as shown in the case study by Gilchrist, which shows how the oil/gas sector uses DDS as a publish subscribe protocol. (Gilchrist., 2016) The data has global use for reservoir suitability, stability and future historical and predictive analysis. The organisation can also secure their future through IIOT deployment of reservoir management. Through collating large pools of data, algorithms can be used to identify patterns, for purposes of stability and risk. A fully connected cloud ecosystem would be a crucial integration for success. But investment in this could provide a USP for the organisation and create future resilience as a library of data for the industry.

7.1.1 Cyber Security

To integrate this recommendation, gaining ISO 27001 certification is recommended. This process for managing security throughout the organisation has the potential to build trust amongst existing and new clients. Working through the process of attaining an ISO allows for initial assessment. Allowing the organisation to complete an initial audit of their management systems and processes, to have an initial assessment and follow a process of improvement, prior to further assessment. Annual assessments ensure continuous standard of improvement are maintained. (British Assessment.co.uk, 2022)

The process

It's quick and easy to achieve your ISO certification and start winning new business.



(British Assessment.co.uk, 2022)

Creating IT secure systems for the organisation, of a scale, used for medical data. (The NHS are ISO 27001 certified) will support a process of risk mitigation, a crucial factor in protecting the knowledge bank, employee, and client data. (Digital NHS, 2022)

As the organisation has international satellite offices and B2B customers, there is an opportunity to improve service through access to resources, data and individual company reports through using big data resources. However, data security is paramount to this offer. In this sector not securing GDPR and data security has the potential to put the organisation out of business, which would impact the whole workforce. Using specific software to support live data access by securing the organisation's technology assets, could support the organisation to discover vulnerabilities and reduce cyber risk. Operation Technology e.g., Dot software created by: awen collective (Awencollective, 2022) has the potential to support IT systems and data access services and could work in conjunction with the process of working towards ISO 27001.

Building in ISO 27001 systems and processes has the potential to:

- ✓ Strengthen your data security
- ✓ Continually refine your processes
- ✓ Prepare for the future
- ✓ Impress existing clients
- ✓ Engage your employees
- ✓ Secure your information assets
- ✓ Improve your reputation
- ✓ Win more business

(British Assessment.co.uk, 2022)

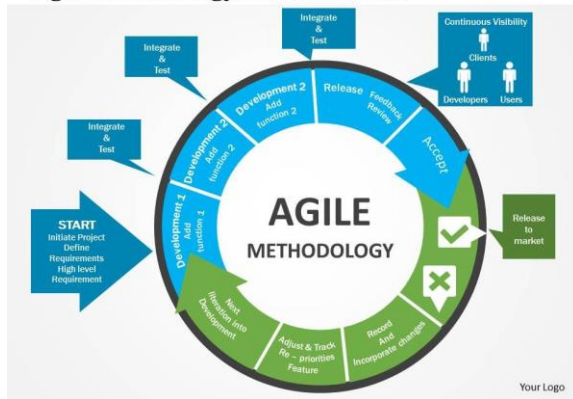
7.1.2 Considerations for implementation and the workforce.

Recruitment of an IT specialist, who understands the implications of IT, data, and system security is recommended. Cooperation to maintain the integrity of the systems put in place will be crucial to successful operation and a significant amount of initial and ongoing training for all employees and business partners will be important factors to implement secure development lifecycles and architecture. (This NHS case study offers a good example of integrating partners with ISO 27001. NHSP achieves ISO 27001 certification and improves their infosec management. (ISMS, 2022)

There may be a requirement to build in ISO 27001 certification for partner agreements and contracts of procurement to mitigate risks for security breaches. Using Agile Methodology Business process for this integration will support the organisations change paradigm. (Gilchrist., 2016)

Agile project management is recommended to deliver upon both projects for change, as they offer flexibility to navigate challenges found within a project. As a nonlinear process the project can interact with all partners to facilitate customer driven delivery. (Gilchrist., 2016)

Agile Methodology Business Process



[Agile Methodology Template - Bing images](#)

7.2 Develop B2B Target Profiles for International customers, considering language and culture.

Figure 1: How b2b customers are becoming more discerning

Requirements of b2b customers		
Type of b2b market	Traditional differentiating needs (now hygiene factors)	Current differentiating needs
Primary and secondary markets (especially manufacturing)	Product quality and consistency, rapid delivery, relationship with sales and service representatives	Innovation and partnership
Tertiary markets (services – not knowledge-based)	Precision, consistency, responsiveness	Innovation, partnership and thought leadership
Quaternary and quinary markets (knowledge-based services)	Innovation, partnership and thought leadership	Inspiration

(B2binternational.com, 2022)

Completion of a 'Target Profile' exercise to understand how the new B2B consumer identifies with the Brand.



(Piercy, 2016)

Recommendations include undertaking a segment of old and new consumers, from different locations and cultures to identify Brand perception and any steps required to move seamlessly into new product development. Cultural differences are significant.

For this to be effective it is recommendations include:

- Collate market intelligence of the new sector.
- Analyse similarities and differences between existing B2B consumers (oil & gas) and new target within the CUUS sector.

Software applications that are available to support B2B design thinking include: Focus Group Software.

Peer reviewed research of software is recommended, prior to use for purposes of ROI.

Creating a brief, outlining the desired intelligence is recommended prior to investing in software or external services. This would be better achieved with collaborations from the leadership management team to include Business operations, IT specialist, Marketing Manager and Finance Manager.



