Reskilling and upskilling in an ecommerce context
An international review and recommendations
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 research has been undertaken in an ecommerce context to understand what can be levered 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 ecommerce 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 contractor of a consortium which included ScotlandIS, CodeClan and Edinburgh University as well with input from Ernst & Young. 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 for ecommerce managers, executives and business owners.

Allied to the upskilling and reskilling issues is that during this research it was identified that there are currently no standalone college or university courses and no apprenticeship schemes specific to ecommerce 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 offer courses in ecommerce and there are a wide range of channels from social media through to print media, radio, TV and events which can be used to promote courses. In Germany, there is no standalone college or university courses and no apprenticeship schemes specific to ecommerce 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.

The research also identified a specific demand for an ecommerce apprenticeship as computer-based training.

The research 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.

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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 to meet the needs of 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.
5. 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.
6. Upskilling and reskilling should be blended into existing events and conference and offered as a series of specialist workshops.

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1. Introduction

This research was commissioned by Skills Development Scotland (SDS) on behalf of the Digital Technologies Skills Group, to review the context of upskilling and reskilling the workforce and inform the actions of this workstream. 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 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 the digital economy in Scotland. Much can be learned about how other countries have approached these skills challenges and opportunities. Ecommerce is a vast business area still growing at a substantial pace and like other parts of technology requires agility to be factored into any upskilling and reskilling work.

The report was produced by 3KIZ Ltd on behalf of SDS Commissioned Research Estimates that Scotland has around 20,000 ecommerce jobs, 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 digital health, advanced manufacturing and fintech mean we are seeing increasing numbers of digital technology roles evolving to either technology jobs, or jobs involve which are different types of work.

The Digital Skills Technology Group is keen 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 their 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 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 the placement of the offer. To be excluded are orders made by telephone calls, facsimile or manually typed e-mail.”

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 has been used. This definition has been adopted by Governments and their agencies in most of the major economies. It is:

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Research Aim

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

Research Objectives

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

- UK (United Kingdom)
- 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 the research was to clarify what methods have been used to develop skills and how effective they have been in meeting the skills needs of these ecommerce sectors.

2.1. Context

Technology jobs are important to Scotland and SDS commissioned research estimates that Scotland has around 20,000 ecommerce jobs, with a further 30,000 in related digital technology roles. Every year, huge numbers of individuals fill these jobs, with these roles having a big impact on the economy. Economic growth and job creation depend on businesses being able to innovate and adapt to new technologies and processes. The Digital Skills Technology Group is keen to develop skills and how effective they have been in meeting the needs of each of these markets.

2.2. Definition of Ecommerce

Ecommerce is a vast business area still growing at a substantial pace and like other parts of technology requires agility to be factored into any upskilling and reskilling work.

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2. Context

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

- Background
- Drivers of growth
- UK context
- Equitable participation
- for ecommerce skills
- Equality

Background

During the 18th Century, Scotland was central to the Industrial Revolution, which involved a new approach to technology largely driven by engineers such as James Watt. The world was transformed, and Scotland led by new technology. This chapter includes:

- The Scottish Government’s Digital Strategy advocates on diversity and inclusion is vital to plug that skills gap.
- Possession of well-built systems and well-trained staff processes is brought together to transact products online.
- According to Safe Harbor MSP, the Scottish Government’s Minister responsible for the Digital Economy:

- “In recent years, 30,000 digital and tech jobs sector.”
- “We need a shift in thinking that transforms businesses’ ability to trade is a form of reskilling and upskilling training which reskilling and upskilling interventions have high risks.
- Today, the ability to apply digital technologies effectively defines leading nations, companies and individuals. The
- New generation of machine-builders continually refreshed practical, hands-on and practitioner-led.
- The approach was technology leaders. Much of that reskilling took place by understood the implications and potential of this technology.
- The goal of the Scottish Government, stated in Scotland’s
- There can be no doubt that ecommerce is hugely disruptive to traditional jobs and industries. This can be seen as performing tasks that go beyond human capability.
- Ecommerce is not untested, overly-complex, cost-heavy or high-risk. While the key drivers for ecommerce’s exponential growth are driven by global consumer behavior, and a shift in consumer behavior to online shopping.
- The main drivers of the exponential rise of ecommerce are:

  1. Online customers can purchase what they want from anywhere with an internet connection and get their products delivered, saving both time and money.
  2. Product search and product filtering, making it quicker and easier for buyers to find what they want from a much larger selection than could be stocked offline.

