IRISH FUNDS SECTOR TECHNOLOGY SKILLS NEEDS ANALYSIS

September 2022

Research Conducted by

fit The ICT Talent Pipeline

if irish funds

Contents

Company Summary

About Irish Funds

The Irish Funds Industry Association (Irish Funds) is the voice of the funds and asset management industry in Ireland. Founded in 1991, Irish Funds represents fund managers, depositaries, administrators, transfer agents, professional advisory firms and other specialist firms involved in the international fund services industry in Ireland. Our vision is that Ireland will be the premier location to enable and support global investing through its reputation for trust, capability and innovation. Irish Funds 150+ members are responsible for more than 14,000 investment funds with a net asset value of €6.2 trillion, making Ireland a significant EU and global centre of excellence.

About FIT

Fastrack into Information Technology (FIT CLG) is a not-for-profit, industry-led organisation. Its core mission is to promote an inclusive Smart Economy by creating routes to marketable technical skills for people who are underemployed or at risk in Ireland's labour market. It has pioneered its own methodology for working with employers to understand their skills requirements through granular analysis of the skills, knowledge and competencies required. FIT researches and designs in-demand skills technology programmes that enable people to acquire the identified competencies and collaborates with further education and training (FET) providers nationally in their delivery while assisting those who complete them secure quality employment in technology driven sectors. Since commencement in 1999 FIT has engaged with 25,000 learners of which over 21,000 have secured employment in technology sectors.

Foreword

When we launched our Strategic Framework last year, we identified capability and leadership as two key pillars which support our industry's relevance and reputation. This report is part of our commitment to enable capability and demonstrate leadership on behalf of our 150+ member firms and the 17,000+ people directly employed by the industry all across Ireland.

Our people power our industry. The skill sets they possess are important, ever-evolving, raw materials which enable our industry to manage the complexity which we encounter in providing solutions for global investors. Like many other industries, technology is an intrinsic and increasingly influential enabler across the value chain of activities which we undertake here so the skills and competencies which unlock the potential of technology are especially relevant.

The inevitability of change recommends to us that the manner in which we embrace it will have a significant bearing on our collective future success. By partnering with FIT in this ground-breaking research for our sector we are getting the benefit of a structured and rigorous approach to defining needs and gaps, an essential first step in meeting and filing them.

I would like to express my thanks to

- the member firms who allocated significant time and effort to contribute to this skills needs analysis,

- Peter Davitt and the entire FIT team for their professional, dedicated and collaborative approach in completing this work,

- the following members from our member companies Ciaran Fennessy, Len Sutton, Aaron Lynch, Shane Mulcahy and Kieran Fox from my own team.

The insights and outputs from this study will support our members and the entire industry's journey into the future as well as supporting our engagement with and advocacy towards external stakeholders across government and its agencies, the regulator and the education sector. Finally, we hope that it highlights to both those working within the sector (and those we seek to attract over time) of our vibrancy and ambition.

Pat Lardner
Chief Executive – Irish Funds

Executive Summary

The Irish Funds and Asset Management Sector (the 'sector') is currently going through a new phase of transformational change that will require, in effect, a revamp of its skills ecosystem. The digitisation challenges and opportunities presented in this research to the sector are significantly impacting the business models that fund and asset management organisations can adopt, how they implement them, and the specific collaborations, professions and competencies required across their work teams.

Three high-level objectives namely, enhancing the investment decision-making process, increasing operational efficiency, and improving the client experience, provide a compass for the sector in its deeper adoption and integration of digital technologies. These objectives rely heavily on having the right people with the necessary skills in the correct roles to ensure they are achieved. The purpose of this first ever Irish Funds and Asset Management Sector Technology Skills Audit, which has been undertaken by Irish Funds in collaboration with sector leaders and with the support of FIT, is to provide insight into the current and future tech skills requirements of the sector to ensure its continued expansion and dynamism within Ireland's key International Financial Services Sector as a whole.

The Audit is based on a detailed questionnaire that was completed by 20 leading companies in the Irish Funds and Asset Management Sector. In preliminary consultation with key players in the sector, 21 specific technical competencies which companies highly valued were identified as were the accompanying professional aptitudes considered essential. The structured questionnaire organised the competencies most sought by the particular ICT disciplines in which they are arising; it asked participating companies to estimate the current and emerging vacancies each had, the specific skills they required of candidates to fill these vacancies, and the level at which they needed these skills to be exercised within their organisations, i.e., whether at entry-level, competent level or at an expert (advanced) level.

The overall findings of the Irish Funds and Asset Management Technology Skills Audit 2022 point to a significant and increasing demand for tech talent in the Sector. Significantly, it finds that the demand is even stronger at entry/competent levels (54%) than at the expert level (46%). The overall picture that emerges is of an increasingly digitally enabled sector in need of substantial numbers of competent ICT practitioners.

The intent in compiling this report has been to obtain critical insight and information on the transformational impact of digitalisation so that required training and upskilling solutions for the sector can be created and implemented in an industry-focused manner. The report provides detailed information on the specific tech skills in demand and the likely trajectory of the sector if those skills needs are supplied.

The data gleaned from the research suggests there are significant skills gaps emerging in the funds and asset management sector due to digital transformation, as would be expected, and the competition for similar skills across industry is escalating exponentially. It is also evident from the findings that nurturing of a multi-faceted approach to growing tech talent is critical. Necessitating the reskilling and upskilling of existing employees, the attraction of new entrants and professions, alongside the embracement of diversity into the sector so that technological competencies to realise digital transformation can be achieved.

The overriding insight from this report is the need to further inform this sector's employers, training and education providers, job seekers/learners, career guidance professionals and other interested stakeholders in the funds and asset management sector about the future skills needs being fuelled by emerging technologies impacting the sector as never before. Appreciation of the associated technology skills matrix with respect to prevailing and future hiring requirements and the continuous professional development of existing employees to meet the rapidly evolving technology competency requirements within the sector is paramount.

Introduction

It is hoped that this first ever Irish Funds and Asset Management Sector Technology Skills Audit, which is deeply informed by leading companies in the sector, will lead to an increase in supply of the skills most in demand and facilitate the dissemination of best practice across the sector. The primary objective of the research undertaken is to assess the additional skills needed for current and emerging technology roles in the sector to be discharged to the mutual satisfaction and benefit of employers and ICT practitioners, and to advocate support for new initiatives that will strengthen the necessary future talent pipeline.

The Context

International Financial Services in Ireland

Ireland has become a globally significant international financial services and fintech hub. It is the third largest investment fund location in the world and has significant activity across international banking and insurance. International Financial Services (IFS) are generating a GDP contribution of €19.3 billion and, in 2019, contributed €2.47 billion in corporation tax, 23% of total corporation tax receipts that year. Across the country, over 44,000 people (full-time equivalents, FTE) work in IFS; it is estimated this constitutes 10% of all third level graduates in employment. The regional spread of this employment has broadened significantly in recent years. While 63% of financial services companies are located in Dublin, 37% are based outside the capital and employ almost 20% of all IFS workers[1]. It is clear that the value of international financial services to the Irish economy is hugely significant.

The Government's International Financial Service Strategy 2025 – Ireland for Finance[2] for the industry is to grow employment to over 50,000 by 2025 by encouraging the scaling up of existing activities and the creation of new roles required by on-going digitalisation. It is envisaged that many of the new roles will result in enhanced professions informed by nascent technologies, new processes, and alternative delivery platforms. The Strategy makes clear, it expects the future of International Financial Services in Ireland to be markedly different from the recent past because of the new technologies, policies and practices it will have to adopt to retain competitiveness and dynamism in a global sector where change is the only constant.

Realisation of our national ambitions for the IFS industry of which funds and asset management is the largest element, will therefore involve keeping fully abreast of the on-going re-conceptualisation and reclassification that is taking place within the industry of just what IFS are and how they can be delivered most efficiently using the new digital technologies, as well as the reappraisal of core talent requirements that the new business models will need.

Of all the job functions within financial services, nationally and globally, technology appears to possess the highest levels of vacancies across all recruitment platforms. The areas of greatest demand are in roles that support digital transformation, product management and infrastructure. In digital transformation, where the increase in demand is the highest, there appears to be a very limited talent pool of people with the necessary combination of business expertise and technical knowledge to fill the roles. Particular areas set to accelerate in demand appear to be Cloud Computing, Blockchain, Robotic Process Automation, Machine Learning and Software Development. Interestingly, a 2021 Bank of America research report found that 21% of banks in its sample had already incorporated blockchain into their businesses. This percentage is likely to accelerate in 2023 and beyond as major firms make large investments in their technology.

The current strong demand for data analysts, scientists and engineers also shows no signs of abating as financial institutions look to enhanced data analysis to drive automation and make faster decisions. New sources of data are constantly emerging (from social media to credit card spending), while data science is also helping to strengthen risk management systems. Increasing volumes of data are also accelerating the pace of machine learning (ML) development in the sector. While ML has had a foot-hold in activities such as anti-money laundering and fraud detection as well as in customer-facing applications, according to a Bank of England report it is now migrating into credit risk management, trade pricing and execution, and general insurance pricing and underwriting.

The Ireland for Finance 2021 Action Plan has proposed that the Expert Group on Future Skills Needs (EGFSN) undertake a study to assess the potential additional skills demands to fully capitalise on opportunities in subsectors such as fintech, applied alternative assets, sustainable finance, artificial intelligence, and blockchain to be published this year. The proposed report will hopefully expand on the evolution of IFS in Ireland and internationally and shed further insight on the needs of the industry in meeting the challenges it is facing and its publication is awaited.

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1 https://www.pbig.ml.com/latest-thinking/research-insights.html
2 https://www.gov.ie/en/publication/ireland-for-finance-strategy/#international-financial-services-strategy-2025-ireland-for-finance

The Context

The Irish Funds and Asset Management Sector

Of the 44,000 currently employed in international financial services, over 17,000 (full-time equivalents, FTE) work in the Irish Funds and Asset Management Sector. The main areas of employment are in management companies, fund administration and depositary services, auditor and tax services and legal services companies.

Ireland is currently the domicile for 5.9%[3] of world-wide investment funds assets, making it the 3rd largest global centre and the 2nd largest in Europe. A recent Indecon report estimated that €9.82 billion in revenue was generated by the investment funds and asset management sector in Ireland in 2020, an increase of 6% on 2018[4]. Investment/asset managers and fund management companies comprised the largest portion of this revenue, followed by administrators/depositaries.

The Irish Funds and Asset Management Sector is acknowledged as being at the forefront in responding to regulatory developments at the EU and national level. Its responsiveness and adaptability have enabled clients to bring innovative products to market quickly, aided by a developed regulatory, product and service infrastructure. Ireland is also recognised as a global centre of excellence for listings of Green and Environment, Social and Governance (ESG) Bonds.

Going forward, it is imperative that the sector engage fully with digital transformation if it is to continue to meet the high standards of excellence expected. The accelerating pace and extent of change requires not only the wide adoption of digital technologies that increase efficiencies but also the adoption of new practices and methodologies in how business is delivered. In effect, business models will need to be fundamentally reshaped.

The sector's leaders are already rethinking the occupational profiles of their work teams and exploring new paths for acquiring and retaining the talent required. Organisations that are late adopters will find it increasingly difficult to keep pace with those that are digital leaders.

Many firms' investments in new technology have targeted the 'quick wins' associated with robotic process automation (RPA) in particular. RPA supports the automation of repeatable processes. Emerging artificial intelligence (AI) models and automation allow straight through processing (STP) to increase, facilitating the retention of a larger cohort of in-house staff with process and accounting expertise.

Digital leaders in the sector are also investing in Application Programming Interface (API) that enable more reliant and cleaner integration between front, middle and back-office tasks to efficiently and seamlessly automate operations which previously resided on fragmented IT platforms that necessitated teams to methodically put together the pieces of the puzzle. Cohorts of asset managers are at the forefront in championing the deeper digitisation of their businesses, spearheading sectoral transformation, adopting robo-advisors to digital investors, onboarding self-serve client portals, embracing the new intelligence gleaned from data analytics and utilising the accessibility of cloud technologies.

Yet, the barriers to adoption of digital technologies remain largely the same, centred around strategy, people, and capital allocation. Key to addressing such obstacles is buy-in and leadership from the top. Conviction to resource and implement long term strategies that fashion real change, involving investment in capital projects, new technologies, training & development programmes that support upskilling and the onboarding of new talent and competencies to future proof the sector.

With long-term investment in technology infrastructure becoming a critical competitive lever as digital solutions become an industry status-quo, it will be imperative for asset management firms to take steps to integrate advanced analytics into their business strategies and to move to the forefront of environmental, social and governance (ESG) strategies. It is essential that asset managers, in forging their digital, future call on their Boards to invest in technology infrastructure and integration that can deliver the sophisticated solutions now demanded by investors across a host of asset classes, capabilities and geographies. Those asset

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3   https://www.efama.org/sites/default/files/files/International%20Statistical%20Release%20Q1%202022.pdf
4   https://irishfunds-secure.s3.amazonaws.com/1622622761-2021-05-Irish-Funds-Indecon-Report-2021-Executive-Summary-upload.pdf

managers who fail to invest, will be left behind in the short to medium term.

Despite its association with high levels of expertise, a significant regionalisation of the Irish investment funds and asset management industry has strengthened over the last 2-3 years. This is evidenced by an expansion of almost 40% in the number of its office locations outside of Dublin. Further proof of the increased regional spread of economic activity in the industry can be seen in the distribution by location of its employees. The industry now employs individuals living in every county in the Republic of Ireland and the numbers have increased in every county bar Dublin since 2018.

As companies in the sector believe that significant percentages of their employees are likely to continue to work remotely after the COVID-19 pandemic, it is anticipated that the distribution of its employment across the regions will continue. The greater regional spread of employment evident in the industry supports a wider regional dispersion of incomes, with potential for knock-on impacts being felt more widely across the country and in local communities.

Ireland's Labour Market Landscape 2022

Ireland's unemployment rate has naturally fluctuated significantly over the last two years as a result of the pandemic. As of August 2022, the unemployment rate had fallen to 4.2%[5] and the ESRI expect the unemployment rate for 2022 and 2023 as a whole to average 6.3 and 4.8 per cent, respectively. This figure is more conservative than previously estimated as a result of the Russian invasion of Ukraine and the uncertainty that it has brought. In the ESRI's Spring 2022 Quarterly Economic Commentary, it is noted that several factors will influence the Irish labour market in the near-term. They do not expect any significant job losses to occur in Q2 2022 as pandemic-related supports come to an end nor do they expect any reversal in the re-opening of the economy. However, they do note that immigration patterns and the integration of Ukrainian refugees into the Irish labour force as likely influences on the path of wage inflation over the coming period. The policy decisions that are taken in the coming months will

likely have a big impact on the labour market given the current terrain.

As the economy skirts full employment unprecedented demand for certain skills sets not least of which technology skills is staringly evident. Technology skills are ubiquitous in demand across a wide range of industry sectors that heretofore may not have traditionally been a natural home for them, and as a result the competition for employees possessing those skills is high and escalating.

Transformed workplace

A further consideration with regard to workforce development and talent management is the transformed work environment post pandemic. The seismic shift to home working that occurred in March 2020 continues to have a lasting impact across all sectors. Having entire workforces working from home acted as a catalyst for the widespread adoption of cloud services and digital technologies, making the tech employment market increasingly competitive for employers.

Irelands National Skills Strategy 2025 purports that "*A key challenge over the next decade will be to ensure an adequate supply of the skills required in the labour market. The appropriate quantity and type of skills will come from our existing workforce and from people who will enter the workforce over the next decade, both from Ireland and abroad.*"

The National Skills Bulletins regularly highlight current skills demand by occupation and in recent years have consistently highlighted skills shortages for Professionals and Associate Professionals across all sectors emphasising that the talent shortage is potentially significant for several sectors where ICT skills are deemed not just necessary but essential, namely Software Development, Data Analytics, Financial Services, Distribution and Health Services.

With the labour market constantly evolving because of the progressive interdisciplinary nature of the world of work resulting in crosspollination in the skills. Competencies and professions required across different sectors and occupations, Ireland's workforce will have to

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The Context

embrace a mix of sectoral, cross-sectoral and transversal skills (soft skills / generic competencies). Transversal skills are viewed as the foundation for the development of the vocational skills required to succeed in the labour market. The increasing convergence between sectors such as ICT, business, and engineering necessitates the consideration of a cross-sectoral approach is the development of such technical competencies. In this regard the National Skills Strategy advocates enhanced development of core technology skills such as software development, data analytics, cloud, security, networking and infrastructure supplemented with business/analytic/ foreign language skills as required.

Changing Workforce

The total Irish labour force increased by 165,500 in the two-year period to the end 2021 signifying a 6.3% increase. Importantly and meriting consideration with respect to work flexibility and accessibility there has been a significant increase of 9.2% (104,000), in the number of women entering the workforce, compared to an increase of just 4.6% amongst men. Consequently, Ireland's female labour force participation rates, historically low, have risen from 56.5% to 60.1% with the highest increase in the 15-19 age cohort at 38%. This is due in part to a high youth population becoming of working age, with a parallel rise in the share of teenagers employed or seeking employment.

In response to this dynamic working environment, education and training systems need to engrain within their DNA an adaptive approach to the continuously evolving workplace requirements, mindful of the accessibility of clients be they enterprises, those already in the workforce or job seekers. Access to a range of flexible learning opportunities post formal education and the development of innovative progression pathways will prove vital with a mantra of lifelong learning for all.

Irish Funds Technology Skills Audit

The Methodology

The Skills Audit is based on a detailed questionnaire that was completed by 20 leading companies in the Irish Funds Sector. In preliminary consultation with key players in the sector, 21 specific technical competencies, listed in the table below, which companies highly valued were identified and the accompanying professional aptitudes that they considered essential.

The detailed questionnaire organised the competencies being most sought by the particular ICT disciplines in which they are arising; it asked participating companies to estimate the current and emerging vacancies each had, the specific skills they required of candidates to fill these vacancies, and the level at which they needed these skills to be exercised within their organisations, i.e., whether at entry-level, competent level or at an expert (advanced) level.

Figure 1 List of disciplines surveyed

Big Data (Analytics)	Enterprise Applications	Production Support & Database / System Administration
Blockchain	Innovation Design Thinking & Disruption	Quantum Computing * (Processing Power / Messaging / Entanglement)
Call Centre/Contact Centre Support*	Machine Learning & AI	Robotic Process Automation
Cloud Computing	Maintaining & Decommissioning Legacy Systems	Software Development Tools & Methodologies Technologies
Cybersecurity & Digital Forensics	Mobile / App Development Platform	Systems / Application Architecture
DevOps	Networking Technologies	Transformation / Solutions / Client Onboarding and Integration
eBusiness / Digital Marketing	Process Optimisation (Lean / Six Sigma / Automation)	Web Development Technologies

* Questionnaires were also provided on Quantum Computing and Call Centre's, however, the response data set size was too small to be significant so no findings are presented. Therefore, these technical disciplines are removed from the analysis of the report.

This list of technical disciplines was supplemented by questions covering Professional Skills to obtain a rounded picture of the skills and competencies required in the Fin-Tech roles.

In addition, the survey included questions on the current number of roles by discipline and the projected growth by discipline over the next 12 to 18 months. Information was also requested on their recruitment practices including their views on apprenticeship programmes, barriers to developing skills, gender balance and diversity, key requests to policy makers on the skills agenda and key requests to policy makers in relation to doing business in Ireland.

Profile of Participating Companies

Twenty leading companies from the Irish Funds sector participated in this survey of their Fin-Tech skills needs. The participating companies ranged in the overall number of staff employed in Ireland from 20 to 5,000. The breakdown by size is shown in Figure 3.

Irish Funds Technology Skills Audit

Figure 2 List of participating companies

Accenture	CubeMatch Ltd	Fenergo	Mercer Global Investments Europe
Amundi	Deloitte	Grant Thornton	Northern Trust
BNY Mellon	Expleo Technology Ireland Ltd.	HSBC	PwC
Citco Fund Services Ltd.	EY	JPMorgan	State Street
Citi	FD Technologies	Launchpad Technologies TA Fund Recs	Temenos

Figure 3 Paricipating companies by size (empoyees in Ireland)
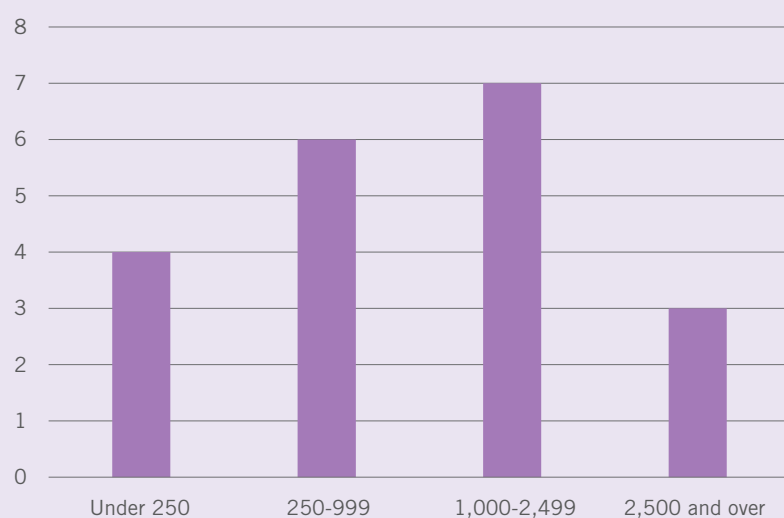
Seventeen of the twenty participating companies were of FDI origin and three were indigenous.

Key Findings

The survey questionnaire comprised of twenty key disciplines and respondents were asked to indicate in which disciplines they employed tech staff. The aggregated responses were analysed to produce a ranking of 'most needed' tech staff by discipline.

ICT Practitioners are classified into three levels reflective of the competencies and skills outlined by the European e-Competency Framework. Within each discipline respondents were asked to indicate their need for each of its constituent skills and to do this by skills level, namely Entry, Competent and Advanced Level. As shown in the resulting overview of skills needs by

level there was a requirement across all levels with 46% needed at the Advanced Level followed by 31% at Competent Level and 23% at Entry Level.

Survey respondents were also asked to quantify the current tech staff headcount for each discipline and to forecast their recruitment needs over the next 12-18 months, which was analysed to generate a growth projection by discipline, as shown in figure 3 below. The overall growth rate was significant at 46% and three high growth disciplines exceeded this, namely Cloud Computing (236%), Blockchain (100%) and Robotic Process Automation (65%), acknowledging that these are emerging technologies and therefore starting from a relatively low baseline.

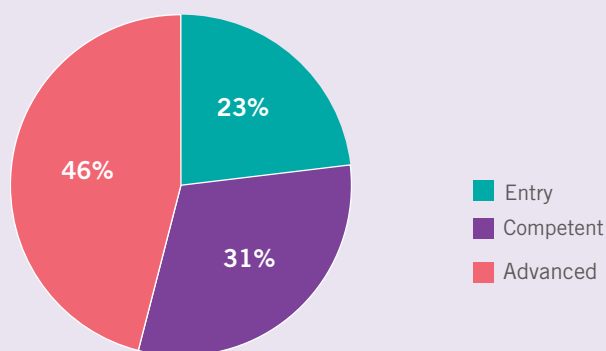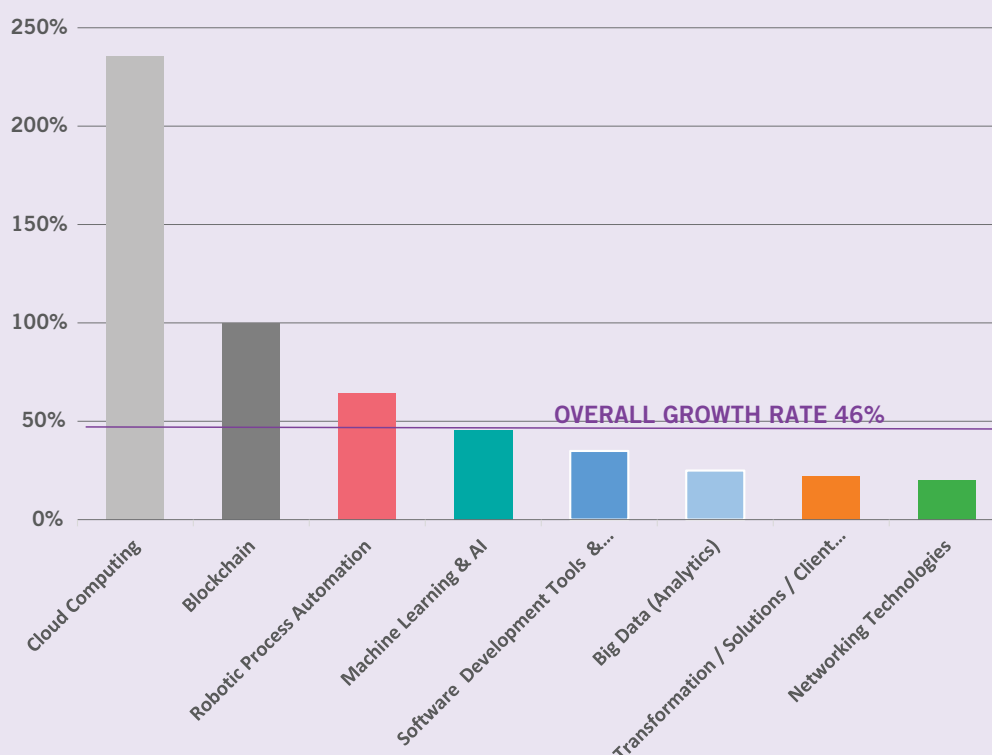**Figure 4**
Overview Of Skills Needs By Level

- Entry
- Competent
- Advanced

Figure 5
% Growth in staffing over 12/18 months

OVERALL GROWTH RATE 46%

Irish Funds Technology Skills Audit

The growth forecast by the technologies accessed in the survey was applied to the current Irish Funds tech staff breakdown, to generate a projection of what the workforce by these different technology groupings would look like over the next 12-18 months.

Figure 6 shows the current breakdown by discipline of existing tech staff. It is shown in a tree diagram, which presents a rectangle for each discipline whose size is proportional to the number of staff in the discipline. So, looking at figure 4 we can clearly see that the discipline Software Development Tools & Methodologies Technologies has the largest current tech staff cohort, followed by Robotic Process Automation and then Cloud Computing.

Figure 6 Breakdown by discipline of existing tech staff

Legend:
- Software Development Tools & Methodologies Technologies
- Cloud Computing
- Robotic Process Automation
- Machine Learning & AI
- Transformation / Solutions / Client Onboarding and Integration
- Web Development Technologies
- Blockchain
- Enterprise Applications
- DevOps
- Networking Technologies
- Big Data (Analytics)
- Innovation Design Thinking & Disruption
- Production Support & Database / System Admnistration
- Cybersecurity & Digital Forensics
- Systems / Application Architecture
- Mobile / App Development Platform
- Quantum Computing (Processing Power / Messaging / Entanglement)

Irish Funds Technology Skills Audit

In figure 7 we see the breakdown by discipline of projected tech staff in 12 - 18 months. While it is still dominated by Software Development Tools & Methodologies Technologies it is clear the Cloud Computing tech staff cohort is projected to become a much larger share of the overall tech workforce.

Figure 7 Breakdown by discipline of projected tech staff

Legend:
- Software Development Tools & Methodologies Technologies
- Cloud Computing
- Robotic Process Automation
- Machine Learning & AI
- Transformation / Solutions / Client Onboarding and Integration
- Web Development Technologies
- Blockchain
- Enterprise Applications
- DevOps
- Networking Technologies
- Big Data (Analytics)
- Innovation Design Thinking & Disruption
- Production Support & Database / System Admnistration
- Cybersecurity & Digital Forensics
- Systems / Application Architecture
- Mobile / App Development Platform
- Quantum Computing (Processing Power / Messaging / Entanglement)

Irish Funds Technology Skills Audit

Within each discipline respondents were asked to indicate their need for professional skills under the headings Leadership Skills, Project Management, Problem Solving and Professional Development (Soft Skills). These skills were needed for all disciplines and the needs did not vary significantly between disciplines. For that reason, the aggregated results are presented here as shown in Figure 8.

Within the sample set the most needed professional skill identified was Project Management, closely followed by Problem Solving and Leadership Skills. Not far behind in fourth rank was Professional Development (Transversal Skills).

Respondents were asked to categorise their responses across three skills levels, namely Entry, Competent and Advanced. This information did provide some insights, notably that leadership skills were required at not only Advanced and Competent levels, but also at Entry level. This is a very important factor to note for third level institutions, where the primary focus of the syllabi may be on the technical skills, there is an industry requirement for Project Management and Leadership Skills.

Figure 8 Professional Skills
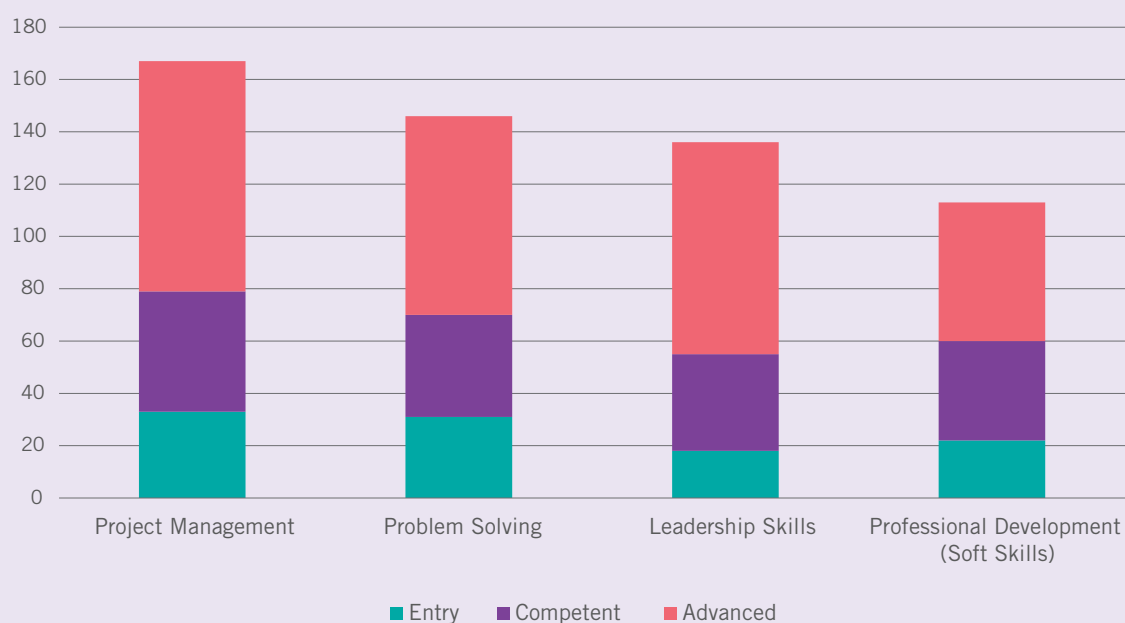
Irish Funds Technology Skills Audit

Respondents were asked if they experienced any barriers to developing skills within their organisations. Two thirds of the respondents said they did experience barriers and the pie chart shown in figure 9 ranks those barriers with 'Time' being cited as by far the biggest.

Information was also sought on recruitment practices. When asked if they hired from abroad 77% said they did. Companies indicated that they hired directly and also used external recruiters. Difficult to fill roles were cited as Project Manager, Developers / Engineers using multiple architectures in AWS Cloud, Full Stack Developers, Angular/Java Developers, QA Automation Engineers, Cybersecurity Analysts, Senior Blockchain Engineers,

Business Analysts with funds management knowledge, Data & Analytics, Client On-boarding and roles needing an overlap of Business & Tech Knowledge. Companies also benefited from transfers of people from offshore locations to Ireland and opportunities also existed for staff in Ireland to move around globally. Companies were positively disposed to apprenticeship programmes with all respondents indicating that they would be interested in hiring an apprentice and 46% confirming that they had hired an apprentice in tech related areas. Respondents indicated that tech and related apprenticeships should be increasingly adopted to meet the skills needs identified in this report.

Figure 9 Barriers to developing skills

- Time
- Cost
- Skills Needs Analysis
- Knowledge / Access to Training Provision
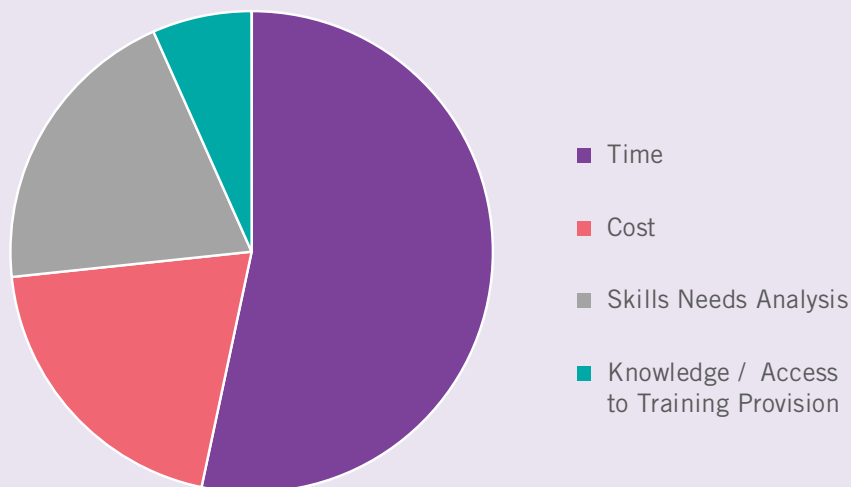
Gender balance and diversity is an issue for 70% of respondents and almost 90% of companies had strategies in place to address this. Coaching and mentoring programmes were reported as in place in almost all companies.

Respondents cited the following key requests to Policy Makers on the Skills Agenda.

- Focus on ABCD Technologies: AI, Blockchain, Cloud and Data Analytics in training programmes.

- Develop schooled based programme in maths and physics - to encourage great female participation.
- Students are incredibly smart at a young age, integrate optional coding programs, coder dojo, etc. at school curriculum levels that are in the secondary school range.
- Development of Third-Party Management and Oversight skills.

Irish Funds Technology Skills Audit

Respondents mentioned the following key requests to Policy Makers in relation to doing business in Ireland:

- More agility in policy and legislation - as an enabler at country and European level.

- Tax - personal tax rate is a disincentive for senior investment managers.

- Relocation costs - addressing housing stock and rental cost inflation is deemed a priority.