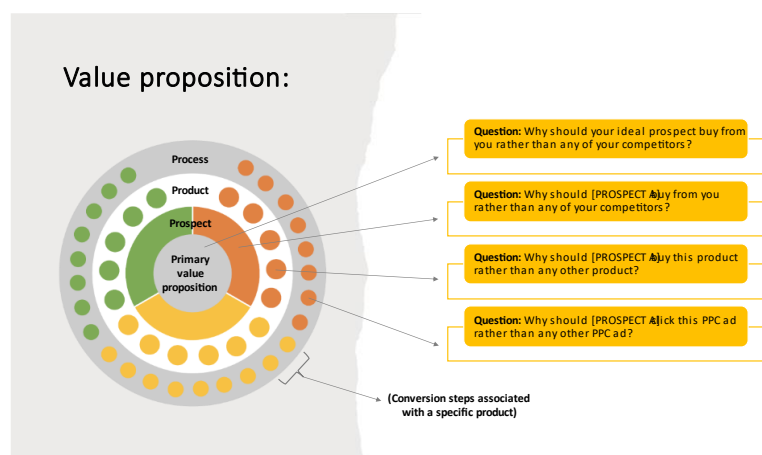
Ittracks and Recollective offer examples of companies that offers services that use, computer applications and instructions for designing, posting, managing, and collecting information from online/virtual focus groups, bulletin boards and one-on-one interviews. (Greenbook, 2022)

7.2.1 Language

100 countries globally signed up to Methane reduction, the opportunity to communicate and build networks of opportunity and business reward, sit within the ability to communicate with emotional intelligence and to respond to contact approaches in multiple languages. Systems that support this are recommended and will support competitive difference.

Oracle Analytics Cloud is a partner of Microsoft and can accept queries in more than 28 languages – this is more than any other platform. (Forbes, 2020) this can be paired with automated contact forms, to satisfy the anytime anywhere customer service trends and would be a beneficial addition. Measuring ROI when investing in this software is recommended. (Oracle.com, 2021)

7.3 Develop and Implement IOT and Industry 4.0 processes to build a leading Value Proposition and Marketing Strategy.



To include:

- Brand evaluation
- Website review
- SEO Performance

As ongoing processes of business.

(Piercy, 2016)

During this process of change, navigating the perspective of the end user and how the organisation incorporates the sustainability offer, into their existing offer, is recommended. Previously the organisation was promoted for the oil/gas sector. Values of the sustainability sector and government organisations differ broadly. Visible positioning through the Brand, CSR, Customer Reviews, and internal sustainable measurement, plus knowledge sharing will be valuable promotional tools.

In this change period it is recommended that the organisation inserts a process of continued evaluation of global competitors and their website shop windows vs the organisations own website (Considerations will include ease of use, clarity of message (content), key words, points of difference and added value). B2B consumers will be accessing company values as much as the services available. Consideration should be given to up-to-date changes in SEO algorithms (e.g., Google's AI favours content that is published at least twice a week and is mobile friendly). These changes occur frequently. <https://www.digiupdates.net/the-latest-google-algorithm-updates-for-seo-in-2022/>

Effectiveness can also be gauged through use of automated customer surveys (E.g., Trust pilot), Google Analytics (Bounce rates, click through), Lead generation.

SEO performance through using SEO analysis software of which there are free versions (E.g., SEMrush/HubSpot) or paid versions for integration. (Capterra.com, 2022) Which support effectiveness through:

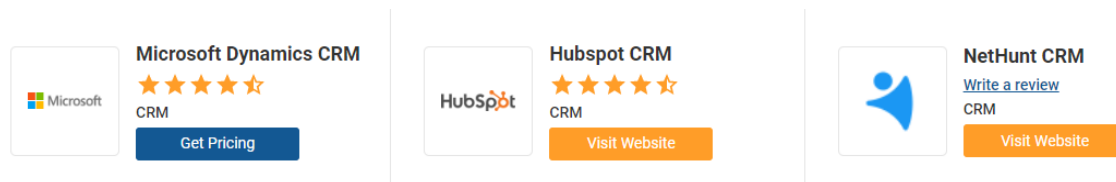
Audit Management	Competitive Analysis	Dashboard	Keyword Rank Tracking	Keyword Research Tools	Localization Automation
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(Capterra.com, 2022)

7.3.1 CRM Systems

A Customer Relationship Management System is a recommended integration, to manage the customer journey, with ease and efficiency.

Examples of CRM systems.



(Top10.com, 2022)

Software that supports an efficient and positive customer journey, is recommended allowing each part of the journey to be monitored and measured for performance metrics. From initial lead generation, through first contact to completion and maintenance of the relationship. Leading CRM's inc. Salesforce, HubSpot and Microsoft Dynamics (each provider offers different dynamics). Prior to insertion a functional analysis against achievement goals is recommended, the CRM would need to be able integrate with all other software and language is a consideration, for this international consultancy. Training of the workforce and management team would be a crucial factor for quality management of the system.

7.4 Cohesive and Connected Management Systems and Processes

Cloud applications are recommended to support the organisation to build cohesive management systems across their global networks.

Cloud ecosystems empowered with AI have matured and show continuous improvement, supporting decision making through utilising reporting tools, this supports decision making, through making data concise and visual through chart conversion and enabling predictions, these are recommended.

However, partnerships and integrations are key components for getting the best out of a chosen cloud system.

E.g., SAAS (Software as a service) (Oracle.com, 2021) allows users to subscribe to and use application software in the cloud. A modern cloud provides secure software for your entire business. (HR, Marketing, Project Management, Sales Management, service, manufacturing, and supply chain). (Oracle.com, 2021). Having integrated systems to manage all business functions makes good sense, however they will only benefit the business if the data incorporated is systematic and consistent. Which means investing in training of the workforce and measured outputs.

Integrated processes for management evaluation are recommended for both inputs, outputs, and the workforce.

The organisation currently Uses Microsoft within the Business, utilising cloud productivity computing to support the team. With built in apps and cloud services and security can provide several benefits. Including file storing, access and sharing. Team communications for meetings and chat. Data protection for employees, data, and customers. (Forbes, 2020)

8.0 Conclusion

In this decade of business analytics, the top trends for managing data and business functions are cloud, artificial intelligence, automation, on-device analytics, and augmentation.

For the organisation to grow and to weather economic storms and to be relevant to the direction for global circularity, the organisation will need to set out a clear roadmap to embrace disruptive technology or succumb to it.

To maintain a successful transition and strong future, the organisation is advised to prepare short- and long-term business strategies, due to PESTLE environments continued volatility (E.g., Ukraine war – fuel, food, trade issues, Post Pandemic and Brexit challenges inflation, cost of living crisis).

Addressing digital transformation at this juncture requires planning to include an agile and flexible workforce, who are willing to adapt to change. Transitioning from the organisations current position will require consideration of Strategy, Culture, People, Processes, and technology and budget.