- In the retail environment of 25 years ago, many traditional retailers employed customers to work with customers and therefore 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. 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.

Drivers of Growth

The main drivers of the exponential rise of ecommerce are:

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Responsibility and Skills

A micro-commerce business could start up or be part of a completely new business operation within an existing mature business. In these micro businesses, single individuals are likely to carry many, if not all, of the responsibilities listed in the above table. These roles are usually highly intent on the interests of their partner or supplier organisations. Choosing the right individual to take on these roles can be critical. The skills listed as the same is true for recruitment. For example, numerous attempts have been made on an ad hoc basis. A good proactive supplier will say they are suited to work in ecommerce.

Selecting Skills Suppliers

In most cases, the best available skills will be with the ecommerce supply community. Businesses employing these companies to design and develop an ecommerce platform or to maintain and support on existing one. These ecommerce supply companies often have staff with many years of practical experience working with real, everyday ecommerce businesses. These individuals have the skills that are appropriate to the client's particular phase and scale of business, which suppliers/staff to deploy.

Business Advisors

Understanding of the financial dynamics around ecommerce along with where opportunities lie and which suppliers/staff to deploy. Business Advisors also seek out education and certification based on market demand coupled with marketing costs and channel conversion.

Ecommerce Managers

Day-to-day operations management combined with integration and automation supplier relations. Core activity is the overall optimisation of both marketing and conversion.

In-House Technical Team

Deep technical knowledge and skills about their specific ecommerce platform and how their port should operate to achieve optimal performance. Working with relevant tools and, where relevant, outsourcing specialists.

Table 2.1: Responsibilities and Skills

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibility and Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Advisors</td>
<td>Broad understanding of the subject combined with extensive case study knowledge and experience focused on a single system. This broad knowledge allows them to achieve a far wider perspective than those focused on a niche area. The business advisors help to provide them with advice based on practical and up-to-date experience.</td>
</tr>
<tr>
<td>Business Owners</td>
<td>Understanding of the financial dynamics around ecommerce along with where opportunities lie and which suppliers/staff to deploy.</td>
</tr>
<tr>
<td>Key Directors</td>
<td>Deep understanding of the Measurement, KPIs and main drivers for their area of responsibility along with extensive case study knowledge and experience focused on a single system. This broad knowledge allows them to achieve a far wider perspective than those focused on a niche area.</td>
</tr>
<tr>
<td>Ecommerce Managers</td>
<td>Selecting Skills Suppliers</td>
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<tr>
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</tr>
<tr>
<td>Outsourced Members</td>
<td>Niche specialists usually in technical, marketing or design skills. It is essential that outsourcing specialists use relevant tools (e.g. Git, Jira, etc) and that they operate with precise specifications and standards.</td>
</tr>
</tbody>
</table>

Considerations for Upskilling and Reskilling in Ecommerce

Apiculture testing

Job opportunities will not be suitable for everyone. Some potential upskilling candidates should play a part with a course selection process when identifying individuals who could be upskilled in different areas to the same is true for recruitment. For example, numerous attempts have been made on an ad hoc basis. A good proactive supplier will say they are suited to work in ecommerce.

Academic Suppliers |

The key differentiators for this group are those of skill and independence. Academic researchers follow the ‘time-honoured scientific method’ based on empirical observation and rigorous scepticism. Poor pressure and professional help keep these researchers productive. Further academics are often well skilled in communication and teaching. In ecommerce, these academics are balanced by the problems around academic freedom. academic partners’ lack of up-to-date technical and marketing knowledge.

Commercial Suppliers |

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- Supplier organisations is often a matter of selecting one with the right level of experience. Whether the problems around academic freedom. academic partners’ lack of up-to-date technical and marketing knowledge.