- Many young people moved home / remote working during covid - additional supports may be necessary to encourage companies to promote and institutionalise remote working.

- Operational costs in Ireland.

- Extremely expensive to live and work in Dublin.

- Post-Covid people desire a blended work environment in line with work-life balance.

In terms of enterprise support policies, a number mentioned that they were actively engaged with and supported by the IDA. There was also a mention of the Skillnet programme.

Analysis of Results by Discipline

The survey responses have been analysed to determine the specific skills most in demand for each discipline and at what level of competency, namely Entry, Competent or Advanced. Results of the Audit are summarised below in radar diagrams. This information is presented in radar charts which provide an overview of the 'skills eco-system' for each discipline. In each radar diagram:

- The outermost ring represents the highest demand for a specific skill.

- All rings represent significant demand, even the inner ones.

- Different coloured lines show the demand for Entry, Competent and Advanced levels.

- A stacked bar chart provides the same information in an alternate form that some readers may find useful.

What follows is a detailed representation of the specific skill sets in demand for each discipline and an analysis of the qualitative data obtained in the interview process.

Discipline 1. Software Development Tools & Methodologies Technologies

The discipline Software Development Tools & Methodologies Technologies was broken down into ten sub-disciplines as follows.

SUB-DISCIPLINES WITHIN SOFTWARE DEVELOPMENT TOOLS & METHODOLOGIES TECHNOLOGIES		
Coding	SD Cloud Tools	Development Methodologies
Development Tools*	Prototyping (UI/UX)*	Software Testing Competencies
IDEs	Content Management	
Development Frameworks	UML Tools	

* As the aggregated date sets were too small to be statistically significant, results are not presented for these sub-disciplines.

Sub-Discipline: Coding

The most sought-after skill is Python closely followed by Java. Skills in JavaScript-based front end web frameworks AngularJS and ReactJS are also in demand as are the complementary web tools HTML5 and CSS3. Skills are needed at all levels.

CODING SKILL NEEDS

Python, SQL, Java, Putty, AngularJS, C#, HTML5, Solidity, React JS, JavaScript (Jquery), CSS3, .Net

Legend:
- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Analysis of Results by Discipline

Coding

Legend: Entry (teal), Competent (purple), Advanced (pink/red)

Categories: Python, Java, AngularJS, HTML5, React JS, CSS3, .Net, JavaScript (Jquery), Solidity, C#, Putty, SQL
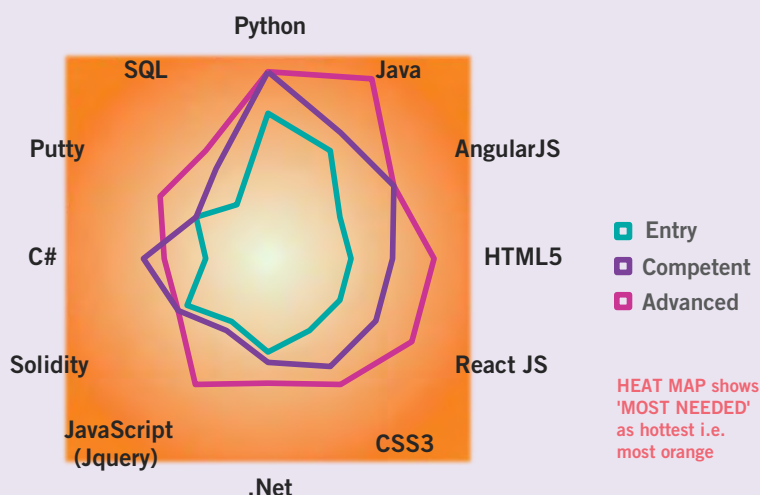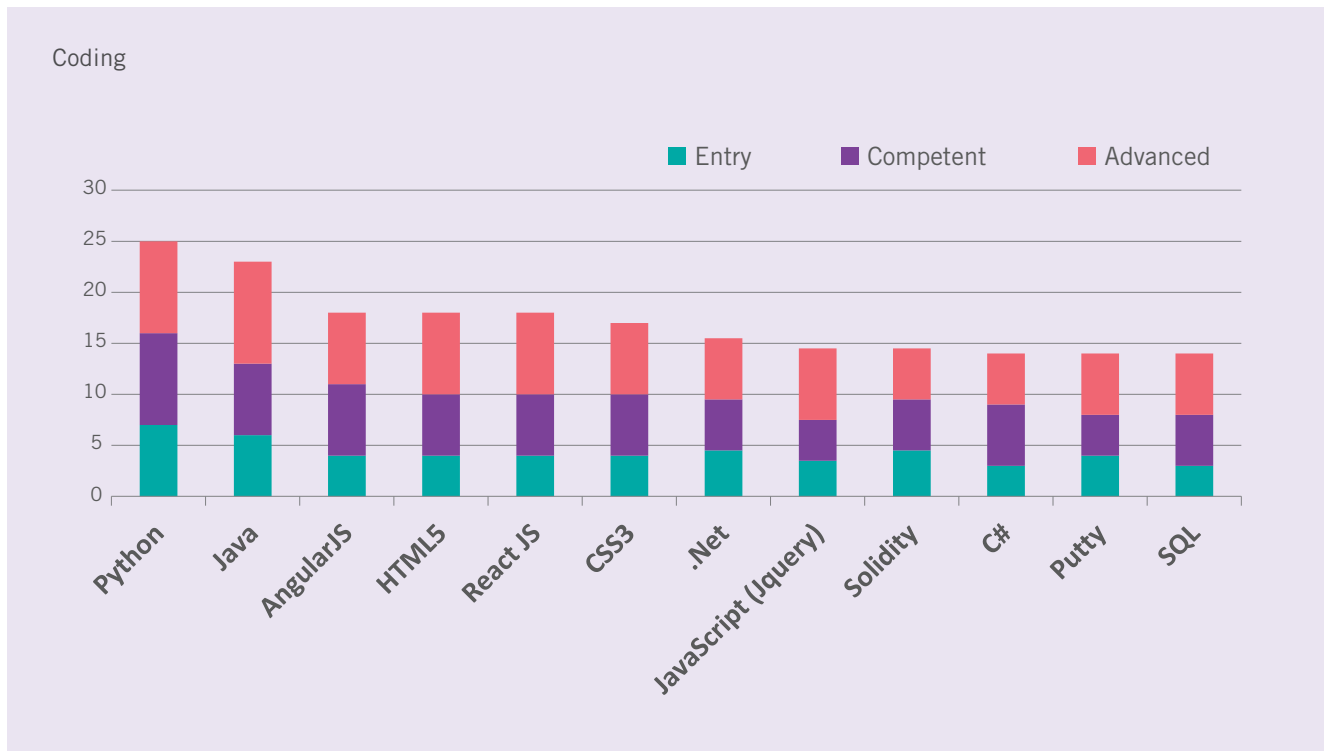
Sub-Discipline: IDEs

The most sought-after skill is IntelliJ. Also known as IntelliJ IDEA it is an integrated development environment written in Java for developing computer software. Skills are needed at all levels.

IDE SKILL NEEDS

IntelliJ, Cloud9 IDE, Spiralogics Application Architecture, Visual Studio, Eclipse, Other

Legend: Entry, Competent, Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Analysis of Results by Discipline

IDEs
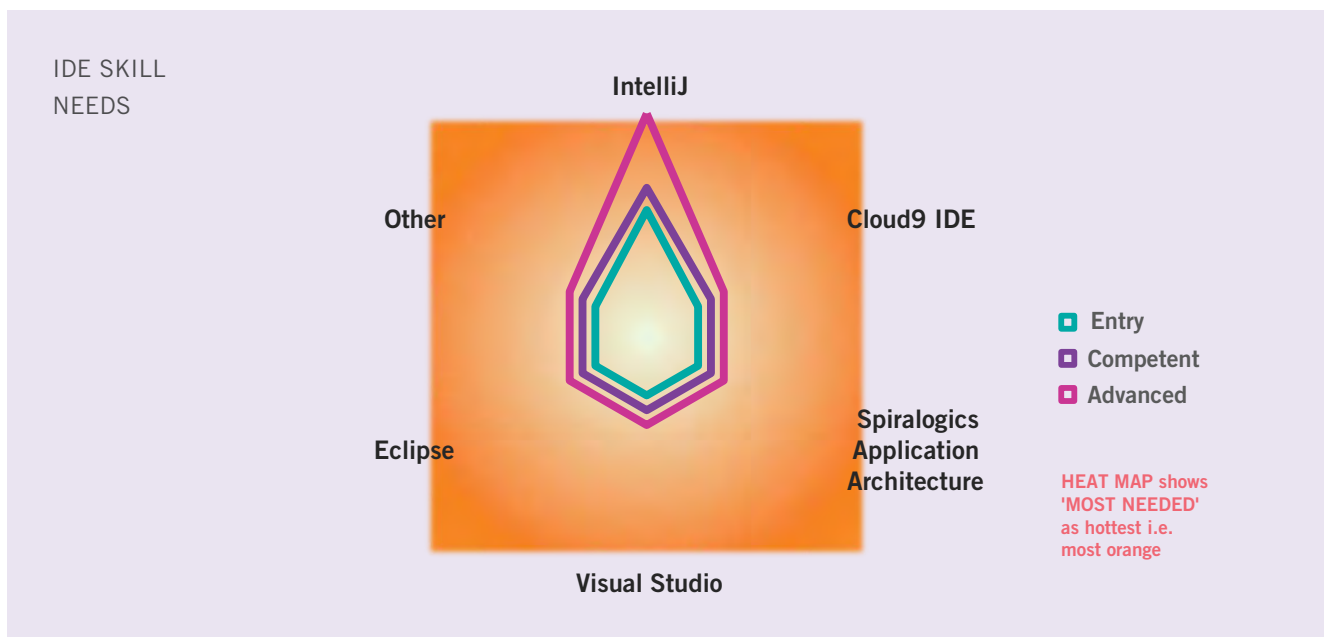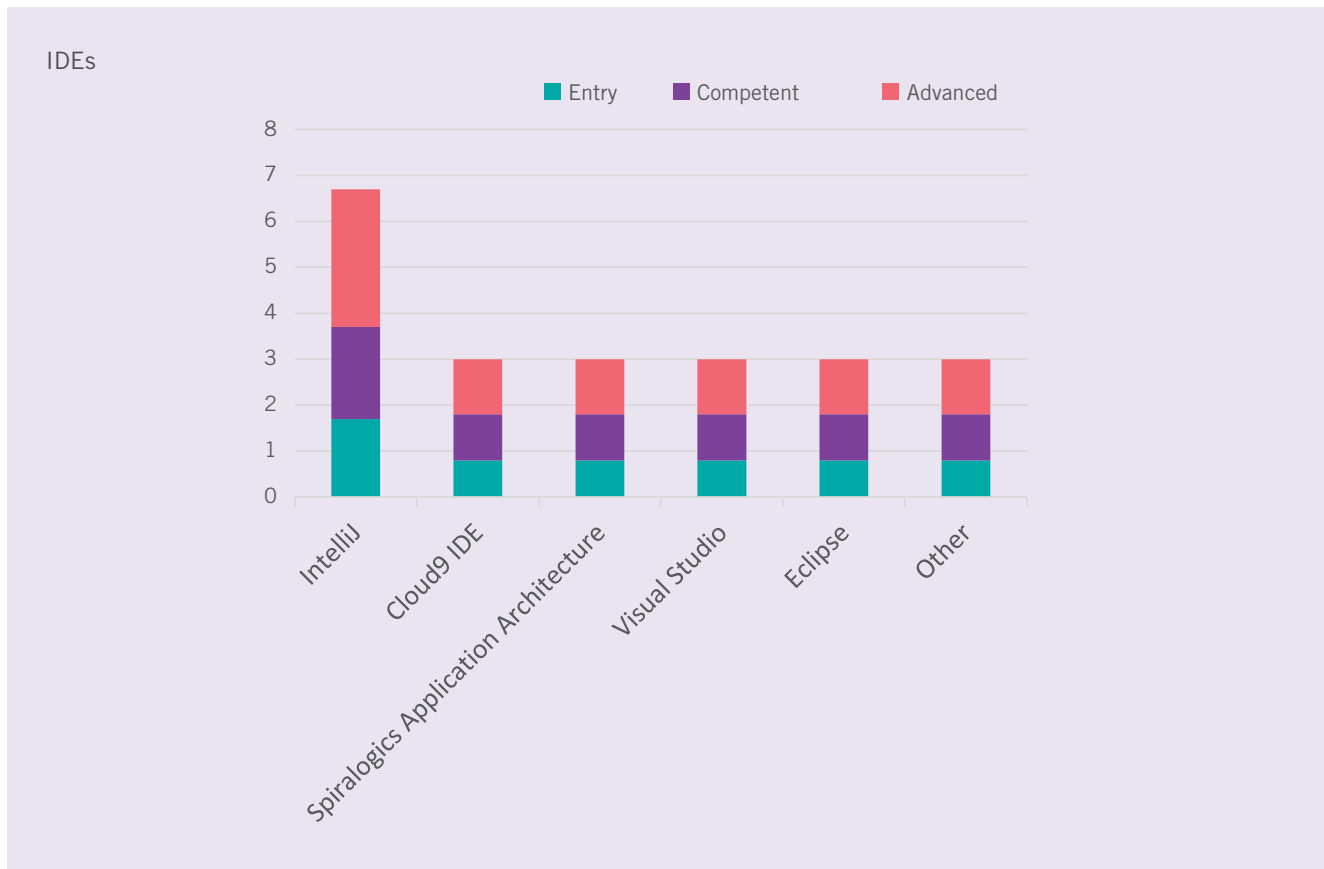
Sub-discipline: Development Frameworks

The most sought-after skill by some distance is Bootstrap, an open-source CSS framework directed at responsive, mobile-first front-end web development. Skills are needed at all levels.

DEVELOPMENT
FRAMEWORK
SKILL NEEDS

Bootstrap

Other

HTML5
Builder

Visual Online

■ Entry
■ Competent
■ Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange
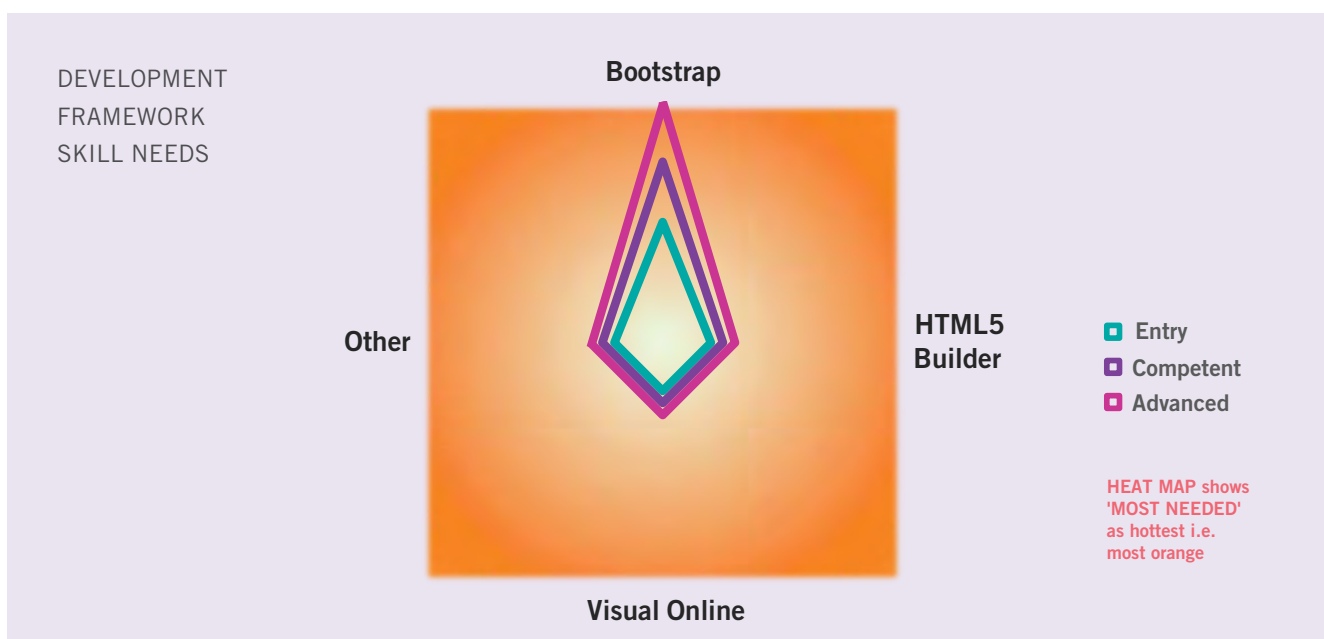
Analysis of Results by Discipline

Development Frameworks
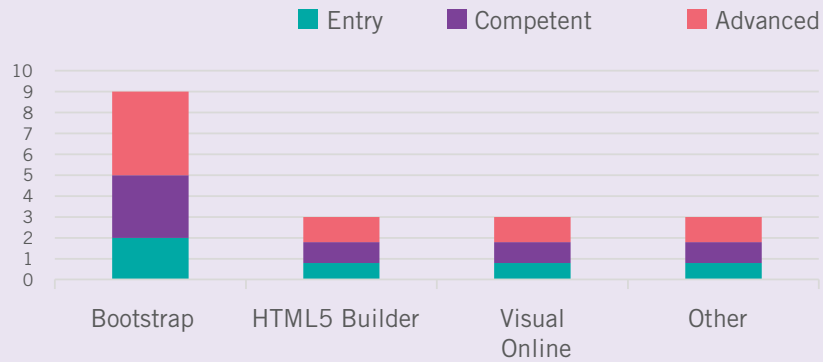
Sub-discipline: SD Cloud Tools

The most sought-after skill is GitHub closely followed by Azure and to a lesser extent BitBucket. At their core GitHub, Azure and Bitbucket are comparable when it comes to core version controlling functionality. Their differentiating factors are the additional features and integrations offered by each platform that aid in the software development life cycle. Skills are needed at all levels.

SD CLOUD TOOLS SKILL NEEDS

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Analysis of Results by Discipline

SD Cloud
Tools
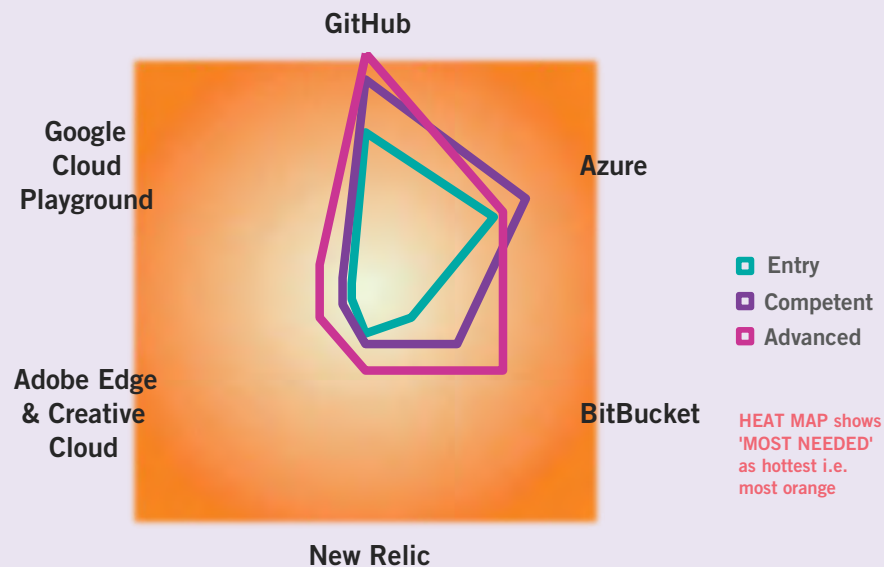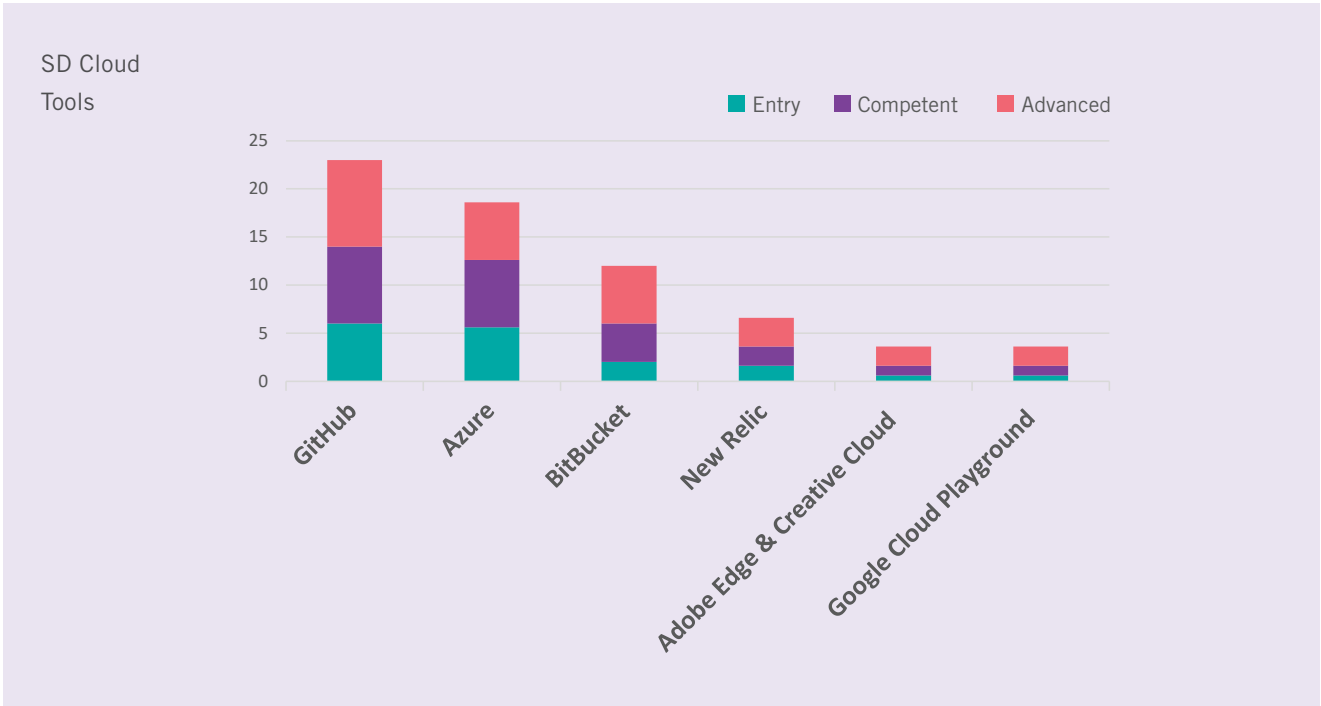
Sub-discipline: Content Management

The most sought-after skill is Kubernetes followed by Docker and Jira. Further down the rankings but still significant are AWS, Jenkins and Git. Skills are needed at all levels. An attractive skillset at Entry level would certainly be a good working knowledge of the applications of Kubernetes and Docker and they would make suitable components in a Cloud Apprenticeship programme.

CONTENT
MANAGEMENT
SKILL NEEDS

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange
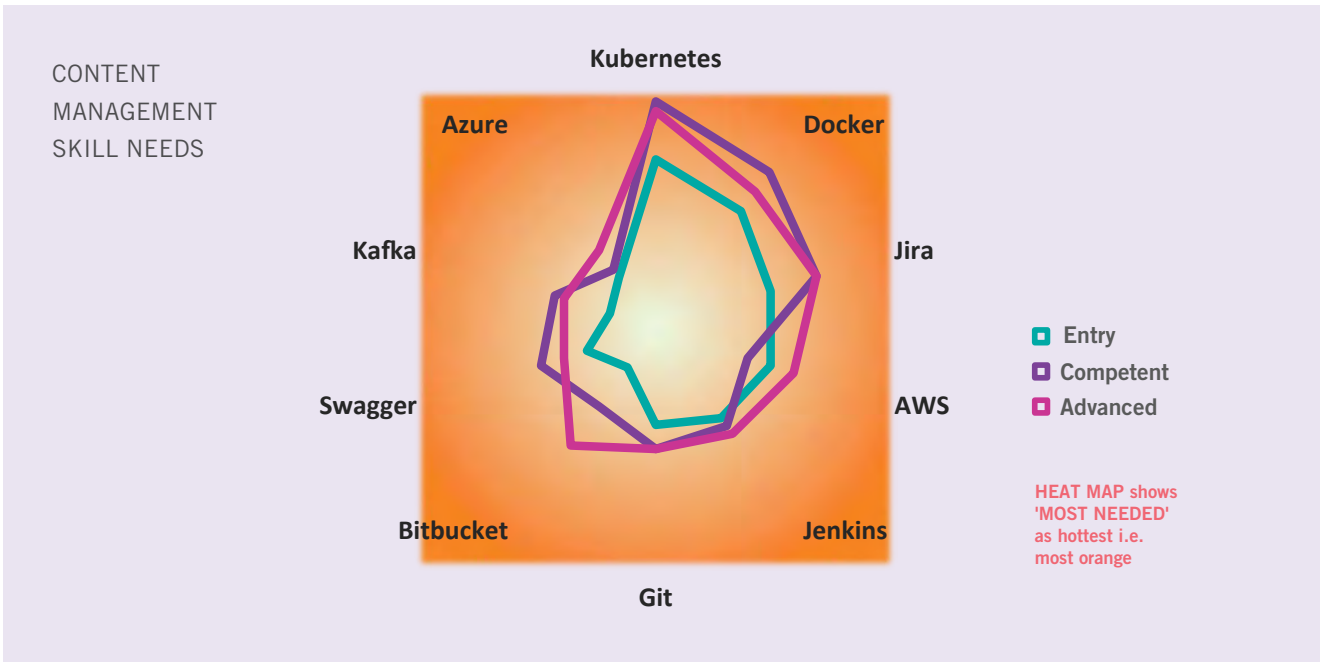
Analysis of Results by Discipline

Content
Management
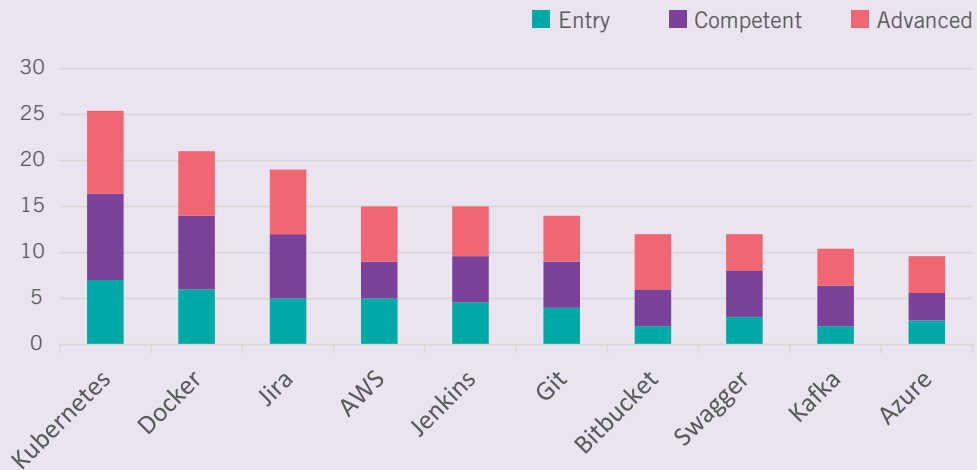
Sub-discipline: UML (Unified Modelling Language Tools)

The most sought-after skill by some distance is Microsoft Visio, a diagramming and vector graphics application which is part of the Microsoft Office family. Skills are needed at all levels.

UML SKILL
NEEDS

Entry
Competent
Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange
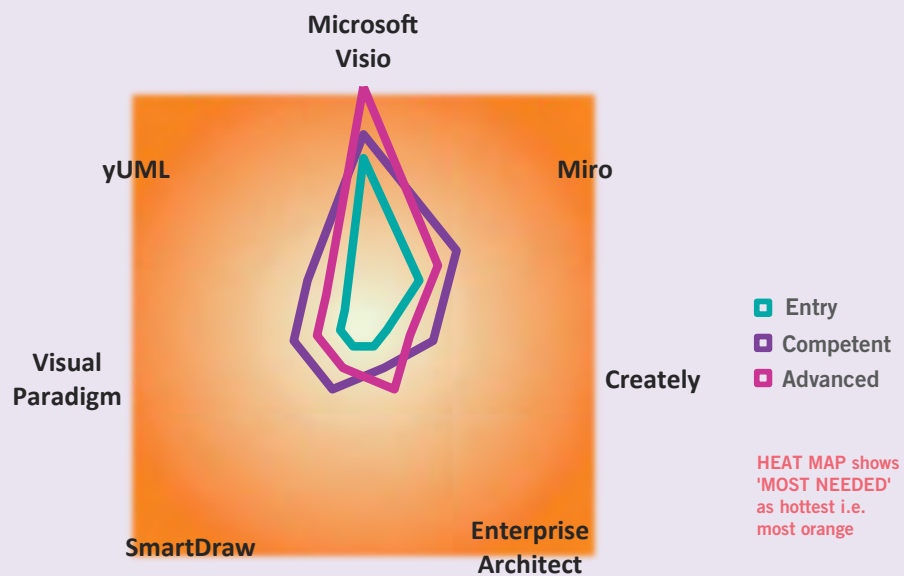
Analysis of Results by Discipline

UML
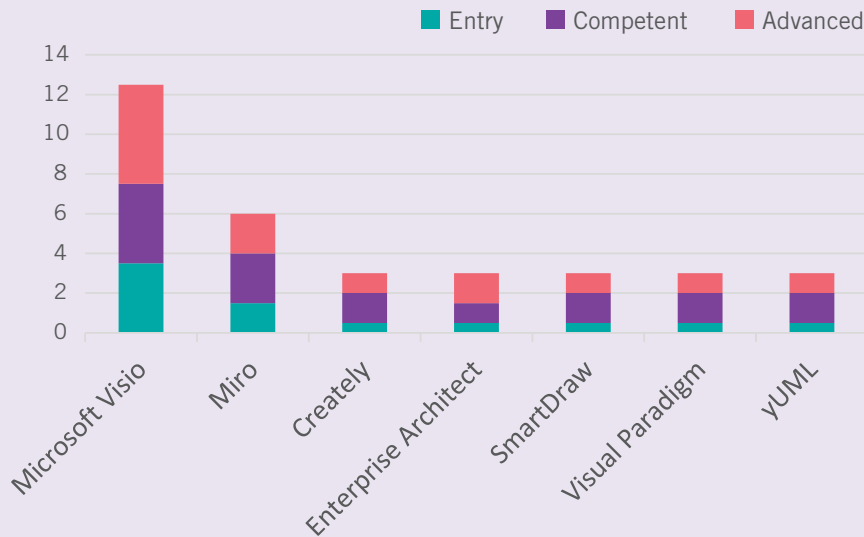
Sub-discipline: Development Methodologies

The most sought-after skills are Scrum Development and Agile Development. Further down the rankings but still significant are Continuous Delivery, DevOps and Waterfall Development, which was widely used pre-2000, before the Scrum/Agile methodology emerged, and still is in many instances. Skills are needed at all levels.

DEVELOPMENT METHODOLOGIES SKILL NEEDS

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Analysis of Results by Discipline

Development Methodologies

Stacked bar chart showing Entry, Competent, Advanced levels across: Scrum Development, Agile Development, Continuous Delivery, DevOps, Waterfall Development, Lean Development, Feature Driven Development..., Exteme Programming (XP)
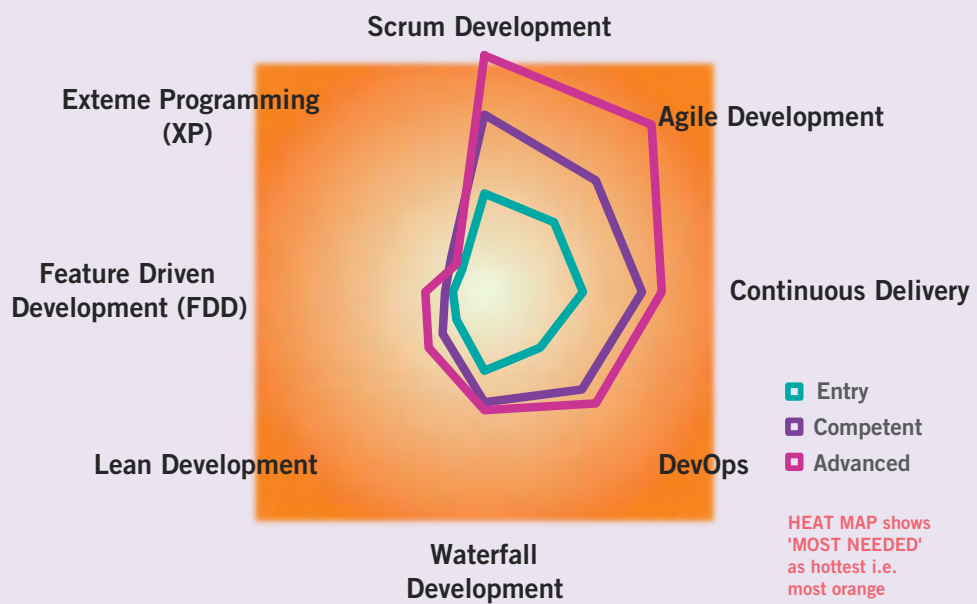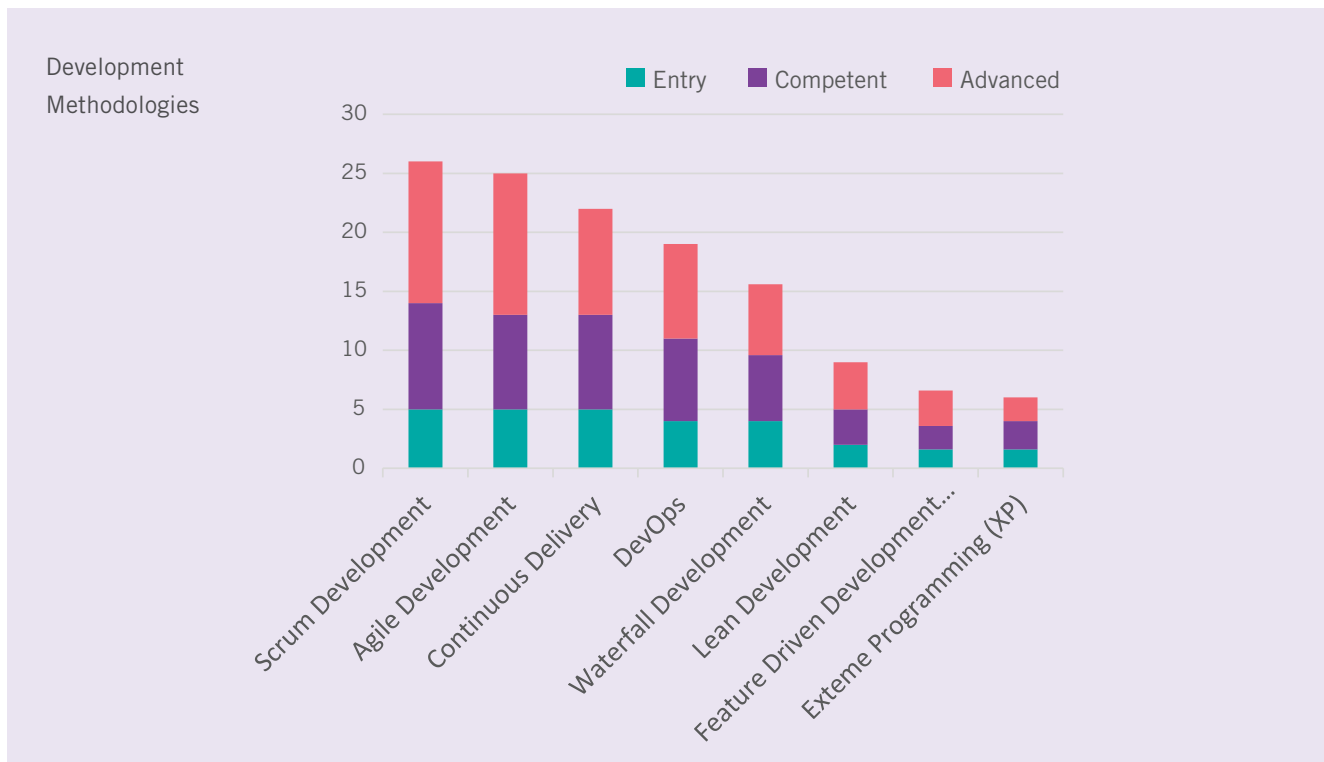
Sub-discipline: Software Testing Competencies

The most sought-after skill is clearly Automation. Three further skills with strong demand are DevOps & Agile Methodology, SDLC Methodologies (Waterfall, Kanban, Scrum, Lean etc.) and Testing Tools and Technologies

(Blackbox, Penetration, Security, Systems, GUI). Several other complementary skills are commonly required as shown below. Skills are needed at all levels.

