

ARRANGEMENTS DOCUMENT

G8L3 47 PDA IN COMPUTER SUPPORT

**G8L4 48 PDA IN DATABASE
PROGRAMMING**

**G8L5 48 PDA IN
NETWORK TECHNOLOGY**

Version 2.0

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RATIONALE

FOR THE DEVELOPMENT OF THE AWARD(S) AND THE PROCESSES OF CONSULTATION AND MARKET RESEARCH CARRIED OUT

This is the 'Arrangements Document' for the creation of a new suite of Professional Development Awards to supplement and replace the current Professional Development Award's (PDAs) related to the HN Computing and HN Computer Networking frameworks.

There are three PDAs available:

- PDA in Computer support (G8L3 47)
- PDA in Database Programming (G8L4 48)
- PDA in Network Technology (G8L5 48)

BACKGROUND TO THE DEVELOPMENT

SQA currently offers a number of Professional Development Awards in Computing and related areas. Some of these awards are vendor specific while others are vendor neutral. Almost all of them are now seriously out of date and reaching the end of their projected lifespan. The existing PDAs are as follows:

Vendor-Neutral

- **G2KM 16 Diploma in Computing** is due to lapse on 31/07/05. This PDA currently has only one centre undertaking it with 52 registered candidates for academic year 2004/5.
- **G2M2 18 Advanced Diploma in Computing** is due to lapse on 31/07/06. This PDA currently has only one college still undertaking it with 5 registered candidates for academic year 2004/5.
- **G5J8 17 Advanced Certificate in Computer Networking** is due to lapse on 31/07/06. This PDA currently has no take-up from centres and no registered candidates in 2004/05

Vendor-Specific

- **G5J9 17 Advanced Certificate in Networking (Microsoft NT 4.0)** is due to lapse on 31/07/06. This PDA currently has no take-up from centres and has no registered candidates for 2004/5. It should also be noted that this operating system has been superseded by newer versions.
- **G5X2 17 Advanced Certificate in Networking (Microsoft Windows 2000).** This PDA currently has five centres undertaking it with 75 registered candidates for 2004/5. It should be noted that this operating system has been superseded by a newer version.

There were some obvious drawbacks to the way these PDAs were designed. There was confusion between the vendor-neutral and vendor-specific PDAs, often a centre did not know which one to pick. The vendor-specific PDAs were designed around specific operating systems which have been superseded by newer versions, thus making the PDA redundant.

It was clear from work done in the design of the HN Computer Networking and HN Computing and frameworks that centres desired vendor involvement, but wanted the flexibility of generic units to allow centres to make their own informed choices. Having a variety of vendor specific units/PDAs for several vendors Microsoft would prove difficult to manage for both the SQA and college administration systems.

Generic units were designed for a variety of topics, but there were clear links to the vendor certification opportunities embedded into the units to allow SQA centres to decide which route they wished to adopt.

At the same time as the above developments were taking place, SQA we working on another project in collaboration with Oracle Corporation to identify areas where the Oracle Internet Academy Program could be aligned with both upper secondary and HND Computing curricula, to allow the Internet Academy Program to be embedded into courses in Scottish Schools and Colleges. This project resulted in detailed curriculum mappings being drawn up and a number of schools and colleges offering courses which incorporated the Oracle Internet Academy Program.

The final report on this project suggested that there were “strong indications that it should be possible to construct a seven or eight credit PDA which could be fully embedded within HNC/D Computing, or delivered as a standalone programme”. The report also suggested that this work should be carried forward. This has been done as part of this document.

DEMAND FOR COMPUTING SKILLS

Since 1995, the field of Computing and Information Technology has seen massive change, both in the technology and in the skills required of computing professionals. In particular two important changes stand out. These are: the immense importance of the Internet to modern society; and a considerable extension of networks and network technology into almost every part of life. Both of these are reflected in the HN Computer Networking framework and the revised HN Computing frameworks.