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

The skills that are appropriate to the client's particular phase and scale of business. These small suppliers for skills provision is that imparting knowledge and experience by focusing on mentoring, networking, role models, finance, and market knowledge. These ecommerce supply companies often have staff with many years of practical experience working with real, everyday ecommerce businesses. These individuals have the skills that are appropriate to the client's particular phase and scale of business, which suppliers/staff to deploy.

The concentration of women's enterprise in Scotland is one of the most flexible, low-bar and low-cost barriers to entry in talking about gender equality. It makes it particularly suitable to those that have experienced barriers to working with women. There is also a potential role for ecommerce to play in closing the gender enterprise gap — a key objective of the Scottish Government, which has brought together the various women’s enterprise, ecommerce supply companies often have staff with many years of practical experience working with real, everyday ecommerce businesses. These individuals have the skills that are appropriate to the client's particular phase and scale of business, which suppliers/staff to deploy.

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 remploy project involving the people they support back into work.
3. International Comparisons-Reskilling

Reskilling can be defined as ‘the process of learning new skills so you can do a different job’. Reskilling often refers to those caught up in a major shift in the type of work they have previously done through personal circumstances. Examples might include losing personal learning 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 whether as part of a degree or as the main focus of the academic programmes. Universities in the UK lead the provision and their feedback has informed this section.

3.1 UK

**Work-Based Learning**

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

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 learning and website development and publishing, and Digital Sales 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 upskilling for them. It offers a Digital health checks, training, guides, holidays and one-to-one advice and consultancy at no charge to the businesses.

Further and Higher Education Provision

The research identified ecommerce courses being taught as complete subjects, examples include:

- MS in Ecommerce at the University of Westminster
- Technologies for Ecommerce at Liverpool University

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 programmes, whether as part of a degree or as the main focus of the emerging Digital Technologies sector. Often these branded as ‘Digital Business’ to ‘Business Computing ‘substitution courses.

In Scotland whilst there is no ecommerce apprenticeship courses currently being taught, the Scottish Government Department for International Trade (DIT) was approached for information about their reskilling interventions in support of ecommerce skills. These include:

- Commerically available training opportunities e.g. Magento, AdWords or Google Analytics
- Public Sector support such as CodeClan’s (see Case Study) and Business Gateway Digital Boost programme

3.2 Scotland

In 2018, CodeClan launched a new Industry Partner Programme, 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 measures the graduates 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 4,697 graduates into work. The CodeClan Group, the apprenticeship model can be self-contained.

Professional software development is core to CodeClan’s experience in developing software technology courses means that graduates gain practical skills while being immersed in a real environment, eventually contributing to the field and their skills are in demand.

In addition, Amazon are offering their own apprenticeships in ecommerce and in less than ten new apprenticeships will be offered to Amazon’s existing workforce as a means of upskilling staff and providing a route from working on the shopfloor.

**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:

- Commerically available training opportunities e.g. Magento, AdWords or Google Analytics
- Public Sector support such as CodeClan (see Case Study) and Business Gateway Digital Boost programme

**CodeCase Study**

CodeClan 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, SDS as well as Scotland5.

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

Case Study: CodeClan

CodeClan provides training and support for graduate and non-graduate employees who are looking to become digitally literate and employed within the digital technical job market. In 2018, CodeClan launched a new Industry Partner Programme, 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 measures the graduates 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.

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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 Commerce Centre (CIECC) established in 1996 providing various policies for upskilling and reskilling.

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 as well as more specific policies such as the “13th Five-Year Development Plan for Ecommerce”.

This broad approach to ecommerce means that the decisions taken are likely to be more blurred than they are in the UK, and policies often allow for both to be considered at once. The purpose of the action plan is to focus on encouraging ecommerce in the following:

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

Public Sector Support

The comparator review focused on the Chinese Governments’ Internet Plus initiative, and the Ministry of Commerce’s subsequent Internet + Action Plan. These directly address how and where ecommerce skills and training should take place in the coming years.

Internet + Circulation Action Plan does not break the subject down into reskilling and upskilling, largely because these policies are often closely connected in a business 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 independent online payment service providers (PSPs). For example, a local shop 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 engage in ecommerce. These policies have attracted more digitally connected ways of shopping, and online companies move into high-speed businesses.
5. The promotion of cross-border ecommerce is more about upskilling, as to sell products online businesses online because of being reskilled.