SOFTWARE TESTING SKILL NEEDS

Heat map / radar chart with axes: Creativity & Laterial Thinking, DevOps & Agile Methodology, SDLC Methodologies (Waterfall, Kanban, Scrum, Lean etc.), Testing Tools & Techniques (Blackbox, Penetration,...), Test Planning & Documentation, Reporting (Written & Oral Communications), Programming Comprehension (Functioning, Create...)

Legend: Entry, Competent, Advanced — HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Analysis of Results by Discipline

Software Testing Competencies

Legend: Entry, Competent, Advanced

Analysis of Results by Discipline

Discipline 2. Web Development Technologies

Sub-discipline: Web Development Competencies

The most sought-after skill is Python, followed closely by Java, C#, HTML5, JavaScript and SQL. These are needed at all skills levels and as such would comprise a good core curriculum for Entry level practitioners to assist their career development.

WEB
DEVELOPMENT
COMPETENCIES

Entry
Competent
Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange

Web Development
Competencies
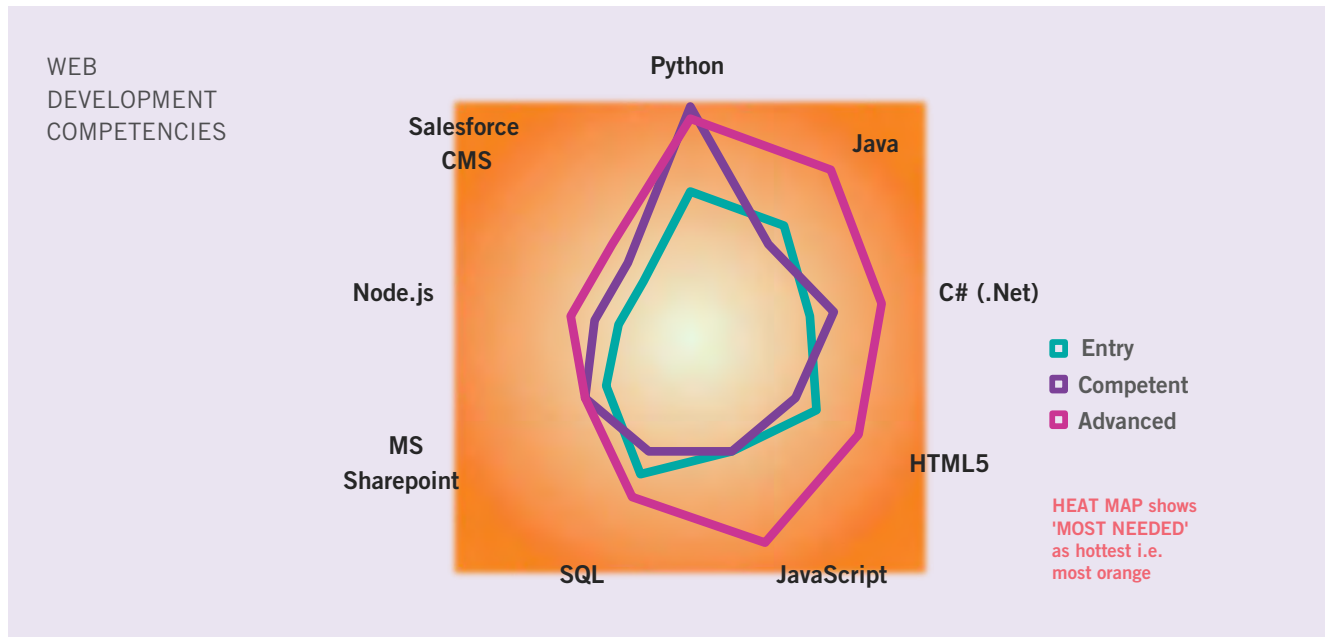
Analysis of Results by Discipline

Sub-discipline: Web Editor

The most sought-after skills are React and AngularJS and these were developed by Facebook and Google respectively and support web editing in Android and IOS environments. Next most required skills are in ASP.NET MVC and Visual Studio, both developed by Microsoft. These are needed at all skills levels.
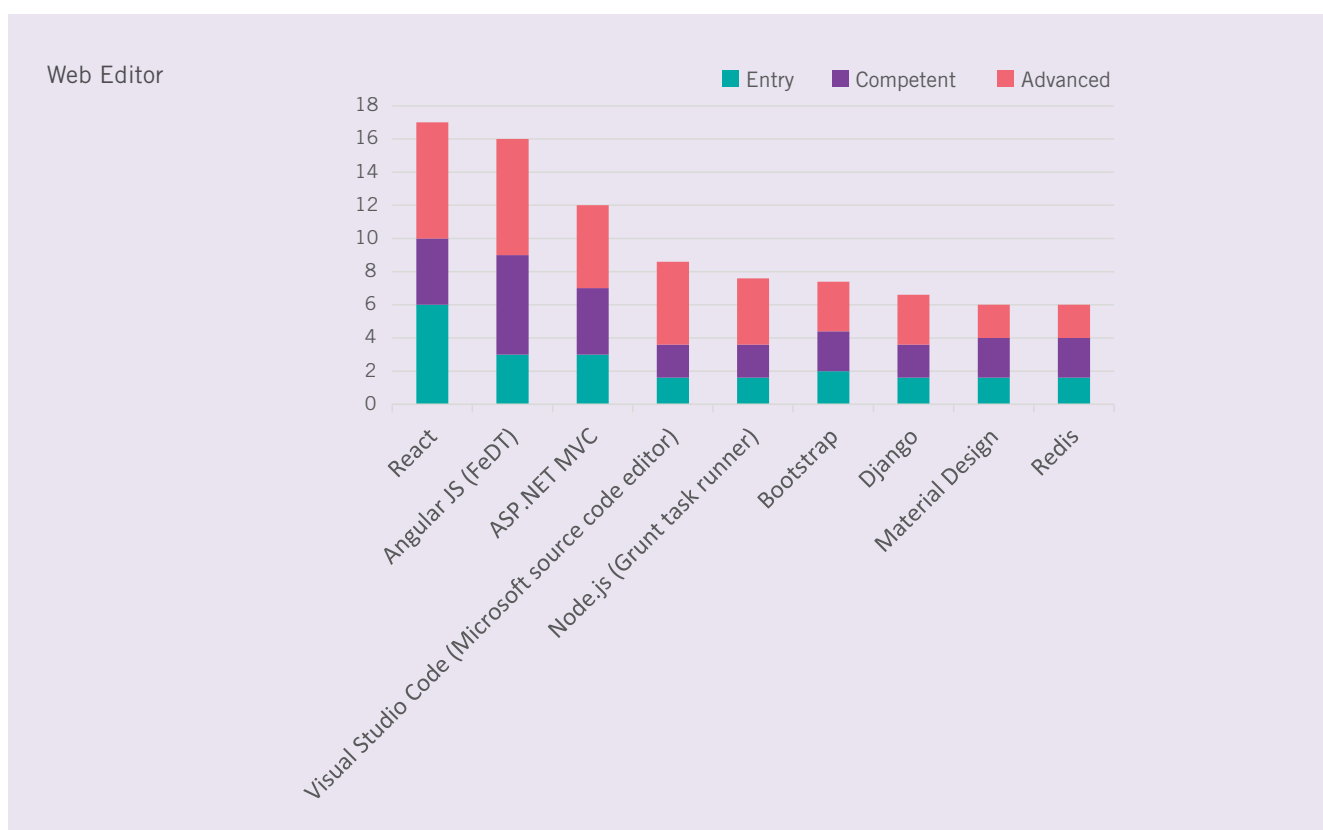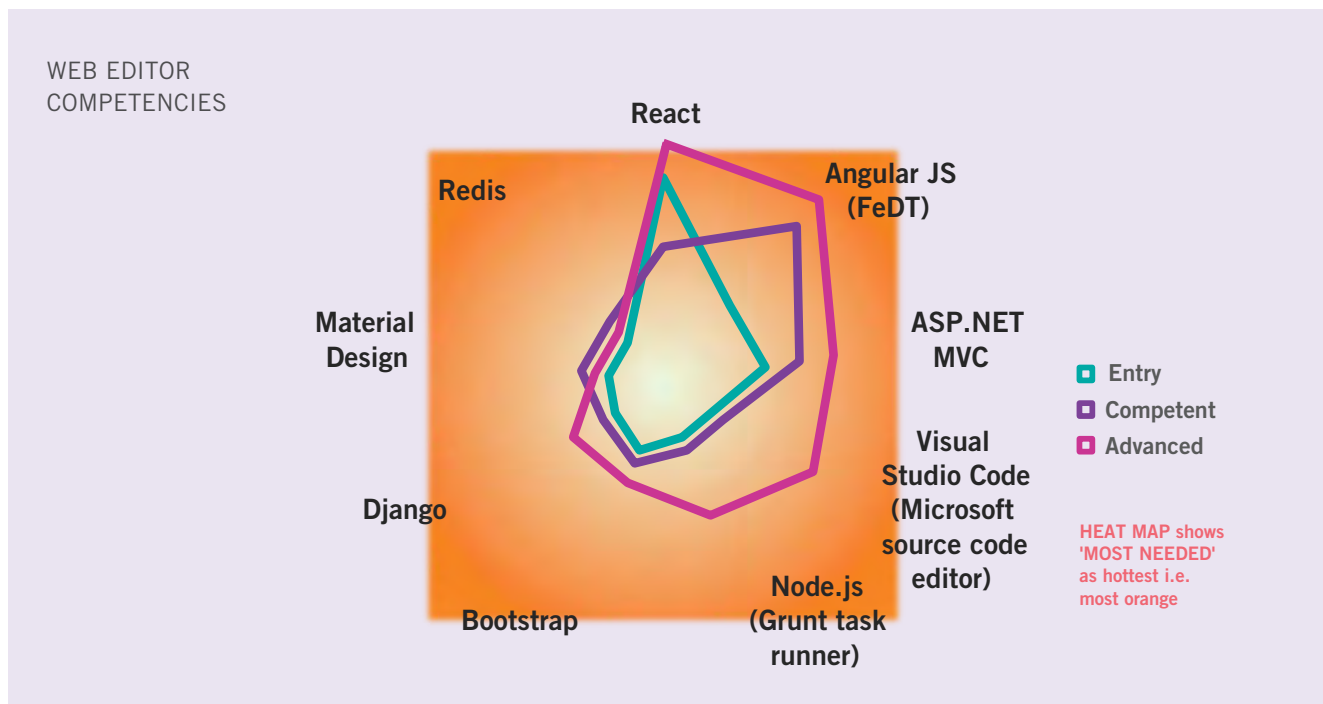
WEB EDITOR
COMPETENCIES

React
Angular JS (FeDT)
Redis
ASP.NET MVC
Material Design
Visual Studio Code (Microsoft source code editor)
Django
Bootstrap
Node.js (Grunt task runner)

□ Entry
□ Competent
□ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Web Editor

■ Entry ■ Competent ■ Advanced

Analysis of Results by Discipline

The most sought-after skills by far are Docker and GitHub, popular for the productivity and version control capabilities they deliver. These are needed at all skills levels.

GRAPHIC
DESIGN
COMPETENCIES

Docker
(Containers)

Slack   Github

Chrome Dev
Tools   Notepad++

■ Entry
■ Competent
■ Advanced

PyCharm
(Python
Developmer
s)   IntelliJ IDEA
                         (IDE)

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange

Postman

Graphic Design

■ Entry ■ Competent ■ Advanced
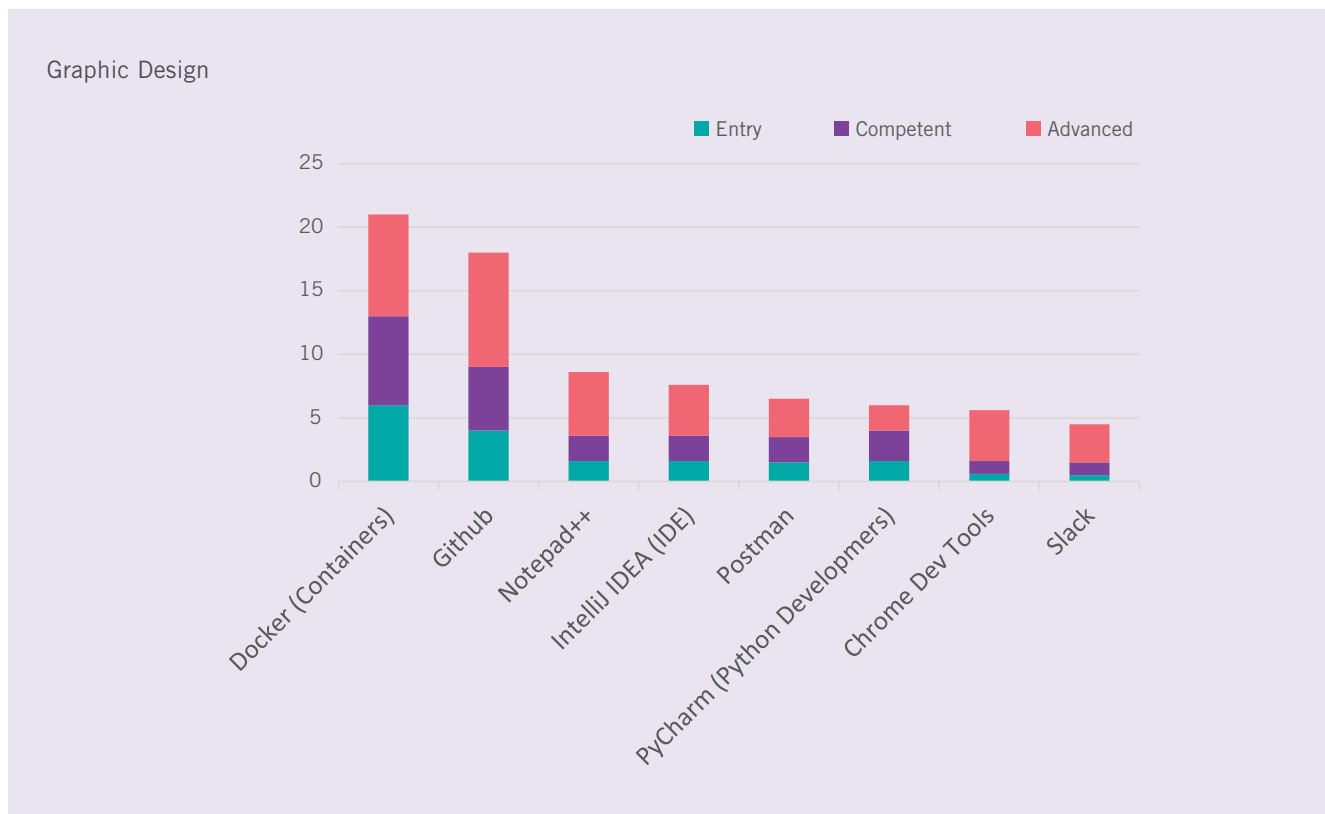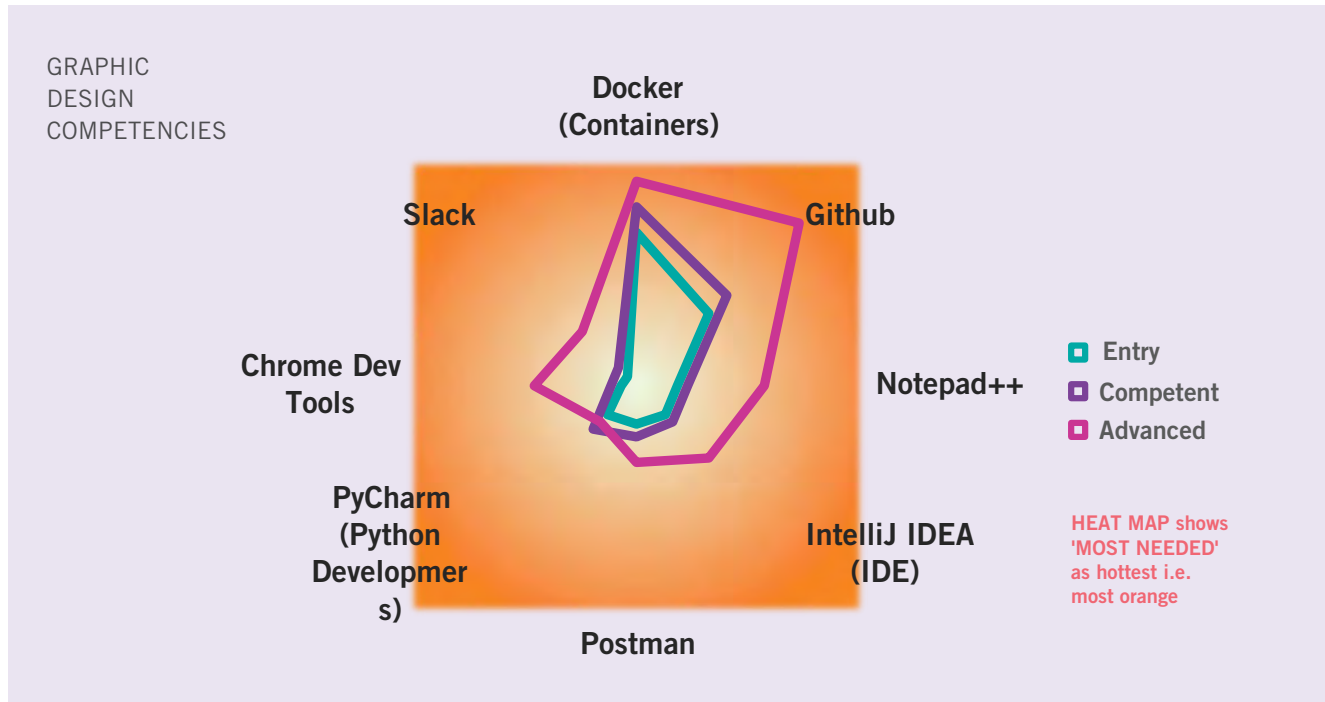
Discipline 3. Cloud Computing

Sub-discipline: Cloud Computing Skills

The most sought-after skills are Amazon Web Services and Microsoft Azure. These are followed by five skills sets in the areas of Cloud Deployment & Migration, Cloud Security, DevOps, Machine Learning and VMWare.

It is notable that for this, the fastest growing of all the disciplines, that entry level skills are as much in demand as the competent and advanced level skills. This is very clearly portrayed in the radar diagram.

CLOUD COMPUTING COMPETENCIES

Amazon Web Services
Cloud Skills / Competencies
Microsoft Azure
Database Management
Cloud Deployment and Migration
Google Cloud
Cloud Security (Cyber Security)
VMWare
DevOps
Machine Larning / AI

□ Entry
□ Competent
□ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Cloud Computing

■ Entry ■ Competent ■ Advanced
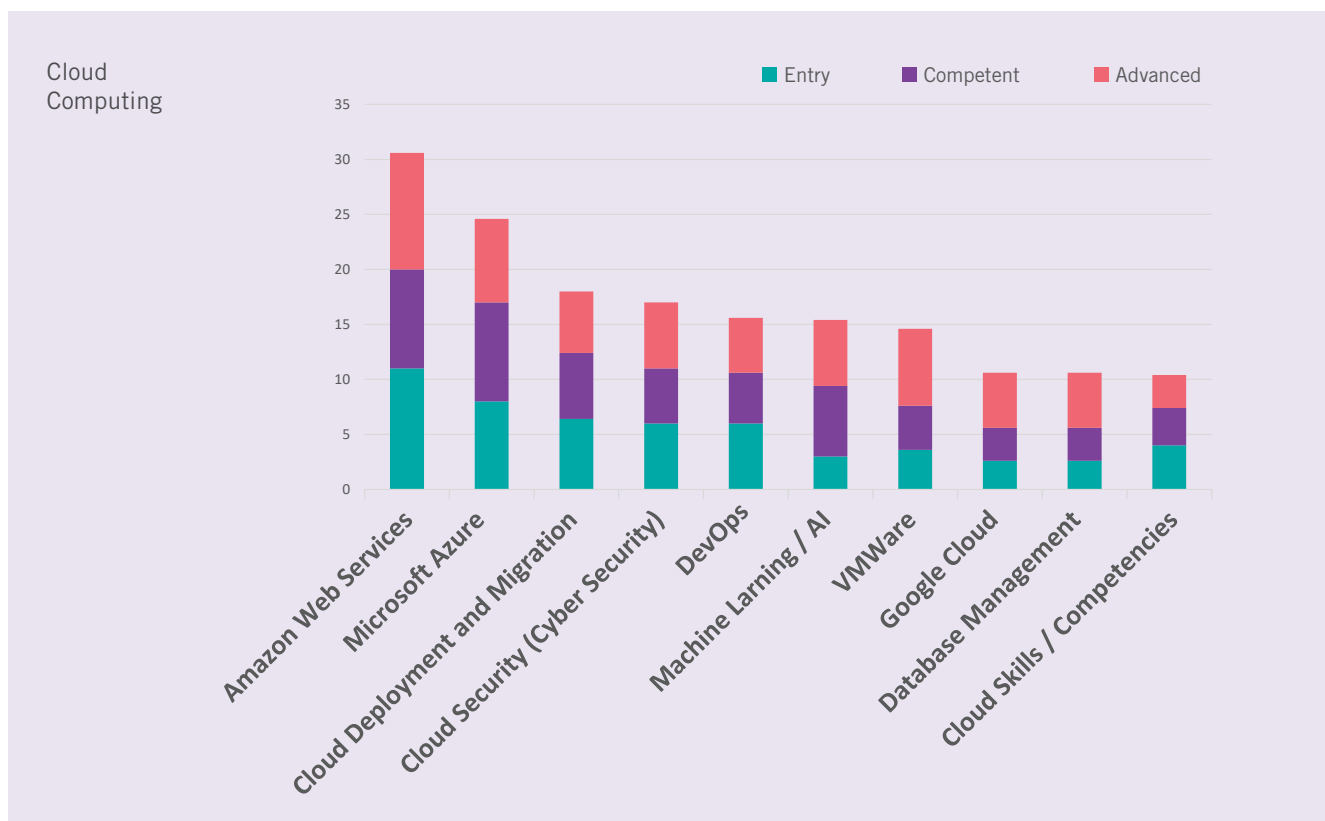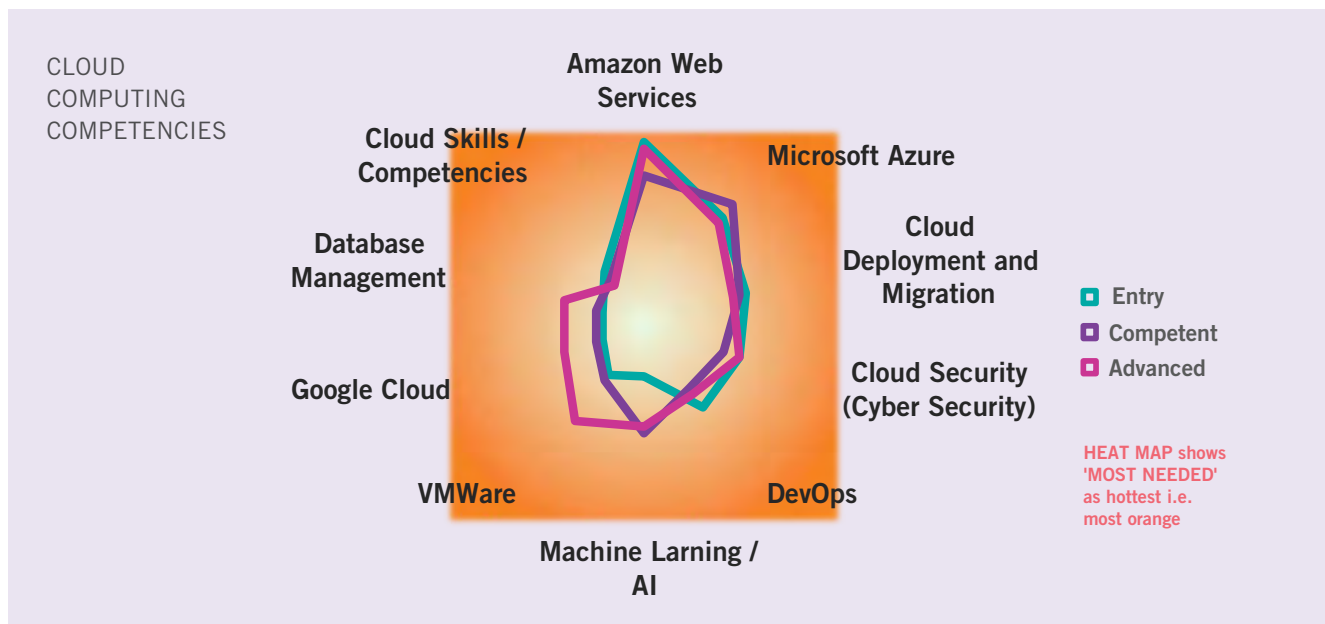
Analysis of Results by Discipline

Sub-discipline: Cloud Computing Programming Skills

The most sought-after skills are Java and Python. These are followed by three skills sets in the areas of JavaScript, Asdp.net and HTTP. Skills are needed at all levels although for this discipline there is a marked demand for Advanced Level skills.

CLOUD COMPUTING PROGRAMMING SKILLS

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Cloud Computing Programming

Entry   Competent   Advanced
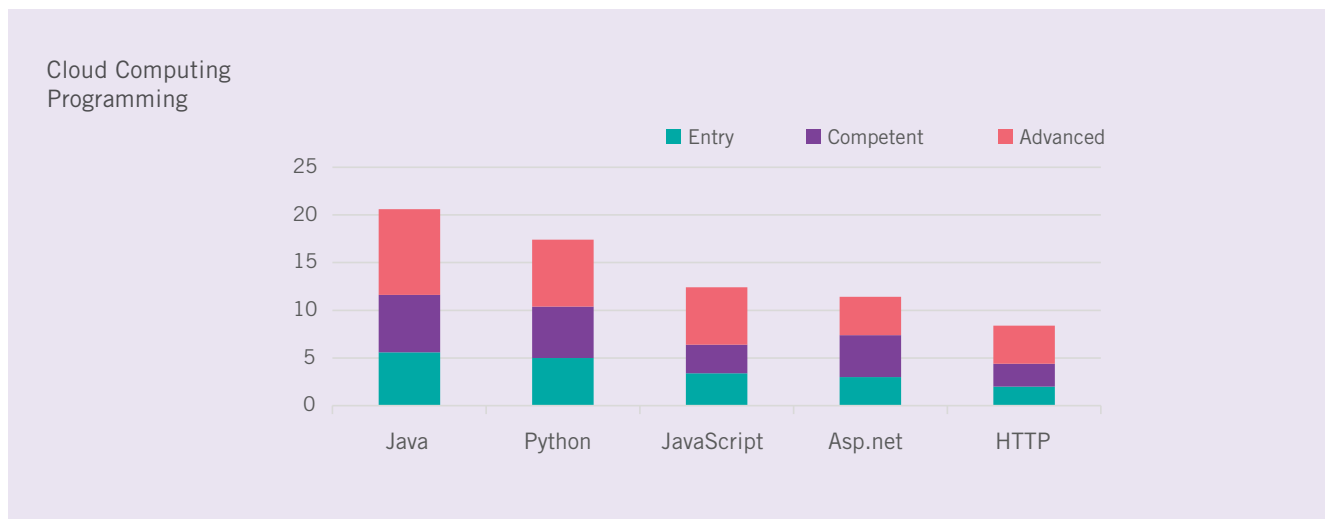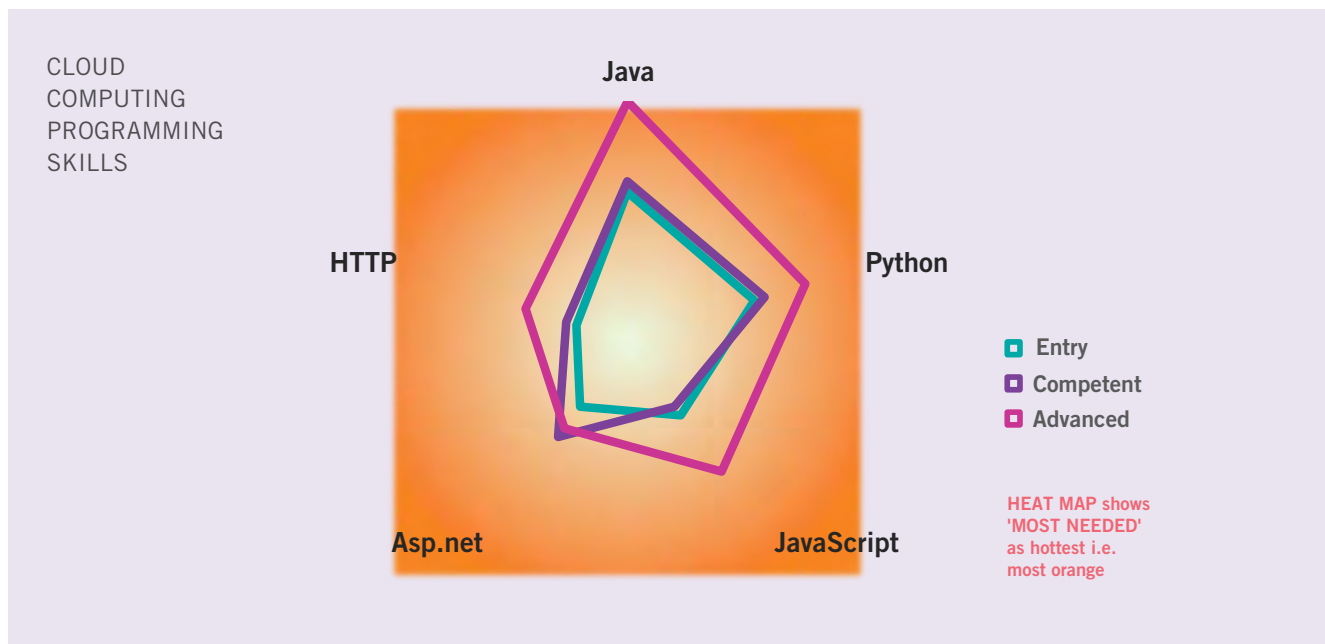
Analysis of Results by Discipline

Sub-discipline: Cloud Computing Development Tools

The most sought-after skill is MySQL. This is followed by four skills namely Automation, Docker, Back-up & Restore and Change Management with a further four rounding out the picture as shown below. Skills are needed at all levels.