QUALIFICATION DESIGN TEAM

The members of Qualification design team for these PDAs have also been part of the design teams for the HN Computer Networking and HN Computing frameworks and have been supported and advised by the relevant supervisory panels for both HN frameworks. There were two principal design members:

- Ted Hastings, SQA Consultant: Computer Networking
- Mike Smith, Lecturer, Stevenson College

CONSULTATION AND MARKET RESEARCH

SUMMARY OF CONSULTATION

The design team, in consultation with industry representatives, undertook market research into a number of areas:

- The impact of offering specific PDAs aligned to HN frameworks and vendor products
- The impact of ICT employer requirements in the UK
- The impact of vendor certifications on candidate achievement

SUMMARY OF MARKET RESEARCH

COLLEGE STATISTICS

The Head of Computing in each of Scotland's colleges were mailed in October last year (2004) asking for comments on proposed PDAs linked to vendor certifications. Since some specialist colleges do not offer mainstream HN provision in Computing, the maximum number of likely responses was 37. SQA received responses from approximately 27% (10 colleges). Details were as follows:

Response to PDA structures:

- **PDA in Computer Support based on the CompTIA + concepts series:** The structure was well received colleges felt this was a good introductory course which would allow students to progress to either Desktop Support or Systems Administration.
- **PDA in Desktop Support based on Microsoft Desktop Support Technician:** The two units which make up this award were well received and most colleges felt that it was really good to see desktop support skills embedded into the award. Most felt that this PDA had the most value with good progression routes into Systems Administration and Systems Engineering PDAs.
- **PDA in Systems Administration based on Microsoft Certified Systems Administrator:** The structure was well received and the progression routes from Computing Concepts or Desktop Support PDAs were seen as an advantage.
- **PDA in Network Technology based on the Cisco Network Academy Programme and CCNA:** A larger PDA, this was seen as advantageous to those colleges who were already Cisco academies and that non-academies would find the burden of providing resources to teach this PDA difficult, but not insurmountable.

- **PDA in Systems Engineering based on Microsoft Certified Systems Engineer:** This is the largest PDA, however most colleges felt the progression routes outlined from Computer Support or Desktop Support to Systems Administration and onto Systems Engineering were viable.

Colleges were asked the potential volume in the first year, if the PDAs were available in academic year 2005/06.

- 5 colleges indicated they would enrol between 8 and 15 students per PDA.
- 5 colleges indicated that they expected to enroll students for the PDAs but gave no estimate of numbers.

All 10 colleges made positive comments about the PDAs being embedded into HN frameworks. This allowed flexibility for students studying part time or on short courses to work towards an HN. This empowered the students to plan their time, resources and funding more flexibly and offered more opportunities for colleges to encourage students to enrol.

All of the PDA units are already in either HN Computer Networks (validated) or HN Computing (validated) frameworks and can assist in preparation towards vendor certification exams and can be covered by vendor courseware.

All colleges in Scotland were contacted about Microsoft IT Academy consortia. Of 47 colleges 10 were too specialist (Agricultural, Nautical, Food technology etc) so they saw no benefit in joining as they are NOT delivering IT related courses.

In May 2005 a further questionnaire relating to the embedding of vendor certifications in SQA awards was circulated to the colleges who were members of the Cardonald Consortium. Replies were received from 14 colleges: Aberdeen, Angus, Dumfries, Dundee, Falkirk, Glenrothes, Fife, James Watt, Langside, Lauder, Reid Kerr, Stevenson, Stow and Edinburgh Telford. All the colleges who replied were keen to see vendor qualifications embedded and they were also in agreement that candidates who had already acquired vendor certifications should be able to use these to obtain credit transfer towards SQA awards. The following comment was typical:

“The marriage of vendor and academic/vocational programmes I believe is the future for IT courses run at colleges. This can be evidenced in a Foundation Degree I was involved in where Vendor Certification (Cisco/Microsoft) formed part of the qualification. The feedback from students and local companies was positive.

It is becoming more common that industry requires potential employees to have professional qualifications as well as degree, HNC/HND, vocational qualifications. Anything that encourages students to gain dual qualifications is something we should pursue, so if we can offer academic accreditation to already existing qualifications, all the better.”

SECTOR INFORMATION

SFEU

Recent studies and surveys by various sector organisations have highlighted the growth and potential working patterns for students undertaking study leading to employment in the next 2-3 years. The Scottish Funding Education Unit (SFEU) recently surveyed the FE sector in a report to the SFEFC Knowledge Transfer Taskforce (February 2005), called *Initiating, Adopting and Building Knowledge Transfer and Scotland's Colleges* and found that:

CPD–Company focused was the provision of educational and/or training provision for a specific organisation which is self financing, developmental and aims to meet the organisational needs through staff development. The income data recorded was regarded as robust, but figures given were underestimates of the reality. All colleges recorded activity in this category. Category total revenue received = £948,000 with 3,516 participating students.

