Skills Development Scotland

Reskilling and upskilling in an ecommerce context

An international review and recommendations

Contents

Executive Summary

This research was commissioned by Skills Development Scotland (SDS) on behalf of the Digital Technologies Skills Group to undertake a review of international best practice in upskilling and reskilling of the workforce. The review has been undertaken in an ecommerce context to understand what can be learned and applied to other parts of digital technology skills development, as well as to ecommerce skills development. This research forms part of a wider digital technology upskilling and reskilling work package and will be used to inform the actions of this workstream.

Ecommerce is used as the context for this report because it is an important sector in Scotland, and this report is an opportunity to learn from how other countries have approached developing skills in ecommerce. Global ecommerce is a vast business area still growing at pace and like other parts of technology requires agility to be factored into any upskilling and reskilling approaches.

This report was produced by INDEZ Ltd as the lead contractor of a consortium which included ScotlandIS, Scotland Food & Drink, CodeClan and Edinburgh University as well with input from Emil Stickland ecommerce specialist and consultant, Gillian Crawford: ecommerce specialist and vice chair of British Association of Women Entrepreneurs (BAWE) and Colin Donald: Technical/business writer with special interest in ecommerce.

Further information on ecommerce is available on the www.instituteecommerce.com website.

Ecommerce Skills Demand

The research also identified a specific demand for ecommerce upskilling and reskilling interventions in Scotland. All the Scottish commerce companies contacted for this study claimed to suffer from the unavailability of appropriately skilled personnel and identified a specific gap in upskilling and reskilling interventions for ecommerce in Scotland. Difficulties in recruiting staff were also reported to be holding back growth and development.

These missing skills impact every level of the business from operators in niche areas of the business through to ecommerce managers, executives and business owners. The larger and more experienced the ecommerce business was, the more likely it was to advocate the need for better training interventions

Allied to the upskilling and reskilling issue is that during this research it was identified that there are currently no standalone college or university courses and no apprenticeship schemes specific to/titled ecommerce on offer in Scotland. Ecommerce skills will feature in other business and technology courses, and there are offerings such as the Modern Apprenticeship in Digital Marketing. The situation contrasts with other nations. In China for example, around a third of all universities run courses in ecommerce while successful online companies such as Alibaba offer extensive reskilling and upskilling training programmes. In Germany, there is now a national plan to deliver one-year and three-year ecommerce apprenticeships. Whilst this is in part out with the scope of this study it is recommended this issue is taken forward, and some of the information in this report will be of assistance.

Recommendations

Based on the international review this report recommends that a broad and scalable set of reskilling and upskilling activities are made available to Scottish businesses. A twin-track strategy involving a combination of both reskilling and upskilling is most likely to create a critical mass.

The proposed plan recommends the following:

1. Gathering statistics on the current level of upskilling and reskilling interventions to provide a baseline to monitor improvement.

2. Gathering case studies from successful practitioners who have benefited from upskilling and reskilling opportunities and communicating these across a wide range of channels from social media through to print media, radio, TV and events.

3. Providing an online platform where businesses can access online upskilling and reskilling resources.

4. Providing various reskilling and upskilling courses at a variety of levels and seek a mechanism for providing qualifications. Over time, it is expected that these courses will increasingly be delivered online as computer-based training.

5. In other countries ecommerce apprenticeships have been identified as a useful reskilling/upskilling tool for the existing workforce and could be promoted more widely as such. For ecommerce further research should be undertaken to confirm the demand for an ecommerce apprenticeship in Scotland.

6. Businesses will often have a good understanding of existing formal and informal upskilling and reskilling opportunities, and what works and doesn't work, and they should be supported to share these.

7. Upskilling and reskilling should be blended into existing events and conference and offered as a series of specialist workshops.

1. Introduction

This research was commissioned by Skills Development Scotland (SDS) on behalf of the Digital Technologies Skills Group, to review best practice in upskilling and reskilling the workforce and inform thinking about how this could be applied in a Scottish setting.

Using selected geographical comparators, the review aims to identify areas of best practice that can be applied to skills development both in an ecommerce, and wider digital skills development context. This research forms part of a wider digital technology upskilling and reskilling work package and will be used to inform the actions of this workstream.

Ecommerce has been used as the context for this research as it is an important subsector of Digital Technology in Scotland. Much can be learned about how other countries have approached developing skills in ecommerce. Global ecommerce is a vast business area still growing at substantial pace and like other parts of technology requires agility to be factored into any upskilling and reskilling approaches.

This report was produced by INDEZ Ltd as the lead contractor of a consortium which included ScotlandIS, Scotland's Food & Drink, CodeClan and Edinburgh University as well with input from Emil Stickland ecommerce specialist and consultant, Gillian Crawford: commerce specialist and vice chair of British Association of Women Entrepreneurs (BAWE) and Colin Donald: Technical/business writer with special interest in ecommerce.

Context

Technology jobs are important to Scotland and SDS commissioned research estimates that Scotland has around 13,000[1] tech job opportunities each year. Many of the individuals who fill these jobs will come through traditional and normally full-time career pathways from college, university and apprenticeships. There have been significant efforts by education to ensure that these courses are producing high quality and industry relevant graduates.[2]

At the same time and driven by technology the world of work is changing, and the impact of this digital revolution is no longer consigned to technology companies, but across all sectors as increasing types of business are harnessing the benefits of technology to drive innovation and increase competitiveness. The evolution of sectors such as digi-health, advanced manufacturing and fin-tech means we are seeing increasing numbers of existing jobs evolving to either technology jobs, or jobs involve which involve a significant element of technology.

The Digital Skills Technology Group is keen to understand how best to support employers to help their current workforce to be re-trained for these emerging job roles. For this reason, SDS on behalf of the Digital Technologies Skills Group has established an Upskilling and Reskilling Workstream who are exploring this area.

Definition of Ecommerce

It is acknowledged there a variety of ecommerce definitions. For the purposes of this report the Organisation for Economic Co-operation and Development (OECD) definition for ecommerce[3] has been used. This definition has been adopted by Governments and their agencies in most of the major economies. It is:

"the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. The goods or services are ordered by those methods, but the payment and the ultimate delivery of the goods or services do not have to be conducted online. An ecommerce transaction can be between enterprises, households, individuals, governments, and other public or private organisations. To be included are orders made over the web, extranet or electronic data interchange. The type is defined by the method of placing the order. To be excluded are orders made by telephone calls, facsimile or manually typed e-mail."

Research Aim

This study sought to:

- Review the different types of skills training for reskilling and upskilling both within the UK and internationally

- Identify recommendations for a Scotland-wide plan for reskilling and upskilling in digital technology, as well as in ecommerce

The research will help ensure Scotland provides the most appropriate levels of skills training for people at different levels within an organisation while ensuring equality of training and opportunity for those wishing to enter and improve within the industry.

Research Objectives

This study explored how the challenge of upskilling and reskilling individuals, and meeting ecommerce skills needs is tackled globally, specifically in:

- **United Kingdom (UK)**
- **China**
- **Germany**
- **United States of America (USA)**

These four locations were selected by the consortium for review based on ecommerce business activity and skills provision.

The purpose of this research was to clarify what methods have been used to develop skills and how effective they have been in meeting the needs of each of these markets.

Taking a global perspective, the report reviews how other successful nations have confronted this task of adjusting to the realities of digitally-enabled trade and considers how successful they have been. It uses evidence and international best practice to make recommendations for SDS to review, and which could inform an ambitious and scalable national plan to ensure that Scotland participates as it should, and must, to take part in this new commercial-industrial revolution.

As well as considering geographical comparators, the report also considers skills development through a sectoral lens, with a special focus on the Food & Drink sector. At a Scottish level, the Food & Drink example is pertinent given that:

- Food and Drink is a priority sector in Scotland and represents a disproportionately high percentage of the SME businesses base compared to other parts of the UK.

- Food and Drink products are subject to a unique set of rules, regulations, packaging requirements, taxes, duties and restrictions that apply only within the sector.

Study Method

The study was carried out in six stages, detailed in Figure 1.1 below.

Report Structure

The remainder of the report is structured as follows:

- **Chapter 2: Context**
- **Chapter 3: International Comparison - Reskilling**
- **Chapter 4: International Comparison - Upskilling**
- **Chapter 5: A Focus on Food and Drink**
- **Chapter 6: Conclusions and Recommendations**

The consortium benefited from international expertise within the research team which enabled a number of international sources to be reviewed. Consequently some of the data sources which are referenced include a range of overseas materials.

