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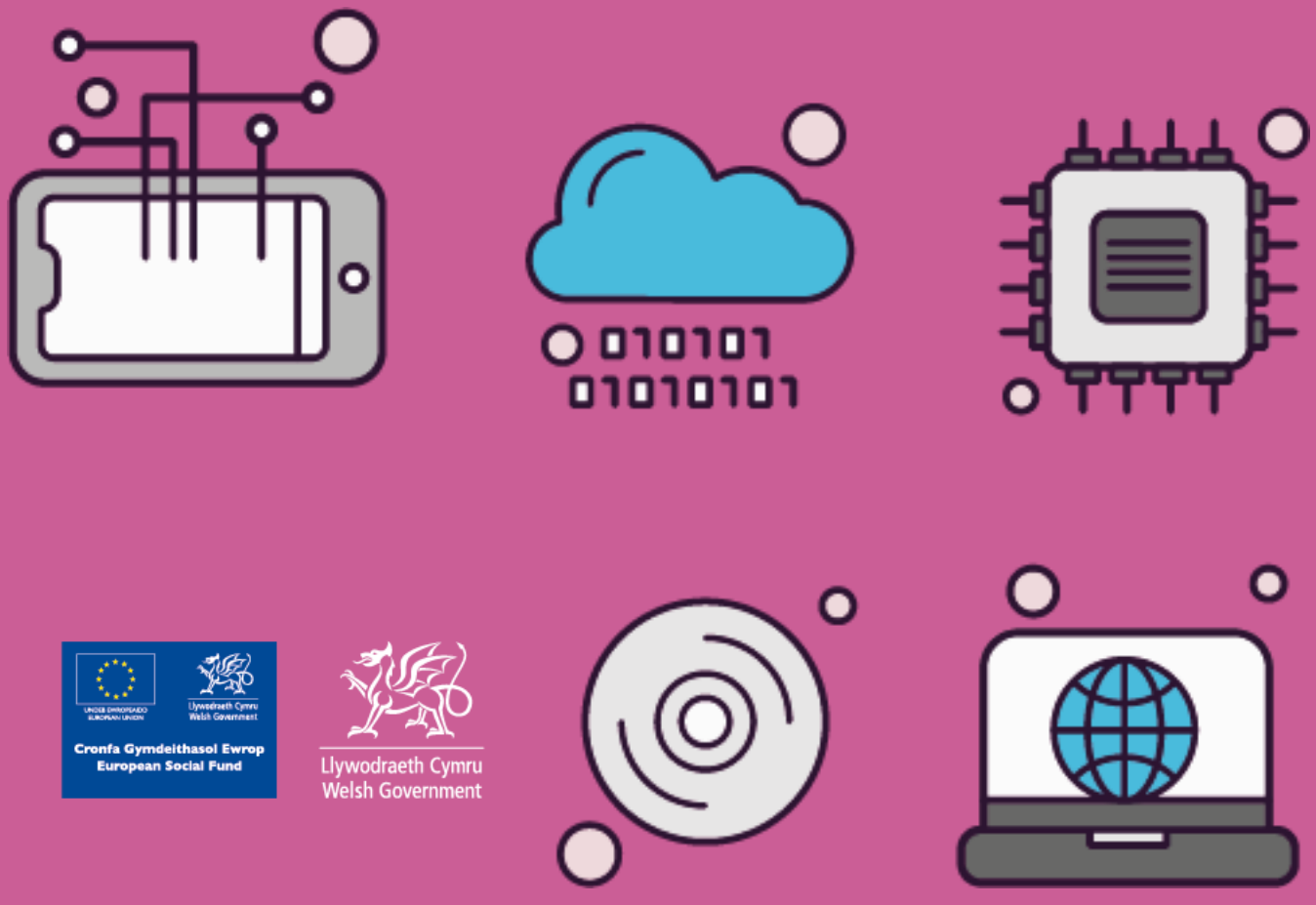
Careers Wales LMI Bulletin: May 2022