Activity included the following areas:

- ***IT skills development through bespoke programmes using national qualifications and vendor frameworks***
- Developments of specific functional areas of company operation including specialist IT applications, CNC operation and interview techniques

CPD-Employer focused was the provision of educational and/or training provision for a specific organisation which is self financing, developmental and aimed at sustaining and/or employment-related skills of participants. Category total revenue received = £2,493,237 with 3937 participating students.

Activity included the following areas:

- A wide range of commercial courses derived from mainstream curriculum areas
- ***Continuous professional development in focused areas often related to industry standard qualifications***
- Skills development including vocational qualifications

Full details of the report can be found at: <http://www.sfefc.ac.uk/>

E-SKILLS UK

In a recent report (IT Insights Employer Skills Needs) e-skills UK reported that just over four out of ten establishments in Britain (43%) employed IT Professionals. These are people who, plan, manager, support and develop IT hardware/software. The report highlighted there would be moderate growth in this area over the next two-three years, with the biggest shortfalls in staff occurring in the following areas:

- **IT Operations 20%**
- Development and Training 17%
- **Applications and System support 16%**
- Education Training Management and Delivery 14%
- Capacity Management 11%
- **Network control 10%**

34% of employers were experiencing difficulties in filling IT Professional jobs. Of these hard-to-fill vacancies 30% were for web-support staff and **29% were for technicians/engineers**. Highlighted in the report was a growth of 12% anticipated in Scotland over the next twelve months for IT Professionals.

Scotland has an IT workforce with:

- Over 37,000 employees in the IT industry
- Over 42,000 IT Professionals working in other industries
- A total IT workforce of over 79,000
- 1.6 million IT users in the workforce

The most common IT Professional role in Scotland is that of, “software professional” and it is also the commonest job in the UK as a whole. Whilst there was concentrated demand for web support, IT architects and security specialists, there is an on-going need for networking specialists and increasing demands for systems integration competencies.

Around 41,000 British businesses were seeking to recruit IT Professionals and just over a third were experiencing difficulties in recruitment. This was having a major impact on the operation of the company and in the development of new products and services.

The full report findings can be found at: <http://www.e-skills.com>

COMPUTER PERIODICALS/INDUSTRY INFORMATION

COMPUTER WEEKLY.COM

In a recent article Computer Weekly reported that a number of IT industries are seeking support from a variety of awarding bodies to incorporate vendor certifications into awards, in a vendor-neutral way, thus providing a number of benefits for both industry and potential future employees from the student market. As vendor certifications have world-wide recognition they add to the global credibility of people in the IT industry.

Students who could not previously afford to undertake vendor courses or exams will have the option to sit the vendor related exam within the structure of the award. This combined learning experience gives students a greater starting point in their IT careers.

MICROSCOPE

In an article about the new Skills Framework for the Information Age (SFIA), Microscope highlighted that the skills framework has received backing from the government’s central IT Unit for the provision of a common reference model for the identification of jobs that exist in the IT industry and the skills required to perform them. The framework has received support from IBM, EDS and Microsoft.

SKILLS FRAMEWORK FOR THE INFORMATION AGE (SFIA)

Qualification	Awarding Body	Category	Sub category	Level	Technical Skill
HND Computing Support	SQA	5	3	3	Applications and Systems Support
Installing and Supporting IT Systems	NVQ 2 & 3	5	3	3	Applications and Systems Support
Microsoft Certified Desktop Support Technician	Microsoft	Likely to be level 5	TBC	TBC	Applications and Systems Support
Microsoft Certified Professional	Microsoft	5	3	3	Network Administration and Systems Support
Microsoft Certified Systems Administrator	Microsoft	5	3	3	Network Administration and Systems Support
Microsoft Certified Systems Engineer	Microsoft	5	3	3	Network Administration and Systems Support

Extract from SFIA-ICT skills framework

It is clear from the above extract that vendor certifications have been classified at the equivalent levels as NVQs 2 & 3 and HND’s and they cover the same level of technical skill.

The full SFIA-ICT skills framework can be found at: <http://www.sfia.org.uk>

COMPTIA CERTIFICATIONS

The following information is extracted from the CompTIA web site (www.comptia.org)

CompTIA A+® Certification

CompTIA A+ certification is an international industry credential that validates the knowledge of computer service technicians with the equivalent of 500 hours of hands-on experience. Major hardware and software vendors, distributors and resellers accept CompTIA A+ as the standard in foundation-level, vendor-neutral certification for service technicians. The exams cover a broad range of hardware and software technologies, but are not bound to any vendor-specific products. The skills and knowledge measured by the CompTIA A+ exams were derived from an industry-wide and worldwide job task analysis. To date, more than 500,000 individuals have obtained CompTIA A+ certification.