The following appendix follows the main report:

- **Appendix A: Demand for Ecommerce Skills**

Figure 1.1: Study Method

Study Inception	Desk Based Review	Stakeholder Consultation (7)	Industry Consultation (8)	Synthesise Research Findings	Production of Final Report

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1   www.skillsdevelopmentscotland.co.uk/media/43306/scotlands-digital-technologies-summary-report.pdf
2   For example Digital Skills Partnership which works with industry to inform college and university curriculum https://digitalskillspartnership.scot/
3   https://stats.oecd.org/glossary/detail.asp?ID=4721

2. Context

To contextualise the business environment in which reskilling and upskilling interventions have been analysed, this chapter provides background information on ecommerce. This chapter includes:

- Background
- Drivers of growth
- UK context
- Ecommerce skills
- Demand for ecommerce skills
- Equality

Background

During the 18th Century, Scotland was central to the Industrial Revolution, which involved a new approach to economics[4] inspired by the writings of Adam Smith and by new technology largely driven by engineers such as James Watt. The world was transformed, and Scotland led the way[5].

As the first usable steam engines were built, those who understood the implications and potential of this technology acted to reskill themselves to imitate and compete with the technology leaders. Much of that reskilling took place by working alongside the original pioneers. The approach was practical, hands-on and practitioner-led. Once reskilled, the new generation of machine-builders continually refreshed their knowledge and capacity so that they and their businesses could compete and prosper.

Today, the ability to apply digital technologies effectively defines leading nations, companies and individuals. The creation of wealth through business demands an ability to trade successfully, and ecommerce is how today's trade is increasingly conducted.

The goal of the Scottish Government, stated in Scotland's Trade and Investment Strategy (2016-2021) is to "support more businesses to sell more goods and services to a wider range of international markets" . In today's world, capacity in ecommerce is essential to achieving that aim.[6]

It should be stressed that ecommerce is highly disruptive to traditional jobs and industries. This can be seen most obviously in the UK's so-called "disappearing high-streets" as retail units in many towns and cities lie vacant as shoppers move online. As entire supply chains become digitalised, the need for retraining interventions to promote participation in this new economic landscape becomes paramount. The ubiquity of online trade means that businesses of all sizes and types can benefit from understanding the methodologies now driving global commerce. Individuals at all levels from operators to owners and from managers to workers and apprentices require training if they are to contribute effectively.

The Scottish Government's Digital Strategy advocates excellence in all areas of the digital landscape combined with a strong emphasis on an inclusive approach for all segments of society[7]. Ensuring that all groups have access to the right type of reskilling and upskilling training interventions is vitally important to ensuring that no group is left economically excluded:

According to Kate Forbes MSP, the Scottish Government's Minister responsible for the Digital Economy:
"As there are nearly 13,000 digital and tech jobs.......a focus on diversity and inclusion is vital to plug that skills gap. Scotland's Apprenticeship family of offerings ensures we nurture the right talent, both in terms of professional skills and supporting our drive to promote equality in Scotland"[8].

Drivers of Growth

The main drivers of the exponential rise of ecommerce are as follows:

1. Online customers can purchase what they want from anywhere with an internet connection and get their products delivered directly, saving both time and money.

2. Product search and product filtering, makes it quicker and easier for buyers to find what they want from a much larger selection than could be stocked offline.

3. In the retail environment of 25 years ago, many traditional retailers expected to see profit margins on goods at between 40% and 100%, sometimes more. Since then, average margins have dropped by more than half[9].

4. Ecommerce suppliers have numerous cost advantages over bricks-and-mortar counterparts. While rent, rates and tax rates will have an impact, the main reason for the cost advantage is that, compared to traditional trade, ecommerce businesses have much higher productivity levels.

5. While traditional traders use manual processes throughout most of their operations, ecommerce businesses make extensive use of automation.

Ecommerce is not untested, overly-complex, cost-heavy or high-risk. While the key drivers for its successful technological implementation involve automation, artificial intelligence (AI) and use of 'big data', its practical expression can, with appropriate training, be implemented well by most of businesses. The techniques underpinning ecommerce can be applied to large companies, medium-sized companies, SMEs, micro businesses and start-ups. In this context 'successful implementation' means 'no more than providing a positive return on investment.

Further automation and use of AI are set to transform the nature of work and the workplace itself. Machines will carry out more of the tasks currently undertaken by workers, complementing the work that only humans can do, as well as performing tasks that go beyond human capability. This shift will see some occupations decline while others will grow. What seems beyond doubt is that many traditional work patterns will be transformed, and that the pace of change will itself increase.

UK Ecommerce Landscape

Ecommerce increasingly underpins all aspects of trade which in turn sustains Scotland's national capacity to create wealth, jobs and exports.

In the UK alone web-based sales total over £560 billion and grew by 21% in 2017 from the previous year. The UK dominates European online trade and, globally, the UK is third after China and the US in ecommerce sales.

Worldwide retail ecommerce is estimated to be worth over US$6 trillion by 2021. Ecommerce synthesises the latest advances in cloud computing, AI, big-data and business process engineering to build complete automated businesses. This wide mix of component technologies and processes is brought together to transact products online. Possession of well-built systems and well-trained staff commonly result in improved productivity and often lead a business to focus on exporting.

Most of the tools, techniques, processes and mechanisms that underpin ecommerce are held in common, irrespective of what is being sold or the size of the business. This means that the set of skills that support successful ecommerce are mostly generic and can be applied in other technology jobs and sectors. These skills are required at all levels within businesses from those involved in niche technical activities through to managers, executives, business owners and business advisors.

Changes in UK Retail Employment

There can be no doubt that ecommerce is hugely disruptive of traditional business patterns. Most noticeable has been the sharp reduction in traditional retail outlets in the UK. In 2018, as many as 1,267 retail stores closed[10].

In 2017 there were 2.9 million people employed in traditional retail across the UK[11]. In January 2019, the British Retail Consortium announced that just in the previous three months of 2018, the seasonally-adjusted number of employees in the retail sector fell by 2.2%. That amounts to 70,000 fewer people than the previous year. The total hours worked fell by 2.8%. Most of the jobs lost were those of frontline staff involved with sales[12].

Online and offline retail are entirely different areas. Each uses different supply chains, marketing channels, tools and approaches to marketing and sales conversion as well as different mechanisms for fulfilment. What both approaches have in common however is that each requires people with appropriate skills.

An important point that is sometimes overlooked when considering the number of jobs involved in ecommerce is the size and performance of the sector as a whole. While it is true that online businesses achieve higher productivity than traditional high-street businesses, they often operate in different markets. With some exceptions, a traditional high street business can only sell products to people who walk into their physical shop. Many online businesses can sell products all around the world. Cross-border ecommerce trade is now one of the fastest growing online sectors[13].

Were we to compare an offline with an online business then each might have a comparable number of staff, but the online company may well have a considerably greater reach and customer base.

Successful online business requires many inputs from skilled people. The actual premises where the ecommerce business is based may only be staffed with a few people. However, that company is likely to be making use of hosting companies, ecommerce marketing companies, content specialists, conversion-rate specialists as well as all those involved in fulfilment, returns or third-party warehousing. The workforce may be distributed, and the questions asked in employment surveys could lead to incorrect conclusions about the numbers of people needed to ensure the smooth running of the business.

4 The Wealth of Nations, Adam Smith, Published by W. Strahan & T. Cadell, Edinburgh & London, 1776
5 The Scottish Enlightenment: Scotland's Invention of the Modern World, Arthur Herman, new edition 2002.
6 https://www2.gov.scot/Resource/0050/00504798.pdf
7 https://www.gov.scot/publications/realising-scotlands-full-potential-digital-world-digital-strategy-scotland/pages/13/
8 https://futurescot.com/apprenticeships-importance-technology-industry/kate-forbes-digital-skills/
9 https://www.drapersonline.com/news/margins-under-pressure-as-black-friday-discounting-deepens/7033235.article

10 https://www.telegraph.co.uk/business/0/1300-retail-store-closures-counting-tracking-high-streets-miserable/
11 https://www.retaileconomics.co.uk/library-retail-stats-and-facts
12 https://www.bbc.co.uk/news/business-46975278
13 https://www.dhl.com/content/dam/downloads/g0/press/publication/g0_dhl_express_cross_border_ecommerce_21st_century_spice_trade.pdf

Ecommerce Skills

Most ecommerce businesses require a range of individuals with a wide range of skills. One important missing skillset can cause an entire business to fail. These skills exist at a range of different levels from vision to strategy, planning, operational implementation and various essential but niche tasks. Above all else, each of these require to be joined-up if a business is to achieve its full potential.

Table 2.1 below, provides a rough segmentation of the different sets of skills needed for different parts of an ecommerce business.

A micro-ecommerce business could be a start-up or a completely new business operation within an existing mature business. In these micro businesses, single individuals are likely to carry many, if not all the responsibilities listed in the above table. These small businesses are usually heavily reliant on the skills of their partner or supplier organisations. Choosing the right supplier organisation is often a matter of selecting one with the skills that are appropriate to the client's particular phase of growth. The supplier is only useful while their skills are greater than those of the client.