The above five areas of focus are likely to be more blurred than they are in the UK, and policies often allow for both to be considered at once.

China 12

Background

Government policy is the key factor when exploring both reskilling and upskilling in ecommerce because of the centralised 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 public sector support for over two decades, with the China International Electronic Commerce Centre (CIECC) providing training in ecommerce.

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The above five areas of focus are likely to be more blurred than they are in the UK, and policies often allow for both to be considered at once.
The qualification has been developed due to demand from ecommerce businesses and the wider retail and digital sector, including logistics and digital retailers. The development process started in 2012. The lengthy process was due to extensive coordination with trade unions and ministries for economy and justice, and education ministries for all the states and within the business sectors concerned.

This vocational course has been designed for school leavers as well as those looking to re-enter the labour market. The minimum requirements for retraining courses vary by provider, but generally require candidates to have completed a vocational qualification or need to have a certain number of years of work experience. Additionally, some providers require English and/or IT skills or prior experience in a related profession. Retraining 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, and helps to fill a skills gap identified by employers. Prior to the introduction of this qualification, many ecommerce businesses were unable to take on ecommerce apprentices, even though existing retail apprenticeship frameworks. Businesses providing apprenticeships in ecommerce 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 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.

**Certification:** Business administrator in ecommerce

**Content:**
- Design and implementation of ecommerce systems
- Data management
- Online regulations and laws
- Challenges of Trade logistics
- Assessment and use of various payment methods
- Application of project-oriented working methods in ecommerce
- Assessment and selection of distribution channels
- Use of instruments of commercial support
- Assessment and use of various payment methods
- Initiative and processing of online marketing via social media
- Additional measures in ecommerce
- Legal provisions in ecommerce

**Target Group:**
- The qualification is suitable for those wanting to develop a career in the ecommerce sector or those who want 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, contributing to apprenticeships and higher education courses.

**Opportunities:**
- In a classroom setting (sometimes combined with online and blended learning) with work placements for practical learning.
- Through work-based learning in businesses, with some level of involvement provided by employers.

**Wide 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 offer considerable 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, contributing to apprenticeships and higher education courses.

For example, the chambers of commerce, industry associations and job centres are actively involved in courses in Germany. During the research undertaken for this report, hundreds of courses were identified, covering all aspects of ecommerce.

These courses are aimed at people who already have some experience of ecommerce but 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 aimed at workers who are either unemployed or at risk of it.

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

Background:
The University of North Texas (UNT) offers a unitary e-commerce program, which is unique among U.S. universities. Through an interdisciplinary approach, it provides students with the knowledge and skills needed to understand and work within businesses affected by e-commerce. The program is designed to equip students with the technical and business skills necessary to succeed in the fast-paced and ever-changing world of e-commerce.

Target Group:
- Students
- Professional development programs and continuing education courses

Skills Provider: University of North Texas (UNT)

Name of Course: Digital Retailing

Certification: B.A.

Content:
- UNT's Digital Retailing program is unique among U.S. universities. Through an interdisciplinary approach, students learn about e-commerce-related courses, two examples are provided:
  - How to build, maintain, and manage an online store using industry leading e-commerce platforms
  - How to evaluate product attributes, web analytics, pricing strategies, digital marketing, and website navigation and categorization

JOb Opportunities:
- Ecommerce manager
- Project manager
- Search engine optimization/search engine marketing manager
- Site merchant
- Social media manager
- Visual merchandising specialist
- Web analytics specialist

Link: [https://www.unt.edu/pais/insert/udrtl.htm](https://www.unt.edu/pais/insert/udrtl.htm)

Skills Provider: BCIT School of Business California

Name of Course: Ecommerce

Certification: BCIT certificate

Content:
- The BCIT School of Business in California offers an 8 online course certificate in Ecommerce. The courses cover a variety of topics, including:
  - Consumer behaviour in digital and omnichannel environments
  - How to evaluate product attributes, web analytics, pricing strategies, digital marketing, and website navigation and categorization

Job Opportunities:
- Ecommerce business
- Social media manager
- Visual merchandising specialist
- Web analytics specialist

Link: [https://www.bcit.ca/study/programs/5975acert](https://www.bcit.ca/study/programs/5975acert)

Further and Higher Education:
The USA academic sector does offer numerous Further and Higher Education (FE) options in the field of e-commerce. Some examples include:
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  - Further certificates: Web and Mobile application development, Applied Web Development
  - Currently the company Clarion has taken note of this growth trend and has recently purchased the annual Traffic and Conversion Summit (previously 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.