Earning CompTIA A+ certification proves that a candidate has a broad base of knowledge and competency in core hardware and operating system technologies including installation, configuration, diagnosing, preventive maintenance and basic networking.

Industry Support for CompTIA A+®

The technology community identifies CompTIA A+ certification as the perfect entry into an IT career. Technology and certification companies including Microsoft, Hewlett-Packard, Cisco, Novell and Certiport recognize CompTIA A+ certification as part of their certification tracks. Top technology companies including CompuCom, CompUSA and IBM have also made CompTIA A+ certification mandatory for their service technicians. Additionally, more than 100 companies now require CompTIA A+ certification as a prerequisite to qualify for their corporate and vendor-specific training programs.

CompTIA Network+® Certification

The CompTIA Network+ certification is an international industry credential that validates the knowledge of networking professionals with at least nine months of experience in network support or administration or adequate academic training. A typical candidate would have CompTIA A+ certification or equivalent knowledge, but this is not a prerequisite. An accepted foundation-level, vendor-neutral certification for networking professionals, many IT certifications integrate CompTIA Network+ into their curriculums. There are approximately 135,000 CompTIA Network+ certified professionals worldwide. The skills and knowledge measured by this examination were derived from an industry-wide job task analysis and validated through an industry-wide survey of more than 2,500 participants.

Earning a CompTIA Network+ certification demonstrates that a candidate can describe the features and functions of networking components, and possesses the knowledge and skills needed to install, configure and troubleshoot basic networking hardware, protocols and services. The exam tests technical ability in the areas of media and topologies, protocols and standards, network implementation, and network support. The exam also covers new technologies such as wireless networking and gigabit Ethernet.

Industry Support for CompTIA Network+®

The technology community identifies CompTIA Network+ as the perfect entry into a networking career. Top technology companies including Microsoft, Novell, Cisco, Compaq, Lotus and 3Com recognize CompTIA Network+ as part of their certification track. Many other corporations recommend or require the CompTIA Network+ certification for their IT employees. Companies such as CDW Computer Centers and CompuCom know the value of a CompTIA Network+ certification and require it of their IT employees. NexInnovations relies on IT certifications to validate their employees' skills. As the demand for skilled network support professionals grows, CompTIA Network+ is quickly becoming the standard for networking competency.

CompTIA Server+™ Certification

CompTIA Server+ certification is an international industry credential that validates the knowledge of individuals with 18-24 months of experience with Industry Standard Server Architecture (ISSA) technology. Professionals who want to certify their advanced technical knowledge in areas such as RAID, SCSI, multiple CPUs and the like, should consider this certification. While CompTIA Server+ does not require CompTIA A+ certification as prerequisite, either this certification or similar is recommended.

The skills and knowledge measured by this examination were developed with global input to assure accuracy, validity and reliability.

The Server+ certification credential validates advanced-level technical competency of server issues and technology, including installation, configuration, upgrading, maintenance, environment, troubleshooting and disaster recovery. This certification is geared toward mid- to upper-level technicians.

Industry Support for CompTIA Server+™

Many corporations recommend or require CompTIA Server+ certification for their IT employees. Companies such as CDW Computer Centers and CompuCom know the value of a CompTIA Server+ certification and require it of their IT employees. CompTIA Server+ is also required for IBM's warranty authorization program.

ORACLE INTERNET ACADEMY

The following information is extracted from the Oracle Internet Academy brochure:

Why the Oracle Academy?

A direct connection to Business and Industry...

Oracle Corporation is the world's leading provider of enterprise software and the world's second largest software company with revenues of more than 10 billion dollars. We offer our customers the ability to harness the power of information through database technology, application development tools, enterprise applications, and a host of information technology (IT) services.

A great addition to the school...

The Oracle Academy is a strategic relationship with schools and colleges to empower students with technical and professional skills that employers demand. By partnering with Oracle, each school receives an in-kind grant of more than £75,000 per year that includes curriculum, professional development, instructor support and hosted software. The curriculum complies with several nationally recognized standards. The Oracle Academy is currently working with the Scottish Qualifications Authority to map this curriculum to the following qualifications: -

HND/C Computing
HND/C Computer Networking
Higher Information Systems
Higher Business Administration

High-Quality Professional Development...