CLOUD COMPUTING DEVELOPMENT TOOLS COMPETENCIES

Legend:
- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Cloud Computing Development Tools

Legend: Entry, Competent, Advanced
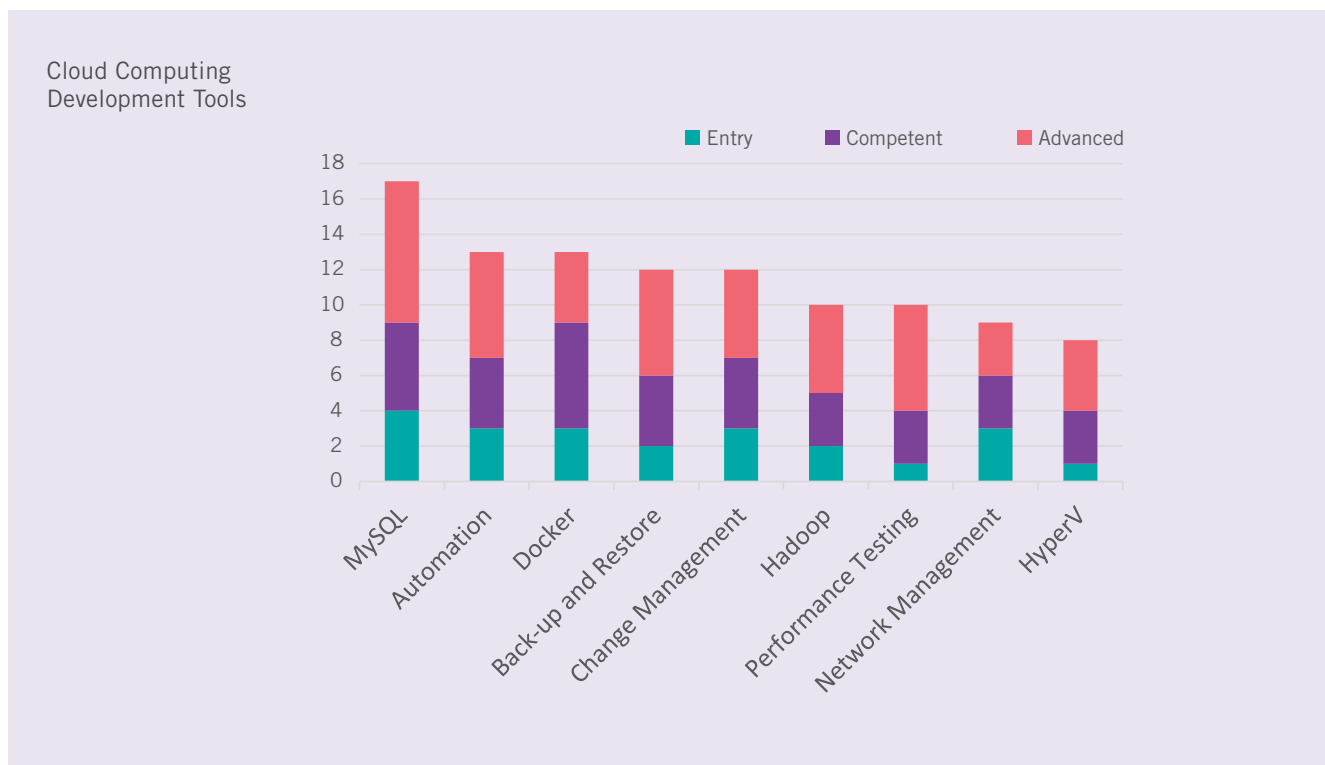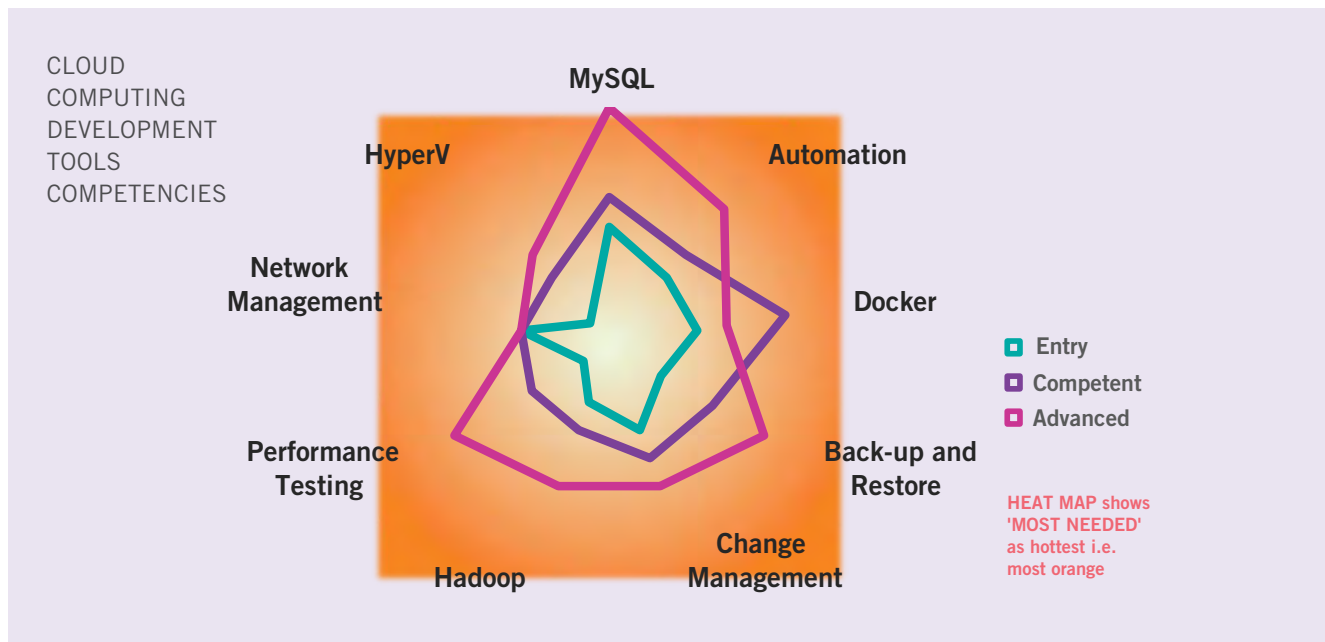
Discipline 4. Machine Learning & AI

Sub-discipline: Machine Learning & AI

Python stands out as the most sought-after skill. This is followed by R Programming and JavaScript and others to a lesser degree as shown below. Skills are needed at all levels.

MACHINE
LEARNING & AI
COMPETENCIES

Python

C/C++   R Programming

☐ Entry
☐ Competent
☐ Advanced

Scala   JavaScript

**HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange**

Java   C#

Machine
Learning & Ai

■ Entry ■ Competent ■ Advanced
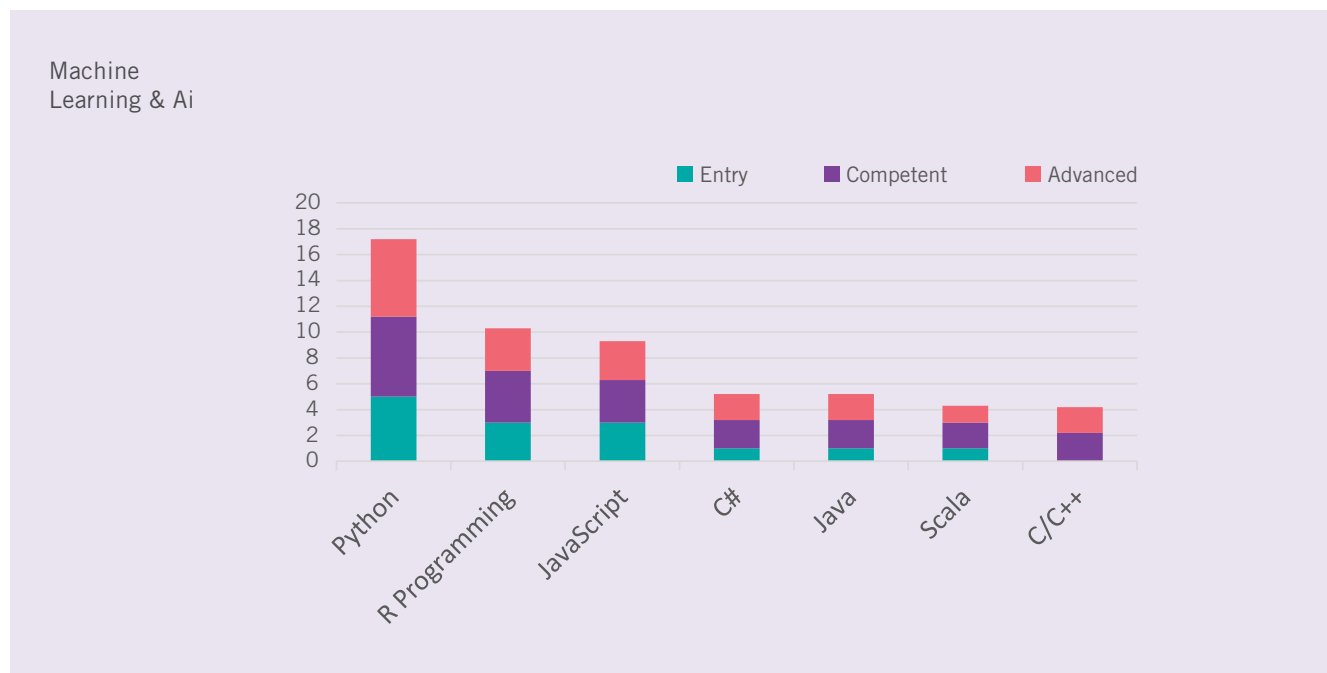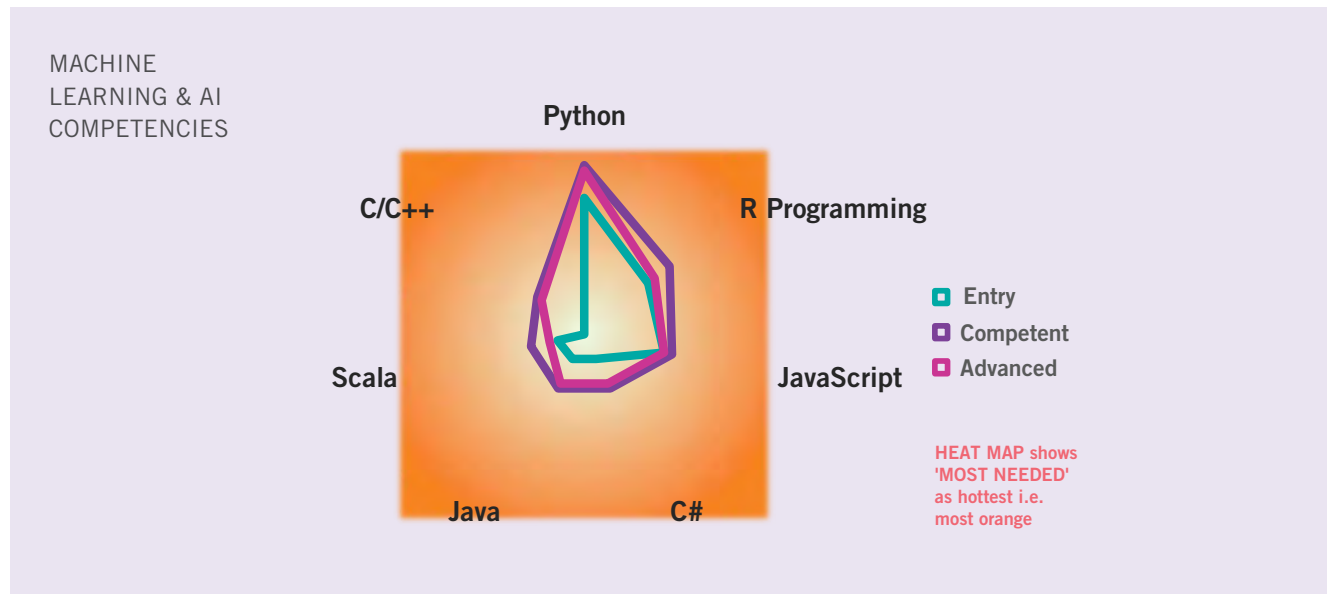
Analysis of Results by Discipline

Sub-discipline: ML Tools & Frameworks

The most sought-after skills are Jupyter Notebook, Amazon Machine Learning and Anaconda followed by a further five as shown below. Skills are needed at all levels.

ML TOOLS &
FRAMEWORKS
COMPETENCIES

Jupyter
Notebook

Amazon
Machine
Learning

TensorFlow

Anaconda

PyTorch.

Google Cloud
AutoML

Apache Spark
MLlib.

Scikit-Learn

■ Entry
■ Competent
■ Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange

ML Tools & Frameworks

■ Entry   ■ Competent   ■ Advanced
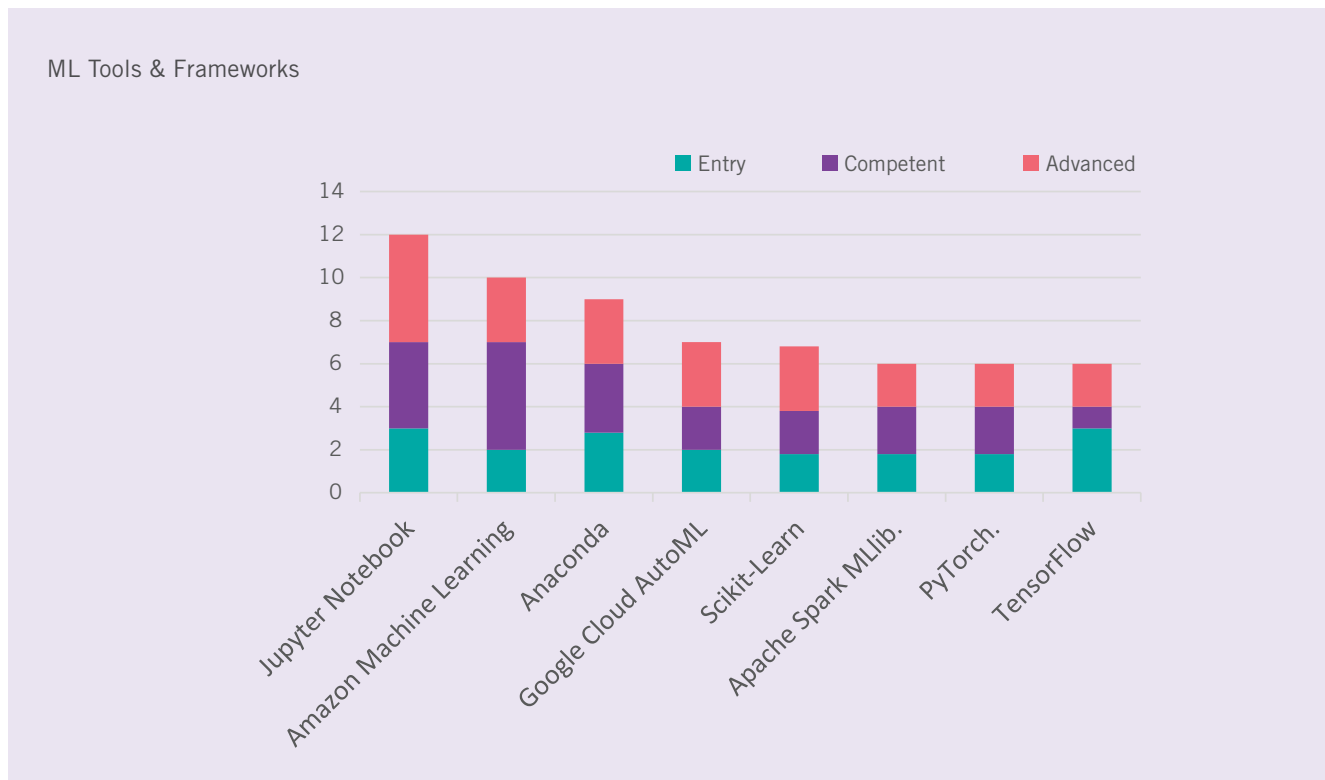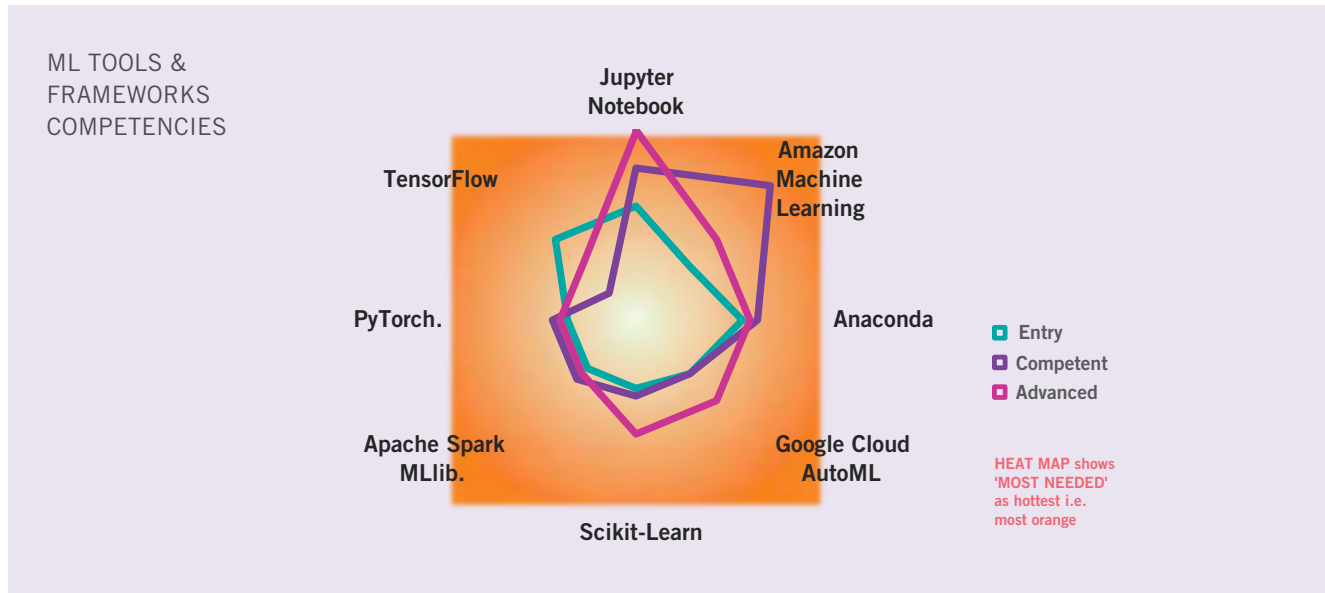
Analysis of Results by Discipline

Sub-discipline: AI Platforms

The most sought-after skills are aligned with the market leaders in cloud platforms, namely Amazon Machine Learning (AML), Azure Machine Learning Studio and Google AI Platform. Although skills are needed at all levels the greatest need is for competent skills.

AI PLATFORMS COMPETENCIES

Amazon Machine Learning (AML)

Azure Machine Learning Studio

Wipro HOLMES

TensorFlow.

Google AI Platform

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

AI Platforms

Entry   Competent   Advanced
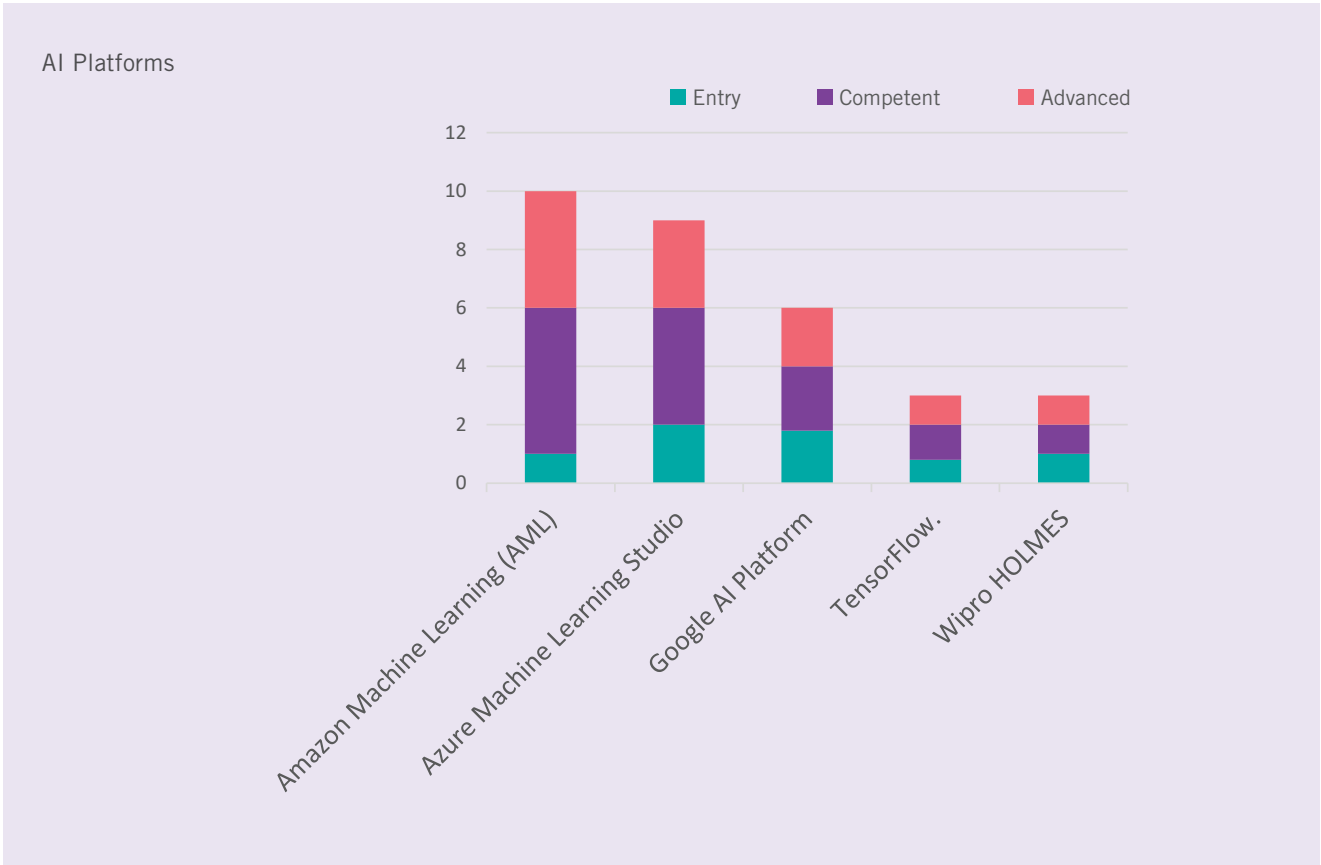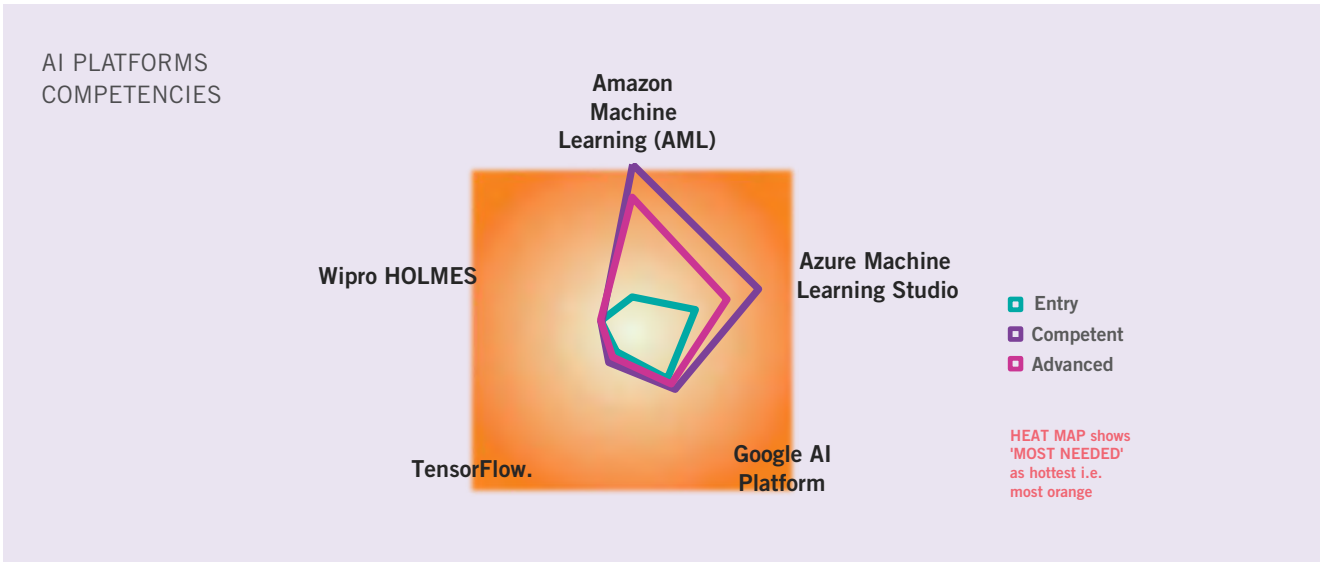
Analysis of Results by Discipline

Sub-discipline: Data Analytics Skills

The most sought-after skills are a bundle of ten complementary skills, shown below, that together satisfy the requirements of these Data Analytics roles. The skills bundle contains both technology (e.g. SQL) and professional skills (e.g. Communication & Presentation). Skills are needed at all levels.

DATA ANALYTICS COMPETENCIES

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Data Analytics Skills

Analysis of Results by Discipline

The most sought-after skill is Python. A further bundle of complementary skills makes up the three next most needed skill sets; namely SQL, Cloud Computing and Excel. Skills are needed to a similar extent at all levels.

DATA SCIENCE / AI SKILLS

Entry
Competent
Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Data Science / AI Skills

Entry   Competent   Advanced
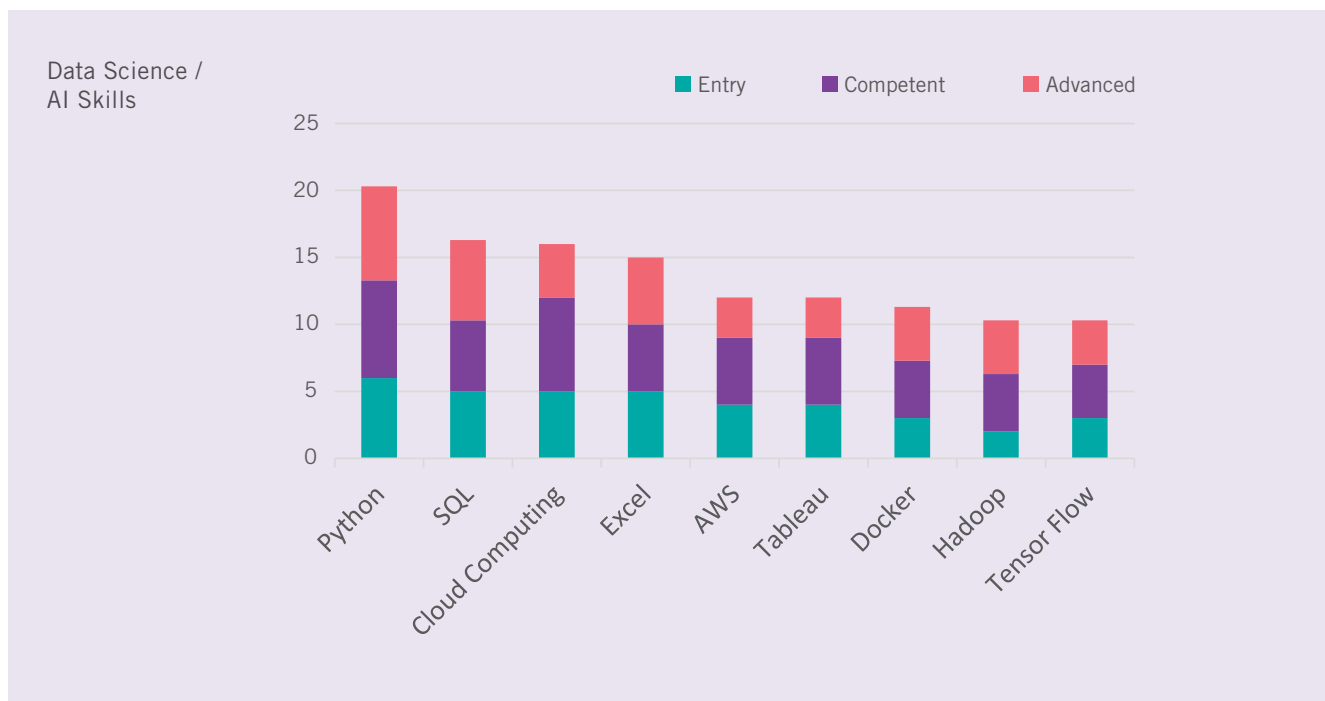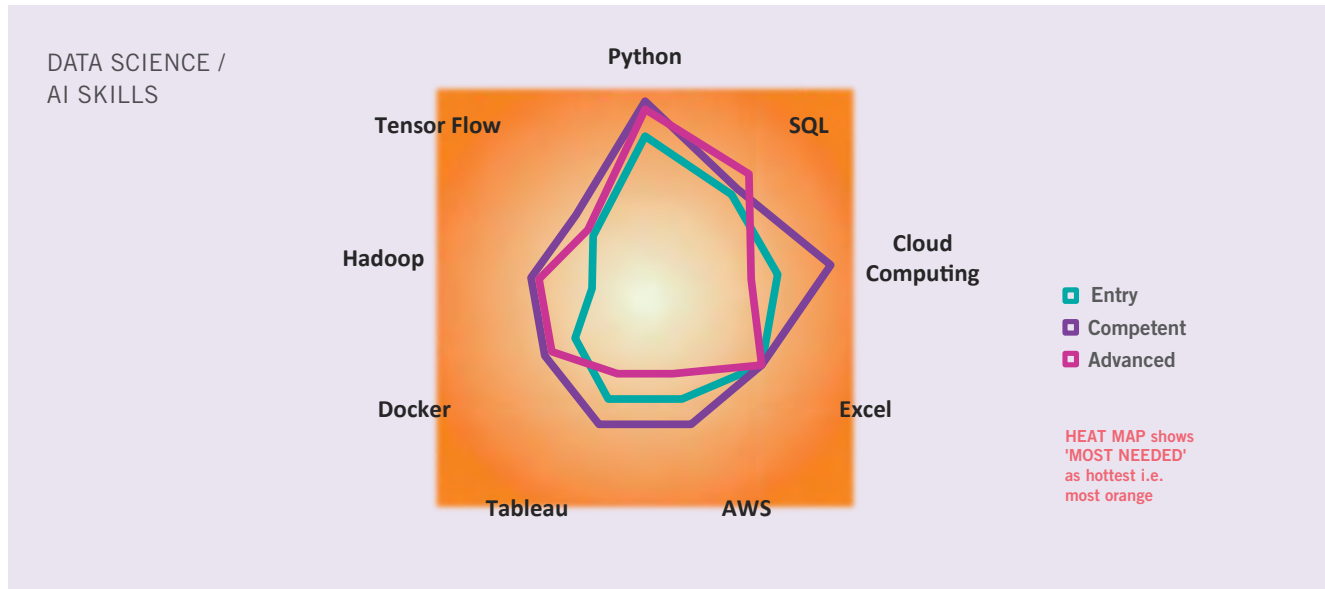
Discipline 5. Big Data

The most sought-after skills are PowerBI, MongoDB and Tableau. A further seven skill sets make up the remaining list of most needed skills and in so doing, cover a wide range of competencies. Skills are needed to a similar extent at all levels.

BIG DATA
(ANALYTICS)
SKILLS

PowerBI
(Micrsoft)

Oracle BI   MongoDB

SAP
Business
Objects   Tableau

Cloudera   Apache
Hadoop

CDH
(Cloudera
Distribution
for Hadoop)

Qlik

Kafka

- Entry
- Competent
- Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange

Big Data
(Analytics)
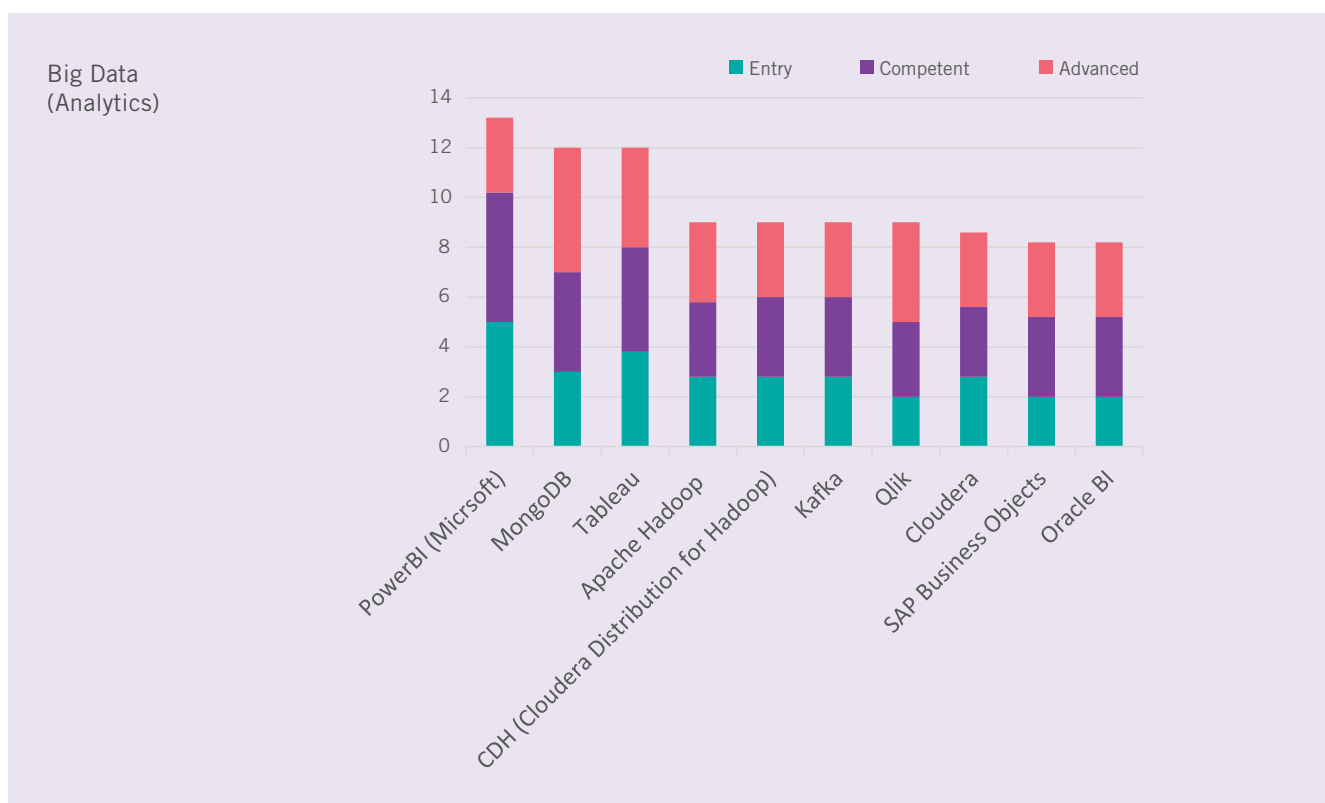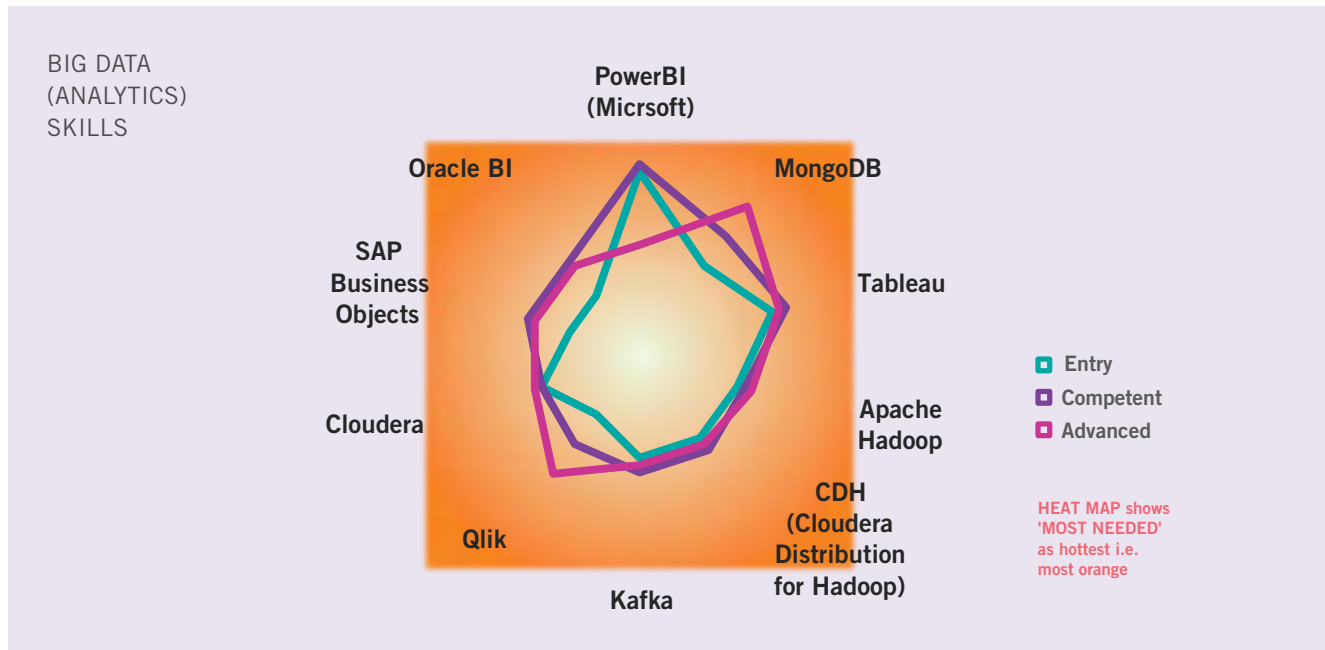
Discipline 6. Robotic Process Automation

Sub-discipline: BP Management Software

The most sought-after skills are Microsoft Power Automate and UiPath RPA. A further four skill sets shown below are also in demand. Skills are needed at all levels.