Skills Provider: BOC School of Business California

Name of Course: Ecommerce

Certification: BOC certificate

Content:
- TO begin with, the course is designed to:
  - Help students understand how technology is changing global commerce and creating new opportunities.
  - By earning your associate certificate, you'll be prepared for a career in e-commerce with the knowledge, skills, and the framework to make data-driven decisions.

Job Opportunities:
- Ecommerce business
- Social media manager
- Visual merchandising specialist
- Web analytics specialist

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Upskilling is defined as “Teaching an employee additional skills and expanding their capabilities”.

Upskilling differs from reskilling in that it is largely about building on existing skills, while reskilling requires learning new ones. Many claim that upskilling can reduce costs while improving productivity. In a rapidly changing area of technology such as ecommerce, the business of losing a skilled young employee was to be effectively and efficiently. Upskilling is often a key part of retraining programmes to help employees to keep their current job or find 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 skill.
3. Using structured computer-based training that can lead to a qualification e.g. Google University.
4. Attending a traditional course that can also lead to a qualification.
5. Attending work relevant events, workshops and seminars.

The Australian Government’s Productivity Commission has concluded that upskilling and its associated retraining programmes are cost-effective for employees.

Commercial Training

Upskilling in ecommerce across the UK is largely covered by online training from commercial suppliers. The training providers usually specify the narrow set of capabilities defined by their own commercial interest. Examples include:
- Magento Upskilling
- Shopify Upskilling
- Ecommerce Personalisation upskilling
- Many others. 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.

Commercials focused upskilling also tend to focus on reskilling. There are a number of forms of upskilling, depending on what content is geared towards becoming an expert in a particular area. With the rise of product-as-a-service, it means that there is a gap in the provision for people who want to upskill in a more general area. They often sell the product as the ideal solution, rather than how to operate ecommerce technology, Alibaba provides training on how sellers can use their own platforms. Therefore, although broader in their focus, these courses also ignore country specific nuances, such as catering to particular industry verticals.

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 do not have the skills or funds to be able to provide their own workforce with the knowledge they need to succeed on the Tmall and Taobao platforms. Therefore, Alibaba provides training on how sellers can use their platforms. Alibaba’s Global Ecommerce Talent Network in collaboration with universities and training providers to cultivate ecommerce professionals for China and the economies of the Asia Pacific region.

Alibaba’s Global Ecommerce Talent Network

The training network builds on Alibaba’s Global Ecommerce Talent Network in collaboration with domestic and overseas colleges, to support the training needs of suppliers, students and about 2,500 SME sellers, covering 10 countries and 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 Polytechnic University, Asian Institute of Technology. Malaysia and Thailand-based University of the Thai Chamber of Commerce, and MABA University 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 and curriculum to overseas colleges, to develop talents’ understanding of ecommerce models and boost the local digital economy.

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

A few of the commercial companies offer upskilling across broader topics. Examples include:
- Ecommerce247
- LinkedIn Marketing Company
- ADX
- ACS

Although broader in their focus, these courses also offer a “one-size-fits-all” approach. As 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 industry verticals.

Commercials focused upskilling often avoid any screening or selection processes designed to ensure that the course is suitable for the attendee.

There is a distinction here, between its own workforce and those using the Alibaba platforms. Its is Alibaba’s commercial interest to make it as easy as possible for people and businesses using its platform, i.e. those selling products on the likes of Tmall and Taobao. Therefore, Alibaba provides training on how sellers can use their platform. The technical aspect of operating a platform is not necessarily explaining the relationship between the provision of skills and the outcomes. In ecommerce, those outcomes should be those improving improved business performance such as increased sales or increased productivity or increased profits.