Feature: The Digital Economy



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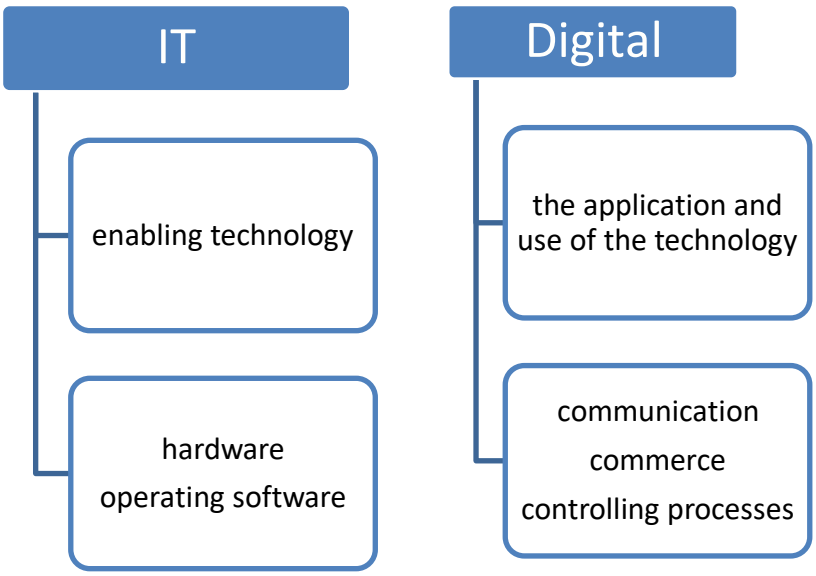
Introduction

The focus of this feature is an overview of the digital economy in Wales and beyond and the distinction between the enabling Information Technology and high-tech jobs, which featured in our February LMI Bulletin.

The world of work is in a state of transformation due to technological advancements, environmental changes, demographic shifts, and the impact of Covid-19. Calls are intensifying for workforce reskilling and a re-engineering of education and training to meet the demands of the future.

The IT Jobs and Skills Feature published in the February 2022 Careers Wales LMI Bulletin, focussed our attention to the distinction between IT and Digital.



What is the digital economy?

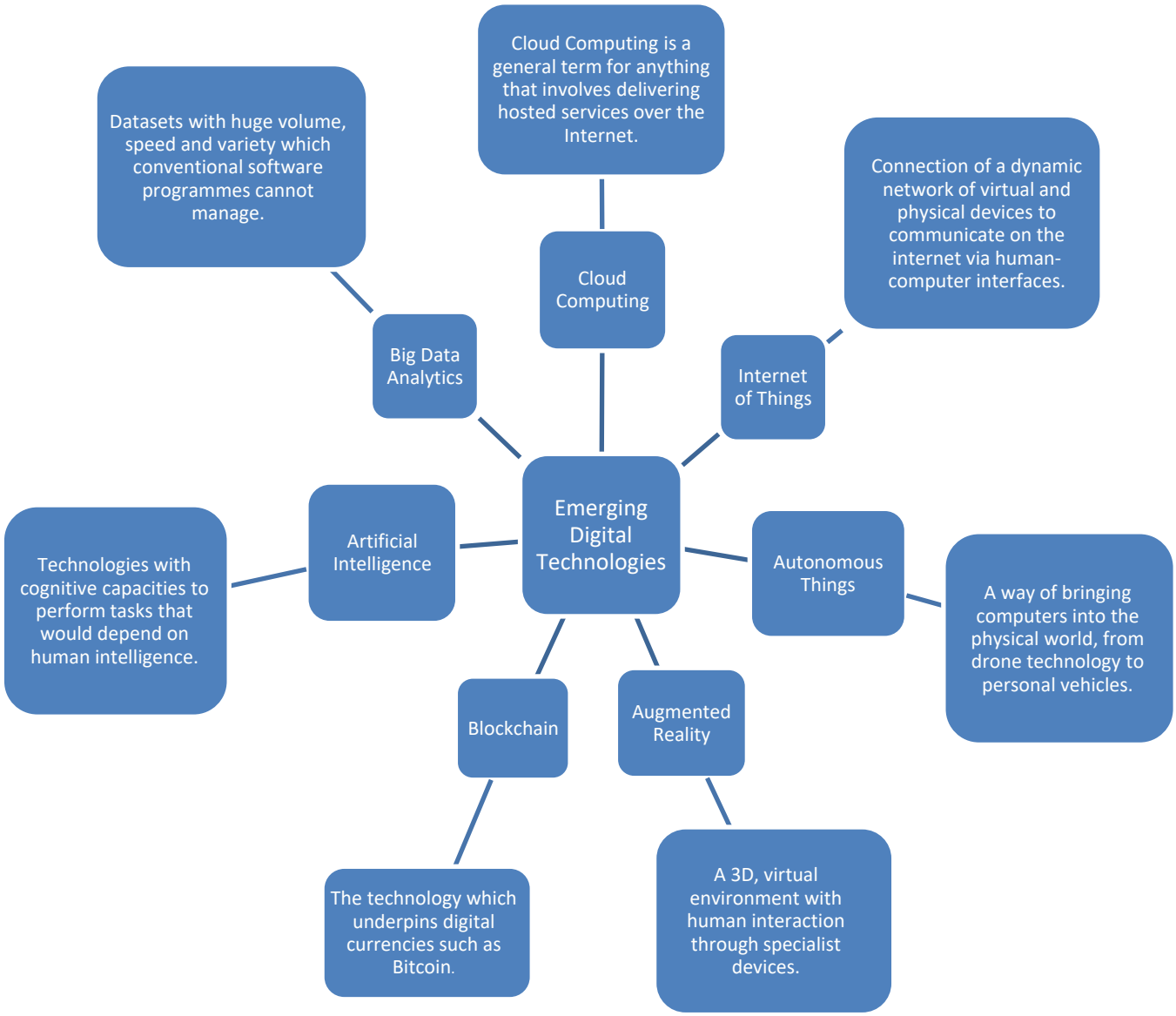
The world as we know it is continually changing, and one of the fundamental drivers is digital transformation. Digital transformation refers to the adoption of digital technology to transform services or businesses. This is achieved by replacing manual (non-digital) processes with digital ones or replacing outdated digital technology with upgraded digital technology. This is happening at breakneck speed across the globe.