BP MANAGEMENT SOFTWARE SKILLS

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

BP Management Software
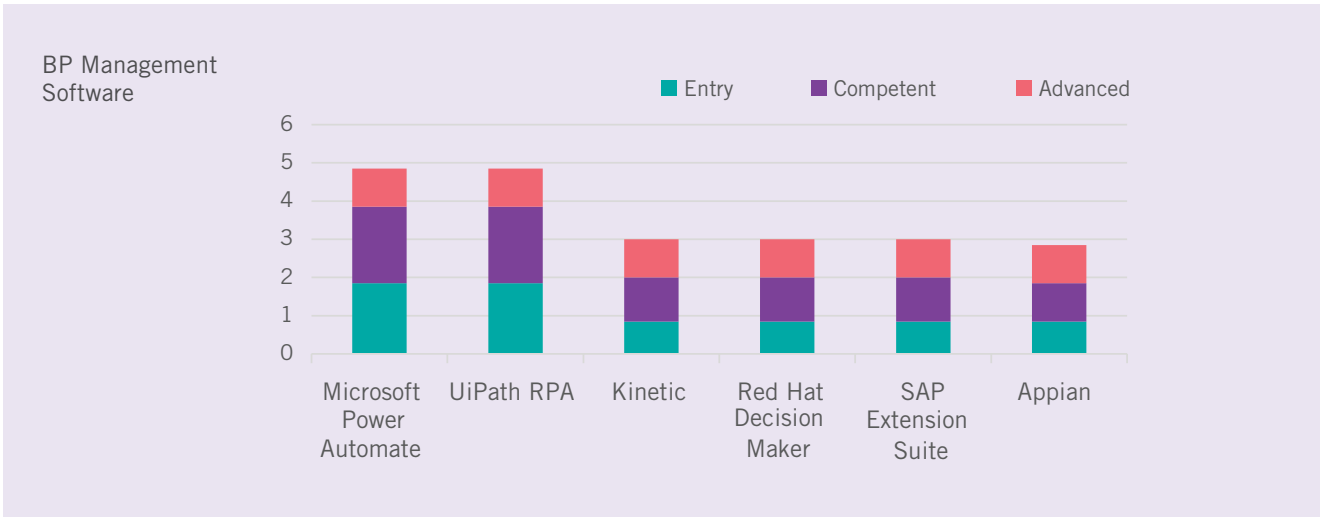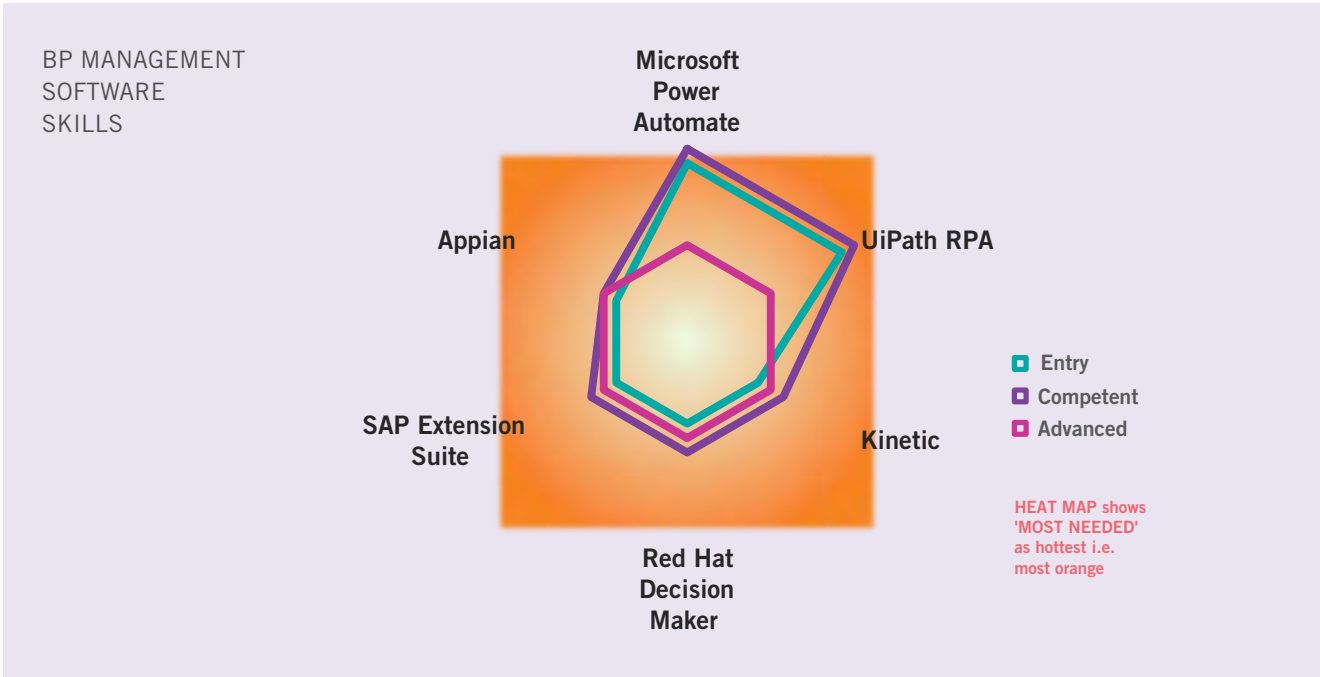
Analysis of Results by Discipline

Sub-discipline: BP Simulation

The most sought-after skills are UiPath RPA and Blue Prism. This is followed by Automation Anywhere RPA and to a lesser degree a further five skill sets as shown below. Skills are needed at all levels.

BP SIMULATION
SKILLS

UiPath RPA
Workfusion
Blue Prism
Pega Platform
Automation Anywhere RPA
Enablesoft
AnyLogic
Automate RPA

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

BP simulation

- Entry
- Competent
- Advanced

Analysis of Results by Discipline

The most sought-after skills are Problem Solving and Process Optimisation. These are followed by a range of Professional skills as shown below. Skills are needed at all levels but most significantly at Expert Level.

RPA COMPETENCIES

- Problem Solving
- Process Optimisation
- Business Knowledge
- Leadership Skills
- Project Management
- Problem Solving
- Professional Development (Soft Skills)

Legend:
- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

RPA Competencies

Legend: Entry, Competent, Advanced

Categories: Problem Solving, Process Optimisation, Business Knowledge, Leadership Skills, Project Management, Problem Solving, Professional Development (Soft...)

Analysis of Results by Discipline

Discipline 7. Blockchain

Sub-discipline: Coding

The most sought- after skills are Python, SQL and JavaScript. This is closely followed by a further five skills as shown below. Skills are needed to a similar extent at all levels.

BLOCKCHAIN CODING SKILLS

Python
Swift
SQL
Ruby
Javascript
Go
C#
Solidity

Entry
Competent
Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Blockchain Coding

Entry   Competent   Advanced

Python, SQL, Javascript, C#, Solidity, Go, Ruby, Swift
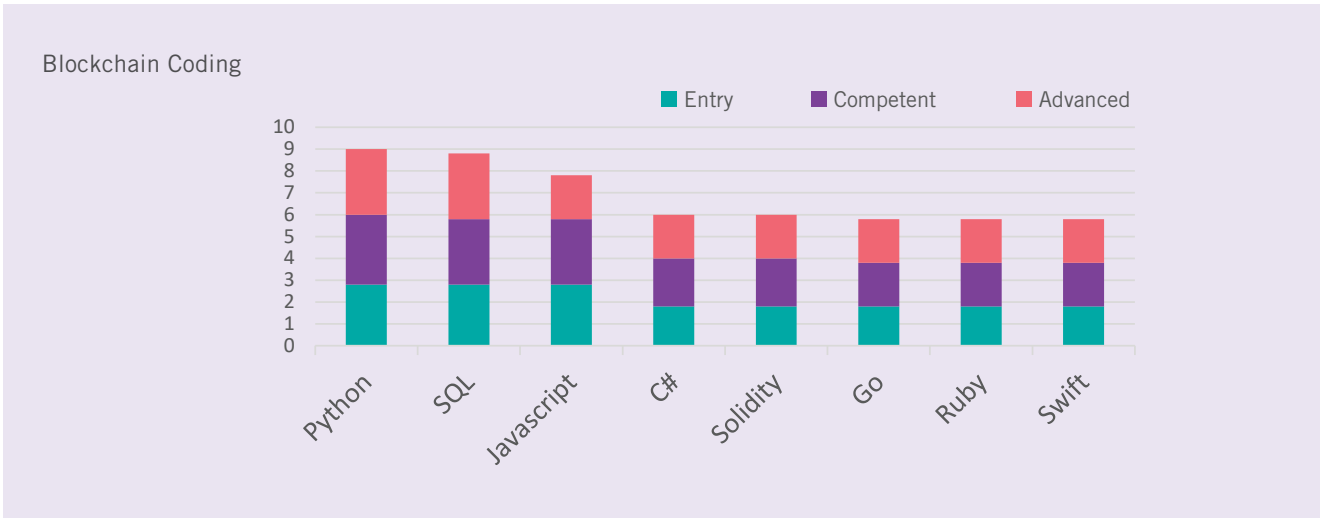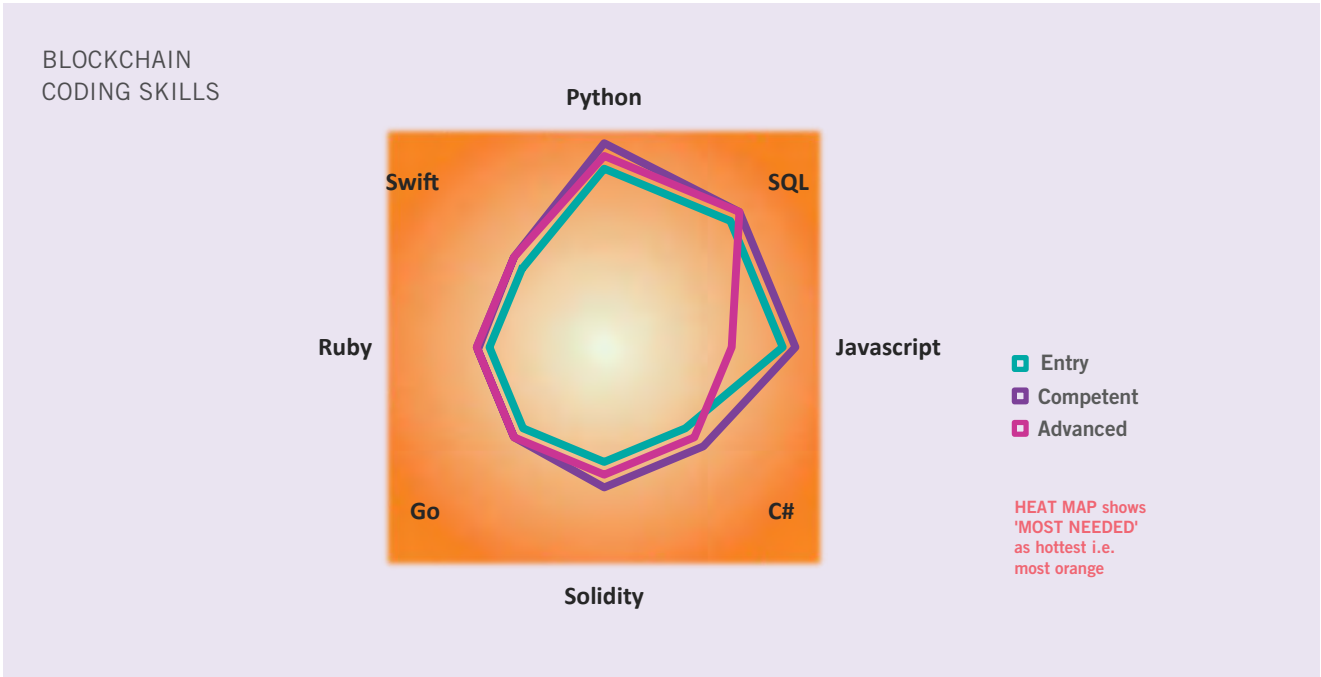
Analysis of Results by Discipline

Sub-discipline: Blockchain Competencies

The most sought-after skill is Blockchain Templates for Hyperledger Fabric. This is closely followed by AWS Blockchain Templates for Hyperledger Fabric, Blockchain Enterprise Applications, Cryptocurrencies and Central Bank Digital Currencies. Skills are needed at all levels but most significantly at Expert Level.

BLOCKCHAIN COMPETENCIES

Blockchain Templates for Hyperledger Fabric

AWS Blockchain Templates for Hyperledger Fabric

Systems Development

Blockchain Enterprise Applications

Systems Analysis & Design

- Entry
- Competent
- Advanced

Software Applications Testing

Cryptocurrencies and Central Bank Digital Currencies

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Blockchain Use Cases and Sales Cycle

Web Development Technologies

Blockchain Competencies

Entry   Competent   Advanced

Analysis of Results by Discipline

Sub-discipline: Building an Application for
the Hyperledger Fabric Network

The most sought-after skill is Hyperledger Sawtooth. This is followed by four complementary skill sets as shown below. Skills are needed at all levels but most significantly at Expert Level.

BLOCKCHAIN -
BUILDING AN
APPLICATION FOR
THE HYPERLEDGER
FABRIC NETWORK

Hyperledger
Sawtooth

Chaincode and
Transaction Flow in
Hyperledger Fabric

Hyperledger Cello

Working with
Hyperledger Iroha

Docker Processes and
Exploring the CLI
Container

☐ Entry
☐ Competent
☐ Advanced

**HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange**

Blockchain - Building an Application
for The Hyperledger Fabric Network

■ Entry   ■ Competent   ■ Advanced

7	
6	
5	
4	
3	
2	
1	
0	

Hyperledger Sawtooth | Chaincode and Transaction Flow in Hyperledger Fabric | Docker Processes and Exploring the CLI Container | Working with Hyperledger Iroha | Hyperledger Cello

Discipline 8. Innovation Design Thinking & Disruption

The three most sought-after skills are Knowledge Management (KM), A Strong Awareness of Market Research/Technology Trends & FinTech landscape and the Ability to Take a Human-centric Approach to Problem Solving. This is followed by seven complementary skill sets as shown below. Skills are needed at all levels but most significantly at Expert Level.

INNOVATION
DESIGN THINKING
& DISRUPTION

Knowledge Management (KM) is foundational in building an Innovation capability & value

A Strong awareness of market research/technology trends and the FinTech landscape

Provide Strategic influence in guiding the organizational direction

Ability to take a human-centric approach to problem solving (real people rather than generic personas)

Lead teams through the innovation lifecycle and work with partners to design, validate and deliver solutions

Innovative Thinking from the perspective of Customers and Stakeholders

Innovation Management - Leadership and Management of adjacent and disruptive innovations from discovery

Lead cultural change within organization

Prototyping and implementing feedback loop mechanism - allow for a 'fail early' mentality - Converge, diverge,...

☐ Entry
☐ Competent
☐ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

46

Innovation Design Thinking & Disruption

Legend: ■ Entry ■ Competent ■ Advanced

Chart Y-axis: 0, 5, 10, 15, 20, 25

Categories:
- Knowledge Management (KM) is fundational in building an...
- A Strong awareness of market research/technology trends and the...
- Ability to take a human-centric approach to problem solving (real...
- Innovative Thinking from the perspective of Customers and...
- Lead cultural change within organization
- Prototyping and implementing feedback loop mechanism - allow for a...
- Innovation Management - Leadership and Management of adjacent...
- Lead teams through the innovation lifecycle and work with partners...
- Provide Strategic influence in guiding the organizational direction
- Stimulate innovation internally

Analysis of Results by Discipline

Discipline 9. Production Support & Database / System Administration

Sub-discipline: System Admin

The most sought-after skills are AWS and Azure which aligns with the two market leading cloud platforms. This is followed by Microsoft 365 and then a further seven skill sets as shown below. Skills are needed to a similar extent at all levels.

PRODUCTION SUPPORT & DATABASE / SYSTEM ADMIN

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Production Support & Database / System Admin

Legend: Entry, Competent, Advanced

Analysis of Results by Discipline

The most sought-after industry certification for this discipline is Project Management Professional (PMP). This is followed by a bundle of six desired industry certifications as shown below. The industry certifications are more in demand at Expert Level.

PRODUCTION SUPPORT &
DATABASE / SYSTEM ADMIN

Project Management
Professional (PMP)

Microsoft SharePoint
Server Content
Management for
SharePoint 2013 and
2016

Certified Cloud Security
Professional (CCSP)

CompTIA Network+

Certified Information
Security manager
(CISM)

Cisco Certified
Internetwork Expert
(CCIE)

Certified Information
Systems Security
Professional (CISSP)

■ Entry
■ Competent
■ Advanced

**HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange**

Production Support & Database / System Admin

■ Entry   ■ Competent   ■ Advanced

Analysis of Results by Discipline

Discipline 10. Systems / Application Architecture

The most sought-after skill is AWS. This is followed by Microsoft 365, Azure and PowerShell 5.0 DSC.

Skills are needed to a greater extent at Expert level.

SYSTEMS / APPLICATION ARCHITECTURE SKILLS

AWS

Microsoft Hyper-V

Microsoft 365

Google Cloud

Azure

Cloudstack

PowerShell 5.0 DSC (Desired State Configuration)

Business Architect

Analytical / Quantitative Skills

☐ Entry
☐ Competent
☐ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Systems / Application Architecture

■ Entry   ■ Competent   ■ Advanced
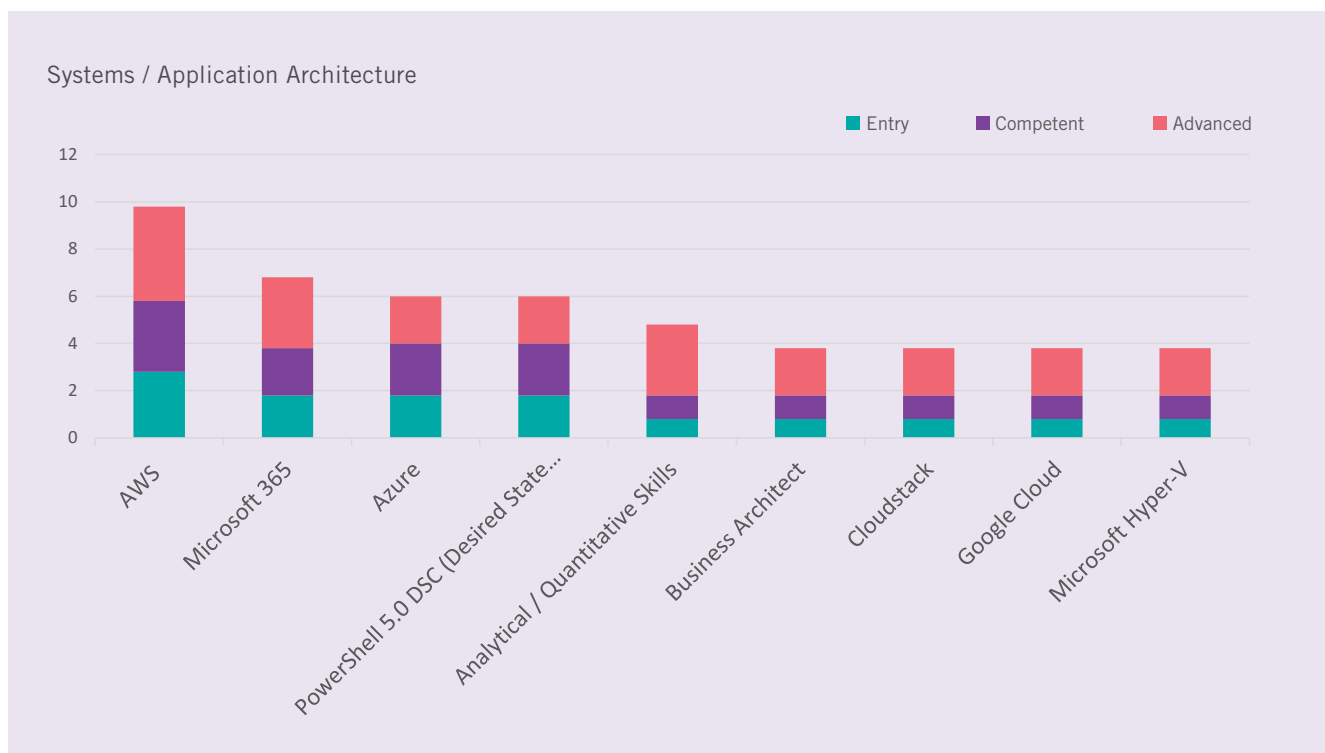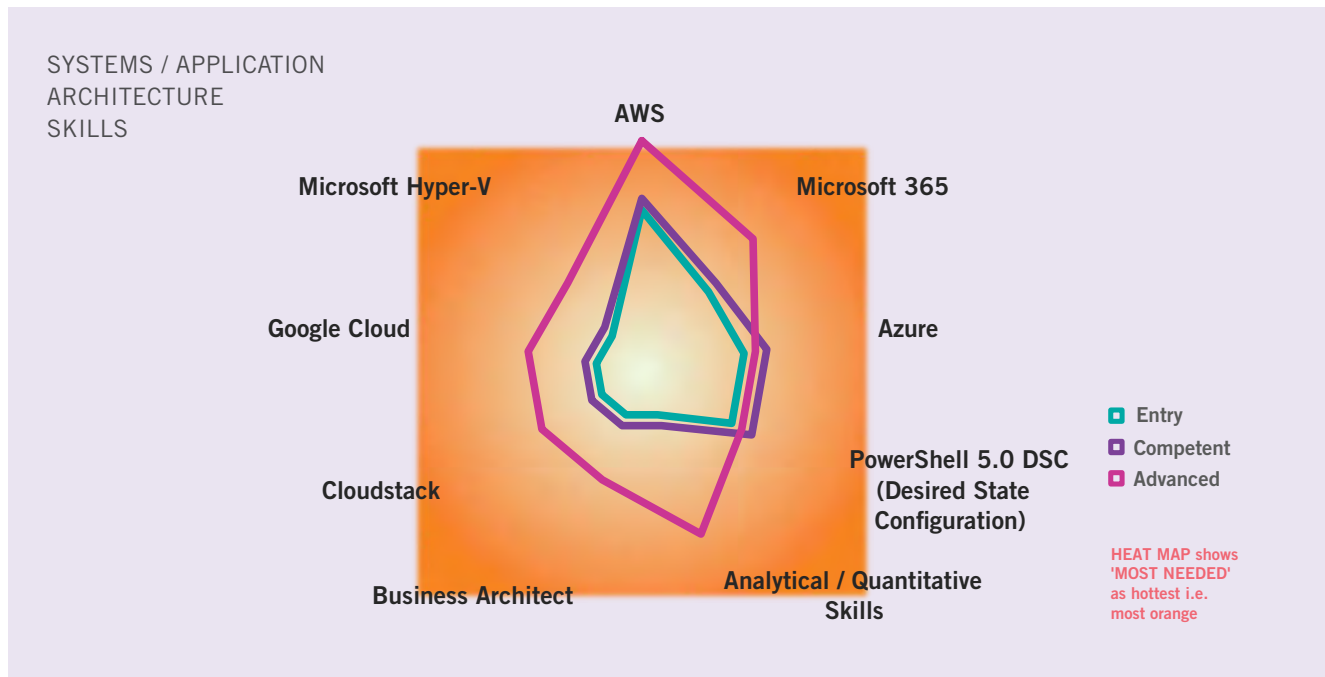
Discipline 11. Mobile App Development Platform

The most sought-after skills are C#, Java, Python and
SQL which are all popular programming languages.

Skills are needed at all levels.

MOBILE APP DEVELOPMENT
PLATFORM SKILLS

C# (.Net)

HTML5

JAVA

Angular- Repository

Python

SQL

- Entry
- Competent
- Advanced

**HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange**

Mobile App Development Platform

■ Entry ■ Competent ■ Advanced
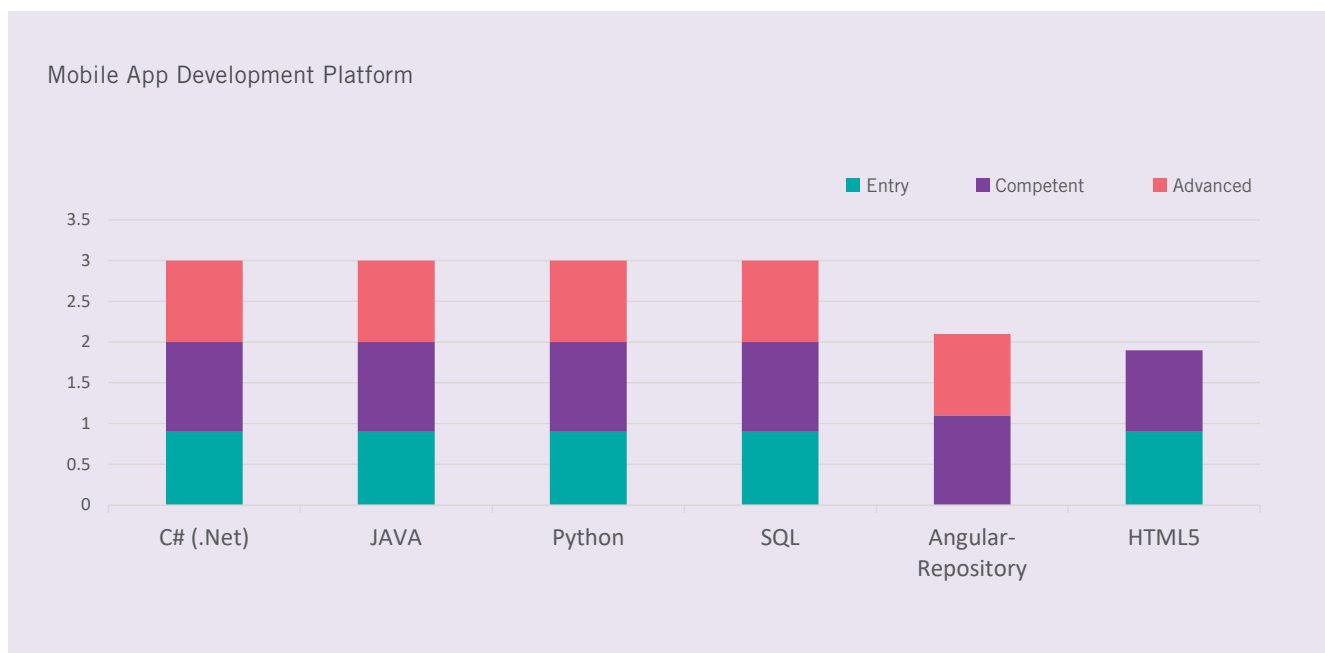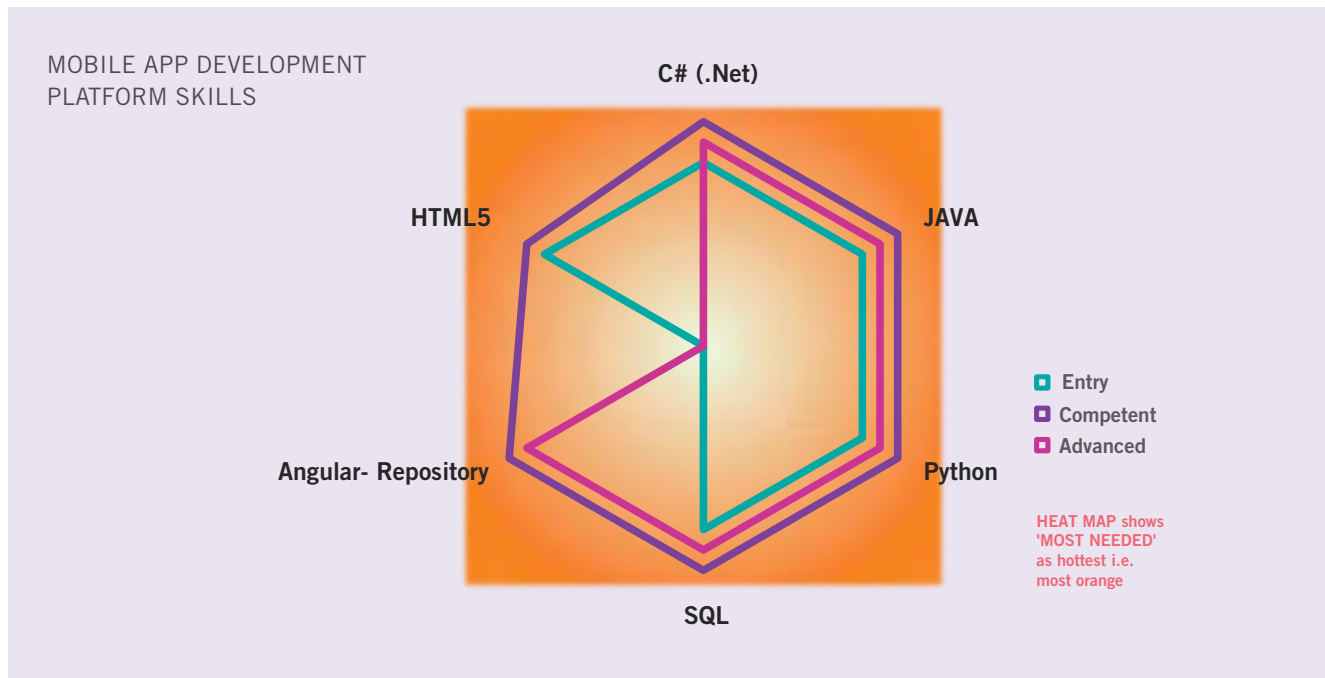
Analysis of Results by Discipline

Discipline 12. DevOps

Sub-discipline: DevOps

The most sought-after skill is Amazon Web Services followed by Kubernetes. These are followed by a further ten skills as shown below which round out the bundle of required skills. Skills are needed to a similar extent at all levels.