Each instructor receives over 100 hours of professional development, which includes online and in-person training and prepares them to sit for industry-recognised certification. Mentors are provided to work closely with new teachers to ensure IT proficiency and understand best practices. Instructors receive support from Oracle throughout the school year to ensure their success with the new material.

Student-empowered learning...

Leveraging the power of small learning communities, they learn database technology in the context of collaborative projects. They are motivated to investigate business requirements, create conceptual models, execute according to a plan, present and defend their work, and evaluate others. They won't learn solely about the IT business; they will experience what it takes to be successful in the any business. Students are encouraged to network with local businesses and have the opportunity to compete in an international student competition.

CISCO NETWORKING ACADEMY PROGRAM

This information is taken from the Cisco web site (www.cisco.com):

The **Cisco Networking Academy Program** is a comprehensive e-learning program that provides students with the Internet technology skills essential in a global economy. The Networking Academy delivers web-based content, online assessment, student performance tracking, hands-on labs, instructor training and support, and preparation for industry standard certifications.

Launched in October 1997 with 64 educational institutions in seven states, the Networking Academy has spread to more than 150 countries. Since its inception, over 1.6 Million students have enrolled at more than 10,000 Academies located in high schools, technical schools, colleges, universities, and community-based organizations.

Interested educational institutions are given the designation of Networking Academy at the level of training that they will be providing in the program. There are currently three possible tiers of training. Industry experts at Cisco Systems train the Instructor Trainers at the Cisco Academy Training Centers (CATCs), the CATC Instructors train Regional Academy Instructors and the Regional Academy Instructors train the Local Academy Instructors who then educate students. Utilizing this three-tier training model helps to provide instructors the training they need in close proximity to where they are located. Educational institutions may play a role at one or more of these training levels.

Cisco's partners from business, government and community organizations form an ecosystem to deliver the range of services and support needed to grow tomorrow's global workforce. Initially created to prepare students for the Cisco Certified Network Associate (CCNA) and Cisco Certified Network Professional (CCNP) degrees, the Academy curriculum has expanded with ecosystem-partner sponsored courses. Optional courses include: HP IT Essentials: PC Hardware and Software and HP IT Essentials: Network Operating Systems sponsored by Hewlett-Packard; and Panduit Network Infrastructure Essentials sponsored by Panduit Corporation.

The Internet enables anytime, anywhere learning for all students, regardless of location, socio-economic status, gender, or race. With the United Nations Development Program, the United States Agency for International Development, and the International Telecommunication Union, Cisco has made the Academy program available to students in Least Developed Countries to help them build their country's economies.

The Networking Academy program continually raises the bar on e-learning and educational processes. Through community feedback and electronic assessment, the Academy program adapts curriculum to improve outcomes and student achievement. The Global Learning Network infrastructure designed for the Academy delivers a rich, interactive, and personalized curriculum to students around the world. The Internet has the power to change the way people learn, work, and play, and the Cisco Networking Academy Program is in the forefront of this transformation

MARKET RESEARCH FOR HNC/D COMPUTER NETWORKING

The HNC and HND in Computer Networking were validated in June 2004. Much of the market research relating to these programmes is also of relevance to the PDAs and is quoted below:

THE IT SKILLS GAP

Much has been written about the IT Skills Gap and the inhibiting effect the skills gap has on economic development. In many cases, there is more specific information about networking available.

The IDC report "Europe's Growing IT Skills Crisis" (IDC UK, 2000) concludes that, although the supply of IT professionals will increase between 1999 and 2003, the demand for IT professionals will increase at a more rapid rate and therefore the shortage of IT professionals will continue to grow.

A subsequent IDC report "Networking Skills shortages in EMEA" estimates that the shortage of skilled networking staff in the UK will rise from 169,437 in 1999 to 349,801 in 2004, representing 28% of the available jobs.

A more recent report, 'Despite Weak Economy, Skilled ICT Staff Still Needed in Europe' (IDC, UK 2002) suggests that the IT skills shortage in the UK will increase from 214,456 in 2000 to 293,551 in 2005, an increase of 11%. It also highlights the fact that "The shortage of skilled networking professionals (engineers or consultants specializing in designing, implementing, and supporting networks) will increase by a 19% CAGR (compound Annual Growth Rate), indicating the growth in use of the Internet in European organizations".

Another recent report "e-skills Regional Gap: Scotland" (e-skills UK, July 2003) highlighted Operating Systems and Networking as key skill-shortage area. A UK-wide report, published at the same time, reached similar conclusions.