The **digital economy** is the economic activity that results from billions of everyday online connections among people, businesses, devices, data, and processes. This is cross cutting all industries and many jobs today. Researchers are using digitalisation as one of the 'megatrends' shaping our world of work along with automation and AI, none of which are exclusive and are interrelated.

The digital economy was accelerating at a pace before the Covid pandemic in 2020 with new applications of machine learning, advanced AR, VR, automation, robotics, new social media platforms and data analytics, all rapidly changing the skills and competition in the labour market globally. According to the World Economic Forum the unprecedented disruption by COVID-19 has accelerated the urgency for agility, adaptability and transformation. An estimated 70% of new value created in the economy over the next decade will be based on digitally enabled platform business models. However, 47% of the world's population remain unconnected to the internet.

'It is characterised by a fusion of technologies – such as artificial intelligence, gene editing and advanced robotics – that is blurring the lines between the physical, digital and biological worlds'
(Regulation for the Fourth Industrial Revolution - GOV.UK)

What are the technologies driving the digital economy?



Review of Digital Innovation for the Economy and the Future of Work in Wales:
Delivering Economic Transformation for a Better Future of Work (gov.wales)

The digital economy is permeating almost every industry, creating both opportunities for professionals and the potential to strengthen businesses, as well as throwing up new challenges and skill demands.

As with previous Industrial Revolutions the displacement of workers by technology could disrupt labour markets and decrease the need for lower skilled workers, increasing the wage gap. Alternatively, as noted by the World Economic Forum The Fourth Industrial Revolution: what it means and how to respond, it has the potential to increase the opportunities in safe, rewarding jobs, and improve the quality of life globally.

PricewaterhouseCoopers (PwC) in their article Artificial Intelligence for good noted that the global spread of Artificial Intelligence (AI) is inevitable, and that for stakeholders to trust an organisation they must be confident that it is using AI to achieve positive outcomes, such as reducing risks to the enterprise, its employees, and customers.

'AI is...making government more transparent and efficient, healthcare more effective and accessible, cities more liveable, and the planet we share more sustainable…. Whether through smart agriculture, new energy sources, or more resilient infrastructure, AI is central to creating a more just and prosperous world. ' PwC

Similarly, these benefits and positive outcomes on adopting digital technologies are noted in the Welsh Government's Digital strategy for Wales

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Digital Skills

When considering the jobs of the future and the digital skills required in the workforce the World Economic Forum notes that,

'This is about more than digital literacy – the ability to use a smartphone or update a social media profile. It is about the ability to participate and thrive in the digital economy.'

In other words, ensuring that every person has the skills needed to maintain employment in a digitally dominated working landscape.

The pre pandemic report on digital skills by Burning Glass in 2020, commissioned by UK Government found that digital skills are becoming **near-universal requirements** for employment, and that higher-skilled jobs require more specific digital skills. The report categorised 'digital skills' as:

- **Baseline digital skills** - Digital literacy skills required for most jobs across all sectors.
- **Digital skills** - Competence in IT tools including computer programs and programming languages.
- **Specific digital skills** - Digital skill requirements for more technically oriented jobs e.g. customer relationship management software, social media tools, search engine analysis.