Table 2.1: Responsibilities and Skills

Role	Responsibility and Skills
Business Advisors	Broad general understanding of the subject combined with extensive case study knowledge and supplier understanding. Above all else, advisors must have a solid grasp of ecommerce feasibility based on market demand coupled with marketing costs and channel conversion.
Business Owners	Understanding of the financial dynamics around ecommerce along with where opportunities lie and which suppliers/staff to deploy.
Key Directors	Deep understanding of the Measurement, KPIs and main drivers for their area of responsibility along with best practice and innovation.
Ecommerce Managers	Day-to-day operations management combined with integration and automation and supplier relations. Core activity is the overall optimisation of both marketing and conversion.
In-house Ecommerce Team Members	Deep technical knowledge and skills about their specific ecommerce platform and how their part should operate to achieve optimum performance. Fluency with relevant tools and, where relevant, customer service.
Outsourced Specialists	Niche competences usually in technical, marketing or design work. It is essential that outsourced specialists use team-related tools (e.g. Git, Jira, etc) and that they operate with precise specifications and standards.

Considerations for Upskilling and Reskilling in Ecommerce

Aptitude testing
Technology job opportunities will not be suitable for everyone, so screening potential up/reskilling candidates should play a part with all course selection processes when identifying individuals who could be up/reskilled. The same is true for recruitment. For example, numerous attempts have been made to optimise the recruitment of people who are suited to work in ecommerce.

Selecting Skills Suppliers
In most practical situations, the best available skills lie within the ecommerce services supply community[14]. Businesses employ these companies to design and develop an ecommerce platform or to maintain and support an existing one. These ecommerce supply companies often have staff with many years of practical experience working with real, rapidly-growing ecommerce businesses. Staff often carry numerous qualifications for niche skills such as Google accreditations or Magento certification.

Because these specialists often work on a wide variety of projects, they achieve a far wider perspective than those focused on a single system. This broad knowledge allows them to provide advice based on practical and up-to-date experience[15].

A significant downside of using ecommerce service suppliers for skills provision is that imparting knowledge is not usually their primary role[16]. The main purpose of engaging a service supplier is usually to undertake work on programming, design and ecommerce marketing.

The associated skills transfer to upskill a business is usually made on an ad hoc basis. A good proactive supplier will say "I think you should do x".

The client business will want to know why, and the ensuing dialogue may well be classed as 'upskilling' by the client and 'sales' by the supplier. This only works when a relationship of trust exists between the parties and that trust is based on improved ecommerce performance such as increased sales.

Most formal skills suppliers in technical subjects fall into two main categories:

- **Academic Suppliers -** The key differentiators for this group are trust and independence. Academic researchers follow the time-honoured scientific method[17] based on empirical observation and rigorous scepticism. Peer pressure and professionalism help preserve these. Further, academics are often well skilled in communication and teaching. In ecommerce, these positives are balanced by the problems around academic partners' lack of up-to-date technical and market knowledge.

- **Commercial Suppliers -** The key differentiators for this group are that they are, by necessity, up-to-date with cutting-edge technology and business practice. They usually hold the data that informs them exactly what "works" and why.

Demand for Ecommerce Skills

The research also identified a specific demand for ecommerce upskilling and reskilling interventions in Scotland informed by consultation with six recruitment agencies and eight commerce businesses located in Scotland.

All the Scottish commerce companies contacted for this study claimed to suffer from the unavailability of appropriately skilled personnel and identified a gap in upskilling and reskilling interventions for ecommerce in Scotland (Appendix A).

In addition, difficulties in recruiting staff were holding back growth and development. These missing skills impact every level of the business from operators in niche areas of the business through to ecommerce managers, executives and business owners. The larger and more experienced the ecommerce business was, the more likely it was to advocate better training interventions

Equality within Upskilling/Reskilling

It is important that any up/reskilling strategy is inclusive and considers how individuals from diverse backgrounds can be trained to access new technology job roles. In the Scottish technology workforce women are under-represented and as part of Tackling the Technology Gender Gap[18] are a key priority for the Digital Technologies Skills Group.

Gender
Ecommerce is one of the most flexible, low-risk and low-barriers-to-entry business models that exists today. This makes it particularly suitable to those that have experienced barriers to work including women. There is also a potential role for ecommerce to play in closing the gender enterprise gap[19] – a key objective of the Scottish Government, which has brought together the various women's enterprise groups in Scotland to develop policy under the umbrella of the Scottish Framework and Action Plan for Women in Enterprise.

According to research by Strathclyde Business School, the main obstacles facing the development and growth of

women-led businesses fall into three categories – money, markets and management.

Several organisations, including Women's Enterprise Scotland and the British Association of Women Entrepreneurs (Scotland) are working to close the gender enterprise gap, most significantly in the form of the Women in Enterprise Action Group[20] established in 2014 by the Scottish Government to promote female entrepreneurship by focusing on mentoring, networking, role models, finance, skills development and support.

Barriers that can be minimised by ecommerce include, but are not limited to:

- Lower levels of capitalisation and a lack of access to finance.
- The propensity for women-owned businesses to be run from the home
- Issues around childcare and flexible working
- Lower levels of full-time employees in women-led businesses
- The concentration of women's enterprise in "traditionally female sectors"

Wider Equality within Ecommerce
Remploy which is an organisation in the United Kingdom which provides employment placement services for disabled people, estimates that between 3% and 5% of people they work with could be suited to being re-skilled for a career in ecommerce. This would equate to around 800 people across the UK and around 60-70 people across Scotland.

One of the key characteristics highlighted is that, for certain types of job, remote working is not an issue. Remploy expressed an interest in becoming involved in a reskilling project involving the people they support back into work.

14 https://econsultancy.com/small-business-ecommerce-a-beginner-s-guide-to-supplier-selection/

15 https://www.bigcommerce.co.uk/blog/ecommerce-marketing/

16 https://www.marketing-schools.org/types-of-marketing/e-commerce-marketing.html

17 https://en.wikipedia.org/wiki/Scientific_method

18 https://www.skillsdevelopmentscotland.co.uk/media/42478/tackling-the-technology-gender-gap-together-2.pdf

19 https://www.wescotland.co.uk

20 https://www.gov.scot/publications/scottish-framework-action-plan-women-enterprise/

3. International Comparisons-Reskilling

Reskilling can be defined as *"the process of learning new skills so you can do a different job"[22]*. Reskilling often applies to those caught up in a major shift in the type of work they have previously done through personal circumstances. Examples might include service personnel leaving the army or former sports people wanting to move into business.

Another impetus to reskilling is where a skilled person has been doing a job that has been transformed because of the introduction of new technology. Examples might include a high-street shop sales assistant who has been asked to look after some aspect of the shop's online sales activity.

The key point about reskilling is that it is part of a process that results in achieving a completely different skill set.

The research reviewed the approach in four different countries to determine what reskilling activities take place, and lessons learned which can be applied to the wider Digital Technologies sector in Scotland. Each of the countries are reviewed in turn.

UK

Background
The UK Government Department for International Trade (DIT) was approached for information about their reskilling interventions in support of ecommerce skills provision and their feedback has informed this section.

In Scotland whilst there is no ecommerce apprenticeship there are aligned frameworks containing elements of ecommerce. The most relevant are Digital Applications Modern Apprenticeship which includes digital marketing and website development and publishing, and the Digital Marketing Modern Apprenticeship which includes elements such as search engine optimisation and digital analytics.

Promotional messaging about these frameworks do identify that they can be for existing staff and for individuals aged 25+. Similarly, Scottish universities offer provision in courses such as Digital Marketing but not in ecommerce specifically.

Further and Higher Education Provision
The research identified ecommerce courses being taught as complete subjects, examples include:

- MSc in Ecommerce at the University of Wales[23]
- Technologies for Ecommerce at Liverpool University[24]

More commonly, ecommerce forms a component part of academic programmes. Universities in the UK lead the development of individual programmes and courses are based on demand and a market for certain programmes.

In England there are a variety of providers that offer ecommerce degree programmes in some form, whether as part of a degree or as the main focus of the programme. Often these branded as 'Digital Business' to 'Digital Marketing' to 'Business Computing 'ebusiness' courses.

Work-Based Learning
Another approach to solving the reskilling issue in ecommerce is through apprenticeship programmes, either delivered via the public sector or discreetly within larger organisations.

Within large companies such as Amazon or the Hut Group, the apprenticeship model can be self-contained. These large companies already have strong and highly-skilled people working inside their own teams. They can bring people from other professions or parts of the business into these teams and then use their own internal resources to undertake the necessary training to support apprentices.

In addition, Amazon are offering their own apprenticeships in ecommerce and two in every ten new apprenticeships will be offered to Amazon's existing workforce as a means of up/reskilling staff and providing a route from working on the shop-floor.