DEVOPS SKILLS

Entry
Competent
Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange

Devops

Entry · Competent · Advanced
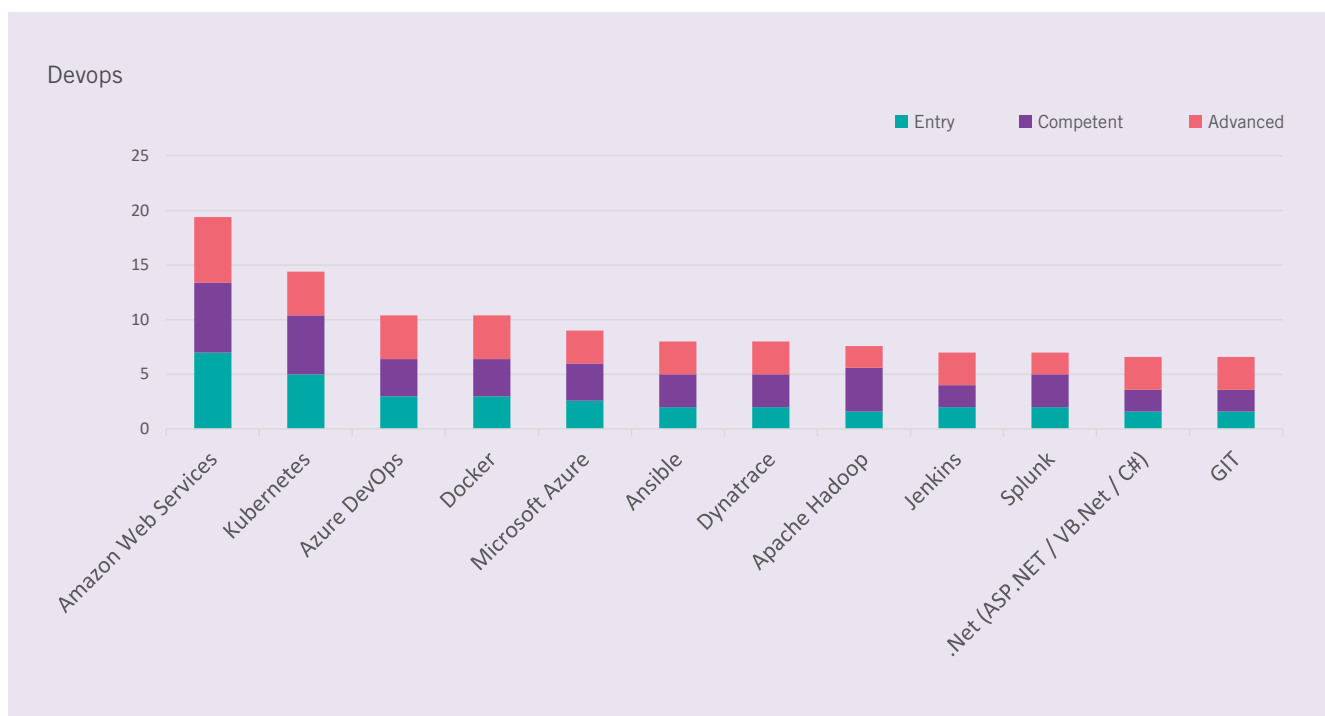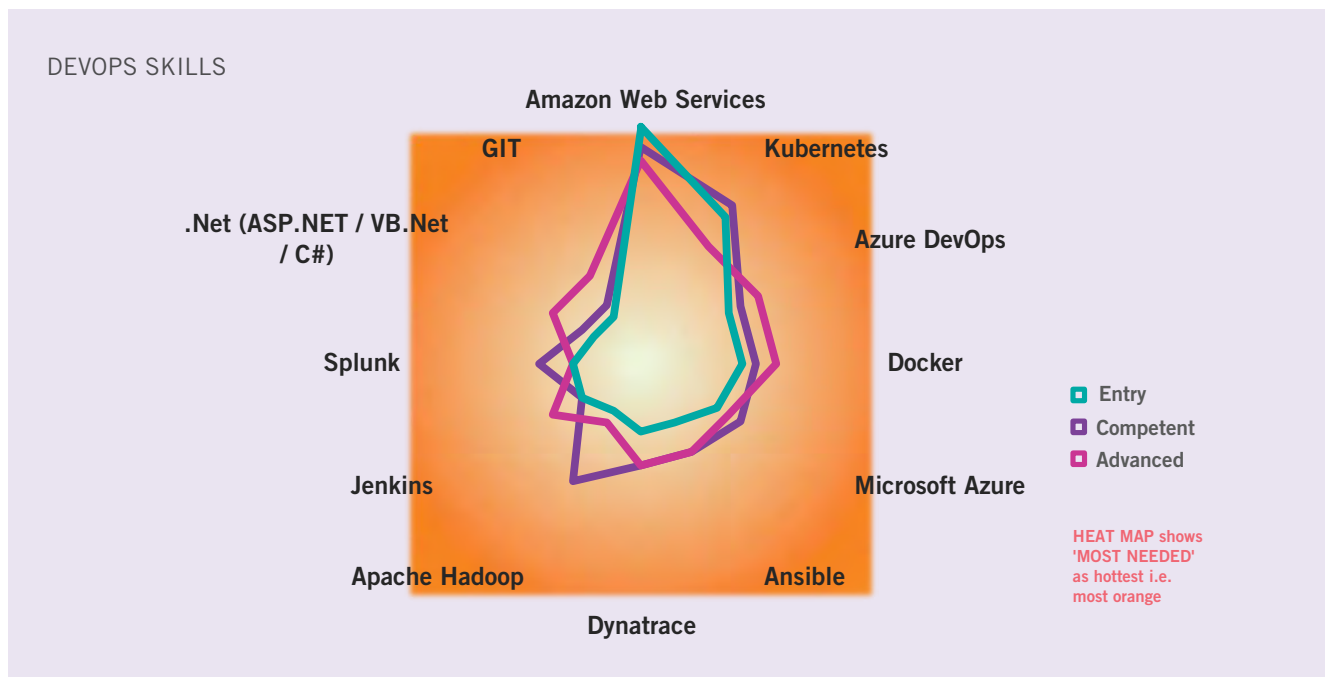
Analysis of Results by Discipline

Sub-discipline: DevSecOps Tools

The response data set size was small for this discipline, so a certain degree of caution is thereby merited. The most sought-after skills are Selenium, Splunk Enterprise and Dynatrace. For Selenium and Splunk Enterprise skills are needed at all levels, but Dynatrace is not required at Entry level.

DEV SEC OPS
TOOLS SKILLS

Selenium

Dynatrace

Splunk Enterprise

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Dev Sec Ops Tools

■ Entry ■ Competent ■ Advanced
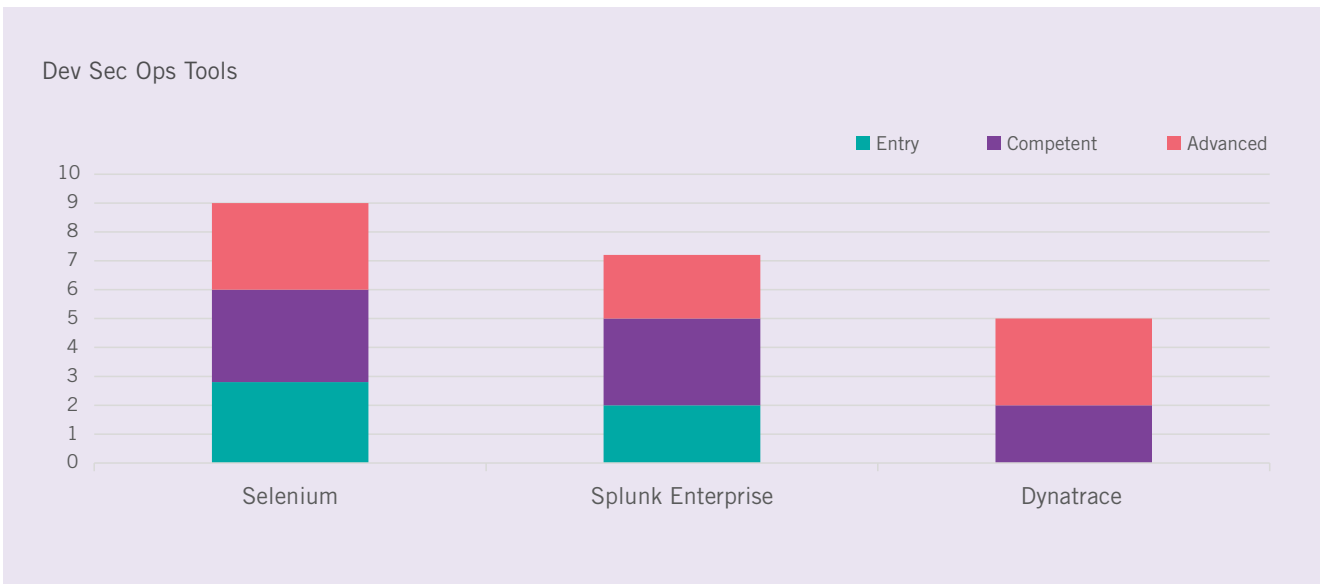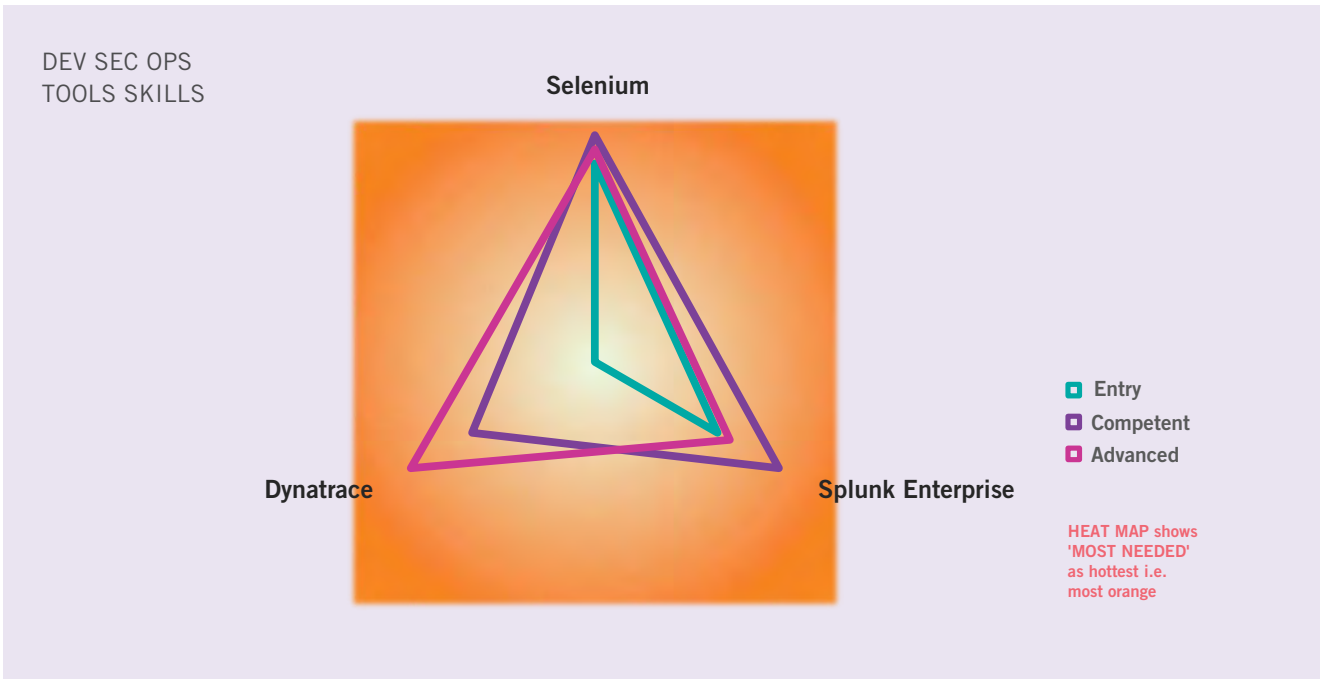
Discipline 13. Enterprise Applications

The most sought-after skill is Jira. Next in line are AWS, Microsoft Teams and Microsoft Office.

Skills are needed at all levels.

ENTERPRISE APPLICATIONS
TOOLS SKILLS

Jira

Zoom

AWS

Knowledge of Data-base Design

Microsft Teams

MS Access/Excel

Microsoft Office 365

- ☐ Entry
- ☐ Competent
- ☐ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Enterprise Applications

■ Entry   ■ Competent   ■ Advanced

25

20

15

10

5

0

Jira | AWS | Microsft Teams | Microsoft Office 365 | MS Access/Excel | Knowledge of Data-base Design | Zoom
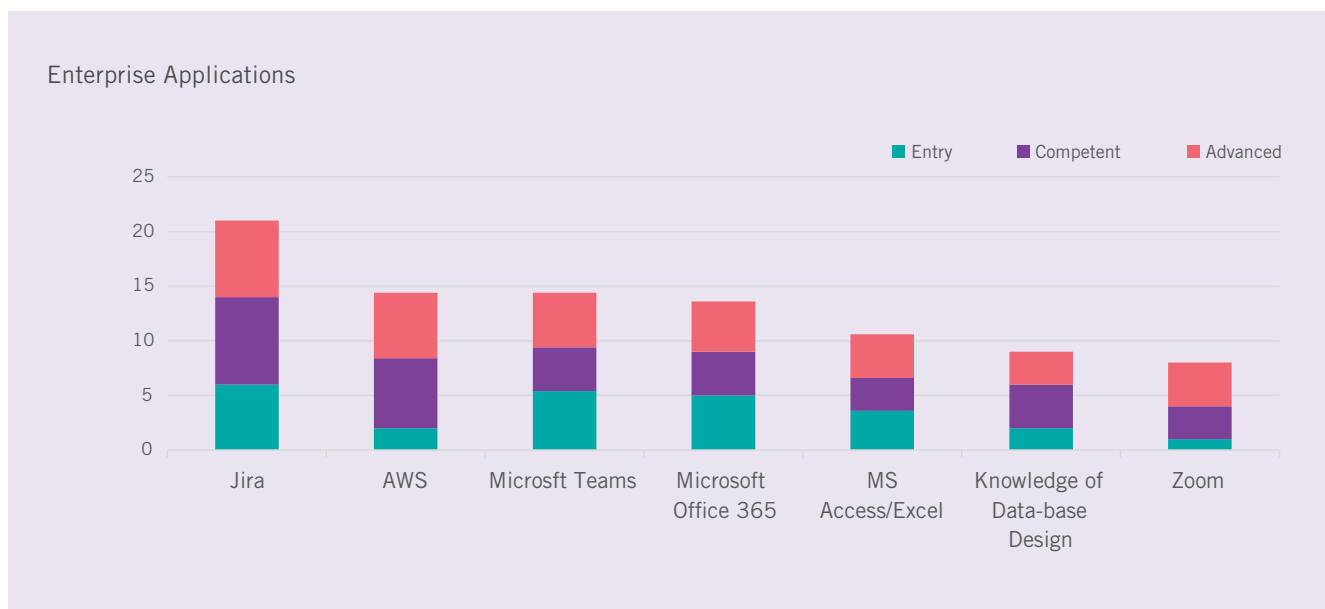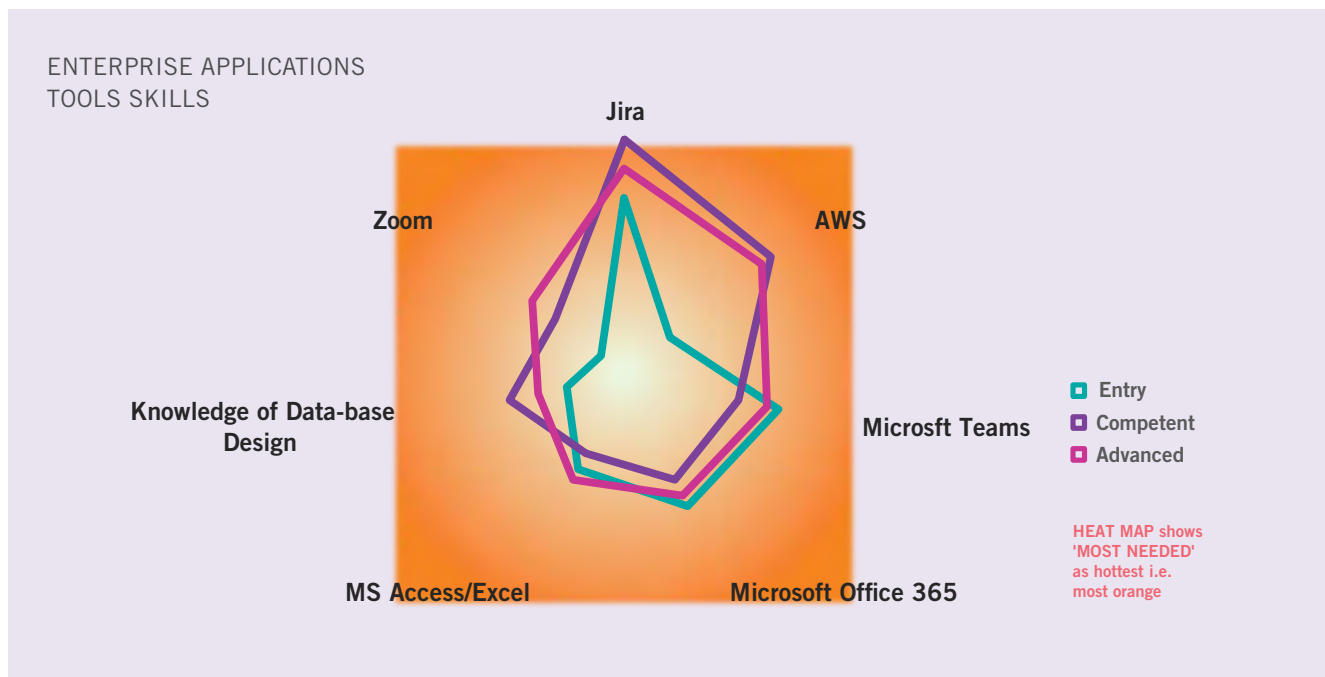
Analysis of Results by Discipline

Discipline 14. Process Optimisation (Lean / Six Sigma / Automation)

The most sought-after skill is Agile / Scrum / Kanban. In addition, a further six skills are required as shown below.

Skills are needed at all levels but most significantly at Expert Level.

PROCESS OPTIMISATION
(LEAN / SIX SIGMA /
AUTOMATION) SKILLS

Salesforce

Six Sigma / Lean

Project Management

SharePoint

- □ Entry
- □ Competent
- □ Advanced

**HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange**

MS Access/Excel

Knowledge of Project
Management
Techniques & Tools

Process Optimisation (Lean / Six Sigma / Automation)

■ Entry   ■ Competent   ■ Advanced
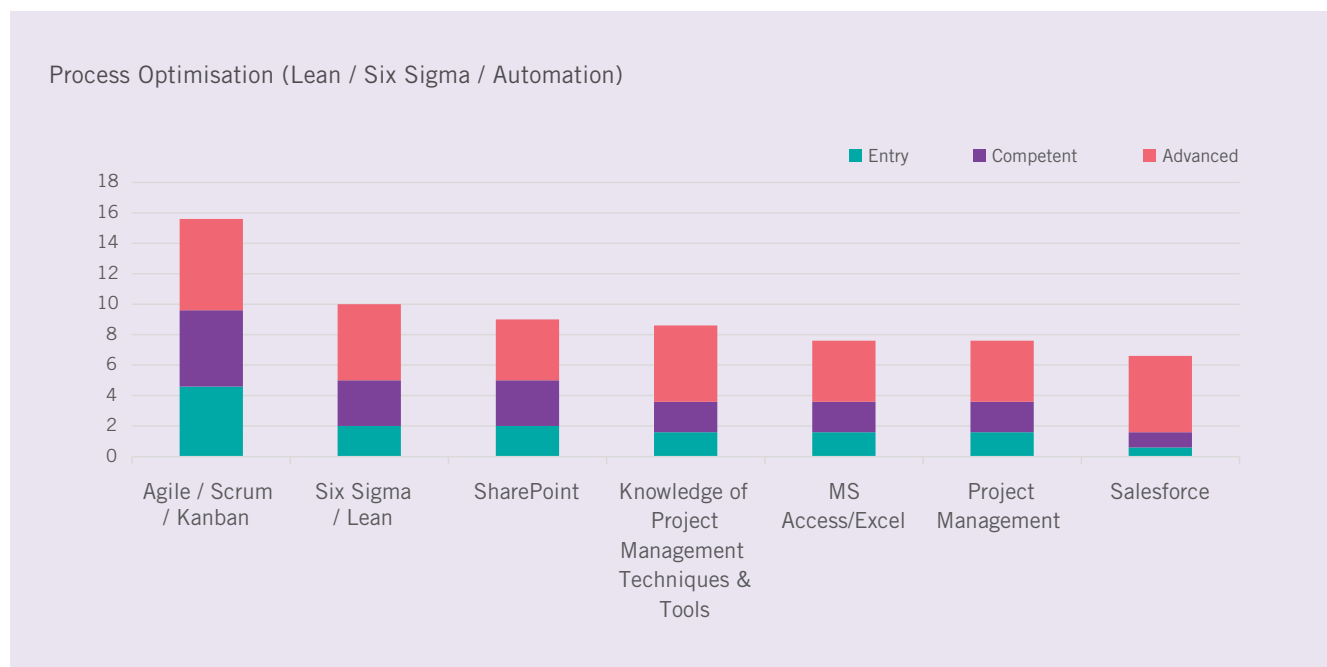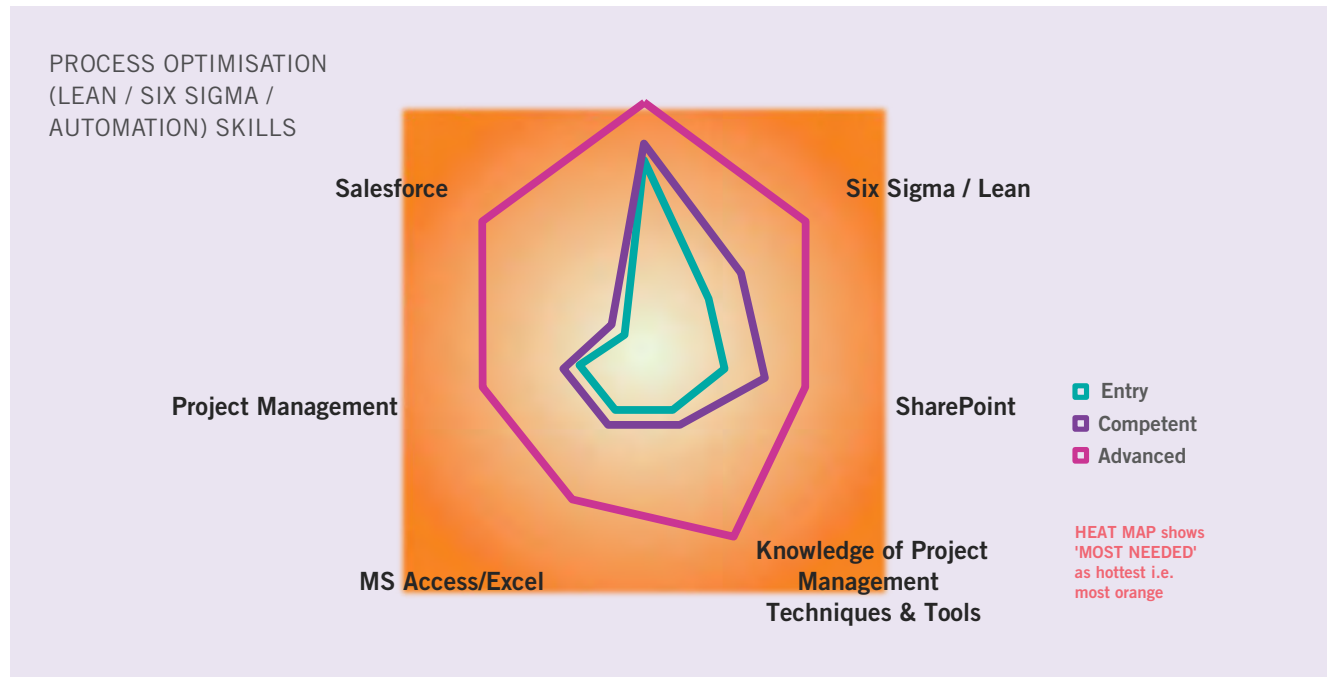
Discipline 15. Cybersecurity & Digital Forensics

Sub-discipline: Competencies

The most sought-after competencies are almost equally spread over ten complementary skill sets as shown below. The requirement for the Irish Funds sector is mainly for Expert level skills in this discipline which is quite different from the profile in most other sectors. The practice may have been to typically recruit externally at expert level, as a response to a growing threat. This may need some reappraisal to put in place strategies for the Irish Funds sector to achieve a strong and sustainable talent pipeline for its Cybersecurity & Digital Forensics workforce into the future, by encouraging recruitment, talent pathways and subsequent progression from Entry and Competent levels.

CYBERSECURITY & DIGITAL
FORENSICS COMPETENCIES

Cloud Technologies

Data Management &
Analysis
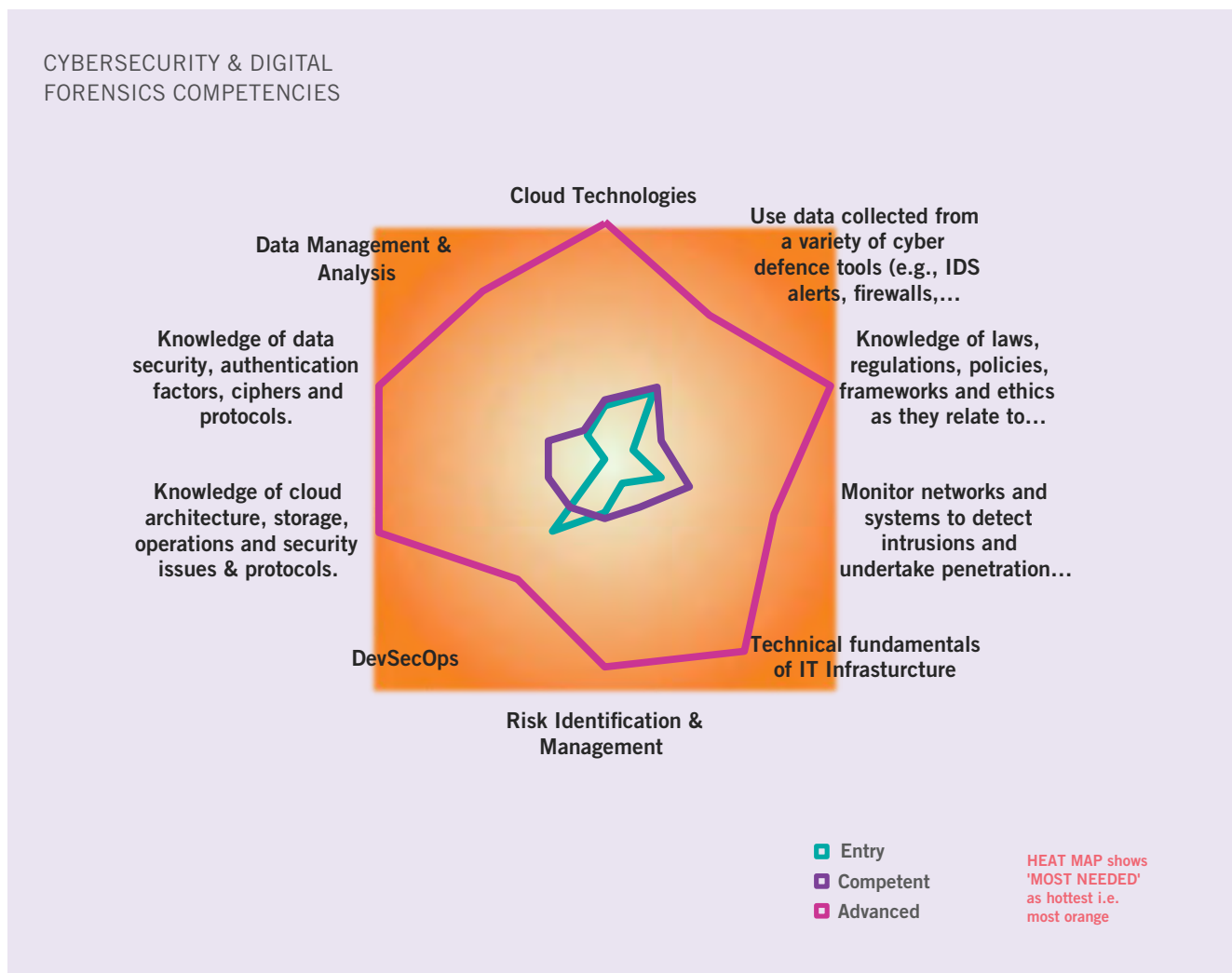
Use data collected from
a variety of cyber
defence tools (e.g., IDS
alerts, firewalls,…

Knowledge of data
security, authentication
factors, ciphers and
protocols.

Knowledge of laws,
regulations, policies,
frameworks and ethics
as they relate to…

Knowledge of cloud
architecture, storage,
operations and security
issues & protocols.

Monitor networks and
systems to detect
intrusions and
undertake penetration…

DevSecOps

Technical fundamentals
of IT Infrasturcture

Risk Identification &
Management

- Entry
- Competent
- Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
most orange

Cybersecurity & Digital Forensics

Legend: ■ Entry ■ Competent ■ Advanced

Categories (x-axis):
- Cloud Technologies
- Use data collected from a variety of cyber defence tools (e.g., IDS alerts, firewalls, network traffic...
- Knowledge of laws, regulations, policies, frameworks and ethics as they relate to cybersecurity and...
- Monitor networks and systems to detect intrusions and undertake penetration and vulnerability...
- Technical fundamentals of IT Infrasturcture
- Risk Identification & Management
- DevSecOps
- Knowledge of cloud architecture, storage, operations and security issues & protocols
- Knowledge of data security, authentication factors, ciphers and protocols
- Data Management & Analysis

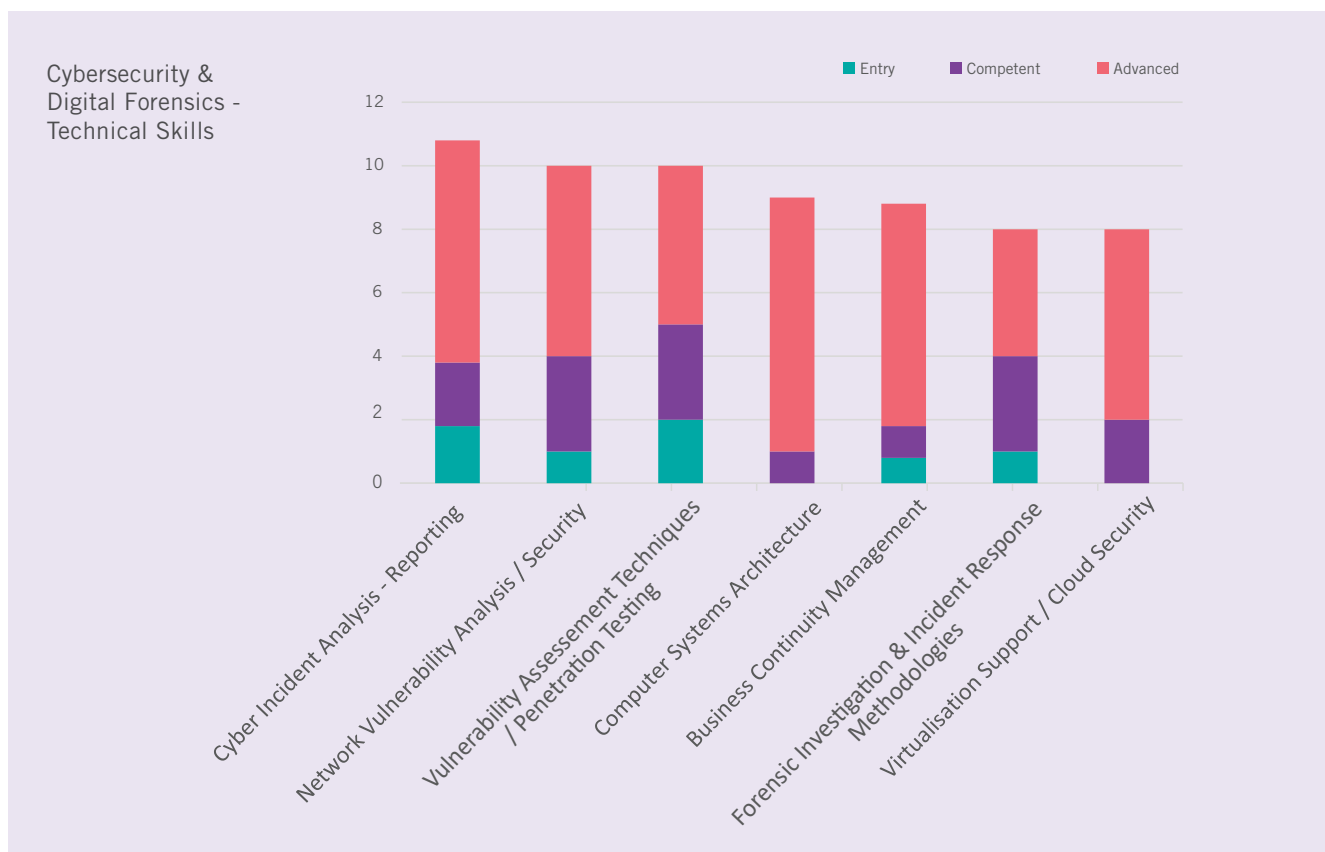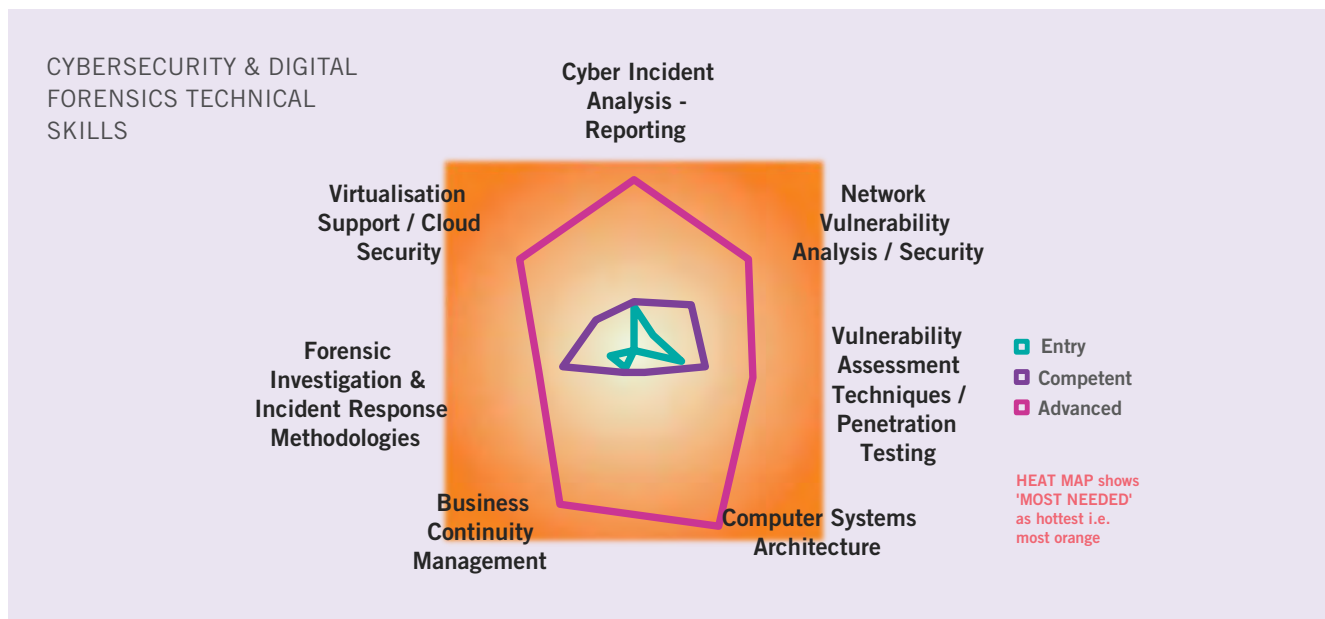# Analysis of Results by Discipline

Most sought-after skills are technical skills in Cyber Incident Analysis – Reporting, Network Vulnerability Analysis / Security, Vulnerability Assessment Techniques / Penetration Testing, Computer Systems Architecture and Business Continuity Management. The requirement for the Irish Funds sector is mainly for Expert level skills which is quite different from the profile in most other sectors. As mentioned above the practice may have been to typically recruit externally at expert level, and this may now need some reappraisal to achieve a strong and sustainable talent pipeline by encouraging recruitment, talent pathways and subsequent.