Moving to digitization has a reputation for reduction of the human workforce, for multiple reasons including redundant job roles and outdated training protocols. This does not have to be the case as with a circular HR improvement process, employees can become trained analysts, improving each division.

Recommendations in this report have considered a cycle of continuous improvement through the Value chain considering strategy, consumer design thinking, marketing strategies, supporting software, service innovation, risk mitigation and corporate processes and control.

Beneficial Technologies have been explored along with processes and management, which have potential to encourage growth and promote longevity and resilience through the changing commercial landscape.

References

- Analytics Google, 2022. *Google Analytics*. [Online]
Available at: <https://analytics.google.com>
[Accessed 2022].
- Anon., 2021. *UN Climate Change conference UK 2021*. [Online]
Available at: <https://ukcop26.org>
[Accessed 03 2022].
- Awencollective, 2022. *dot by awen*. [Online]
Available at: <https://www.awencollective.com/dot>
[Accessed 03 2022].
- b2binternational.com, 2022. *B2B Marketing: 10 Key Differences from Consumer Marketing*.
<https://www.b2binternational.com/publications/b2b-marketing/> ed. s.l.:s.n.
- B2binternational.com, 2022. *B2B Marketing: 10 Key Differences from Consumer Marketing*. [Online]
Available at: <https://www.b2binternational.com/publications/b2b-marketing/>
[Accessed 03 2022].
- Biocatch.com, 2022. *What Is Behavioral Biometrics?*. [Online]
Available at: <https://www.biocatch.com/blog/what-is-behavioral-biometrics#:~:text=Behavioral%20biometrics%20leverages%20machine%20learning%20to%20analyze%20patterns,a%20human%20or%20part%20of%20an%20automated%20attack.>
[Accessed 2022].
- Biometric Update.com, 2020. *Biometrics-backed mobile money and facial recognition markets to grow as everything goes contactless*. [Online]
Available at: <https://www.biometricupdate.com/202006/biometrics-backed-mobile-money-and-facial-recognition-markets-to-grow-as-everything-goes-contactless#:~:text=The%20biometric%20facial%20recognition%20market%20will%20be%20boosted,estimates%20of%2013.5%20percent%20gro>
- British Assessment.co.uk, 2022. *ISO 27001 Information Security Management*. [Online]
Available at: https://www.british-assessment.co.uk/services/iso-27001/?hsa_cam=80898670&hsa_grp=1206164515096015&hsa_acc=6188181041&hsa_ad=&hsa_src=o&hsa_kw=iso%2027001&hsa_tgt=kwd-75385404911346:loc-188&hsa_ver=3&hsa_mt=e&hsa_net=adwords&msclkid=ca1a03a071c6136f735061
[Accessed 03 2022].
- C02Geonet@cop24, 2018. *C02Geonet@cop24*. [Online]
Available at: www.cop24.co2geonet.com
[Accessed 2022].
- Capterra.com, 2022. *SEO Analysis Software*. [Online]
Available at: https://www.capterra.com/sem-compare/seo-software/?utm_source=bing&utm_medium=cpc
[Accessed 2022].
- Capterra, 2022. *Forms Software*. [Online]
Available at: https://www.capterra.com/sem-compare/forms-automation-software/?utm_source=bing&utm_medium=cpc
[Accessed March 2022].
- Carbon Brief, 2018. *Cop24: Key outcomes agreed at the UN climate talks in Katowice*. [Online]
Available at: <https://www.carbonbrief.org/cop24-key-outcomes-agreed-at-the-un-climate-talks-in-katowice>
[Accessed 03 2022].

Digital NHS, 2022. *IG, security and user considerations*. [Online]
Available at: <https://digital.nhs.uk/services/health-and-social-care-network/hscn-technical-guidance/business-applications-guidance/industry-standards>
[Accessed 2022].

Digital.hbs.edu, 2017. *Blockbuster: It's Failure and Lessons to Digital Transformers*. [Online]
Available at: digital.hbs.edu/platform-digit/submission/blockbuster-its-failure-and-lessons-to-...
[Accessed 2022].

Digiupdates, 2022. <https://www.digiupdates.net/the-latest-google-algorithm-updates-for-seo-in-2022/>. [Online]
Available at: <https://www.digiupdates.net/the-latest-google-algorithm-updates-for-seo-in-2022/>
[Accessed 2022].

Drax.com, 2022. *Energy Revolution: A Gloabl Outlook*. [Online]
Available at: <https://www.drax.com/wp-content/uploads/2018/12/Energy-Revolution-Global-Outlook-Report-Final-Dec-2018-COP24.pdf>
[Accessed 01 03 2022].

Ellen McArthur Foundation, 2022. *Building a world free from waste and pollution*. [Online]
Available at: <https://ellenmcarthurfoundation.org>
[Accessed 03 2022].

Emerald Insights, 2010. *A grounded theory model of service providers' stress, emotion, and coping during intercultural service encounters*. [Online]
Available at:
<https://www.emerald.com/insight/content/doi/10.1108/09604521011057478/full/html>
[Accessed March 2022].

eweekuk.com, 2021. *Facing Up to the Influence of Biometrics in the 2020s*. [Online]
Available at: <https://www.eweekuk.com/cybersecurity/facing-up-to-the-influence-of-biometrics-in-the-2020s/>
[Accessed 2022].

Forbes, 2018. *What is Industry 4.0?*. [Online]
Available at: <https://www.forbes.com/sites/bernardmarr/2018/09/02what-is-industry-4-0-here-a-super-easy-explanation-for-anyone>
[Accessed 2022].

Forbes, 2020. *The 10 Best Data Analytics and BI Platforms and Tools In 2020*. [Online]
Available at: <https://www.forbes.com/sites/bernardmarr/2020/06/05/the-best-data-analytics-and-bi-platforms-and-tools-in-2020>
[Accessed 2022].

Gilchrist., 2016. *Industry 4.0 The Industrial Internet of Things*. 1st ed. 2016 ed. s.l.:Apress.

Gilchrist, A., 2016. Industrial Internet Use-Cases. In: *Industry 4.0 The Industrial Internet of Things*. s.l.:Apress, pp. 18-19.