Wider Support
In addition to further/higher education and work-based learning, the UK also provides a range of wider support initiatives to support the reskilling of the labour market. These include:

- Commercially available training opportunities e.g. Magento, AdWords or Google Analytics

- Public Sector support such as: CodeClan (see Case Study) and Business Gateway Digital Boost Ecommerce workshops[25] (aimed at starts-ups, micro and SME businesses). The aim of the programme is to assist companies in assessing the benefits of digital upskilling for them. It offers a Digital health checks, training, guides, tutorials and one-to-one advice and consultancy at no charge to the businesses

Case Study: CodeClan

CodeClan[26] is a SQA-accredited digital skills academy launched in October 2015 providing digital technical skills courses for reskilling through full-time and short-term courses. CodeClan has the support of The Scottish Government, SDS, SQA as well as ScotlandIS.

It was created specifically to address the skills shortages in the digital sector. CodeClan provides a unique immersive software development courses that helps trainees accelerate their career into tech roles within the growing digital tech economy. The aim is to train and reskill a new generation of programmers, delivering high-quality, job-ready, entry level developers to the industry throughout Scotland.

CodeClan's experience in developing software digital courses means that graduates gain practical skills while learning, gain confidence in their abilities, contribute within a team environment and most significantly are better prepared to be employable within the digital technical job market.

In 2018, CodeClan launched a new Industry Partner Programme[27], which enables businesses to have access to CodeClan students and events to allow employers a better understanding of a student's skills set, career goals and capabilities, hence reducing the business risk of a recruit not being suitable or leaving after a short period. It acts as an additional layer of insurance to the business and reassures the graduate that they are valued before they start working for them. By working closely with the business, CodeClan can customise the skills needed in the course by being flexible and adapting to the needs of both the graduate and the business to achieve a 'win-win' solution.

Up to 90% of CodeClan graduates looking for work go into employment within six months of graduating and to-date, CodeClan has trained and helped place 489 graduates however it has been recognised that Scottish Tech graduates demonstrate the need for practical learning to secure jobs[28]. Securing and finding a job after University can be difficult, competitive and ultimately demoralising. Be-IT[29] a recruitment company did a survey and found that 32% of graduates still had not (yet) found a job in related computing/IT job, or not working in IT/computing at all.

22 https://dictionary.cambridge.org/dictionary/english/reskilling
23 https://digital.ucas.com/courses/details?coursePrimaryId=de67cbc4-361f-143d-5acb-bbb27a50d027&academicYearId=2018
24 https://intranet.csc.liv.ac.uk/teaching/modules/module.php?code=COMP315

25 https://www.bgateway.com/resources/digitalboost
26 https://codeclan.com
27 https://codeclan.com/for-employers/become-a-partner/
28 https://codeclan.com/blog/scottish-tech-grads-demonstrate-the-need-for-practical-learning-in-order-to-secure-jobs/
29 https://www.be-it.co.uk

Background

Government policy is the key factor when exploring both reskilling and upskilling in ecommerce because of the centrally-directed nature of the Chinese political system. For over two decades, the Chinese Government and its agencies have encouraged ecommerce including providing various policies for upskilling and reskilling. Beijing has been providing ecommerce support for over two decades, with the China International Electronic Commerce Centre (CIECC) established in 1996[30].

Ecommerce has been included in several key strategic areas of Chinese economic policy-making. These include references in relation to broader economic development policies such as the Belt and Road initiative[31] as well as more specific policies such as the "13th Five-year Development Plan for Ecommerce[32].

This broad approach to ecommerce means that the distinctions between upskilling and reskilling are often more blurred than they are in the UK, and policies often allow for both to be considered at once.

Public Sector Support

The comparator review focused on the Chinese Government's Internet Plus initiative, and the Ministry of Commerce's subsequent Internet + Circulation Action Plan. These directly address how and where ecommerce skills and training should take place[33] and the Ecommerce "13th Five-Year" development plan provides an overview of what will take place in the coming years.

Internet Plus and Internet + Circulation Action Plan

On February 4th, 2015 China unveiled Internet Plus[34]. At the announcement, Premier Li Keqiang set out how China would integrate technologies such as mobile internet, cloud computing and big data into modern manufacturing with the specific goal of encouraging ecommerce[35].

While this is a broad policy, it was later built on by the Ministry of Commerce to include specific ecommerce skills in the Internet + Circulation Action Plan.

The purpose of the action plan is to focus on encouraging ecommerce in the following[36]:

1. Rural areas
2. Small and medium-sized cities
3. The wider community
4. Online and offline interaction
5. Cross-border ecommerce

Training was given as one of the main areas of focus, as it is viewed as a starting point to achieve ecommerce success.

Internet + Circulation Action Plan does not break the subject down into reskilling and upskilling, largely because these policies are focused on a broader approach, rather than simply looking at training. However, it is clear how each of these areas might relate to upskilling and reskilling.

The above five areas of focus can be related to either reskilling or upskilling in the following way:

1. Rural areas are focused on reskilling, as the economy moves either directly from farming to ecommerce, or via manufacturing.

2. Companies in small and medium sized cities are likely to benefit more from upskilling, as they will typically have some skills, but perhaps not to the level of counterparts in larger cities such as Shanghai.

3. The wider community relates to supporting industries, such as logistics companies or payment service providers (PSPs). For example, a logistics company may be reskilled on how to deal with ecommerce-ordered parcels.

4. Online and offline interaction is more about reskilling also, as bricks-and-mortar stores learn to offer more digitally connected ways of shopping, and online companies move into highstreet retail[37].

5. The promotion of cross-border ecommerce is more about upskilling, as to sell products overseas, most companies would aim to have existing ecommerce operations within China.

One key element of the Internet + Circulation Action Plan was to guide the localities to set up 50 ecommerce training bases to provide specialised courses for 500,000 people in ecommerce knowledge and skills within two years[38]. This in turn was an extension of a previous policy by the Ministry of Commerce which set up 15 ecommerce talent training branches training 85,000 students in total[39].

As of January 2017, 50,000 students had received training through the most recent provisions[40]. The latest figures have not been published at the time of writing.

These training bases differ based on their location, and the needs of people and businesses in the surrounding areas. For example, in more rural areas, such as villages in Guangdong, Anhui and other similar provinces, these policies actively support online sales of "one product of one village" policies. In these programmes, corporate companies often engage with rural enterprises to make best use of village resources[41], In so doing, companies and training bases are reskilling the rural workforce to engage in ecommerce. These policies have attracted people back to these rural areas as they can run businesses online because of being reskilled.

China's "13th Five-year Development Plan for Ecommerce"

The "13th Five-year development plan" is relatively recent, being issued in January 2017. While many of the points outlined in the development plan have not had the chance to be implemented, it is worth noting the direction in which policy towards ecommerce is moving.

The most relevant section of the 13th Five-Year plan for reskilling is the provision of ecommerce training to promote employment and entrepreneurship, with the ultimate goal on poverty alleviation[42]. Due to the high demand for ecommerce jobs, and the salaries that can be achieved in China (which are high for the ecommerce sector), reskilling the workforce provides an opportunity to move people from a position of relative poverty, to one of skilled employment.

This is particularly important for rural China, and this policy presents a significant opportunity for Scotland to learn from China. The Chinese Government has pushed hard to speed up the development of the internet infrastructure in rural areas[43], as Scotland has in the Highlands and Islands. China is now shifting its focus from infrastructure to how the rural population can best take advantage of that infrastructure. Reskilling rural populations is an important part of maintaining communities and lifting the population out of poverty, as It means that the rural population no longer needs to move to cities to start ecommerce businesses.

30 http://ciecc.ec.com.cn/en_about/events.shtml
31 http://www.chinadaily.com.cn/business/4thwic/2017-12/05/content_35216123.htm
32 http://images.mofcom.gov.cn/pep/201505/20150515135515086.doc
33 http://dzsws.mofcom.gov.cn/article/zcfb/201505/20150500972952.shtml
34 http://english.gov.cn/policies/latest_releases/2015/07/04/content_281475140165588.htm
35 http://english.gov.cn/premier/news/2015/03/13/content_281475070887811.htm

36 http://img.apec-ecba.org/file/20170324/14051490338867855.pdf
37 https://www.weforum.org/agenda/2018/09/five-trends-shaping-the-future-of-ecommerce-in-china/
38 http://dzsws.mofcom.gov.cn/article/zcfb/201505/20150500972952.shtml
39 http://img.apec-ecba.org/file/20170324/14051490338867855.pdf
40 http://english.mofcom.gov.cn/article/zt_businessreview2016/news/201704/20170402558884.shtml
41 http://images.mofcom.gov.cn/pep/201505/20150515135515086.doc
42 http://images.ipraction.gov.cn/www/201701/20170103121326919.pdf
43 https://cnnic.com.cn/IDR/ReportDownloads/201807/P020180711391069195909.pdf

Background

Reskilling courses (Umschulung) in general have been a part of the German skills development system for a long time. They aim to help people in long term unemployment due to illness, injury or low demand for their existing skills back into the labour market. Financial support to pay for the training and living costs is available through job centres.[44]

Depending on the provider, reskilling is delivered in the following ways:

- In a classroom setting (sometimes combined with online and blended learning) with work placements for practical learning[45], or

- Through work-based learning in businesses, with some teaching in classroom settings[46] (like an apprenticeship model for school leavers).