CONSULTATION WITH EMPLOYERS, COLLEGES AND STUDENTS

All of the Units making up the PDA in Systems Administration and the PDA in Systems Engineering are drawn from the Computer Networking Framework and it was implicit in the development of the framework that the units would later be used to create a series of PDAs which would parallel vendor awards. (The MCDST award did not exist at this time, but the units relating to it have been added retrospectively to the Computer Networking Framework.)

Because of the intention to produce PDAs, a number of questions relating to vendor awards were included in the questionnaires issued to students and employers. These are discussed below:

The Advisory Panel considered that it was important to consult widely on the content of the awards. Accordingly, the following consultation took place.

1. *An online discussion forum was set up to discuss the revision of the framework. This attracted 75 members and was a very valuable means of disseminating information and obtaining feedback*
2. *Contact was established with all colleges currently offering Networking or Internetworking awards.*
3. *A total of 15 Scottish IT companies were surveyed. Due to the amount of national and international market research information available on networking skills shortages the Advisory Panel felt that a small sample of local employers was sufficient.*
4. *A total of 80 current students were surveyed.*
5. *All Universities in Scotland were contacted.*

The main points of the responses to the questionnaires to employers and students are given below:

- 67% of the employers surveyed took vendor certifications into consideration when recruiting staff.
- 47% of the employers surveyed regarded A+ as relevant or very relevant.
- 80% of the employers surveyed regarded Server+ as relevant or very relevant.
- 80% of the employers surveyed regarded Network+ as relevant or very relevant.
- 73% of the employers surveyed regarded CCNA as relevant or very relevant.
- 87% of the employers surveyed believed it was a good idea to embed vendor certifications in HNC/D programmes.
- 93% of the employers surveyed believed that students who had already obtained vendor certifications be able to use these to gain credit towards an HNC or HND.
- 72% of the students surveyed regarded A+ as relevant or very relevant.
- 73% of the students surveyed regarded Network+ as relevant or very relevant.
- 80% of the students surveyed regarded Server+ as relevant or very relevant.
- 76% of the students surveyed regarded CCNA as relevant or very relevant.
- 98% of the students surveyed believed it was a good idea to embed vendor certifications in HNC/D programmes.
- 89% of the students surveyed believed that students who had already obtained vendor certifications be able to use these to gain credit towards an HNC or HND.

UPTAKE AND PROGRESSION

The number of students undertaking PDAs has dropped significantly over recent years. This may be due to a number of factors:

- Centres did not perceive any direct benefit in integrating PDAs into other larger HN frameworks. This may be through ignorance or misunderstanding of how PDAs are related to various HN frameworks.
- Vendor-Specific PDAs have had a finite lifespan because they are based around specific operating systems or architecture, which has changed due to market demand.
- There is a move towards achieving only the vendor qualification, instead of HN qualifications. Vendor qualifications have international recognition and the content can be measured against industry standards.

PROJECTED UPTAKE

	VENDOR NEUTRAL PDAS	VENDOR SPECIFIC PDAS	NEW PDAS
2004/5	57	75	-
2005/6	0	50	150
2006/7	25	25	200
2007/8	50	25	250

The growth figures are based around the new PDAs within in this document, and figures obtained from colleges already undertaking these industry certifications instead of SQA awards. A steady growth is expected based on the new vendor-generic format adopted in the PDA units within this arrangements document. Some of the vendor-specific PDAs in the current SQA catalogue are due for retirement.

The zero numbers indicated for the vendor-neutral PDAs is in direct relation to the retirement of some of these awards in the SQA catalogue in 2005/6.

TARGET SECTOR AND LEVEL OF EMPLOYMENT

Most employers agree that certifications are much like university degrees - they get your foot in the door, but they do not prove you can do the job. Industry certifications should be backed up with educational awards and experience learnt whilst in employment.

Employers do feel that certifications inspire confidence in the individual holding them because the individual has put forth much time, effort, and expense in getting the certification. This proves commitment. Certifications enforce a broader, general understanding of state-of-the-art ideas and best practices for the industry, a detailed understanding of the mechanics of the technology, and how the technology is supposed to interoperate.