Despite the fast pace of new and disruptive digital technology, the literature reviewed by The Nuffield Foundation's report, Essential skills for tomorrow's workforce, suggests there is consensus on the essential employment skills expected to be most in demand in the future labour market which are needed to complement the digital and high tech solutions. Whilst 'specialist digitally enabled' professions are among the fastest growing roles, the continuing need for and importance of human interaction is also clear. The range of transferable (or soft) skills, which will become ever more important in the face of technology are categorised as:

- Analytical/creative
- Interpersonal
- Self-management
- Emotional intelligence skills

The impacts of automation, digitalisation and AI

According to a recent report published by the Nuffield Foundation is estimated that around 1.5% of the manufacturing workforce in the EU has been displaced by technology since 2008 . By 2030, it is estimated that 22% of current workforce activities across the EU could be automated. Workers in low-skilled routine tasks or with low education levels are at the greatest risk of being displaced by technology whilst lacking the skills to transfer into newly emerging opportunities. Overall, however, technology is creating new − and enhancing existing − jobs, rather than diminishing employment opportunities. It is also notable that the Organisation for Economic Co-operation and Development (OECD) is exploring the human capabilities which AI and robotics are unlikely to be able to replicate in the coming decades, and considering what education and training will be needed to develop work-related capabilities beyond these.

The CBI Learning for Life Report published in October 2020 reported that by 2030 almost every job would change to some extent, and as a result 90% of workers would need reskilling:

- 26 million employees will need to upskill as their role changes
- 5 million employees will need retraining due to a major job change

'Automation and technology will bring millions of new jobs in the UK: There will be a big rise in demand for skills such as digital, STEM and interpersonal skills. But many other roles will change significantly or disappear.' CBI 2020

Effects of Covid-19 on digital and technology industries

The pandemic has accelerated the pace of digitalisation, automation and AI as many businesses and organisations have turned to technology. Covid-19 exacerbated existing labour market inequalities, with a growth in high-paid and a decline in low-paid jobs. In addition, the divide between those who can perform their work remotely (mainly higher-paid workers), and those who cannot (mainly lower-paid workers, with some exceptions) became more apparent.

The 4 Regional Skills Partnerships (RSPs)across Wales reported that the tech sector has been very resilient, responsive and adapted well to change over the last two years. Covid-19 has affected the sector to varying degrees, with parts of the industry being impacted, while others have only experienced short-term disruption, if any at all. Productivity within tech businesses remained consistent for many and certain parts of the sector have experienced growth, for example Cyber Security and FinTech.

Digital skills are highly desirable at present and this 'enabling' nature of the tech sector ensures that these higher-level digital skills are forming an important part of the recovery process for various sectors. The increase in demand for suitably skilled tech workers has increased salaries in this sector and skilled employees are in a strong position to negotiate terms and conditions which is creating some 'churn' across the industry. Covid-19 has also provided enhanced opportunities for workers to transition to more specialised roles in the digital and enabling technologies sector.

RSPs also report on the challenges emerging in relation to the supply of high-tech skills and talent from education and a lack of qualified people entering the labour market could hold the sector back in the longer term.

Top reported skills issues relating to the digital/tech economy by the Regional Skills Partnerships during the last two years include:

- Increased exposure of challenges relating to generic and basic digital skills
- Advanced IT skills
- e-commerce
- Digital marketing skills
- Connectivity reliability continues in some areas
- Vacancies difficult to fill
- Fast pace of new technology being introduced
- Challenges for micro and small businesses to compete with the fast pace of change
- Ensuring there is adequate supply of tech/digital skills from fit for purpose education and training programmes
- Retaining tech skill talent in Wales to ensure that individuals contribute to the economy

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How digital technology is transforming sectors across Wales

Financial

Fintech and Insurtech are terms used to describe the industries that develop technological innovations to enhance or automate services and processes within the financial and insurance sectors. In Wales, there are approximately 35,900 jobs in the finance and insurance sector (2019 data from StatsWales).

Cardiff is Wales' base of fintech and insurtech companies, and is one of the top 10 UK cities for tech investment. It currently has one 'futurecorn' fintech platform (a fast-growth company predicted to achieve $1 billion valuation) - Sonovate, which provides finance and tech solutions.

Wales' tech industry's success is attributable to both investment and the high demand in Wales for digital skills in non-digital sectors. According to an article in Business News Wales, this demand has seen average advertised salaries rise 19.5% from 2020, to £49,612 in 2021.