Further and Higher Education Provision

A range of higher and further education reskilling courses are available within Germany, these courses mainly focus on the commercial, management and marketing aspects of B2C ecommerce. Ecommerce-specific digital technology skills are only covered to the extent that students can communicate with and manage suppliers or internal development staff effectively.

Germany is relatively new to ecommerce skills training, offering a vocational qualification "Management assistant in ecommerce" (Kauffrau/Kaufmann im Ecommerce) in 2018, with the first cohort having started in August 2018, detailed in the case study on this page.

Two examples of higher education provision are provided below and opposite:

Skills Provider	EMBA - Europaeische Medien - und Business Akademie[47]
Name of Course	Digital Business Management (Ecommerce und Digital Retail Management)
Target Group	Students
Time Period	3 years
Certification	B.A.
Content	• Planning and conception of online websites • Logistic processes of online shops • Challenges of Trade logistics • Adaptations of processes according to customer needs • Impact of design & functionality of online shops on customer • Background in digital online shop systems • Online Marketing • Online Supply Chain Management • Online regulations and laws • Data management • Development and implementation of concepts and business models for digital trade
Job Opportunities	Digital Experts and Business Managers in: • Online Trade • Logistics • Retail • Online Marketing • Food and Drink Companies
Link	https://www.emba-medienakademie.de/studienangebote/business-40/e-commerce-und-digital-retail-management/

Case Study: Kauffrau/Kaufmann im Ecommerce

The qualification has been developed due to demand from ecommerce businesses and the wider retail and trade sector, including tourism and food and drink retailers. The development process first started in 2012. The lengthy process was due to extensive coordination process with trade unions, federal ministries for economy and justice, and education ministries in all the 16 states and within the business sectors concerned.

This vocational course has been designed for school leavers as well as those looking to reskill. Entry requirements for reskilling courses vary by provider, but usually candidates must have completed a vocational qualification or need to have a certain number of years of work experience (1-3 years). Additionally, some providers require English and/or IT skills or prior experience in a related profession. Reskilling is provided by specialised private sector providers, and usually takes place over two years.

This new framework is likely to have a positive impact on the development and growth of the ecommerce sector in Germany due to it filling a skills gap identified by employers.

Prior to the introduction of this qualification, many ecommerce businesses were unable to take on ecommerce apprentices, even through existing retail apprenticeship frameworks. Businesses providing apprenticeships in Germany need a certain number of staff with relevant qualifications and need to be able to provide training for all aspects of the apprenticeship framework. Since traditional retail apprenticeship frameworks are very focused on physical shops and their management, ecommerce businesses often lost out. The new qualification therefore allows ecommerce businesses to develop their own staff through a supported apprenticeship framework.

Skills Provider	Akademie Handel[48]
Name of Course	Dual Graduate Programme Ecommerce
Target Group	High School Graduates
Time Period	34 months
Certification	Business administrator in Ecommerce
Content	• Conception and development of goods and service assortments • Assessment, use and development of ecommerce distribution channels • Management of online portals and online shops as well as procurement support • Use of instruments of commercial control and control in ecommerce • Design of the interfaces with other distribution channels • Assessment and selection of communication channels, design of internal and external communication • Preparation and implementation of measures of online marketing • Initiation and processing of online goods and service contracts • Assessment and use of various payment systems • Compliance with legal provisions in ecommerce • Application of project-oriented working methods in ecommerce
Job Opportunities	Online-Businesses (Companies, Trade, Tourism, IT, Marketing)
Link	https://www.akademie-handel.de/weiterbildung/abiturientenprogramme-fuer-firmen/ http://kompass-abiturienten.de/ecommerce/
Effectiveness	Starting in September 2019

Work-Based Learning

Germany addresses the lack of ecommerce skills via a combination of apprenticeship employment into companies with day-release courses where the apprentices receive group training. This is mostly carried out, in the first instance as a reskilling exercise. The longer (3-year) ecommerce apprenticeships then involve an intensive programme of upskilling to ensure that students are kept up-to-date with fast-moving developments. This 'day release' training is carried out by specialist training centres and colleges.

Official statistics show that 62% of ecommerce apprentices were male and 38% female (out of 1284 who had started by the end of September 2018). This is a higher proportion of women than in more digital technology focused apprenticeships (e.g. 8% for information technology specialists) but lower than for the "Management assistant in retail" with 50% female apprentices.[49]

Wider Support

In addition to courses provided through formal education pathways, there are a variety of courses that exist for people who already have work experience and would like to gain more ecommerce-related skills. They differ considerably in length, level and skills provided and do not usually lead to an officially recognised qualification. However, they provide workers and employers with a quick and targeted way to both reskill and upskill, compared to apprenticeships and higher education courses.

For example, the chambers of commerce, industry bodies and job centres all offer a range of courses in Germany. During the research undertaken for this report, hundreds of ecommerce focused provision was identified, covering all aspects of ecommerce.

These courses are aimed at people who already have some work experience but who are not necessarily in an ecommerce related environment. Many course providers indicate that their courses are suitable for those wanting to both upskill and reskill. These courses are usually eligible through job centres, with the aid of education vouchers, and are aimed at people who are unemployed or at risk of it.

Most courses are provided by private providers who specialise in upskilling and reskilling courses. Typically, providers work with lecturers and trainers who have industry experience. Some courses, especially those preparing for management positions in ecommerce, are delivered with or by higher education institutions.

44 https://www.beruf.me/umschulung.php
45 http://www.app2job.de/kurs-umschulung-kaufmann-frau-ecommerce-ihk-6-2/
46 https://www.bfz.de/seminardatenbank/sammel/arbeitnehmer/weiterqualifizieren/5246/4/0/
47 https://www.emba-medienakademie.de/studienangebote/business-40/ecommerce-und-digital-retail-management/
48 https://www.akademie-handel.de/weiterbildung/abiturientenprogramme-fuer-firmen/
49 https://www.bibb.de/dokumente/pdf/naa309_2018_tab67_0bund.pdf

Background
In the United States of America (USA), the entry point into ecommerce reskilling is invariably social media. The prevalence of social media in the US - home of Facebook, Twitter, YouTube, SnapChat and Whatsapp - means that digital marketing is an important element of the B2C ecommerce experience.

As much as 64.18% of Americans are active monthly social network users and 30% of online shoppers say they would be likely to make a purchase from a social media network like Facebook, Pinterest, Instagram, Twitter or Snapchat[50]. Amongst online shoppers, 23% are influenced by social media recommendations and 84% of online shoppers in the US review at least one social media site before making a purchase. Of social media platforms, Facebook, which owns Instagram and WhatsApp, is by far the most important. Some 85% of orders from social media sites come from Facebook[51].

Further and Higher Education
The USA academic sector does offer numerous ecommerce-related courses, two examples are provided opposite:

Skills Provider	University of North Texas (UNT)[52]
Name of Course	Digital Retailing
Target Group	Students
Certification	B.A.
Content	UNT's Digital Retailing program is unique among U.S. universities. Through an interdisciplinary approach and innovative curriculum, you'll learn about merchandising processes, marketing, consumer segments and design architecture in digital channels. You'll also hone your analytical and computer skills. Learning opportunities in the program extend beyond the classroom. The Dallas Study Tour provides you with access to leading omnichannel retail businesses for on-site lectures and tours. In the Merchant Development Program, students are mentored by industry executives and shadow them on the job. There are also oversea study abroad programs in Hong Kong, China and Europe and offer courses to study the Silicon Valley, San Francisco and New York markets. The Global Digital Retailing Research Centre hosts educational events and offers competitive industry-financed grants for student research. • Consumer behaviour in digital and omnichannel environments • Effective merchandising and marketing practices in digital and omnichannel environments • How to build, maintain and manage an online store using industry leading ecommerce platforms • How to evaluate product attributes, web analytics, pricing strategies, digital marketing, and web site navigation and categorization • Processes involved in digital business
Job Opportunities	• ecommerce manager • Project manager • Search engine optimization/search engine marketing manager • Site merchandiser • Social media manager • Usability and A/B testing specialist • Web analytics specialist
Link	https://www.unt.edu/pais/insert/udrtl.htm

Skills Provider	BCIT School of Business California[53]
Name of Course	Ecommerce
Target Group	• Computer familiarity (web browsers, spreadsheets, word processors) • Interested in building your own online business or ecommerce site for your employer • Interested in pursuing further training to enhance your future career • To begin with a solid foundation of ecommerce principles
Time Period	8 online courses Flexible training with in-person and online courses
Certification	BCIT certificate
Content	Discover the key aspects of how ecommerce affects and works within businesses. Through this program you'll explore how technology is changing global commerce and creating new opportunities. Each course in this associate certificate program is taught by industry professionals to be sure you get the most current information and skills, including internet law, ecommerce systems, and customer relationship management. By earning your associate certificate, you'll be prepared for a career in ecommerce with the knowledge, context, and analytical insights for conducting business using information technology and the internet.
Job Opportunities	• Ecommerce business • Further certificates: Web and Mobile application development, Applied Web Development
Link	https://www.bcit.ca/study/programs/5975acert

Wider Support
Because of the expansion of social media, a plethora of social media marketers has emerged. Many sell physical products in their ecommerce shops and recycle the knowledge gained through ecommerce by selling courses.