The new PDAs will allow students to undertake roles like:

- Junior Support Technicians
- Desktop Support Technicians
- Junior Network Administrators
- Network Administrators
- Database Programmers
- ICT support technicians for both network and application support

TARGET CANDIDATES

This award is designed to offer candidates academic, technical and professional training leading to the skills necessary to design, implement, support, evaluate or manage IT systems in a vast range of industries. The award is targeted at candidates who have the formal education requirement and –

- Who intend to leave school and further their career path in a college. OR

- Who intend to progress their career after the study of either the NQ in Computing, the NQ in Information Systems. OR
- Who intend to progress their career after the study of the PDA into further study at HN level. OR
- Who leave employment with the intention of changing their career path. OR
- Who are unemployed and wish to study to assist gaining employment. OR
- Who wish to study on a part-time (day or evening) or day-release mode.

At the discretion of a centre, a candidate may be permitted to enter the award by waiving some of the entry requirements - based on their previous experience. Experience has shown that mature candidates often study this award perhaps having also achieved some vendor qualifications.

A candidate may move on to study at a higher level at a college or use the award to articulate to a degree course.

RELATIONSHIP WITH OTHER AWARDS

These PDAs have been formed from discussions with the majority of the FE sector and other associated bodies. They represent an inclusion of vendor related topics, whilst remaining generic in nature. This allows colleges to decide if they wish to utilise the vendor certifications as well as achieving academic recognition.

The units within each PDA have direct links in either mandatory or optional sections of the following two HN frameworks:

- HND Computer Networking
- HND Computing

The PDAs allow students to work towards entry into either of these HN frameworks, whilst allowing the colleges the chance to give students a flexible range of study options.

RATIONALE FOR STRUCTURE AND CONTENTS

The *PDA in Computer Support is a two-credit PDA* which covers the knowledge and understanding associated with the CompTIA A+ certification, along with either Server+ or Network+ and would be attractive to students who were looking for an entry-level position as a junior support technician role, or students who wanted to verify their existing skills as a support technician for advancement within an organisation.

Candidates are required to achieve two core units:

- **Computing: PC Hardware and Operating Systems Essentials** is designed to provide competencies associated with an entry level IT professional working in the lab or field, installing, building, configuring, troubleshooting and performing preventative maintenance on basic PC hardware and operating systems. It is intended for candidates undertaking an HN in Computing, Computer Networking or a related area who require an understanding of computer hardware.

- **Computing: PC Hardware and Operating Systems Support** is designed to provide competencies associated with an entry level IT Professional working as a field service or PC technician, upgrading, configuring, troubleshooting and performing preventative maintenance on PC hardware and operating systems. It is intended for candidates undertaking an HN in Computing, Computer Networking or a related area who require an understanding of computer hardware and operating systems.

Candidates who achieve this PDA can progress to the PDA in Systems Administration and thereafter to the PDA in Systems Engineering.

The ***PDA in Database Programming is a seven-credit PDA*** which covers the knowledge and understanding associated with the Oracle Internet Academy Program and would be attractive to students who were looking for a position as a database programmer, or students who wanted to verify their existing skills in database programming for advancement within an organisation.

Candidates are required to achieve all four core units:

- **SQL: Introduction** is designed to develop a broad knowledge of the concepts, principles, boundaries and scope of relational databases using a query language. These will be reinforced by developing the practical skills required in using the structures and features of a query language in order to maintain and interrogate a relational database system. On completion of the Unit the candidate should be able to: create and maintain a data storage system, manipulate data stored within a table structure and produce formatted reports.
- **Software Development: Relational Database Systems** is designed to enable candidates to understand the manipulation of normalised data structures. On completion of the Unit candidates should be able to: explain the terminology and techniques used in the design of relational information systems, create a relational database design from user requirements, describe the issues involved in implementing a relational database system, implement structures and manipulate data in a relational database management system and use a programming language to interface with a relational database management system.
- **Software Development: Structured Programming** is designed to develop a broad knowledge of the concepts, principles, boundaries and scope of software development using a structured programming language. On completion of this Unit, candidates should be able to: use programming techniques to develop program modules, implement a solution from a design, test the completed product and create technical and user documentation.
- **Software Development: Object Oriented Programming** is designed to develop a broad knowledge of the concepts, principles, boundaries and scope of software development using an object oriented programming language. On completion of this Unit, candidates should be able to: use programming techniques to develop program modules, implement a solution from design, test the completed product and create technical and user documentation

The ***PDA in Network Technology is an eight-credit PDA*** which covers the knowledge and understanding associated with the Cisco Network Academy Program and would be attractive to candidates who were looking for a position as a network engineer, or candidates who wanted to verify their existing skills in network engineering for advancement within an organisation.