GNS Science, 2022. *GNS Science*. [Online]
Available at: <https://www.gns.cri.nz/Home/About-Us>
[Accessed 2022].

Green Journal.co.uk, 2021. *Combining Circular Economy Principles and Industry 4.0 Leads to Increased Sustainability*. [Online]
Available at: <https://www.greenjournal.co.uk/2021/11/combining-circular-economy-principles-and-industry-4-0-leads-to-increased-sustainability/>
[Accessed 01 03 2022].

- Greenbook.org, 2022. *Top Online Focus Group Software Providers*. [Online]
Available at: <https://www.greenbook.org/market-research-firms/online-focus-software>
[Accessed 03 2022].
- Greenbook, 2022. *Top Online Focus Group Software Providers*. [Online]
Available at: <https://www.greenbook.org/market-research-firms/online-focus-software>
[Accessed 2022].
- Hu, Q. R. W. S. a. F. P., 2015. Lean Implementation within SMEs: a literature review: IMS. Journal of Manufacturing Technology Management. *Journal of Manufacturing Technology Management*, Volume 26, pp. 980-1012.
- IEA, 2021. *About CCUS*. [Online]
Available at: <https://www.iea.org/reports/about-ccus?msclid=16ee41afd04011ec82124892823f56fe>
[Accessed 03 2022].
- isixsigma.com, 2022. *PREPARING TO MEASURE PROCESS WORK WITH A TIME STUDY*. [Online]
Available at: <https://www.isixsigma.com/methodology/business-process-management-bpm/preparing-measure-process-work-time-study/>
[Accessed March 2022].
- ISMS, 2022. *NHSP achieves ISO 27001 certification and improves their infosec management*. [Online]
Available at: <https://www.isms.online/case-studies/nhs-professionals/#:~:text=NHSP%20achieves%20ISO%2027001%20certification%20and%20improves%20their,members%20and%20more%20than%2050%20NHS%20client%20Trusts.>
[Accessed 2022].
- Lo, & Campos, N. , 2018. Blending Internet of Things (IoT) Solutions into relationship marketing strategies.. *Technological Forecasting & Social Change*, Issue
<https://doi.org/10.1016/j.techfore.2018.09.029>, pp. 137, 10-18..
- Merlin Energy Resource Ltd, 2022. *Born from and Energy Company*. [Online]
Available at: <https://www.merlinenergy.co.uk/>
[Accessed 2022].
- Microsoft.com, 2022. *What is business intelligence?*. [Online]
Available at: <https://powerbi.microsoft.com/en-us/what-is-business-intelligence/>
[Accessed 2022].
- Nash, M. a. P. S., 2008. *Mapping the total value stream : a comprehensive guide for production and transactional processes*.. Boca Raton:: CRC Press..
- Official website of International Trade Administration, 2021. *Trade Barriers*. [Online]
Available at: <https://www.trade.gov/country-commercial-guides/tunisia-trade-barriers>
- Ofgem, 2022. *Ofgem*. [Online]
Available at: www.ofgem.gov.uk/publications/ofgem-publishes-biennial-survey-how-supplier...
[Accessed 2022].
- Oracle.com, 2021. *SaaS For Dummies, Oracle 3rd Special Edition*. 3rd edition ed. s.l.:John Wiley & Sons, Inc.
- Petrostrat, 2022. *Welcome to Petrostrat*. [Online]
Available at: <https://www.petrostrat.com>
[Accessed 2022].
- Piercy, N., 2016. *Market-Led Strategic Change: Transforming the process of going to market*.. s.l.:Routledge.
- Research Gate.net, 2019. *Industry 4.0 to Accelerate the Circular Economy: A Case Study of Electric Scooter Sharing*. [Online]

Available at: https://www.researchgate.net/figure/Gap-of-the-enterprises-toward-the-circular-economy-CE_tbl1_337528708

[Accessed 25 03 2022].

reve chat, 2022. *Top 10 Customer Service Technology Trends to Follow in 2022*. [Online]

Available at: <https://www.revechat.com/blog/customer-service-trends/>

[Accessed 2022].

Schwab, K., 2016. *The fourth industrial revolution..* Geneva, Switzerland: World Economic Forum.

Semantic Scholar, 2022. *An approach and tool support for assisting users to fill-in web forms with personal information*. [Online]

Available at: <https://www.semanticscholar.org/paper/An-approach-and-tool-support-for-assisting-users-to-Winckler-Gaits/f07ce1c918b72190ad5dfd695cfff59bf3ad8400>

[Accessed March 2022].

Statista.com, 2020. *Mobile device and app usage growth from 2019 to 2020 worldwide, by generation*. [Online]

Available at: <https://www.statista.com/statistics/1237411/mobile-device-and-app-usage-change-by-generation/>

[Accessed 29 03 2022].

Top10.com, 2022. *The Best CRM Software of 2022*. [Online]

Available at:

https://www.bing.com/aclk?ld=e8GXeQmU5osJgysPjcd8qB0zVUCUwdSuaRXfIUxCvHJ4mt_8u2TJEEyCdXg7iEZLRYr6m50agduRhmslvdivkm7YZxznzuBxpm22o1vg-3BiThevumZ7DxztqR1tKczXvn5gdwXSRAA7olEm8fe-S_4RUHKTH7E52wCYAGRHgbHC4bv8ALRuq8o7BQTCFZOOXFFGGgg&u=aHR0cHMIM2ElMmYIMmZ3d3c

3c

[Accessed 2022].

Trott, P., 2012. *Innovation Management and New Product Development (Fifth Edition ed.)*. 5th ed. Harlow: Pearson Education Limited.

Uk Cop 26, 2021. *UN Climate Change Conference Uk 2021*. [Online]

Available at: <https://ukcop26.org>

[Accessed 03 2022].

Utility Warehouse, 2022. *Utility Warehouse*. [Online]

Available at: <https://uw.co.uk/>

[Accessed 2022].