Food and Beverage

The food and beverage industry has been gradually digitalising, for example with the rise in takeaway services and associated apps, but was limited by issues such as supply chain logistics. The pandemic lockdowns accelerated the industry's move to digital, improving the consumer experience as a consequence, and upgrading backend systems, data analytics and supply chain tools as a necessity.

Companies shifting to digital have needed to develop their use of search engine optimisation (SEO), digital marketing, customer relationship management (CRM), and social media to boost their online presence. 'Food and beverage companies that have embraced tech and successfully made the shift to digital have emerged from the pandemic stronger and leaner, with a solid platform for future growth.'

Tourism

StatsWales latest estimates in 2019 is that 124,500 people are employed in the accommodation and food service activities in Wales. The tourism sector, with a less obvious technological links have improved their services and processes by embracing digital technologies. For example, at Mwnt beach in Ceredigion data is gathered via Internet of Things (IoT) devices and managed by the Community Council to enable:

- the coastguard to assess whether remote beaches have a pertinent number of visitors to be included in the daily beach patrol
- café owners to deduce whether if and when it makes logistical sense to open in winter hours for visitors
- visitors to check the availability of the defibrillator machine in an emergency

Human Health and Social Work Activities

Human health and social work activities in Wales employs 206,500 people.
The health sector has accelerated its digital progression spurred by the pandemic. Many GP surgeries became reliant on digital services to enable patients to be seen without the additional risk of face-to-face appointments, these included consultation via phone call, video call, and systems reliant on email or e-consult.

Since the Deputy Minister for Climate Change published the Digital Strategy for Wales in March 2021 there have been a number of initiatives in the health sector in Wales, focusing on putting patient care at the centre of services. Digital Health and Care Wales and the Centre for Digital Public Services have jointly undertaken a *'discovery project exploring how patients interact with digital services in GP surgeries in Wales.'*

Construction

The construction sector, employing 97,300 people in Wales, realised the scale of their challenge and opportunities in 2018 when they published their report Unlocking construction's digital future: A skills plan for industry.

The Grange University Hospital project in South Wales used Building Information Modelling (BIM). BIM is a digital representation of the physical and functional characteristics of a building.

They used 'Product Led Design' using an intelligent understanding of the potential and constraints of the manufacturing process to inform the design.

The Design for Manufacturing and Assembly (DfMA) approach gave greater control over booking manufacturing slots and scheduling deliveries, providing certainty over cost management.

- BIM enabled DfMA helped Laing O'Rourke deliver the largest capital construction project in Wales on time, within budget and to the highest quality.

- A programme saving of 23% (42 weeks) and 237,099 hours of on-site labour (a reduction of 61 people on site during the core construction period) was achieved compared to a traditionally constructed project.

Manufacturing and Engineering Technology

Welsh Government's report Delivering Economic Transformation for a Better Future of Work was published in 2019 and recognised digital innovation as a 'game changer' needed in Wales. This was an ambitious report published pre pandemic when the manufacturing industry was going through one of the most intense periods of change due to Industry 4.0 challenges.

The vision of the future of manufacturing in Wales is predicated on the sector moving towards more value added activities - "High Value Manufacturing". A fundamental issue in future proofing the manufacturing sector in Wales is embedding key functions such as research, development and innovation in our facilities and operations. This sector is one of the largest employers in Wales with 142,200 jobs in 2019, according to StatsWales latest data.

High Value Manufacturing is a confirmed theme in the North Wales Growth Deal, the Cardiff City Capital Region Deal and the Swansea Bay City Deal as well as the proposed Mid Wales Growth

Deal, ensuring that the sector remains a high priority for all regions of Wales.

Wales has several UK-significant High Value Manufacturing industries, including automotive, opto-electronics, space and aerospace, medical devices, advanced materials and metals and a growing industry in nuclear. Wales is also a leader in compound semi-conductors technology, which lies at the heart of Industry 4.0 and is a technology that is growing rapidly in Wales.

This remains a fundamental underpinning technology for many world-leading products, including smartphones; Wi-Fi; satellite communication systems; robotics and efficient light-emitting diodes (LEDs). In Wales, industry, academia and government are working to develop a world class compound semi-conductor cluster, incorporating IQE, the world's leading manufacturer of advanced semi-conductor wafers, working in partnership with Cardiff University.