The 'superstar' ecommerce marketers with large social media followings can attract visitors to large scale conferences and events.

The UK events company Clarion has taken note of this development and has recently purchased the annual Traffic and Conversion Summit (currently held in San Diego, California) with plans to deliver the event in Europe and Asia.

The cost of such courses can vary dramatically, from a few hundred to several thousand dollars for around 10 hours of content. The quality of the courses also varies.

50 https://www.statista.com/chart/14043/top-10-online-stores-in-the-us/

51 https://www.disruptiveadvertising.com/ppc/ecommerce/2018-ecommerce-statistics/

52 https://www.unt.edu/pais/insert/udrtl.htm

53 https://www.bcit.ca/study/programs/5975acert

4.   International Comparisons - Upskilling

Upskilling is defined as *"Teaching (an employee) additional skills and expanding their capabilities"*[54].

Upskilling differs from reskilling in that it is largely about building on existing skills rather than learning new ones. Many claim that upskilling can reduce costs while improving productivity[55].

In a rapidly changing area of technology such as ecommerce it is almost taken as read that all those involved will be undertaking some form of continuous training or improvement. This is essential to keeping up to speed with the skills required to perform a job effectively and efficiently. Upskilling is often a key part of any productivity improvement plan[56].

It has been estimated that the cost to an average business of losing a skilled young employee was to be around $25,000[57]. When the costs of interviewing, hiring and training a replacement employee are added, the cost can be over $35,000. Replacing staff is expensive so it invariably makes more sense to invest in upskilling.

The Australian Government's Productivity Commission has concluded that Upskilling and its associated retraining programmes are central to improving productivity[58]. Their report claims that upskilling also reduces workforce vulnerability and leads to improved job satisfaction. The report found no evidence that upskilling staff led to them being more likely to use their upskilled qualifications to leave for another job.

Upskilling can involve a mix of components including:

1. Peer learning where a work colleague will help and assist a worker to learn a new skill.

2. Using the web to research and learn about a new topic. Videos and webinars can assist.

3. Using structured computer-based training that can lead to a qualification e.g. Google University[59].

4. Attending a traditional course that can also lead to a qualification.

5. Attending work specialism-relevant events, workshops and seminars.

Commercial Training
Upskilling in ecommerce across the UK is largely covered by online training from commercial suppliers. The training providers usually limit their training to the narrow set of functionalities defined by their own commercial products. Examples include:

*   Magento Upskilling[60]
*   Shopify Upskilling[61]
*   Analytics Upskilling[62]
*   Ecommerce Personalisation upskilling[63]
*   Warehousing upskilling[64]
*   Many other examples.

These courses may be suitable if the attendee is looking for a specific form of upskilling, for example, wanting to become a Magento developer. However, this focus on a single platform or service, means that those taking the course are limited.

Commercially focused training also tends to focus on much more complex forms of upskilling, because the content is geared towards becoming an expert in a particular area. While this isn't necessarily a negative, it does mean that there is a gap in the provision for people who want to upskill in a more general sense. They often aim to sell the product as the ideal solution, rather than provide information to inform decision making.

A few of the commercial companies offer upskilling around broader topics. Examples include:

*   Econsultancy[65]
*   London Marketing Company[66]
*   LinkedIn[67]
*   ACS[68]

Although broader in their focus, these courses also offer a "one-size-fits-all" approach. As these courses are typically short (only a few days), this may not provide enough depth to make business specific decisions.

There are several challenges associated with commercial delivery of ecommerce upskilling:

*   Many of the companies providing training are not based in the UK. This, therefore, has the potential to ignore country specific nuances, such as catering to particular industries.

*   Commercially-led courses often avoid any screening or selection processes designed to ensure that the course is suitable for the attendees.

*   There is no clear framework for establishing the relationship between the provision of skills and the outcomes. In ecommerce, those outcomes should be those involving improved business performance such as increased sales or increased productivity or increased profits.

54 https://en.oxforddictionaries.com/definition/upskill
55 https://www.simplilearn.com/ways-upskilling-will-cut-costs-boosts-productivity-article
56 https://businesspartnermagazine.com/upskilling-team-improve-productivity/
57 https://www.huffingtonpost.com/julie-kantor/high-turnover-costs-way-more-than-you-think_b_9197238.html
58 https://www.pc.gov.au/inquiries/completed/productivity-review/report/productivity-review-supporting8.pdf
59 https://www.geolearning.com
60 https://u.magento.com/
61 https://www.shopify.com/become-a-partner
62 https://analytics.google.com/analytics/academy/

63 http://pages.nosto.com/AI-training-series.html
64 https://www.sap.com/uk/products/extended-warehouse-management/training.html
65 https://econsultancy.com/upcoming/region-UK/cat-25-ecommerce/month-20190501%3A20190531/
66 https://londonmarketingacademy.com/ecommerce-course/
67 https://www.linkedin.com/learning/topics/ecommerce-development
68 https://www.acsedu.co.uk/Courses/Information-Technology/ECOMMERCE-BIT100-401.aspx
69 https://www.emarketer.com/content/retail-and-ecommerce-sales-in-china-2018
70 China Daily.com https://bit.ly/2SF6nlA

Case Study: Alibaba and Education

In the same way eBay and Amazon are the "go-to" destinations for ecommerce in the US and Europe, Taobao and Tmall fulfil that role in China. They are, however, both owned by a single company - Alibaba. These two companies accounted for 58.2% of all Chinese ecommerce sales in 2018[69], not to mention Alibaba's other companies which include a host of other ecommerce-related services.

This dominance by a single company is important to note as it is heavily involved in the provision of skills. This is particularly true in relation to upskilling its own workforce or those using the Alibaba platforms.

As Alibaba has grown, it has become more involved with the education of the next generation of ecommerce professionals. To do so, Alibaba has partnered with a broad spectrum of key stakeholders, from the UN to various universities. This has given rise to several initiatives aimed at upskilling both Alibaba employees as well as those not employed by the group.

There is a distinction here, between its own workforce and those using the Alibaba platforms. It is in Alibaba's commercial interest to make it as easy as possible for people and businesses using its platforms, i.e. those selling products on the likes of Tmall and Taobao. Therefore, Alibaba provides training on how sellers can use their platforms. The technical aspect of operating a platform is almost always best provided by the business itself. In the western world; Google, Amazon, Magento and Shopify all provide courses on how to operate their respective platforms. There is no lack of provision for this type of upskilling.

In training its own workforce in ecommerce methodology rather than how to operate ecommerce technology, Alibaba is doing something that SMEs are unable to do. SMEs do not have the skills or funds to be able to provide their staff with this type of upskilling. This is why, as previously mentioned, policy-makers in China are looking to engage with companies who do have that knowledge in order that it can be used to benefit the wider economy.

Alibaba's involvement in education is broad, and many of the programmes they run for their own employees or platforms are focused on upskilling. This focus is likely due to the skills gap that exists between skills being taught and those required by Alibaba. However, this knowledge, with the aid of policy, is spilling into the wider economy.

Alibaba also announced in July 2018 that it will launch a Global Ecommerce Talent Network in collaboration with universities and training providers to cultivate ecommerce professionals for China and the economies of the Association of Southeast Asians Nations.

Alibaba's Global Ecommerce Talent Network
The training network builds on Alibaba's Global Ecommerce Talent programme, which has so far trained nearly 7,000 students and about 2,000 SME owners, covering 10 countries around the globe, according to figures provided by company.

A wide range of domestic and overseas colleges have joined the new alliance, including the University of International Business and Economics, Northwestern Polytechnical University, the Harbin Institute of Technology, Thailand-based University of the Thai Chamber of Commerce, and MARA University of Technology in Malaysia.

The company will work with the Beijing-based University of International Business and Economics to design the curriculum and create ecommerce talent training standards.

The alliance will also expand China's training standards and curriculum to overseas colleges, to develop talents' familiarity with Chinese ecommerce models and boost the local digital economy.

According to a survey by Alibaba[70], 53 % of suppliers in Malaysia are seeking ecommerce talents to support their businesses, compared to 43% of those in Vietnam.

Public Sector Support

As with reskilling, Chinese Government policy also covers the upskilling of the workforce. This is most evident in the aforementioned training bases. In urban areas, these training bases provide skills training focused around the upskilling of the existing workforce as opposed to providing people with a completely new set of skills as they do in rural areas.

Examples include those in Liaoning, Shanxi and similar provinces, where ecommerce upskilling is arranged for staff within the commercial departments of SMEs and micro businesses. The goal here is to improve the survival rate and quality of these SMEs[71].