WIPO, 2021. *Gobal Innovation Index*. [Online]

Available at: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021

Zhang, A. S. a. Z., 2018. *A New Methodological Frontier-in-Entrepreneurship-Resesearch-Big-Data-Studies.Pdf*. [Online]

Available at: <https://www.researchgate.net/profile/Andreas-Schwab-9/publication/323476626>

[Accessed 2022].

Bibliography

Analytics Google, 2022. *Google Analytics*. [Online]

Available at: <https://analytics.google.com>

[Accessed 2022].

Anon., 2021. *UN Climate Change conference UK 2021*. [Online]

Available at: <https://ukcop26.org>

[Accessed 03 2022].

Awencollective, 2022. *dot by awen*. [Online]

Available at: <https://www.awencollective.com/dot>

[Accessed 03 2022].

b2binternational.com, 2022. *B2B Marketing: 10 Key Differences from Consumer Marketing*.

<https://www.b2binternational.com/publications/b2b-marketing/> ed. s.l.:s.n.

B2binternational.com, 2022. *B2B Marketing: 10 Key Differences from Consumer Marketing*. [Online]

Available at: <https://www.b2binternational.com/publications/b2b-marketing/>

[Accessed 03 2022].

Biocatch.com, 2022. *What Is Behavioral Biometrics?*. [Online]

Available at: <https://www.biocatch.com/blog/what-is-behavioral-biometrics#:~:text=Behavioral%20biometrics%20leverages%20machine%20learning%20to%20analyze%20patterns,a%20human%20or%20part%20of%20an%20automated%20attack.>

[Accessed 2022].

Biometric Update.com, 2020. *Biometrics-backed mobile money and facial recognition markets to grow as everything goes contactless*. [Online]

Available at: <https://www.biometricupdate.com/202006/biometrics-backed-mobile-money-and-facial-recognition-markets-to-grow-as-everything-goes-contactless#:~:text=The%20biometric%20facial%20recognition%20market%20will%20be%20boosted,estimates%20of%2013.5%20percent%20gro>

[Accessed 2022].

British Assessment.co.uk, 2022. *ISO 27001 Information Security Management*. [Online]

Available at: https://www.british-assessment.co.uk/services/iso-27001/?hsa_cam=80898670&hsa_grp=1206164515096015&hsa_acc=6188181041&hsa_ad=&hsa_src=o&hsa_kw=iso%2027001&hsa_tgt=kwd-75385404911346:loc-188&hsa_ver=3&hsa_mt=e&hsa_net=adwords&msclkid=ca1a03a071c6136f735061

[Accessed 03 2022].

British Assessment.co.uk, 2022. *ISO 27001 Information Security Management*. [Online]

Available at: https://www.british-assessment.co.uk/services/iso-27001/?hsa_cam=80898670&hsa_grp=1206164515096015&hsa_acc=6188181041&hsa_ad=&hsa_src=o&hsa_kw=iso%2027001&hsa_tgt=kwd-75385404911346:loc-188&hsa_ver=3&hsa_mt=e&hsa_net=adwords&msclkid=ca1a03a071c6136f735061

[Accessed 03 2022].

C02Geonet@cop24, 2018. *C02Geonet@cop24*. [Online]

Available at: www.cop24.co2geonet.com

[Accessed 2022].

Capterra.com, 2022. *SEO Analysis Software*. [Online]

Available at: https://www.capterra.com/sem-compare/seo-software/?utm_source=bing&utm_medium=cpc

[Accessed 2022].

Capterra, 2022. *Forms Software*. [Online]

Available at: https://www.capterra.com/sem-compare/forms-automation-software/?utm_source=bing&utm_medium=cpc

[Accessed March 2022].

Carbon Brief, 2018. *Cop24: Key outcomes agreed at the UN climate talks in Katowice*. [Online]

Available at: <https://www.carbonbrief.org/cop24-key-outcomes-agreed-at-the-un-climate-talks-in-katowice>

[Accessed 03 2022].

Digital NHS, 2022. *IG, security and user considerations*. [Online]
Available at: <https://digital.nhs.uk/services/health-and-social-care-network/hscn-technical-guidance/business-applications-guidance/industry-standards>
[Accessed 2022].

Digital.hbs.edu, 2017. *Blockbuster: It's Failure and Lessons to Digital Transformers*. [Online]
Available at: digital.hbs.edu/platform-digit/submission/blockbuster-its-failure-and-lessons-to-...
[Accessed 2022].

Digiupdates, 2022. <https://www.digiupdates.net/the-latest-google-algorithm-updates-for-seo-in-2022/>. [Online]
Available at: <https://www.digiupdates.net/the-latest-google-algorithm-updates-for-seo-in-2022/>
[Accessed 2022].

Drax.com, 2022. *Energy Revolution: A Gloabl Outlook*. [Online]
Available at: <https://www.drax.com/wp-content/uploads/2018/12/Energy-Revolution-Global-Outlook-Report-Final-Dec-2018-COP24.pdf>
[Accessed 01 03 2022].

Ellen McArthur Foundation, 2022. *Building a world free from waste and pollution*. [Online]
Available at: <https://ellenmcarthurfoundation.org>
[Accessed 03 2022].

Emerald Insights, 2010. *A grounded theory model of service providers' stress, emotion, and coping during intercultural service encounters*. [Online]
Available at:
<https://www.emerald.com/insight/content/doi/10.1108/09604521011057478/full/html>
[Accessed March 2022].

eweekuk.com, 2021. *Facing Up to the Influence of Biometrics in the 2020s*. [Online]
Available at: <https://www.eweekuk.com/cybersecurity/facing-up-to-the-influence-of-biometrics-in-the-2020s/>
[Accessed 2022].

Forbes, 2018. *What is Industry 4.0?*. [Online]
Available at: <https://www.forbes.com/sites/bernardmarr/2018/09/02what-is-industry-4-0-here-a-super-easy-explanation-for-anyone>
[Accessed 2022].

Forbes, 2020. *The 10 Best Data Analytics and BI Platforms and Tools In 2020*. [Online]
Available at: <https://www.forbes.com/sites/bernardmarr/2020/06/05/the-best-data-analytics-and-bi-platforms-and-tools-in-2020>
[Accessed 2022].

Gilchrist., 2016. *Industry 4.0 The Industrial Internet of Things*. 1st ed. 2016 ed. s.l.:Apress.