Agriculture

According to Farming Connect, deploying low-cost, long-lasting sensor technology onto Welsh farms has the potential to make farming more 'digital', reducing costs and boosting production efficiency.

Coleg Glynllifon near Caernarfon is pioneering new countryside management techniques using low-cost digital sensor technology. Recent advances have produced small, battery-powered IoT devices that can operate remotely for months, sometimes years at a time. Crucially, these sensors can operate wirelessly, removing the need for cables.

This technology could be a game-changer for farming. For years, farmers have acted as manual data gatherers, assessing the state of their land, crops and livestock, and acting accordingly. But with increasingly chaotic weather patterns, plus the vagaries of disease and pests, traditional ways of working are proving to be inefficient and can rapidly devolve into crisis management if remedial measures aren't implemented in time.

Creative Industries

CreaTech is a recent development from Creative Wales and encompasses AI, virtual media production, games engine technology and other cutting edge technology. Companies in Wales have been exploring immersive technology, using AR (augmented reality), VR (virtual reality) and MR (mixed reality).

M7Virtual have established themselves as Wales' go-to experts in moving 360 VR video. Based in Flintshire, the company produces immersive content for advertising campaigns, audience engagement and virtual reality experiences. When filming, M7Virtual uses customised camera rigs that are synchronised together, producing full 360-degree panoramas that viewers can freely explore. Some complex shots require the use of drones, remote-controlled cars or cable-rigged systems – all of which the business can provide in-house. The team can draw on experience in a wide range of fields including 3D CGI, gaming, cinematography and post-production.

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Job Roles in the Digital Economy

It is clear that the digital economy is permeating almost every aspect of daily life, and consequently most sectors to some extent. Some jobs will take on a digital aspect, or responsibility but there are a multitude of careers considered to be digital roles, some traditional but there are also plenty of emerging ones.

This article by Futurelearn looked at three key groups of digital roles.

Technical roles: requiring specialist knowledge and involve the creation and implementation of various technologies.

- Software Developers write the coding that instructs computers to perform particular tasks.
- UX Designer control how a user interacts with a product or service through a website or app. Every step of a user journey through a website is the responsibility of the UX Designer.
- Software Testers plan and carry out tests on computer programs to see if they do exactly what they have been designed to do.
- Computer Games Developers produce games for PCs, games consoles, the internet and mobile phones.

Business roles: that utilise the commercial aspects of digital technology.

- Product Managers organise employees to make the best use of their time and skills.
- Data Analysts collect data, organising it, and then presenting the results as useful information.
- Digital Marketing Executives are responsible for establishing and managing this online presence and customer connection.

Creative roles: that focus on producing products for the end-user.

- Web Developers build and maintain websites.
- Copywriters produce advertisements for a range of media types.

- Social Media Managers use excellent verbal and writing skills to manage your organisation's entire social media presence.
- UX Designer (User Experience) control how a user interacts with a product or service through a website or app.

Education and Training

As detailed in the IT Jobs and Skills in Wales Feature published in February, The ICT steering group's report to the Welsh Government in 2018 highlighted the need for Digital Skills to become a core subject in education. It's challenging for education providers to keep up with the fast pace of technological change and ensure that the new supply of skills from education is relevant and current. Education and learning providers are embracing the challenge and

' will seamlessly integrate digital technology into delivery; and encourage innovation in using inclusive, accessible and bilingual approaches to enhance the learner's experience. ……. providers will equip learners and staff with the digital capabilities and confidence they will need to succeed in everyday life and in work.' Digital 2030

Conclusion

A key message of the Welsh Government's report into digital innovation and the future of work was that:

'…over the next decade, digital technologies will result in both job displacement and creation, but of even greater significance is its impact on how we experience work.'

This feature has focused on the fast pace of digital technologies, the opportunities, risks and the urgency of adoption to keep up to date, relevant and competitive as businesses, industries and individuals. However, keeping in mind the generic soft employability skills that employers also need,

"it's not just about computers. It's about people."
Lee Waters AM, 2021 Digital strategy for Wales

In Careers Wales, we are keeping our customers informed and up to date about the digital economy to create Brighter Futures for the people of Wales by

- Keeping people switched on to learning
- Encouraging people not to close down opportunities too early
- Broadening horizons and challenging inaccurate assumptions
- Creating relevant experiences and exposure to the world of work
- Contributing to improved education, economic and social outcomes
- Providing up-to-date careers information, specific to various industries

We continue to welcome feedback on the relevance of the data and key messages included in this bulletin. Please send your feedback to information@careerswales.gov.wales.