CYBERSECURITY & DIGITAL FORENSICS TECHNICAL SKILLS

Cyber Incident Analysis - Reporting

Virtualisation Support / Cloud Security

Network Vulnerability Analysis / Security

Forensic Investigation & Incident Response Methodologies

Vulnerability Assessment Techniques / Penetration Testing

Business Continuity Management

Computer Systems Architecture

■ Entry
■ Competent
■ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Cybersecurity & Digital Forensics - Technical Skills
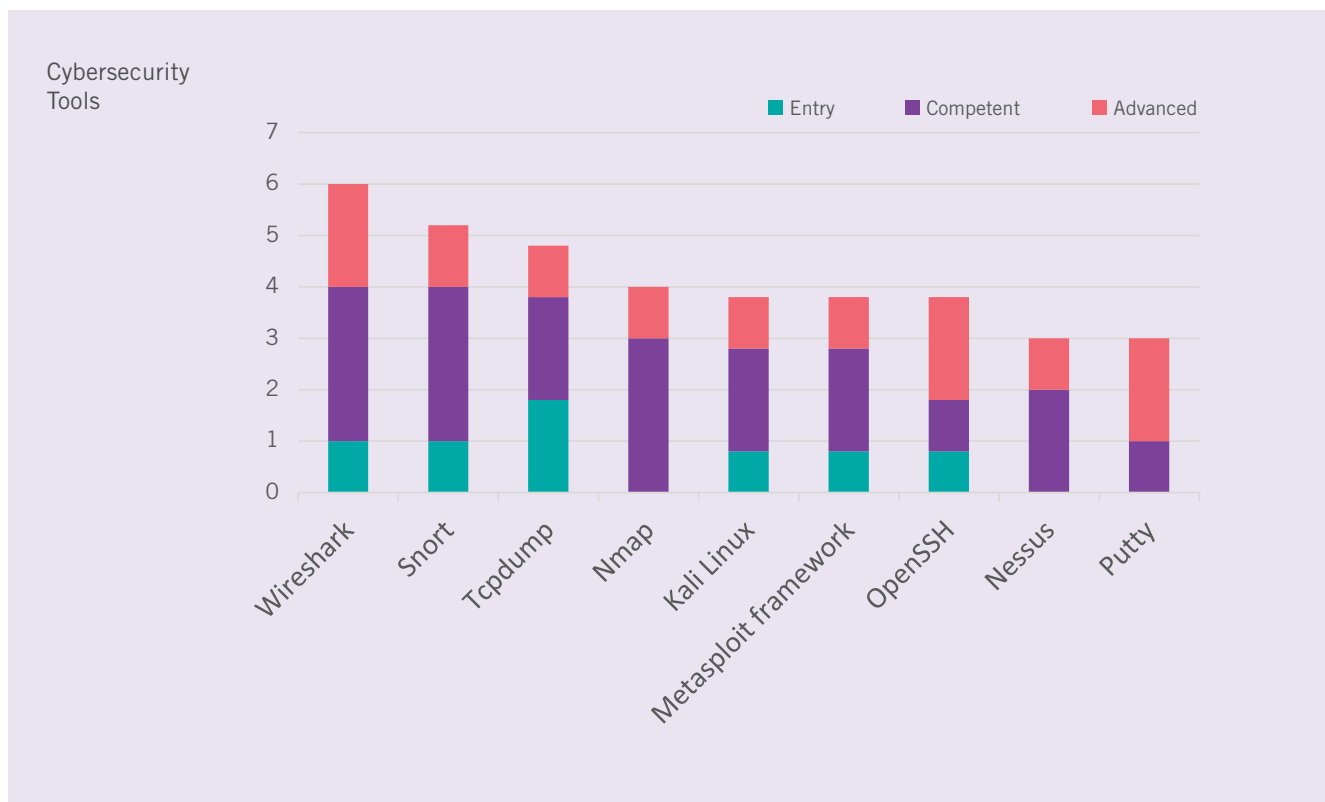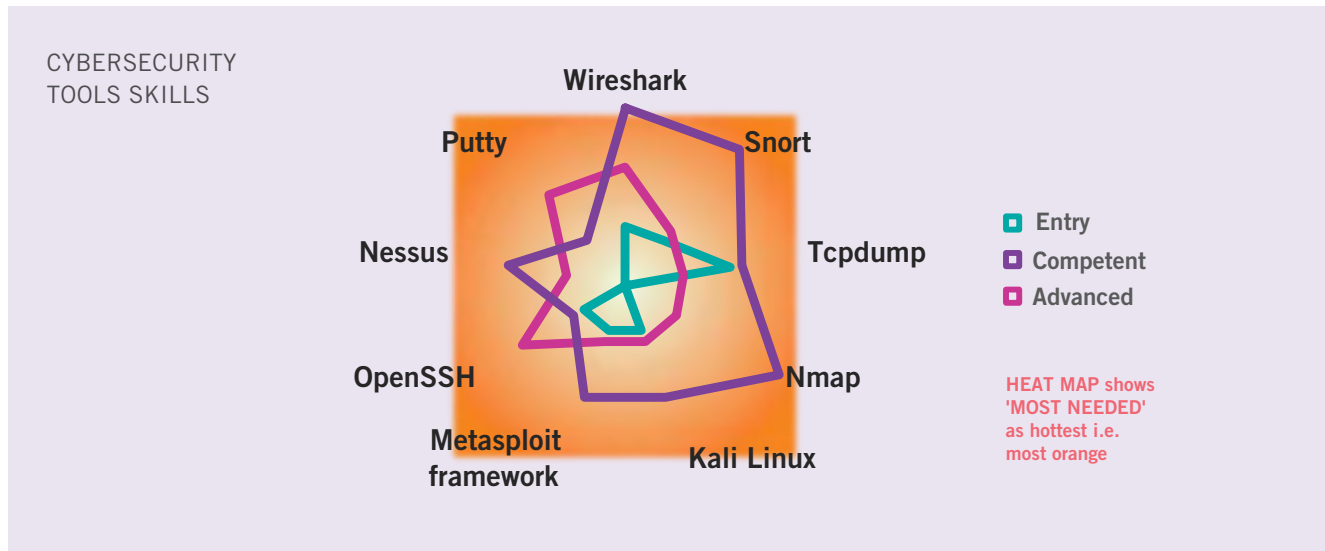
■ Entry ■ Competent ■ Advanced

Analysis of Results by Discipline

Sub-discipline: Cyber Security Tools

Most sought-after skills are Wireshark, Snort and Tcpdump. A further six skill sets are in demand indicating the application of these popular cybersecurity tools. All skill levels are required although mainly Competent level.

CYBERSECURITY
TOOLS SKILLS

- Entry
- Competent
- Advanced

HEAT MAP shows
'MOST NEEDED'
as hottest i.e.
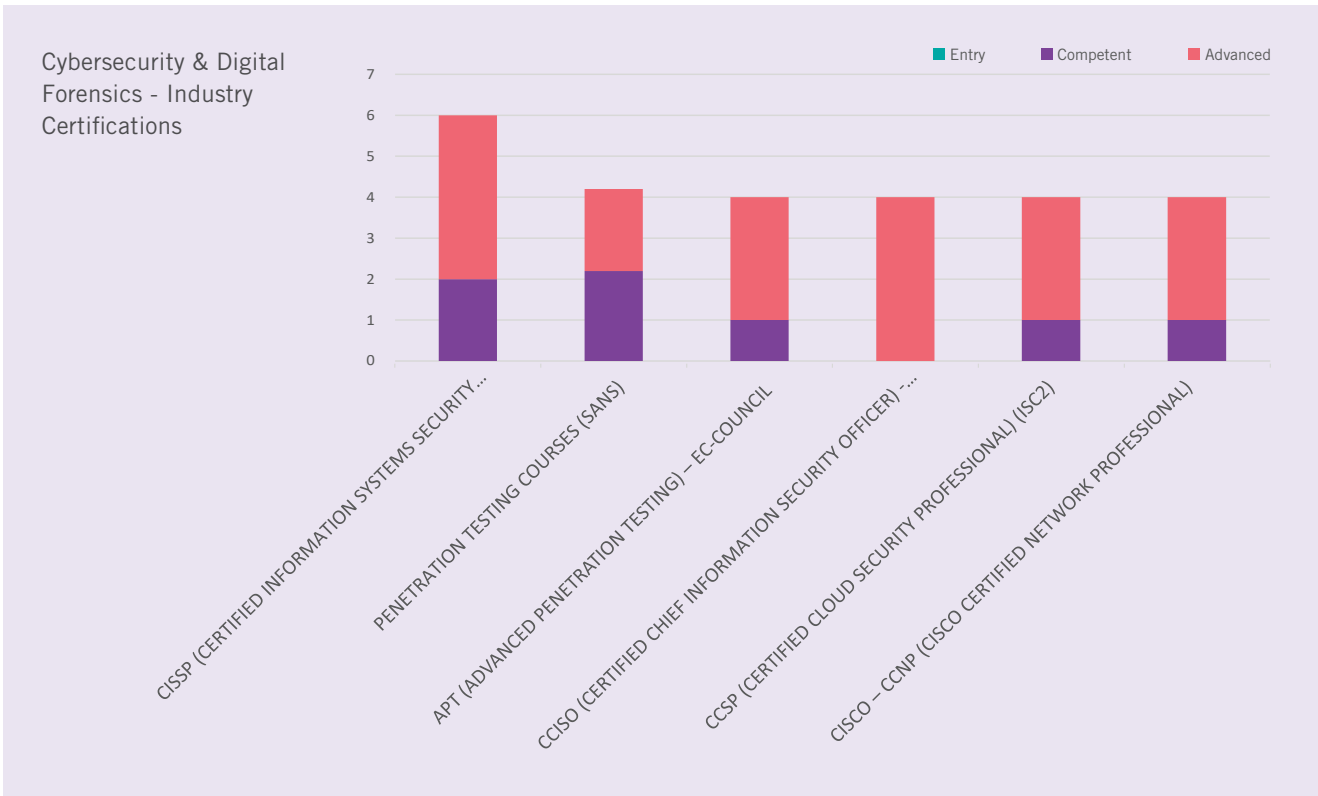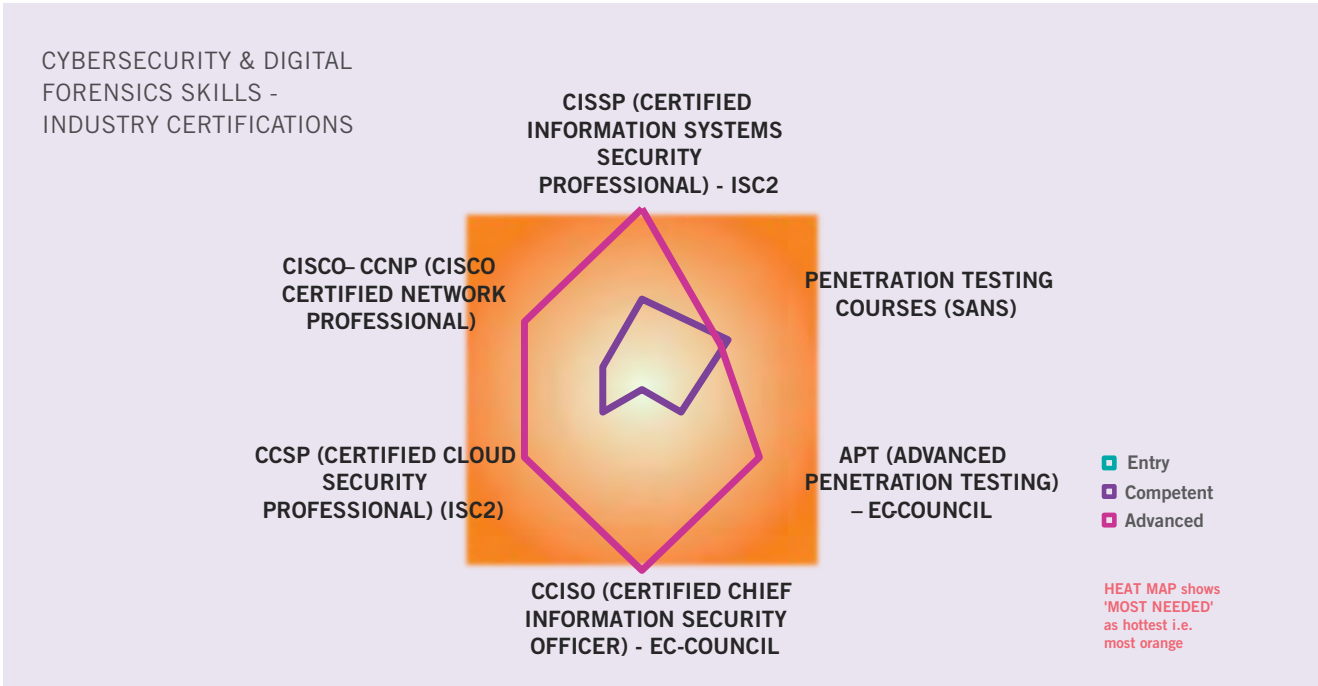most orange

Cybersecurity
Tools

Analysis of Results by Discipline

Sub-discipline: Cybersecurity & Digital Forensics – Industry Certifications

Most sought-after industry certification is CISSP (CERTIFIED INFORMATION SYSTEMS SECURITY PROFESSIONAL) - ISC2. A further five industry certifications are sought-after as shown below.

The requirement is mainly for Expert level and again this is at variance with the profile in other sectors and reflects the findings and issues discussed above.
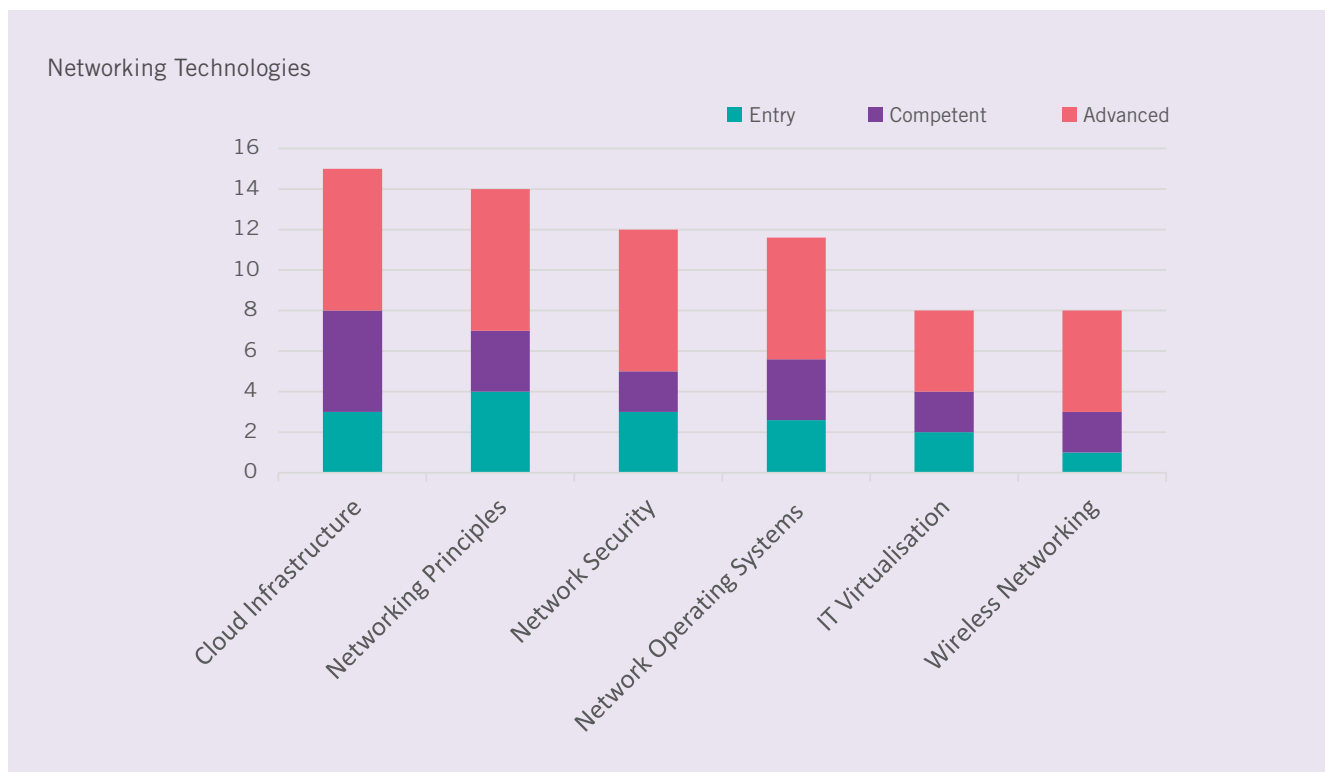

CYBERSECURITY & DIGITAL FORENSICS SKILLS - INDUSTRY CERTIFICATIONS

CISSP (CERTIFIED INFORMATION SYSTEMS SECURITY PROFESSIONAL) - ISC2

CISCO– CCNP (CISCO CERTIFIED NETWORK PROFESSIONAL)

PENETRATION TESTING COURSES (SANS)

CCSP (CERTIFIED CLOUD SECURITY PROFESSIONAL) (ISC2)

APT (ADVANCED PENETRATION TESTING) – EC-COUNCIL

CCISO (CERTIFIED CHIEF INFORMATION SECURITY OFFICER) - EC-COUNCIL

☐ Entry
☐ Competent
☐ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Cybersecurity & Digital Forensics - Industry Certifications
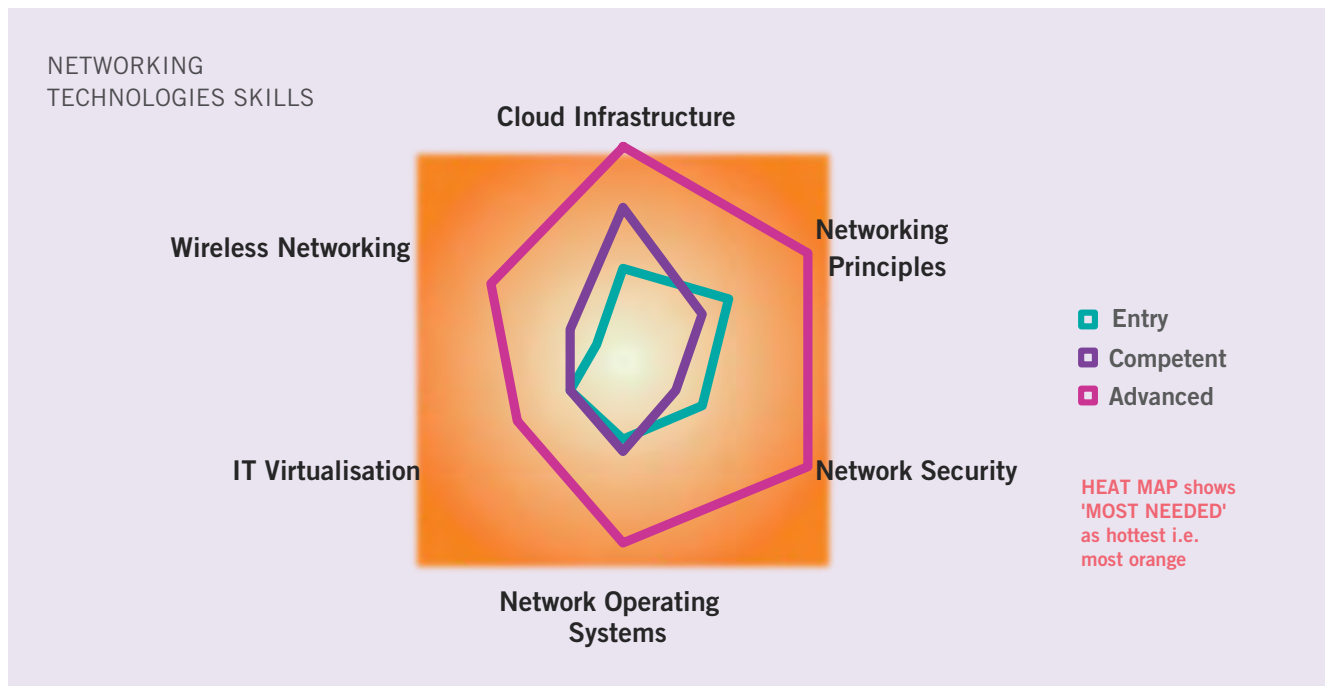
■ Entry ■ Competent ■ Advanced

Analysis of Results by Discipline

Discipline 16. Networking Technologies

Most sought-after skills are Cloud Infrastructure, Networking Principles, Network Security and Network Operating Systems. The requirement is mainly for Expert level.

NETWORKING TECHNOLOGIES SKILLS

Cloud Infrastructure

Networking Principles

Network Security

Network Operating Systems

IT Virtualisation

Wireless Networking

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Networking Technologies

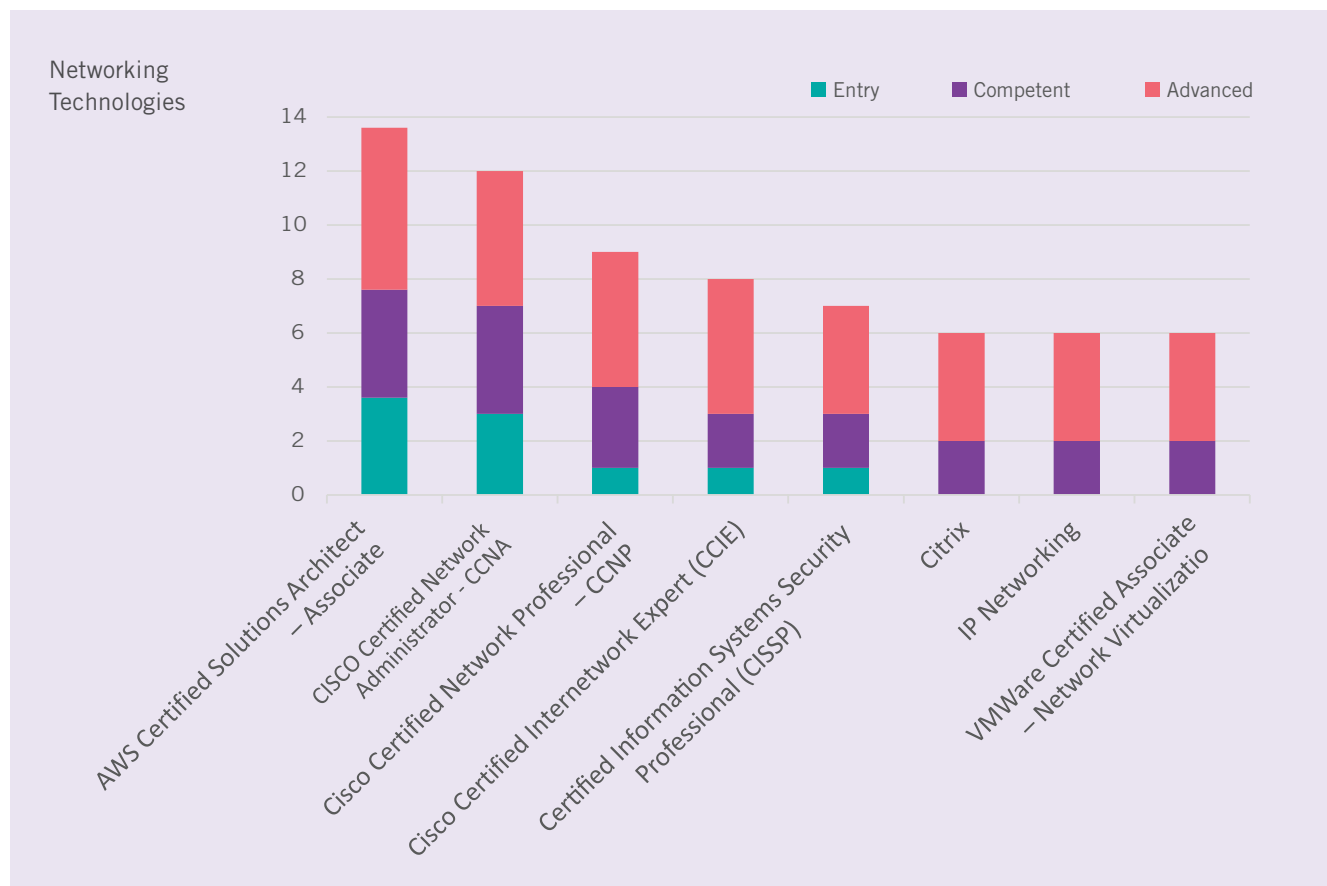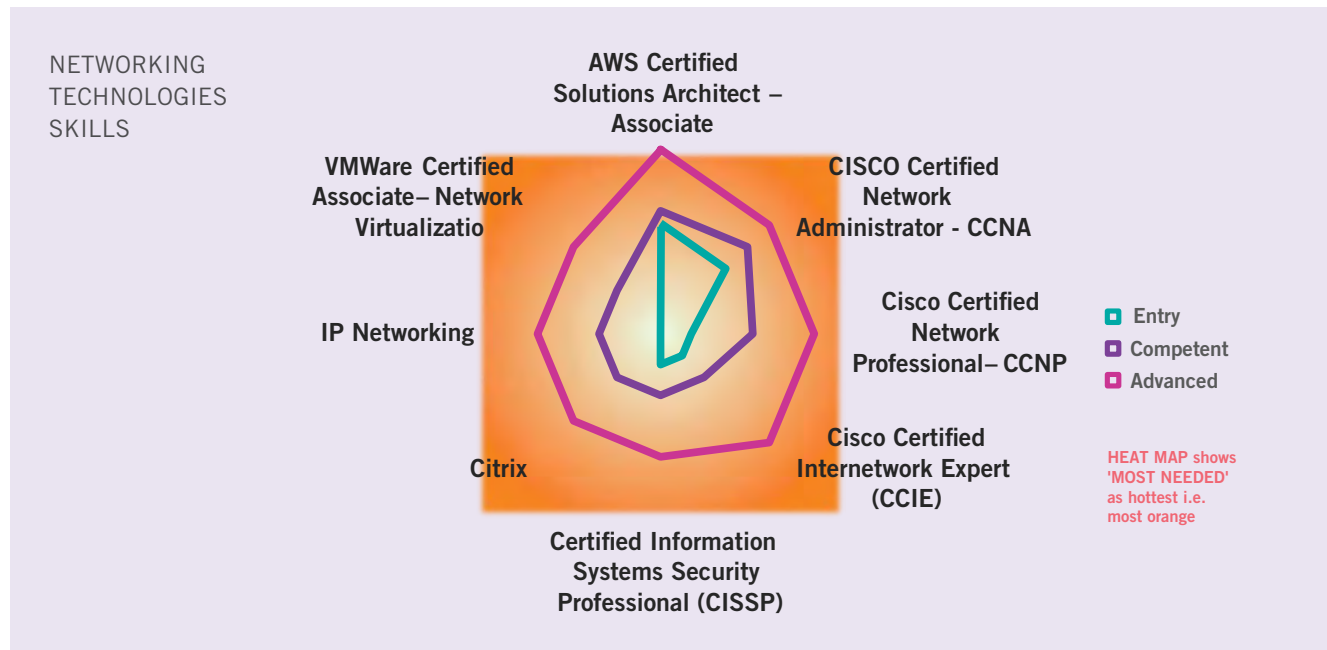- Entry
- Competent
- Advanced

Analysis of Results by Discipline

Sub-discipline: Networking Technologies – Industry Certifications

Most sought-after industry certifications are AWS Certified Solutions Architect – Associate and CISCO Certified Network Administrator - CCNA. A further six industry certifications are sought-after as shown below. All levels are required although mainly Expert level.
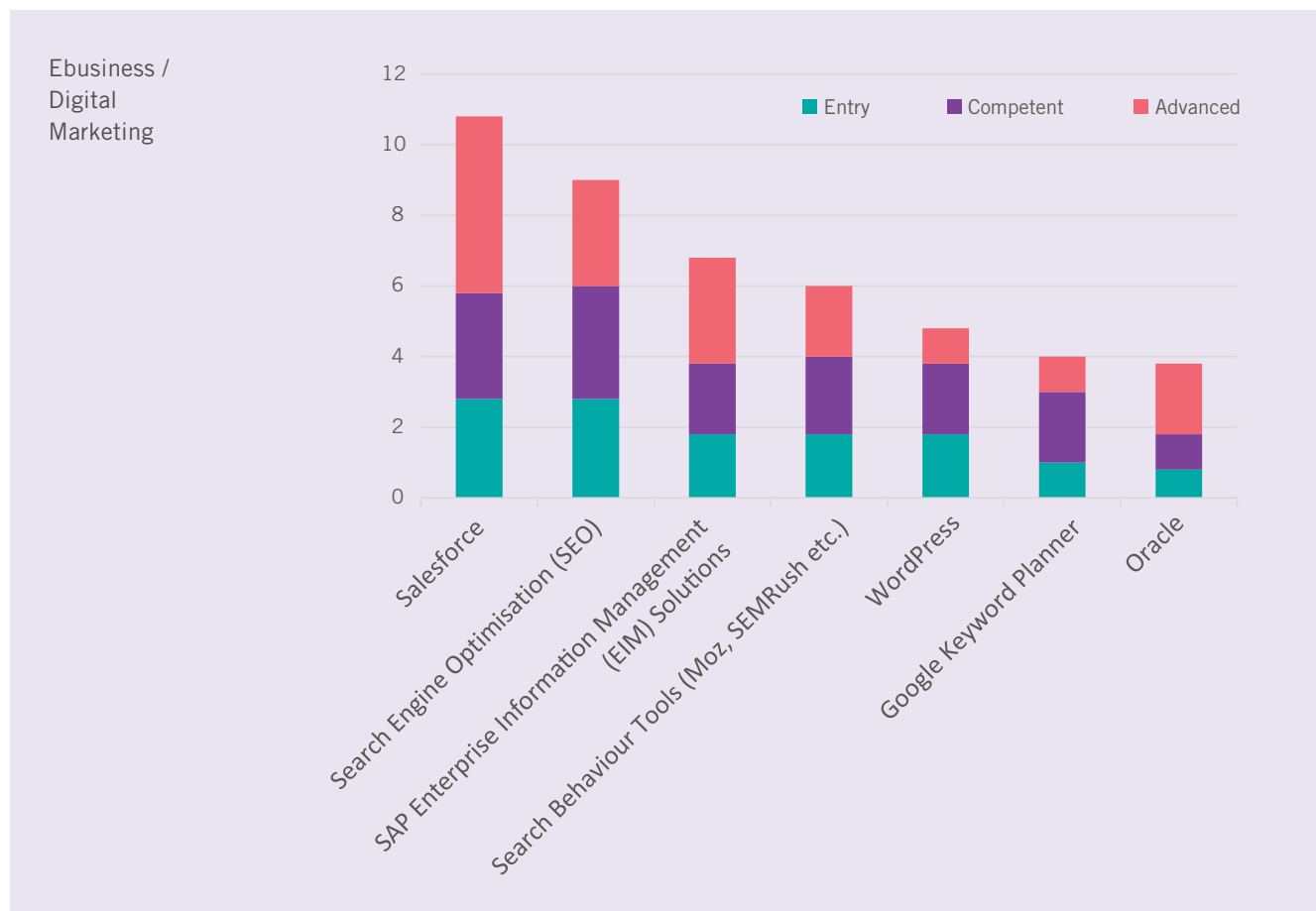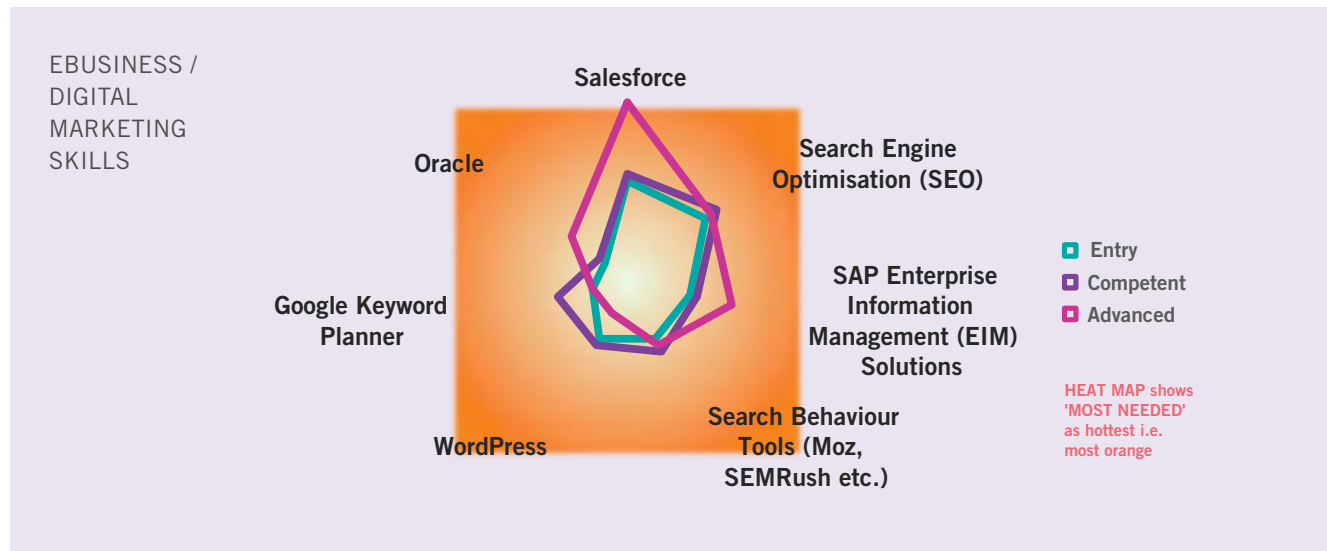

NETWORKING TECHNOLOGIES SKILLS

AWS Certified Solutions Architect – Associate

VMWare Certified Associate– Network Virtualizatio

CISCO Certified Network Administrator - CCNA

IP Networking

Cisco Certified Network Professional– CCNP

Cisco Certified Internetwork Expert (CCIE)

Citrix

Certified Information Systems Security Professional (CISSP)

- ■ Entry
- ■ Competent
- ■ Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Networking Technologies