Gilchrist, A., 2016. Industrial Internet Use-Cases. In: *Industry 4.0 The Industrial Internet of Things*. s.l.:Apress, pp. 18-19.

GNS Science, 2022. *GNS Science*. [Online]
Available at: <https://www.gns.cri.nz/Home/About-Us>
[Accessed 2022].

Green Journal.co.uk, 2021. *Combining Circular Economy Principles and Industry 4.0 Leads to Increased Sustainability*. [Online]
Available at: <https://www.greenjournal.co.uk/2021/11/combining-circular-economy-principles-and-industry-4-0-leads-to-increased-sustainability/>
[Accessed 01 03 2022].

- Greenbook.org, 2022. *Top Online Focus Group Software Providers*. [Online]
Available at: <https://www.greenbook.org/market-research-firms/online-focus-software>
[Accessed 03 2022].
- Greenbook, 2022. *Top Online Focus Group Software Providers*. [Online]
Available at: <https://www.greenbook.org/market-research-firms/online-focus-software>
[Accessed 2022].
- Hu, Q. R. W. S. a. F. P., 2015. Lean Implementation within SMEs: a literature review: IMS. Journal of Manufacturing Technology Management. *Journal of Manufacturing Technology Management*, Volume 26, pp. 980-1012.
- IEA, 2021. *About CCUS*. [Online]
Available at: <https://www.iea.org/reports/about-ccus?msclid=16ee41afd04011ec82124892823f56fe>
[Accessed 03 2022].
- isixsigma.com, 2022. *PREPARING TO MEASURE PROCESS WORK WITH A TIME STUDY*. [Online]
Available at: <https://www.isixsigma.com/methodology/business-process-management-bpm/preparing-measure-process-work-time-study/>
[Accessed March 2022].
- ISMS, 2022. *NHSP achieves ISO 27001 certification and improves their infosec management*. [Online]
Available at: <https://www.isms.online/case-studies/nhs-professionals/#:~:text=NHSP%20achieves%20ISO%2027001%20certification%20and%20improves%20their,members%20and%20more%20than%2050%20NHS%20client%20Trusts.>
[Accessed 2022].
- Lo, & Campos, N. , 2018. Blending Internet of Things (IoT) Solutions into relationship marketing strategies.. *Technological Forecasting & Social Change*, Issue <https://doi.org/10.1016/j.techfore.2018.09.029>, pp. 137, 10-18..
- Merlin Energy Resource Ltd, 2022. *Born from and Energy Company*. [Online]
Available at: <https://www.merlinenergy.co.uk/>
[Accessed 2022].
- Microsoft.com, 2022. *What is business intelligence?*. [Online]
Available at: <https://powerbi.microsoft.com/en-us/what-is-business-intelligence/>
[Accessed 2022].
- Nash, M. a. P. S., 2008. *Mapping the total value stream : a comprehensive guide for production and transactional processes*.. Boca Raton:: CRC Press..
- Official website of International Trade Administration, 2021. *Trade Barriers*. [Online]
Available at: <https://www.trade.gov/country-commercial-guides/tunisia-trade-barriers>
- Ofgem, 2022. *Ofgem*. [Online]
Available at: www.ofgem.gov.uk/publications/ofgem-publishes-biennial-survey-how-supplier...
[Accessed 2022].
- Oracle.com, 2021. *SaaS For Dummies, Oracle 3rd Special Edition*. 3rd edition ed. s.l.:John Wiley & Sons, Inc.
- Petrostrat, 2022. *Welcome to Petrostrat*. [Online]
Available at: <https://www.petrostrat.com>
[Accessed 2022].
- Piercy, N., 2016. *Market-Led Strategic Change: Transforming the process of going to market*.. s.l.:Routledge.
- Research Gate.net, 2019. *Industry 4.0 to Accelerate the Circular Economy: A Case Study of Electric Scooter Sharing*. [Online]

Available at: https://www.researchgate.net/figure/Gap-of-the-enterprises-toward-the-circular-economy-CE_tbl1_337528708

[Accessed 25 03 2022].

reve chat, 2022. *Top 10 Customer Service Technology Trends to Follow in 2022*. [Online]

Available at: <https://www.revechat.com/blog/customer-service-trends/>

[Accessed 2022].

Schwab, K., 2016. *The fourth industrial revolution..* Geneva, Switzerland: World Economic Forum.

Semantic Scholar, 2022. *An approach and tool support for assisting users to fill-in web forms with personal information*. [Online]

Available at: <https://www.semanticscholar.org/paper/An-approach-and-tool-support-for-assisting-users-to-Winckler-Gaits/f07ce1c918b72190ad5dfd695cfff59bf3ad8400>

[Accessed March 2022].

Statista.com, 2020. *Mobile device and app usage growth from 2019 to 2020 worldwide, by generation*. [Online]

Available at: <https://www.statista.com/statistics/1237411/mobile-device-and-app-usage-change-by-generation/>

[Accessed 29 03 2022].

Top10.com, 2022. *The Best CRM Software of 2022*. [Online]

Available at:

https://www.bing.com/aclk?ld=e8GXeQmU5osJgysPjcd8qB0zVUCUwdSuaRXfIUxCvHJ4mt_8u2TJEEyCdXg7iEZLRYr6m50agduRhmslvdivkm7YZxznzuBxpm22o1vg-3BiThevumZ7DxztqR1tKczXvn5gdwXSRAA7olEm8fe-S_4RUHKTH7E52wCYAGRHgbHC4bv8ALRuq8o7BQTCFZOOXFFGGgg&u=aHR0cHMIM2ElMmYIMmZ3d3c

3c

[Accessed 2022].

Trott, P., 2012. *Innovation Management and New Product Development (Fifth Edition ed.)*. 5th ed. Harlow: Pearson Education Limited.

Uk Cop 26, 2021. *UN Climate Change Conference Uk 2021*. [Online]

Available at: <https://ukcop26.org>

[Accessed 03 2022].

Utility Warehouse, 2022. *Utility Warehouse*. [Online]

Available at: <https://uw.co.uk/>

[Accessed 2022].