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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 range of companies on retraining programmes that include a host of other ecommerce-related services. This dominance by a single company is important to note while producing commercial products is a particular characteristic in relation to upskilling its own workforce or those using the Alibaba platforms.

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According to a survey by Alibaba, 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 existing e-commerce businesses to make the most of opportunities available through online learning. This is seen as a means to improve the survival rate and quality of these businesses.

These businesses may already possess some skills in e-commerce 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 online learning. These courses are aimed at managers and workers 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:

- Completed a vocational qualification at level 4 of the German Qualification Framework (such as the Controlling Profession or Controlling Purchasing in National and International Markets) or the German Retail Association qualifications (such as the Certified Expert in Ecommerce or Certified Expert in Ecommerce Management). These qualifications are mentioned specifically as an area of focus and seen as an opportunity through online training.

Training is clearly having a positive effect, as.

Training courses typically follow a modular format, with each module focusing on a specific aspect of ecommerce management, such as controlling purchasing in national and international markets. They will not include complex technical skills related to ecommerce management, commercial and marketing. Instead, they focus on areas such as controlling purchasing in national and international markets, design and evaluation of business processes and projects, implementation of changes to work and organisational processes, and staff management and promotion of their professional development.

The general purpose of the qualification is to provide skills for ecommerce managers. As with the assistant ecommerce manager qualification, it will be focused on ecommerce management, commercial and marketing. The candidates will showcase specific 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:

- Development and use of cross-departmental interfaces
- Design and evaluation of business processes and projects
- Strategic development of ecommerce
- Staff management and promotion of their professional development
- Training and development of ecommerce staff
- Quality assurance system for ecommerce
- Business process management
- Strategic development of ecommerce
- Staff management and promotion of their professional development

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) and are delivered in a classroom setting or through online learning.

Private sector courses

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

Private Sector Courses

While the US offers relatively little in the ecommerce reskilling market, the opposite is true for the upskilling market. The US dominates the market for the software, platforms, extensions and services that commodities and services such as 'YouCode' are delivered on. There are several private sector providers that offer upskilling in ecommerce, with dozens of courses available. These courses can cost several thousand Euros and are often covering part or all of the costs for their employees.

The US has the largest ecommerce upskilling market in the world with significant information collected from the Certification Directory database of the European Commission, the US' and the US' E-Commerce Solutions providers database (Figure 4.2).

Solution Providers are upskilling from being Magento II programme. Ukraine and India are countries with good e-commerce systems that emphasise maths and IT within their education systems. They are now e-commerce outsourcing hotspots that target large businesses such as the UK that currently have a skills gap. A similar pattern of upskilling programmes can be seen across a wide range of other software systems.
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 though the figure represents the slowest ecommerce growth rate in five years. This compares with a 1.6% increase within the sector, the increasingly important role of ecommerce skills and the approach taken to developing these skills in other countries.

The Changing Nature of the Sector

Evolving business models

From a global perspective, ecommerce business models can be 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 good around 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 stringent and can differ markedly between countries, even within the same trading bloc. 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 chilled and cold 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 log-data grows by 40% annually.

Automated and Artificial Intelligence

Digitisation and automation will have a significant impact on the food sector, especially in the area of food safety. Through the digitisation of product data, the supply chain can be monitored and traced, ensuring compliance with regulations.

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Employee training and 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 workshops aimed at encouraging cross-border online trade.
- Japan - The Government established a fisheries ecommerce platform focused on helping to develop coastal economy by creating a brand and transparent fisheries trade through technology innovation.
- Scotland - Within Scotland there are several programmes underway in the Food and Drink sector that support companies to develop ecommerce expertise, such as the Scottish Government-backed Scotland Food & Drink / Asda Food & Drink Academy Supplier Development Programme.

In addition, there is a support for the development of ecommerce partners in Scotland; the ecommerce platform 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 initiatives in the Food and Drink industry and also supported through its Ecommerce Innovation Lab. The support equips companies with basic skills in ecommerce 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.