These businesses may already possess some skills in ecommerce and may already be trading. However, the training is specifically tailored to provide skills that enable businesses to make the most of opportunities available through ecommerce. International trade is one area that is mentioned specifically as an area of focus and seen as an opportunity[72]. Training is clearly having a positive effect, as in 2018, 39% of the top sellers on Amazon Europe (Spain, Italy, France, UK, and Germany) were based in China[73]. If this percentage hold globally, then Amazon alone accounts for an added $68bn in revenue going into the Chinese economy.

Another area of note is the focus on the role companies will play in the development of ecommerce training. The government hopes to bring together multiple types of ecommerce business in areas such as talent training, business incubation, and other ecommerce services[74] to do this. There are several examples of this happening already, the largest of which is Alibaba (see previous page).

Further and Higher Education

While Germany does not currently have any government-supported upskilling provision for ecommerce, there is a plan to launch a vocational qualification for a "Certified expert in ecommerce" (Ecommerce Fachwirt/in) in summer 2019. Its development is aligned with the qualification for the Assistant Manager in Ecommerce with the "certified expert in ecommerce" being the next level in the qualification framework for this profession.

The "Certified expert in ecommerce" qualification is aimed at people with a relevant existing qualification and work experience who want to upskill and acquire the skills for the next step in their career. To be considered for this course candidates are required to have:[75]

• Completed a vocational qualification at level 4 of the German Qualification Framework (such as the apprenticeship for ecommerce manager) in a retail or commercial sector + one year of ecommerce related work experience OR
• Completed a vocational qualification at level 4 of the German Qualification Framework in another sector + two years of ecommerce related work experience OR
• Gained 90 ECTS[76] credit points in business management higher education courses + two years of ecommerce related work experience

As these courses are yet to start, there is limited information about how they will be provided. However, upskilling courses of this nature are usually provided by the same specialised private sector providers that deliver reskilling courses described above. They can be completed full-time (3-12 months) or part-time (13-18 months)[77] and are delivered in a classroom setting or through online learning.[78]

The general purpose of the qualification is to provide skills for ecommerce managers.[79] As with the assistant ecommerce manager qualification, it will be focused on ecommerce management, commercial and marketing. They will not include complex technical skills related to ecommerce. The German Retail Association is involved in the development of the qualification framework and has suggested the inclusion of the following skills[80]:

• Strategic development of ecommerce
• Development and use of cross-departmental interfaces
• Designing the range of goods and services as well as controlling purchasing in national and international markets
• Analysing and assessing the effects of changes in customer wishes and behaviour as well as trade-relevant developments and responding with appropriate plans and actions
• Implementation and evaluation of concepts for online marketing and integration of online marketing into the overall strategy of the company
• Controlling ecommerce sales by means of key figures and based on the analyses of consumer behaviour
• Implementation of customer and innovation orientation in all work and business processes
• Design and evaluation of business processes and projects
• Staff management and promotion of their professional development
• Organisation and implementation of vocational training
• Implementation of changes to work and organisational processes
• Implementation of quality management and promotion of sustainability in online trade

Private sector courses

As with reskilling, there are several private sector businesses which offer upskilling in ecommerce. The courses available vary considerably in content, length (one day to several months) and level. Candidates who complete the courses usually receive a certificate.

Courses provided usually do not have formal entry requirements, apart from sufficient digital skills. Higher level upskilling courses indicate that they are aimed at people with a certain level of experience, but candidates usually self-select and there is no formal candidate selection process.

These upskilling courses can cost several thousand Euros and employers are often covering part or all of the costs for their employees.

Private Sector Courses

While the USA offers relatively little in the ecommerce reskilling market, the opposite is true for the upskilling market. The US dominates the market for the software systems, platforms, technologies and extensions used throughout ecommerce. With each of these digital products, the developers invariably offer high quality online training packages. These are usually available directly from the developers' website that links through to video channels such as YouTube. Alternatively, there are specialist training platforms such as Lynda which has recently been integrated into LinkedIn.

A recent search of the Lynda channel on LinkedIn showed 1,721 courses available on ecommerce. For WooCommerce and Shopify there are 29 courses for each and 90 for Magento. For a new business wanting to learn about an ecommerce platform it is difficult to determine which course(s) are appropriate.

The US has the largest ecommerce upskilling market in the world. By way of example, information was collected from the Magento Certification Directory[81] database to determine the distribution of Magento II Solütion Providers worldwide (Figure 4.1).

Solution Providers are upskilling from being Magento II programmers. Ukraine and India are countries with good education systems that emphasise maths and IT within their education systems. They are now ecommerce outsourcing hotspots that target countries such as the UK that currently have a skills gap. A similar pattern of upskilling behaviour using computer-based training is seen across a wide range of other software systems.

Figure 4.1: Magento II Solution Providers Worldwide (27 March 2019)

USA	23.4%
UK	10.6%
Ukraine	9.4%
Netherlands	8%
India	7.7%
Germany	5.6%
Poland	4.0%
Canada	3.4%
Australia	2.6%
Sweden	1.6%
Spain	1.6%
France	1.6%
Latvia	1.4%
Italy	1.4%
Finland	1.4%
Russia	1.3%

Data collected from magento.com on 27th March 2019

71 http://img.apec-ecba.org/file/20170324/14051490338867855.pdf
72 http://img.apec-ecba.org/file/20170324/14051490338867855.pdf
73 https://www.marketplacepulse.com/marketplaces-year-in-review-2018#chinasellers
74 http://images.mofcom.gov.cn/pep/201505/20150515135515086.doc

75 https://einzelhandel.de/images/publikationen/Branchenreport_Arbeitgeber_2016.pdf , p. 20.
76 https://en.wikipedia.org/wiki/European_Credit_Transfer_and_Accumulation_System
77 https://berufenet.arbeitsagentur.de/berufenet/faces/index?path=null/suchergebnisse/kurzbeschreibung/
78 https://berufenet.arbeitsagentur.de/berufenet/faces/index;BERUFENETJSESSIONID

79 https://www.bevh.org/politik/arbeitspolitik-und-fachkraefte.html
80 Translated list from p. 19/20, https://einzelhandel.de/images/publikationen/Branchenreport_Arbeitgeber_2016.pdf
81 https://u.magento.com/certification/directory

5. A Focus on Food and Drink

Although ecommerce activity underpins many sectors, the research has focused on Food and Drink because of the scale of the opportunity and the way in which ecommerce is changing business models within the sector. This case study shows how demand for skills is changing within the sector, the increasingly important role of ecommerce skills and the approach taken to developing these skills in other countries.

Online sales of groceries grew by 13% globally in the 12 months ending June 2018 and now account for 6.3% of all fast-moving consumer goods (FMCG) sales worldwide according to consumer insights company Kantar Worldpanel. This compares with a 1.6% increase in total FMCG (online and offline) sales though the figure represents the slowest ecommerce growth rate in five years.

The Changing Nature of the Sector

Evolving business models
From a global perspective, ecommerce business models are in varying stages of development, with many European retailers offering a full basket model, Tesco has pioneered a home delivery model in the United Kingdom, and such online retailers in China as Alibaba and JD are aggressively expanding their grocery footprints.

According to General Mills, one of the world's largest packaged grocery companies, the pace of change in grocery ecommerce is accelerating; the company is building real-time analytics using algorithms and machine learning to enable a quick and improved consumer experience.

Smaller Food and Drink producers face unique challenges when selling online and transporting their goods round the world. Online grocery isn't just the most capital intensive in ecommerce, it's also one of the most regulated.

Rules regarding food safety are myriad and can differ markedly between countries, even within the same trading block. Inventory planning, demand forecasting, and cold storage logistics are all complicated in the ecommerce industry. Cold chain logistics remains a problem for exporters targeting Thailand, Vietnam, the Philippines and Indonesia. Online delivery of fresh or chilled products isn't yet practical in many markets around the world.

Technology
With the advent of new technologies around the world, a new era in the Food industry is beginning. Known as the era of intelligent production (also referred to as Industry 4.0) in which physical production merges with the possibilities of digitisation to form cyber-physical systems. As one of the drivers in the food chain, digitisation could lead to a new revolution in the food industry.

By connecting real devices and machines with networks, the internet and digitisation enables the development of novel intelligent products and services. For example, in Europe the use of big data grows by 40% annually[82].

Automation and Artificial Intelligence
Digitisation and automation will all have a significant impact on the food industry in the future as they promise better service, cost savings or reductions, fewer errors, higher productivity and product quality and more. The introduction of new technologies in the food industry will change the role of workers.

Employees need to learn how to work in the new environment, and the demand for well-educated and ambitious employees will increase.

Employees will require problem-solving skills, creativity, teamworking and social intelligence. Retraining and qualification programmes will be important in helping workers change to new roles and take on new jobs. The manufacturing sector will create new careers and job descriptions, and digitisation will even be perceived as promoting the food industry as an attractive workplace, thereby strengthening the recruitment of young and talented people.