WIPO, 2021. *Gobal Innovation Index*. [Online]

Available at: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021

Zhang, A. S. a. Z., 2018. *A New Methodological Frontier-in-Entrepreneurship-Resesearch-Big-Data-Studies.Pdf*. [Online]

Available at: <https://www.researchgate.net/profile/Andreas-Schwab-9/publication/323476626>

[Accessed 2022].

Analytics Google, 2022. *Google Analytics*. [Online]

Available at: <https://analytics.google.com>

[Accessed 2022].

Anon., 2021. *UN Climate Change conference UK 2021*. [Online]

Available at: <https://ukcop26.org>

[Accessed 03 2022].

Awencollective, 2022. *dot by awen*. [Online]

Available at: <https://www.awencollective.com/dot>

[Accessed 03 2022].

b2binternational.com, 2022. *B2B Marketing: 10 Key Differences from Consumer Marketing*.

<https://www.b2binternational.com/publications/b2b-marketing/> ed. s.l.:s.n.

B2binternational.com, 2022. *B2B Marketing: 10 Key Differences from Consumer Marketing*. [Online]

Available at: <https://www.b2binternational.com/publications/b2b-marketing/>

[Accessed 03 2022].

Biocatch.com, 2022. *What Is Behavioral Biometrics?*. [Online]

Available at: <https://www.biocatch.com/blog/what-is-behavioral-biometrics#:~:text=Behavioral%20biometrics%20leverages%20machine%20learning%20to%20analyze%20patterns,a%20human%20or%20part%20of%20an%20automated%20attack.>

[Accessed 2022].

Biometric Update.com, 2020. *Biometrics-backed mobile money and facial recognition markets to grow as everything goes contactless*. [Online]

Available at: <https://www.biometricupdate.com/202006/biometrics-backed-mobile-money-and-facial-recognition-markets-to-grow-as-everything-goes-contactless#:~:text=The%20biometric%20facial%20recognition%20market%20will%20be%20boosted,estimates%20of%2013.5%20percent%20gro>

[Accessed 2022].

British Assessment.co.uk, 2022. *ISO 27001 Information Security Management*. [Online]

Available at: https://www.british-assessment.co.uk/services/iso-27001/?hsa_cam=80898670&hsa_grp=1206164515096015&hsa_acc=6188181041&hsa_ad=&hsa_src=o&hsa_kw=iso%2027001&hsa_tgt=kwd-75385404911346:loc-188&hsa_ver=3&hsa_mt=e&hsa_net=adwords&msclkid=ca1a03a071c6136f735061

[Accessed 03 2022].

C02Geonet@cop24, 2018. *C02Geonet@cop24*. [Online]

Available at: www.cop24.co2geonet.com

[Accessed 2022].

Capterra.com, 2022. *SEO Analysis Software*. [Online]

Available at: https://www.capterra.com/sem-compare/seo-software/?utm_source=bing&utm_medium=cpc

[Accessed 2022].

Capterra, 2022. *Forms Software*. [Online]
 Available at: https://www.capterra.com/sem-compare/forms-automation-software/?utm_source=bing&utm_medium=cpc
 [Accessed March 2022].

Carbon Brief, 2018. *Cop24: Key outcomes agreed at the UN climate talks in Katowice*. [Online]
 Available at: <https://www.carbonbrief.org/cop24-key-outcomes-agreed-at-the-un-climate-talks-in-katowice>
 [Accessed 03 2022].

Digital NHS, 2022. *IG, security and user considerations*. [Online]
 Available at: <https://digital.nhs.uk/services/health-and-social-care-network/hscn-technical-guidance/business-applications-guidance/industry-standards>
 [Accessed 2022].

Digital.hbs.edu, 2017. *Blockbuster: It's Failure and Lessons to Digital Transformers*. [Online]
 Available at: digital.hbs.edu/platform-digit/submission/blockbuster-its-failure-and-lessons-to-...
 [Accessed 2022].

Digiupdates, 2022. <https://www.digiupdates.net/the-latest-google-algorithm-updates-for-seo-in-2022/>. [Online]
 Available at: <https://www.digiupdates.net/the-latest-google-algorithm-updates-for-seo-in-2022/>
 [Accessed 2022].

Drax.com, 2022. *Energy Revolution: A Global Outlook*. [Online]
 Available at: <https://www.drax.com/wp-content/uploads/2018/12/Energy-Revolution-Global-Outlook-Report-Final-Dec-2018-COP24.pdf>
 [Accessed 01 03 2022].

Ellen McArthur Foundation, 2022. *Building a world free from waste and pollution*. [Online]
 Available at: <https://ellenmcarthurfoundation.org>
 [Accessed 03 2022].

Emerald Insights, 2010. *A grounded theory model of service providers' stress, emotion, and coping during intercultural service encounters*. [Online]
 Available at:
<https://www.emerald.com/insight/content/doi/10.1108/09604521011057478/full/html>
 [Accessed March 2022].

eweekuk.com, 2021. *Facing Up to the Influence of Biometrics in the 2020s*. [Online]
 Available at: <https://www.eweekuk.com/cybersecurity/facing-up-to-the-influence-of-biometrics-in-the-2020s/>
 [Accessed 2022].

Forbes, 2018. *What is Industry 4.0?*. [Online]
 Available at: <https://www.forbes.com/sites/bernardmarr/2018/09/02what-is-industry-4-0-here-a-super-easy-explanation-for-anyone>
 [Accessed 2022].

Forbes, 2020. *The 10 Best Data Analytics and BI Platforms and Tools In 2020*. [Online]
 Available at: <https://www.forbes.com/sites/bernardmarr/2020/06/05/the-best-data-analytics-and-bi-platforms-and-tools-in-2020>
 [Accessed 2022].

Gilchrist., 2016. *Industry 4.0 The Industrial Internet of Things*. 1st ed. 2016 ed. s.l.:Apress.

Gilchrist, A., 2016. Industrial Internet Use-Cases. In: *Industry 4.0 The Industrial Internet of Things*. s.l.:Apress, pp. 18-19.