■ Entry ■ Competent ■ Advanced

Analysis of Results by Discipline

Discipline 17. eBusiness / Digital Marketing

Sub-discipline: eBusiness / Digital Marketing

Most sought-after skills are Salesforce and Search Engine Optimisation (SEO). A further five in demand skills are shown below. Skills are required at all levels. It is notable that advanced skill in Salesforce is highly desired.
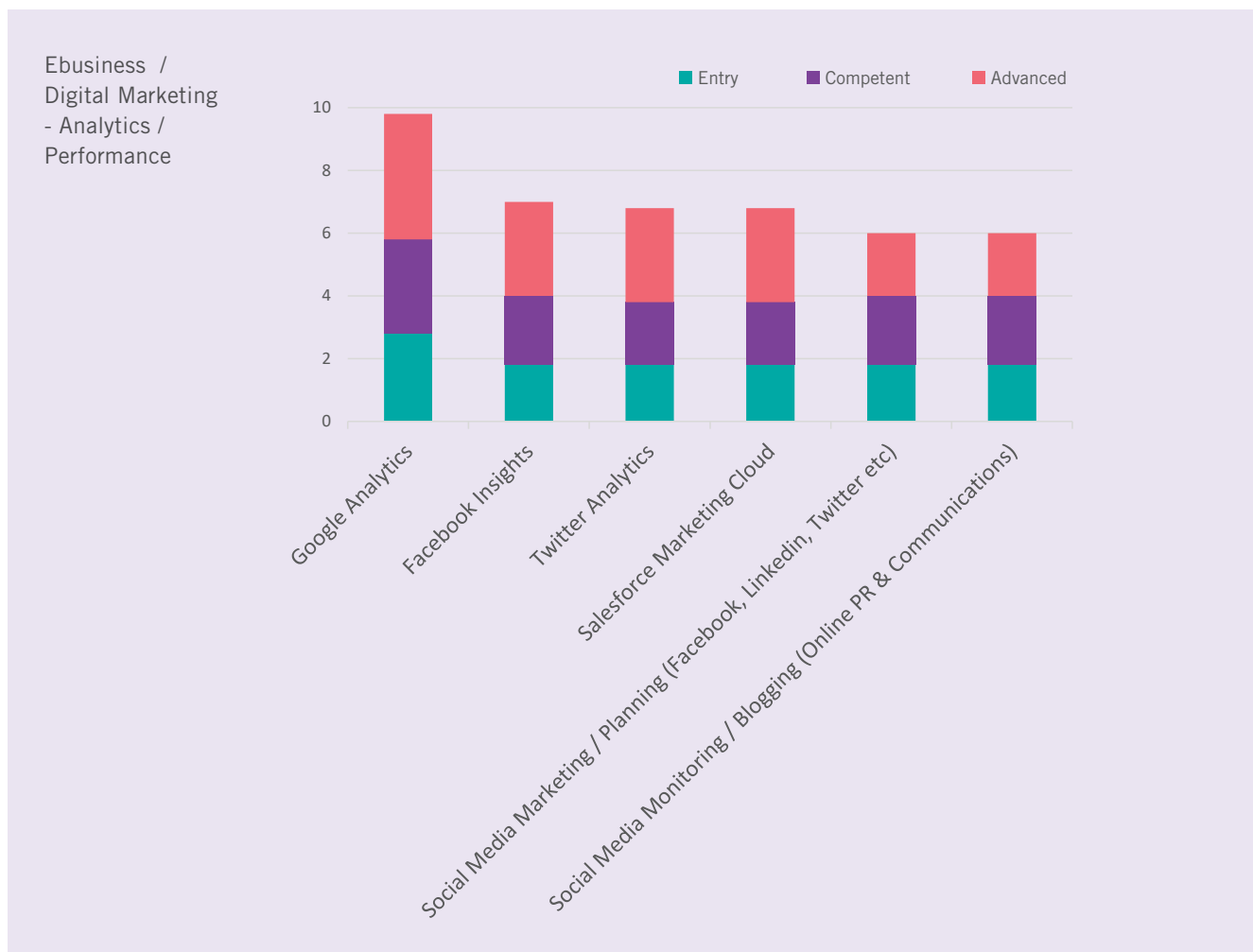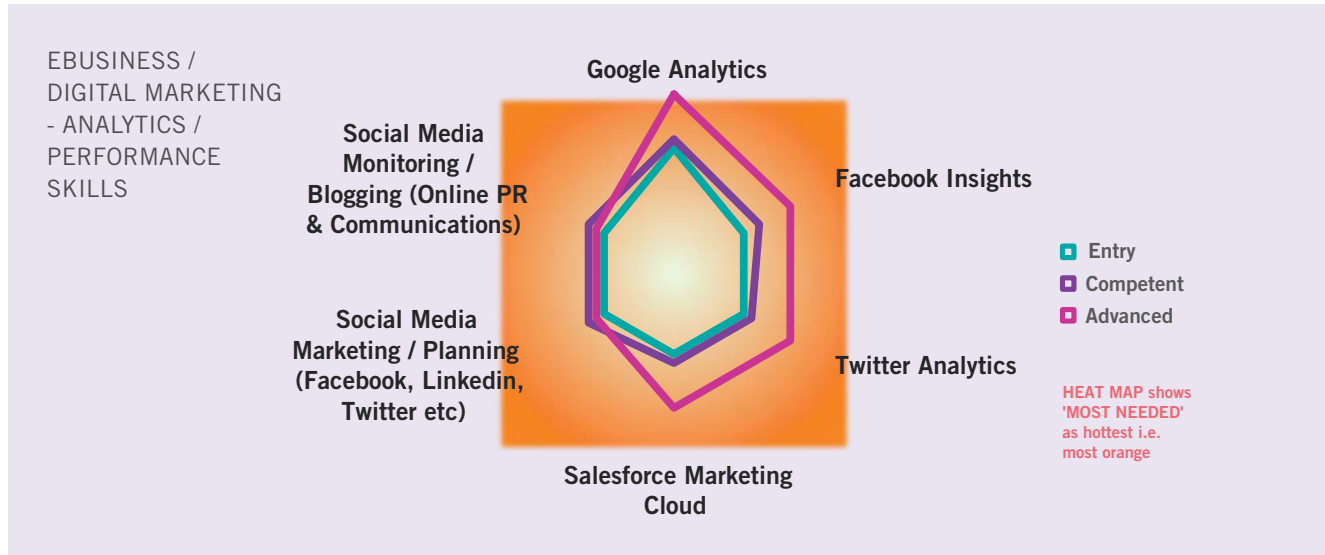
EBUSINESS / DIGITAL MARKETING SKILLS

Salesforce

Oracle

Search Engine Optimisation (SEO)

Google Keyword Planner

SAP Enterprise Information Management (EIM) Solutions

WordPress

Search Behaviour Tools (Moz, SEMRush etc.)

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Ebusiness / Digital Marketing

Legend: Entry, Competent, Advanced

Analysis of Results by Discipline

Sub-discipline: Analytics / Performance

Google Analytics stands out as the most sought-after skill. This is followed by Facebook Insights, Twitter Analytics and Salesforce Marketing Cloud. Skills are needed at all levels.
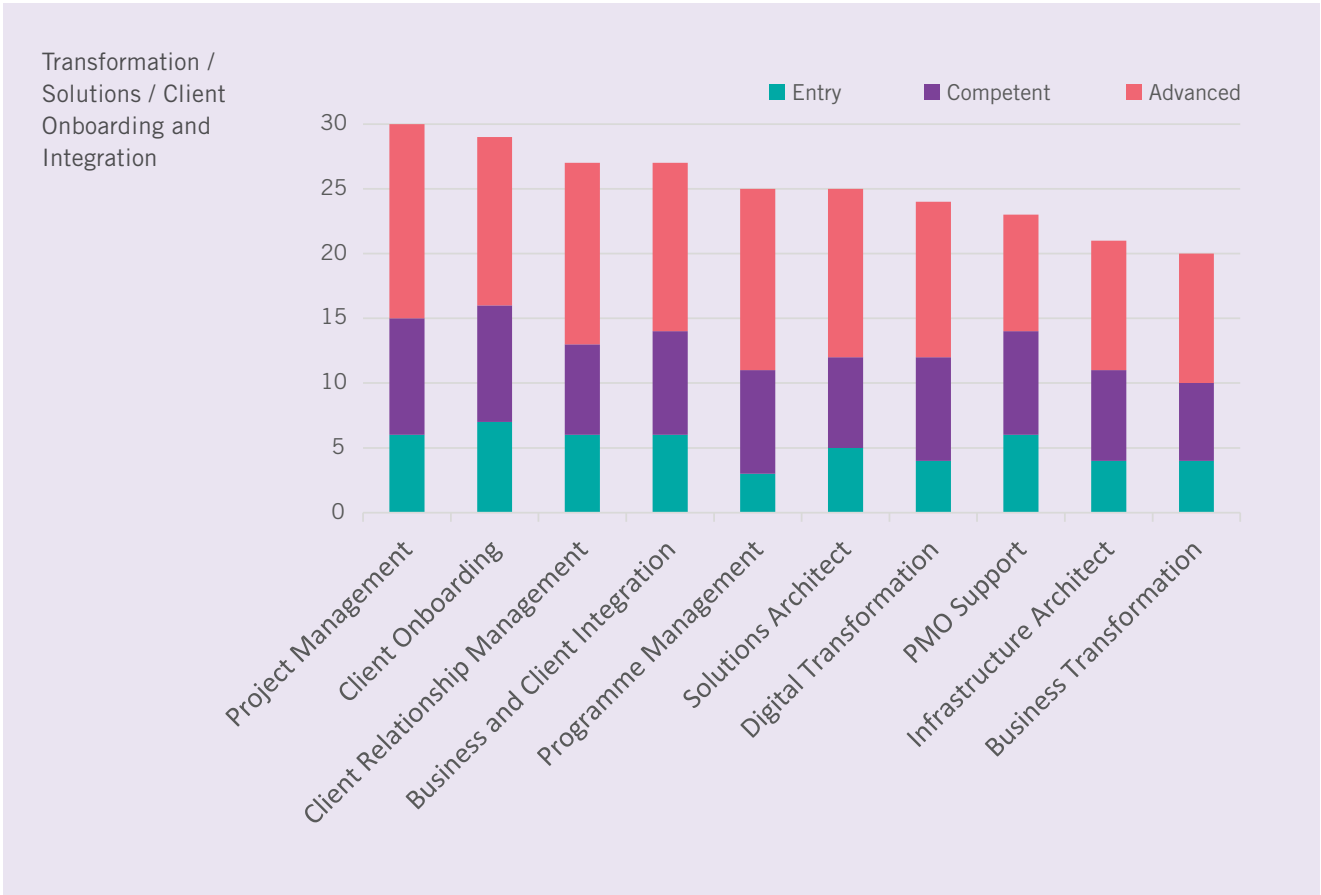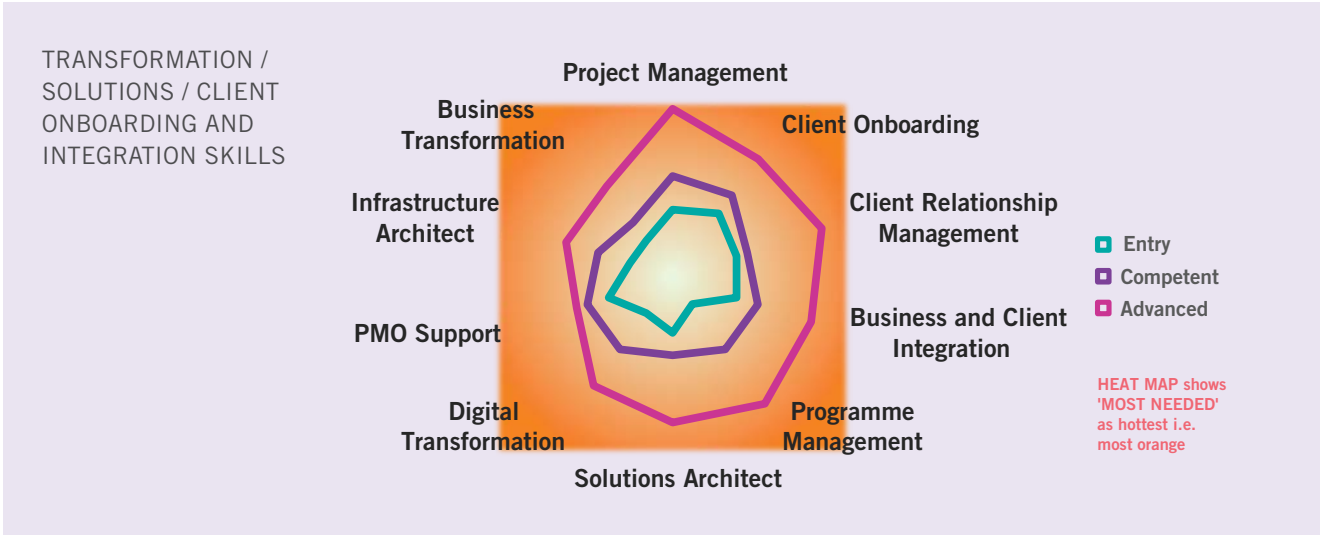
EBUSINESS / DIGITAL MARKETING - ANALYTICS / PERFORMANCE SKILLS

- Google Analytics
- Facebook Insights
- Twitter Analytics
- Salesforce Marketing Cloud
- Social Media Marketing / Planning (Facebook, Linkedin, Twitter etc)
- Social Media Monitoring / Blogging (Online PR & Communications)

Entry
Competent
Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Ebusiness / Digital Marketing - Analytics / Performance

Entry | Competent | Advanced

Analysis of Results by Discipline

Discipline 18. Transformation / Solutions / Client Onboarding and Integration

Most sought-after skills are Project Management, Client Onboarding, Client Relationship Management and Business and Client Integration. A further six skills are in demand as shown below. All skill levels are required although mainly Expert level.

TRANSFORMATION / SOLUTIONS / CLIENT ONBOARDING AND INTEGRATION SKILLS

Project Management
Business Transformation
Client Onboarding
Infrastructure Architect
Client Relationship Management
PMO Support
Business and Client Integration
Digital Transformation
Programme Management
Solutions Architect

- Entry
- Competent
- Advanced

HEAT MAP shows 'MOST NEEDED' as hottest i.e. most orange

Transformation / Solutions / Client Onboarding and Integration

Legend: Entry, Competent, Advanced

Analysis of Results by Discipline

**Discipline 19. Maintaining & Decommissioning
Legacy Systems**

Respondents were asked seven specific questions in relation to
the discipline Maintaining & Decommissioning Legacy Systems.
The questions were:

1. Do you currently run your business on technologies that are more than 20-30 years old? e.g.
   legacy fund services tech stacks from the 1990's

2. Do you use tech resource in Ireland to support and develop these platforms? If No, where do
   you get that support from?

3. If you are currently planning to decommission these platforms, what resource would you need
   and where are you planning to find it?

4. Have you a requirement for staff experienced in the area of Decommissioning Legacy systems
   due to M&A Activity?

5. Have you a requirement experienced in the area of Archiving of Legacy Data / creating
   Archiving Data ware Solutions due to M&A Activity?

6. What incoming technology stack has been selected?

7. Has the incoming technology stack been elected to directly replace those legacy systems?

As the total number of respondents was low, at eight out of
twenty, the resulting dataset is insufficient to present findings
or to draw reliable conclusions. Legacy systems mentioned were
AS400 and Postgres OpenEdge.

Considerations & Recommendations

The creation of new business models, delivery mechanisms and revenue streams arising from the digitisation of the funds and asset management sector make it imperative that its constituent organisations embrace new roles and professions, reorganise current jobs, and prove to be innovative in their management systems.

Some of the sector organisations are to the fore in adopting a proactive approach to digital innovation. They are engaging in strategic partnerships to remain competitive with emerging global financial services hubs elsewhere and strive to attract the talent they need to underpin their transformation.

The accelerating pace and extent of digital transformation within the industry requires not only the wide adoption of new technologies to increase efficiencies but also the adoption of new practices and methodologies in how business is delivered. In effect, business models need to be reshaped. In turn, this is causing the sector's leaders to rethink the occupational profiles of their work teams and to explore new paths for acquiring and retaining the talent that they need. Organisations that are late adopters will find it increasingly difficult to keep pace with those that are digital leaders.

It is hoped that this first ever Irish Funds and Asset Management Sector Technology Skills Audit, which is informed by prominent companies in the sector, will lead to an increase in the supply of the skills most in demand and facilitate the dissemination of best practice across the sector. The thrust of the Audit's findings reinforces the view that current professionals in the sector will need more active encouragement and support in managing and developing their individual skills portfolios. In particular, stronger analytical skills and a greater awareness of the specific skills that are associated with transformation and growth areas within their specialisations and adjacent areas are shown to be important, as well as new initiatives within the sector to train and attract new workers, and re-skill and upskill current employees, on a continuous basis.

The Audit finds that a more heterogeneous set of skills is increasingly being required than was previously the case, across a wide array of actors in the sector to underpin new service models. These service models require not just a broader assortment of technology skills but also a wider dissemination of business development,

entrepreneurial, creativity and interpersonal skills across organisations. The ability to communicate with others, collaborate in teams, be solutions-orientated and digitally proficient are now critical competencies for potential candidates seeking to pursue careers in the financial services sector. It follows, that professionals in the sector stand to be greatly assisted, when organisations formally identify the skills and expertise for which demand will be particularly strong, as this Audit has sought to do.

In addition to providing analysis into the skills, knowledge and competencies for which there is strong current and emerging demand in the sector, this Technology Skills Audit seeks to inform national skills policy development as it relates to the sector, providing substantive information to educational and training institutions that will assist them in their programme development while offering more insight to educationalists, career guidance professionals and those interested in pursuing a career in this buoyant sector. The following recommendations are presented with these objectives in mind.

1. Successful economies and growth sectors going forward will be characterised by their ability to adapt rapidly to the challenges and opportunities of the digitalisation of the workplace.

The convergence of technologies, such as Artificial Intelligence (AI), Data Analytics, Cloud Computing, etc., are radically and rapidly transforming how work gets done across all industry sectors. The convergence is also profoundly reshaping the global value chains on which many of them rely. Enabling organisations to be more intelligent and more agile in adopting these new technologies is the surest way to support them to grow, to optimise functionalities, become more efficient, to assume new business models and adjust to those of others. Nurturing resilience and dynamism in business environments where, increasingly, change is the only constant.

The Irish economy has demonstrated remarkable resilience through, and post Covid-19 and full employment is now in sight. For the economy to remain resilient as new shocks such as the Ukrainian conflict and high inflation environment impact hugely on the European and global economies, and for future employment to be of a high quality and inclusive of the workforce nationally, foreign and indigenous enterprises

in Ireland must embrace the new digital technologies fully to boost productivity, innovate, grow their markets and, most importantly, remain competitive.

2. The successful orchestration of a life-long learning ecosystem is now the single largest challenge being posed to Ireland's national skills strategists, by the unprecedented pace and depth of digital disruption affecting practically every industrial sector, occupation, profession and role in the world of work.

The rate of change and technological transformation make it in increasingly difficult to catalogue the array of digital careers that are flourishing today using yesterday's labels. The classification of ICT occupations developed and used over the past 15-20 years is now in danger of obscuring rather than illuminating the pervasiveness and reach of developments in digital technologies that transcend the boundaries of industrial sectors, professions, occupations and workplace roles. There is a danger that the flexibility and speed of response required from the skills ecosystem is being underappreciated in studies that draw primarily on labour market data as it is conventionally gathered and published. The standard practice is highly useful for time-series analyses and to ground international comparisons but less so for discerning emerging new trends. The urgency of innovative, integrated and comprehensive training responses that young and older workers alike now need is not being communicated strongly enough to government and policy makers.

It is crucial that skills training become more aligned and effective in enabling job seekers and those currently in jobs to meet the requirements of a rapidly changing labour market. Skills programmes need to be informed by research that anticipates more clearly how the labour market is going to change and pays as much attention to the re-skilling and up-skilling programmes of those already in jobs as to the preparation of the new generations entering the labour market. Ensuring that citizens have the skills to benefit from the opportunities offered by new technological developments is integral to maintaining business growth and development and prosperity as well as social cohesion.

A transformation in the type of skills required will also require major developments in how they are provided. Crucial, in terms of the educational system, is not just what is taught but how it is taught and the achievements that are fostered at each level of the

system, particularly during the senior secondary cycle and upwards. The findings of this Irish Funds and Asset Management Technology Skills Needs Analysis emphasise the importance of fostering the cognitive and non-cognitive capabilities that will enable young people and job seekers to pursue and hold careers in the sector even while the precise contours of some of these careers are not yet clearly seen. In this regard it is important to think not just in terms of formal education and training systems and their institutions, but to embrace the idea of sectoral learning ecosystems that encompasses public, private and non-government actors who collaborate and share information to achieve mutually beneficial outcomes for learners and industry sectors within an environment that nurtures and encourage life-long learning.

3. Informing career choices in a sector where emerging technologies are having a transformative impact necessitate a new level of dialogue across a swathe of stakeholders, including policy makers, enterprises, educationalists, career guidance specialists, parents and students.

The disruptive forces of emerging technologies combined with the diverse and changing demands of retail and institutional customers is reshaping the financial services in real-time. Redefining the competitive landscape and necessitating reformed ecosystems in service delivery, compliance, and governance is critical as is reframing the careers within the sector.

Representative bodies have a role to play in supporting education and training institutions in attaining a full appreciation of the tech eco-system and the jobs within. This should facilitate a forward-looking perspective on evolving product and service orientation and the associated existing and emerging technologies, skillsets and professional competencies techniques that will inform the reformation of professions and careers within the sector.

As stated in an earlier section, given the expectation of industry that entry level positions are required to have project management, leadership and problem solving skills, there is a necessity for academic institutions to ensure that modules supporting these skillsets are included in their syllabi.

Similarly, parents, students and job seekers must be

assisted to better understand the roles, opportunities and career prospects emanating from the adoption and integration of new technologies over legacy systems and their application in a changing workplace. The impact of digitisation is growing exponentially and IT-related careers across all sectors of the economy are projected to increase at pace.

4. Dual education initiatives such as the new Tech Apprenticeship programme[6] merit the stature they are attaining in current policy and practice as key and essential contributors in addressing the strong demand forecast for digital competencies; they should become a significant part of the Funds Sector tech-talent pipeline.

The technological challenges and opportunities affecting the business models that funds and asset management organisations can adopt, how they implement them, and the specific partners, professions and competencies that it is essential they have in and across their work teams. Customer preferences are also making it essential that the entire international financial services industry, and the funds and asset management sector in particular, look beyond legacy systems and practices in how they have sourced and developed skills and competencies to date.

The cumulative requirements - for proficiency across a range of technological competencies, for a corresponding revamp of the skills ecosystem on which the sector draws, for the programmes of skills providers to be imbued with a good knowledge of how the sector's business gets done - increase the importance of opportunities for hands-on learning and on-going professional development. The report finds that the potential of dual-education programmes (apprenticeships and traineeships), whether in Further Education and Training or Higher Education, that combine off-the-job training with work-based learning has, indeed, grown in appreciation among both sector employers and those seeking careers in the funds sector.

5. Further Education and Training (FET) can make a significant contribution to talent development and talent acquisition by the Irish funds and asset management sector, similar to the contributions it is making in

other tech-related sectors; it should be viewed as a complement to third level provision and as a valued and integral component in how the Sector meets its growing need for ICT practitioner skills.

The findings of this Tech Skills Needs Audit for the funds and asset management sector are consistent with the findings in tech-skills audits FIT has carried out in other sectors since 2012.

While FIT has repeatedly encountered a widespread and persistent belief that digital skills gaps in tech-intensive sectors consist almost entirely of roles at the apex of the skills triangle, i.e., at the 'expert' level, it has, quite to the contrary, consistently found evidence of a strong need that digital competencies be exercised at different levels of proficiency, with notable levels of demand for their exercise at entry- and competent levels as well as at the expert level. Significantly, this IFS audit finds the demand to be even stronger at entry/competent levels (54%) than at the expert level (46%). Earlier audits also frequently found that the description by tech employers of a requirement for skills at the 'expert' level often referred more to the extent of experience being sought rather than to the high level of formal qualification. The findings of this audit reaffirm the requirement for a more expansive view of the skills ecosystem.

It is FIT's experience, through completing numerous tech skill audits since 2012, that tech and related sector employers have become increasingly convinced that a significant part of the technical competencies and generic skills they need can be delivered through appropriately designed NFQ Level 5 and Level 6 programmes. It is no longer assumed that only people with a higher education should be interviewed for careers in the technology sectors and many employers are modifying their entry criteria accordingly.

To illustrate the potential currency of FET provision, the new ICT Associate Professional Tech Apprenticeship has already won the confidence of over 250 tech employers (multinational & indigenous enterprises, SME's and the public sector) and now has the goal of delivering 5,000 apprentices into tech sectors by 2025 in a range of disciplines including Software Development, Network

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6 https://fit.ie/tech-apprenticeships/

Considerations & Recommendations

Engineering, Cyber Security, Data Analytics, DevOps and Cloud Computing.

This actuality merits greater cognisance on the part of policy-makers. FIT believes there is still a widespread underappreciation of the potential contribution FET skills programmes can make in augmenting the tech talent pipeline that is vital to the continued growth and competitiveness of a wide range of key sectors in the national economy. It sees this lack of appreciation, for example, as particularly evident in the drafting of the new ICT Action Plan. The Irish funds and asset management sector should ensure that new and emerging talent pipelines such as the successful Tech Apprenticeship programme as well as the array of new apprenticeships in disciplines such as financial services, accounting, sales, are adopted and integrated a viable and sustainable recruitment vehicle to the Sector.

6. Remedial actions are needed to realise the significant employment opportunities that currently exist within Ireland's financial services sector.

The overall picture that emerges of the Irish Funds and Asset Management Sector is of an increasingly digitally enabled sector requiring substantial numbers of competent ICT practitioners as challenges relating to deeper digitalisation, productivity and tech-talent acquisition become more acute. The challenges, if not addressed in a sufficiently timely manner, will slow the sector's repositioning in its particularly global and competitive environment. Accordingly, it is incumbent on the key stakeholders - namely government and policy makers, financial services sector and institutions, development agencies and education and training providers - to work cohesively as stakeholders to deliver the necessary training interventions in an effective and timely manner. Better coordination in the development, range and delivery of relevant fin-tech training programmes across the continuum of FET and HE is a critical component for timely success.

The findings of this audit reaffirm the requirement for a more expansive view of the Irish Funds and Asset Management skills ecosystem and the necessity for a continuum of further and higher education and training delivery to meet the unprecedented demand.

7. Ensuring greater workforce diversity within the financial services sector is a beneficial shared objective.

A rapidly evolving finance industry is demanding new capabilities. In turn, this is putting a new premium on organisations' levels of achievement in having more diverse workforces and more inclusive workplace cultures. According to a recent PwC Global survey, 85 per cent of financial services CEOs polled said, promoting inclusion and diversity helps enhance business performance. Other research also supports the business case for inclusive cultures on the grounds that they boost creativity, innovation and lead to increased profitability. Indeed, a 2019 McKinsey & Co. study revealed top-quartile companies for racial and ethnic inclusion outperformed those in the fourth quartile by 36% in profitability.

The CFA Institute defines **diversity** as the spectrum of human attributes, perspectives, identities, and backgrounds within a workforce, and **inclusion** as a dynamic state of operating in which any individual or group can be, and feel respected, valued, safe, and fully engaged. Organisations' human resource development strategies need now to feature specific measures directed at encouraging and leveraging the development of a successful, diverse, and inclusive environment.

There is much to be benefitted from prioritising, and actioning, enhanced diversity and inclusive access to quality employment by underrepresented groups such as, for example, women, young people without higher education and from more social diverse backgrounds, older workers, people with a disability and minority ethnic groups. Enterprise across all industry sectors must continually educate their employees on the importance of equality and inclusion as diverse teams brings distinct benefits.

When businesses comprise of people from different backgrounds with diverse views, insights and experiences are more varied, biases are diluted, and often new product offerings and market opportunities emerge. There is evidence to suggest that IFS enterprises are increasingly recruiting a more diverse workforce, but more can be done. At the same time, care should be taken that diversity agendas tailored for specific groups do not result in some receiving more attention than others at the expense of equality for all. FIT has gained extensive experience with the aid of appropriate aptitude assessments in establishing an individual's future capabilities independently of their labour market history, social welfare status and other individual socio-economic characteristics (frequently

used to determine 'suitedness' for interview when shortlisting from a large cohort of candidates). For example, FIT to date has onboarded 250+ employers with 520 Tech Apprentices created through these employers. Of these apprentices 65% had a Leaving Certificate with the remainder possessing a range of other FET and/or HE qualifications. 60% of those onboarded were over the age of 23 with a tapestry of work experience behind them.

In short, much of FIT's experience belies the narrative that 'past performance' is a reliable indicator of an individual's actual ability, including their suitedness to IT roles, and lends support to selection for IT programmes and recruitment to IT roles that are avowedly based on universal respect and equality for all.

8. The regional reach and economic impact of the Irish Funds and Asset Management industry services sector is significant and increasing, giving wider access to opportunity.

A significant feature of the funds and asset management industry in recent years has been its continuing regionalisation.

Despite its association with high levels of expertise and huge scale of funds, a significant regionalisation of the Irish investment funds and asset management industry has strengthened over the last 2-3 years. The industry now employs individuals living in every county in the Republic of Ireland. As companies in the Sector believe that significant percentages of their employees are likely to desire to some extent to work remotely Post-COVID-19, it is anticipated that the distribution of its employment across the regions will continue. This will contribute to reducing some of the extreme differences in incomes that currently separate rural and urban areas with the beneficial knock-on effects of more residents with higher incomes being felt particularly strongly where the employees in question are living in small towns and local communities.

The types of employment of most relevance to this report are those that specifically require digital skills and a demonstrated competence in using them. The significant regional growth rates in the numbers of ICT practitioners that has been observed must be capitalised upon. The considerable evidence that the sector already has a high degree of regional spread suggests the sector might aim to become an exemplar with regard to sector regionalisation with significant mutual benefits for the

sector and national policies for rural, local and regional development.

9. Taking up the challenge of ensuring that emerging tech skills and competencies are brought into a much sharper focus than can be achieved using traditional classifications and taxonomies of tech skills and competences must enter the DNA of the sector and lead to an overhaul of its recruitment, retention and workforce development strategies, work practices and workplace cultures.

There is a considerable variety of enterprises within the sector with organisations specialising and concentrating to different degrees on fund management, investment/asset management, fund administration and depositary services, auditing and tax, legal and other support services, with several entities providing combinations of services to the industry. Almost every type of enterprise, however, is being challenged to reassess the composition of talent it needs as digital transformation redesigns its operations and encroaches on its current staff landscape. New interventions that accelerate diversity in recruitment and employee development, combined with appropriate upskilling, retention and progression strategies will be crucial in fulfilling future recruitment requirements across the array of enterprises.

Enterprises that are in transformation need to attract and embed talent that is digitally proficient at all levels of their organisation and across product development, and customer service functions. It is important that they do not focus on their digital talent requirements (data, design, and technical knowhow) in isolation from the business competencies, enterprise mindset and client facing skills they would like to characterise and permeate their organisations. Accordingly financial services sector policy makers, stakeholders and representative bodies need to promote and nurture work environments with purpose if they are to attract and retain in-demand and mobile individuals who have ready opportunities across other sectors of the economy.

It is important to note in this regard that younger generations will have different expectations of their workplaces and expect more by way of purpose, flexibility, a zero-carbon footprint and social impact. If the financial services sector is to remain attractive it must respond accordingly through giving purpose, offering variety, encouraging career development and providing progression opportunities.

10. The successful digital transformation of an organisation needs internal champions and enablers.

The financial services sector has made significant progress on the digital agenda in recent years with a growing number of enterprises and managers ascending the maturity ladder and integrating digital capabilities in the reformation of their business models. In contrast, digital laggards are finding it increasingly difficult to keep pace or close the performance gap with the early adopters.

According to respondents, the primary impediments to the faster adoption of new technologies relate to strategy, people, and resourcing. A lack of understanding or appreciation as to how digitisation will enable and enhance business strategy, and the erratic execution of strategy, are resulting in hesitancy for digital initiatives. With regard to upskilling and employee development, the main impediments are human in nature such as resistance to change, caution over new work

practices, and apprehension with regard to upskilling. As for allocating larger sums to investment in new technologies, these impediments then weaken the case that it is currently a good use of what are always finite resources for which there are competing alternatives.

Those charged with the digital agenda need to convey to internal audiences and external stakeholders just how digitisation will deliver competitiveness by enabling the more efficient and effective execution of business strategy. Senior management needs to imbue a culture of digital innovation that is anchored in actions and strategies to support and encourage reskilling, attract new talent and support continuous professional development. In prioritising resource allocation, the contribution of digital investment much be couched in the context of value, cost, risk mitigation and competitive advantage.

Closing Remarks

The financial services sector like many others is experiencing formidable challenges emanating from digital transformations, societal priorities and customer expectations. The findings of this report clearly indicate that digital transformation is no longer an option but a prerequisite for the successful evolution of the financial services sector. As a result, change has become the new constant.

Successful digitisation requires business transformation, and the revision of business models and commercial offerings to meet changing customer needs and preferences. In turn, this requires deep organisational changes that evolve corporate cultures, embrace new ways of working, and enhance capabilities and alliances around digitally infused ecosystems that are suited to this new business paradigm.

Participating companies in this Irish Funds and Asset Management Technology Skills Audit have emphasised three high-level objectives in their adoption of new advances in digital technology, namely: (i) improving operational efficiency; (ii) augmenting investment and decision-making processes; and (iii) enhancing client experience. They are conscious that digital transformation is essential, aware of the potential and need to reshape their business models and operational procedures, and committed to exploring additional ways of articulating and procuring the range and types or skills they will need for success.

The principal objective of the Government's "Ireland for Finance: The Strategy for the Development of Ireland's International Financial Services Sector to 2025"[7] (launched in 2019), is to move the IFS sector further up the value chain, at the same nurturing its continued growth and creating, at a minimum, an additional 6,000 jobs.

This IFS Technology Skills Needs Analysis report suggests that delivering on this ambition will entail going along with a re-conceptualization of what international financial services are, radical changes in how they are provided and a major reappraisal of the industry's core talent requirements and how they are met. It hopes to be a contribution in bringing more stakeholders and policy makers on board in this endeavour and to inform decision making to achieve an enhanced and more diverse talent pipeline into the sector.

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7   https://www.gov.ie/en/publication/ireland-for-finance-strategy/#international-financial-services-strategy-2025-ireland-for-finance

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