International Approaches to Skills Development

A selection of international approaches to ecommerce skills development in the Food and Drink sector are outlined below:

- Australia - The Western Australian government hosted an ecommerce food innovation event. The event involved a series of training workshop aimed at encouraging cross-border online trade[83].

- Japan - the Government established a fisheries ecommerce platform focused on helping to develop costal economy by creating a fair and transparent fisheries trade through technology innovation[84].

- Scotland - Within Scotland there are several programmes underway in the Food and Drink sector that support companies to develop ecommerce expertise, for example the Scottish Government-backed Scotland Food & Drink / Asda Food & Drink Academy Supplier Development Programme[85].

In addition, there is support for the development of ecommerce partners in Scotland; the ecommerce platforms or hubs that can understand the unique challenges of selling and delivering food and alcohol across multiple territories. This coordinated and collaborative programme, working with retailers, producers, industry bodies, higher education and professional service companies has proved a successful and unique model for Scotland in the past 10 years.

- USA - The US Government supports ecommerce export activities in the Food and Drink industry (and other industries) through its Ecommerce Innovation Lab. The support equips companies with basic ecommerce skills and signposts to Service Providers Directory which represents all aspects of the sales process such as Digital Marketing, Cyber Security, and Online Payments.

Summary

Ecommerce is increasing in importance to the Food and Drink sector globally and there are clearly many different component factors at work in this complex area.

There is an increasing demand for higher level skills which is already having an impact on the sector's labour market. The comparator review for relating to Food and Drink highlighted the varying stage of development. China is influencing the future labour market via public policy whilst large private companies in the US are leading the way.

82 Poutanen K, Nordlund E, Paasi J, Vehmas K, Ĺkerman M. Food Economy 4.0 - VTTs Vision einer Ära der intelligenten verbraucherorientierten Lebensmittelproduktion; 2017.

83 https://www.agric.wa.gov.au/newsletters/fii/food-industry-innovation-%E2%94%82december-2018-%E2%94

84 https://aruna.id/

85 https://corporate.asda.com/newsroom/2016/01/01/asda-scottish-supplier-development-academy-launched-by-cabinet-secretary

6.   Recommendations

It is recommended a broad and scalable set of reskilling and upskilling activities are made available to Scottish businesses. It is suggested a twin-track strategy involving a combination of both reskilling and upskilling is most likely to create a critical mass.

The proposed plan recommends the following:

1.   Gathering statistics on the current level of upskilling and reskilling interventions to provide a baseline to monitor improvement. For example, for ecommerce this would be to identify which companies in Scotland currently sell online, in what volumes and to which territories. Over time, these figures will provide the skills-building project with key performance indicators (KPIs).

2.   Gathering case studies from successful practitioners who have benefited from upskilling and reskilling opportunities and communicating these across a wide range of channels from social media through to print media, radio, TV and events.

3.   Providing an online platform where businesses can access online upskilling and reskilling resources. For example, in ecommerce this would be to develop an online destination hub for Scotland's ecommerce community covering all aspects of ecommerce including news, training, advice and training resources. A key focus will be content syndication to other websites and resources.

4.   Providing various reskilling and upskilling courses at a variety of levels and seek a mechanism for providing qualifications. Over time, it is expected that these courses will increasingly be delivered online as computer-based training.

5.   In other countries ecommerce apprenticeships have been identified as a useful reskilling/upskilling tool for the existing workforce and could be promoted more widely as such. For ecommerce further research should be undertaken to confirm the demand for an ecommerce apprenticeship in Scotland.

6.   Businesses will often have a good understanding of existing formal and informal upskilling and reskilling opportunities, and what works and doesn't work, and they should be supported to share these. As an example, for ecommerce developing a Scotland wide network of local ecommerce clubs and providing them with structured resources to assist/facilitate self-help knowledge transfer would be considered an effective.

7.   Upskilling and reskilling should be blended into existing events and conference and offered as a series of specialist workshops
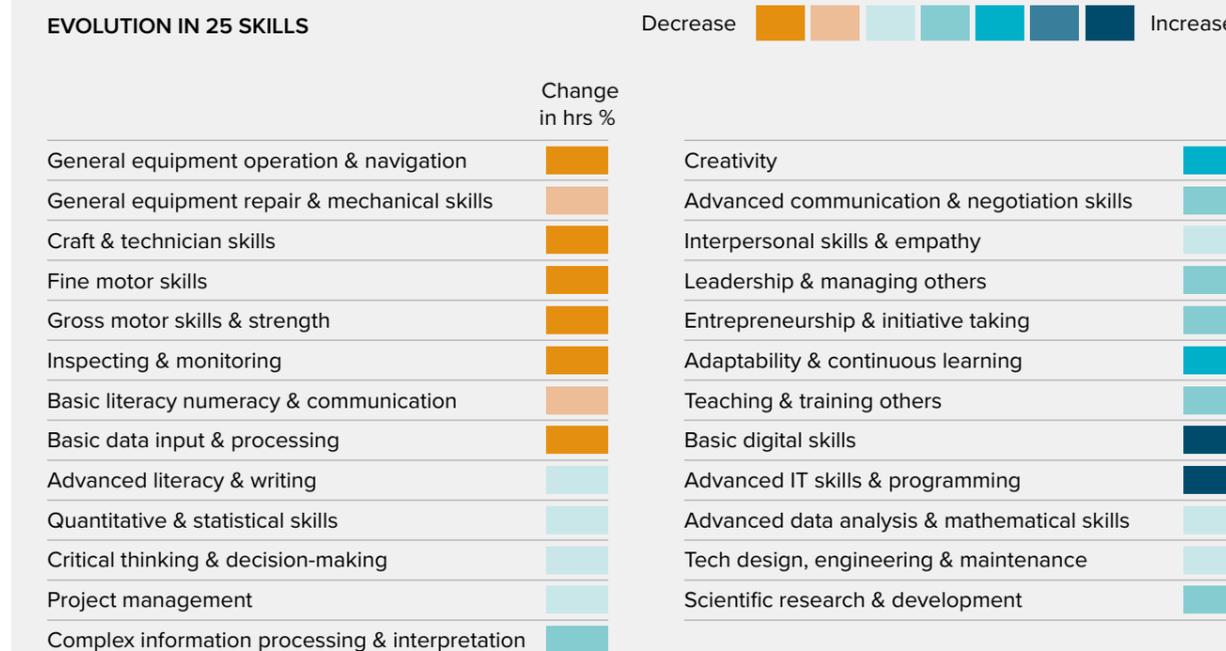
Appendix A: Demand for Ecommerce Skills

Automation will change the required skills of the workforce. According to McKinsey Global Institute, the demand for technological and digital skills will increase by 55%. Demand for social and emotional skills, such as leadership and management is predicted to grow by 24%. Higher cognitive skills will increase moderately, in particular the demand for creativity skills. However, the demand for basic cognitive skills is estimated to decrease by 15% and physical and manual skills by 14% (summarised in Figure B.1).

To help get a better understanding of the challenges around skills and recruitment faced by mature Scottish ecommerce businesses eight companies were consulted with. The companies were chosen randomly from those who attend existing Scottish ecommerce clubs and have reasonably high profile within the local ecommerce community. This research was conducted between 18-28 March 2019. All those companies have a multi-million turnover and have been trading online for at least three years.

Key findings were:

•   All companies faced recruitment challenges when sourcing individuals with ecommerce skills

•   Recruitment activity tends to be resource intensive owing to the lack of suitable candidates

•   There is a lack of applicants with the correct ecommerce skills, often applicants are either lower skilled than required or have marketing skills rather than ecommerce

•   The lack of available talent is having a negative impact on current and future growth of the companies

•   To overcome these challenges, companies reported to either hire staff with skills shortages, make use of agency staff or consultants, or increase salaries to attract applicants from the rest of the UK.

Figure B.1: Future Skills Demand

EVOLUTION IN 25 SKILLS   Decrease [colour scale] Increase

	Change in hrs %			
General equipment operation & navigation	▨	Creativity	▨
General equipment repair & mechanical skills	▨	Advanced communication & negotiation skills	▨
Craft & technician skills	▨	Interpersonal skills & empathy	▨
Fine motor skills	▨	Leadership & managing others	▨
Gross motor skills & strength	▨	Entrepreneurship & initiative taking	▨
Inspecting & monitoring	▨	Adaptability & continuous learning	▨
Basic literacy numeracy & communication	▨	Teaching & training others	▨
Basic data input & processing	▨	Basic digital skills	▨
Advanced literacy & writing	▨	Advanced IT skills & programming	▨
Quantitative & statistical skills	▨	Advanced data analysis & mathematical skills	▨
Critical thinking & decision-making	▨	Tech design, engineering & maintenance	▨
Project management	▨	Scientific research & development	▨
Complex information processing & interpretation	▨		

Courtesy: McKinsey Global Institute 2018