- GNS Science, 2022. *GNS Science*. [Online]
Available at: <https://www.gns.cri.nz/Home/About-Us>
[Accessed 2022].
- Green Journal.co.uk, 2021. *Combining Circular Economy Principles and Industry 4.0 Leads to Increased Sustainability*. [Online]
Available at: <https://www.greenjournal.co.uk/2021/11/combining-circular-economy-principles-and-industry-4-0-leads-to-increased-sustainability/>
[Accessed 01 03 2022].
- Greenbook.org, 2022. *Top Online Focus Group Software Providers*. [Online]
Available at: <https://www.greenbook.org/market-research-firms/online-focus-software>
[Accessed 03 2022].
- Greenbook, 2022. *Top Online Focus Group Software Providers*. [Online]
Available at: <https://www.greenbook.org/market-research-firms/online-focus-software>
[Accessed 2022].
- Hu, Q. R. W. S. a. F. P., 2015. Lean Implementation within SMEs: a literature review: IMS. *Journal of Manufacturing Technology Management*, Volume 26, pp. 980-1012.
- IEA, 2021. *About CCUS*. [Online]
Available at: <https://www.iea.org/reports/about-ccus?msclid=16ee41afd04011ec82124892823f56fe>
[Accessed 03 2022].
- isixsigma.com, 2022. *PREPARING TO MEASURE PROCESS WORK WITH A TIME STUDY*. [Online]
Available at: <https://www.isixsigma.com/methodology/business-process-management-bpm/preparing-measure-process-work-time-study/>
[Accessed March 2022].
- ISMS, 2022. *NHSP achieves ISO 27001 certification and improves their infosec management*. [Online]
Available at: <https://www.isms.online/case-studies/nhs-professionals/#:~:text=NHSP%20achieves%20ISO%2027001%20certification%20and%20improves%20their,members%20and%20more%20than%2050%20NHS%20client%20Trusts.>
[Accessed 2022].
- Lo, & Campos, N. , 2018. Blending Internet of Things (IoT) Solutions into relationship marketing strategies.. *Technological Forecasting & Social Change*, Issue https://doi.org/10.1016/j.techfore.2018.09.029, pp. 137, 10-18..
- Merlin Energy Resource Ltd, 2022. *Born from and Energy Company*. [Online]
Available at: <https://www.merlinenergy.co.uk/>
[Accessed 2022].
- Microsoft.com, 2022. *What is business intelligence?*. [Online]
Available at: <https://powerbi.microsoft.com/en-us/what-is-business-intelligence/>
[Accessed 2022].
- Nash, M. a. P. S., 2008. *Mapping the total value stream : a comprehensive guide for production and transactional processes*.. Boca Raton:: CRC Press..
- Official website of International Trade Administration, 2021. *Trade Barriers*. [Online]
Available at: <https://www.trade.gov/country-commercial-guides/tunisia-trade-barriers>
- Ofgem, 2022. *Ofgem*. [Online]
Available at: www.ofgem.gov.uk/publications/ofgem-publishes-biennial-survey-how-supplier...
[Accessed 2022].

Oracle.com, 2021. *SaaS For Dummies, Oracle 3rd Special Edition*. 3rd edition ed. s.l.:John Wiley & SOns, Inc.

Petrostrat, 2022. *Welcome to Petrostrat*. [Online]

Available at: <https://www.petrostrat.com>

[Accessed 2022].

Piercy, N., 2016. *Market-Led Strategic Chnge: Transforming the process of going to market..*

s.l.:Routledge.

Research Gate.net, 2019. *Industry 4.0 to Accelerate the Circular Economy: A Case Study of Electric Scooter Sharing*. [Online]

Available at: https://www.researchgate.net/figure/Gap-of-the-enterprises-toward-the-circular-economy-CE_tbl1_337528708

[Accessed 25 03 2022].

reve chat, 2022. *Top 10 Customer Service Technology Trends to Follow in 2022*. [Online]

Available at: <https://www.revechat.com/blog/customer-service-trends/>

[Accessed 2022].

Schwab, K., 2016. *The fourth industrial revolution..* Geneva, Switzerland: World Economic Forum.

Semantic Scholar, 2022. *An approach and tool support for assisting users to fill-in web forms with personal information*. [Online]

Available at: <https://www.semanticscholar.org/paper/An-approach-and-tool-support-for-assisting-users-to-Winckler-Gaits/f07ce1c918b72190ad5dfd695cfff59bf3ad8400>

[Accessed March 2022].

Statista.com, 2020. *Mobile device and app usage growth from 2019 to 2020 worldwide, by generation*. [Online]

Available at: <https://www.statista.com/statistics/1237411/mobile-device-and-app-usage-change-by-generation/>

[Accessed 29 03 2022].

Top10.com, 2022. *The Best CRM Software of 2022*. [Online]

Available at:

https://www.bing.com/aclk?ld=e8GXeQmU5osJgysPjcd8qB0zVUCUwdSuaRXfIUxCvHJ4mt_8u2TJEEyCdXg7jEZLRYr6m50agduRhmsHvdivkm7YZxznzuBxpm22o1vg-3BiThevumZ7DxztqR1tKczXvn5gdwXSRAA7oIEm8fe-S_4RUHkTH7E52wCYAGRHgbHC4bv8ALRuq8o7BQTCFZOXXFFGGgg&u=aHR0cHMIM2EIMmYIMmZ3d3c

[Accessed 2022].

Trott, P., 2012. *Innovation Management and New Product Development (Fifth Edition ed.)*. 5th ed.

Harlow: Pearson Education Limited.

Uk Cop 26, 2021. *UN Climate Change Conference Uk 2021*. [Online]

Available at: <https://ukcop26.org>

[Accessed 03 2022].

Utility Warehouse, 2022. *Utility Warehouse*. [Online]

Available at: <https://uw.co.uk/>

[Accessed 2022].

WIPO, 2021. *Gobal Innovation Index*. [Online]

Available at: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021

Zhang, A. S. a. Z., 2018. *A New Methodological Frontier-in-Entrepreneurship-Resesearch-Big-Data-Studies.Pdf*. [Online]

Available at: <https://www.researchgate.net/profile/Andreas-Schwab-9/publication/323476626>

[Accessed 2022].