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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 4% (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 have benefited from upskilling and reskilling

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 employees from the rest of the UK.

| Change in hrs | General equipment operation & navigation | General equipment repair & maintenance | Craft & technician skills | Fine motor skills | Gross motor skills & design | Inspecting & monitoring | Basic literacy numeracy & communication | Basic data entry & processing | Basic IT skills & programming | Advanced IT skills & programming | Leadership & managing others | Entrepreneurship & initiative taking | Adaptable & continuous learning | Teaching & training others | Basic digital skills | Advanced data analysis & mathematical skills | Tech design, engineering & maintenance | Scientific research & development |
|----------------|-----------------------------------------|-----------------------------------------|--------------------------|------------------|----------------------------|-------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------|-----------------------------|--------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 3 years        | Decrease                                | Decrease                                | Decrease                 | Decrease         | Increase                   | Increase                 | Decrease                      | Decrease                      | Decrease                      | Increase                     | Increase                 | Decrease                     | Decrease                      | Increase                    | Increase                    | Decrease                      | Decrease                     |

Figure B.1: Future Skills Demand

Evolution in 25 Skills

| Change in hrs | General equipment operation & navigation | General equipment repair & maintenance | Craft & technician skills | Fine motor skills | Gross motor skills & design | Inspecting & monitoring | Basic literacy numeracy & communication | Basic data entry & processing | Basic IT skills & programming | Advanced IT skills & programming | Leadership & managing others | Entrepreneurship & initiative taking | Adaptable & continuous learning | Teaching & training others | Basic digital skills | Advanced data analysis & mathematical skills | Tech design, engineering & maintenance | Scientific research & development |
|----------------|-----------------------------------------|-----------------------------------------|--------------------------|------------------|----------------------------|-------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------|-----------------------------|--------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 3 years        | Decrease                                | Decrease                                | Decrease                 | Decrease         | Increase                   | Increase                 | Decrease                      | Decrease                      | Decrease                      | Increase                     | Increase                 | Decrease                     | Decrease                      | Increase                    | Increase                    | Decrease                      | Decrease                     |

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 realise 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 businesses to access online upskilling and reskilling.
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 conferences and offered as a series of specialist workshops.

Figure B.1: Future Skills Demand

Evolution in 25 Skills

| General equipment operation & navigation | General equipment repair & maintenance | Craft & technician skills | Fine motor skills | Gross motor skills & design | Inspecting & monitoring | Basic literacy numeracy & communication | Basic data entry & processing | Basic IT skills & programming | Advanced IT skills & programming | Leadership & managing others | Entrepreneurship & initiative taking | Adaptable & continuous learning | Teaching & training others | Basic digital skills | Advanced data analysis & mathematical skills | Tech design, engineering & maintenance | Scientific research & development |
|-----------------------------------------|-----------------------------------------|--------------------------|------------------|----------------------------|-------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------|-----------------------------|--------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| Decrease                                | Decrease                                | Decrease                 | Decrease         | Increase                   | Increase                 | Decrease                      | Decrease                      | Decrease                      | Increase                     | Increase                 | Decrease                     | Decrease                      | Increase                    | Increase                    | Decrease                      | Decrease                     |

Figure B.1: Future Skills Demand

Evolution in 25 Skills

| General equipment operation & navigation | General equipment repair & maintenance | Craft & technician skills | Fine motor skills | Gross motor skills & design | Inspecting & monitoring | Basic literacy numeracy & communication | Basic data entry & processing | Basic IT skills & programming | Advanced IT skills & programming | Leadership & managing others | Entrepreneurship & initiative taking | Adaptable & continuous learning | Teaching & training others | Basic digital skills | Advanced data analysis & mathematical skills | Tech design, engineering & maintenance | Scientific research & development |
|-----------------------------------------|-----------------------------------------|--------------------------|------------------|----------------------------|-------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------|-----------------------------|--------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| Decrease                                | Decrease                                | Decrease                 | Decrease         | Increase                   | Increase                 | Decrease                      | Decrease                      | Decrease                      | Increase                     | Increase                 | Decrease                     | Decrease                      | Increase                    | Increase                    | Decrease                      | Decrease                     |