Candidates are required to achieve all four core units:

- **Networking Technology** is designed to enable candidates to work effectively in a Local Area Network installation or support role using networks that have fewer than 100 nodes.

On completion of the Unit candidates should be able to: describe the characteristics of Local Area Networks, describe common networking media, describe the principles of cable testing, build a simple LAN, describe the features of Ethernet networks, define the operation of Ethernet switching, describe IP addressing and routing and describe the operation of upper layer services.

- **Routing Technology** is designed to enable candidates to work effectively in a network installation or support role for Small Office, Home Office, small business or organisations using networks that have fewer than 100 nodes, requiring complex LAN implementation or interconnectivity via WAN links. On completion of the Unit candidates should be able to: describe router basics, implement a basic router configuration, manage a router, describe the operation of common routing protocols, implement routing protocols, test and troubleshoot a routed LAN, define the principles of a TCP/IP based firewall and configure a firewall.
- **Switching Technology** is designed to enable candidates to work effectively in a network installation or support role for small office, home office, small business or organisations using networks that have fewer than 100 nodes requiring complex LAN implementation or interconnectivity via WAN links. On completion of the Unit candidates should be able to: describe the principles of classless routing, describe common advanced routing protocols, configure advanced routing, describe basic switched LANs, configure a basic switched network, describe redundancy and spanning tree, describe advanced switching concepts and implement an advanced switched network.
- **Internetworking Technology** is designed to enable candidates to work effectively in a network installation or support role for small office, home office, small business or organisations using networks that have fewer than 100 nodes requiring complex LAN implementation or interconnectivity via WAN links. On completion of the Unit candidates should be able to: describe scalable IP address schemes, describe WAN technologies and design techniques, implement a PPP WAN link, describe ISDN WAN concepts, describe Frame Relay Concepts, implement a WAN frame relay link and describe network administration.

Candidates who successfully completed this PDA would have the knowledge and skills required to sit the CCNA exams. Successful completion of these would allow candidates to obtain the Cisco Certified Network Associate award and would give them the opportunity to proceed to higher levels of Cisco certification.

AIMS

OF THE GROUP AWARD(S)

GENERAL AIMS

These Professional Development Awards have a range of broad aims, which are generally applicable to all equivalent Higher Education qualifications. Some of these general aims are:

- To develop the candidate's knowledge and skills such as planning, analyzing and synthesizing
- To develop employment skills and enhance candidates' employment prospects
- To enable progression within the Scottish Credit and Qualifications Framework
- To develop study and research skills
- To develop transferable skills including core skills
- To provide academic stimulus and challenge, and foster an enjoyment of the subject.

SPECIFIC AIMS OF THE PDA IN COMPUTER SUPPORT

The specific aims of the PDA in Computer Support are:

- To prepare students for entry-level employment in an IT/Computing-related post in a computer technician or desktop support role.
- To develop a range of specialist technical support skills and knowledge in hardware installation and maintenance and the use and support of desktop operating systems.
- To prepare students for progression to further study in Computing and Technical Support, for example the PDA in Systems Administration, PDA in Network Technology or HNC/D in Computing or Computer Networking.

SPECIFIC AIMS OF THE PDA IN DATABASE PROGRAMMING

The specific aims of the PDA in Database Programming are:

- To prepare students for employment in an IT/Computing-related post as a database programmer or junior administrator.
- To develop a range of specialist technical support skills and knowledge in the programming and administration of relational database systems. .

- To prepare students for progression to further study in Computing and Technical Support, for example the HNC/D in Computing.

SPECIFIC AIMS OF THE PDA IN NETWORK TECHNOLOGY

The specific aims of the PDA in Network Technology are:

- To prepare students for employment in a senior IT/Computing-related post as a network designer or network engineer.
- To develop a range of specialist technical support skills and knowledge in the administration and design of complex networked computer systems
- To prepare students for progression to further study in Computing and Technical Support, for example, the HND in Computing or Computer Networking.

RECOMMENDED ACCESS

TO THE GROUP AWARD(S)

PRIOR EXPERIENCE AND QUALIFICATIONS

This statement is about access to the Professional Development Awards as a whole. However, in addition to the detail which follows, part of the specification of each and every unit includes recommended access levels. Students should normally be expected to satisfy both sets of access requirements.

As with all SQA qualifications, access will be at the discretion of the Centre and the following recommendations are for guidance only.

Different combinations of relevant National Qualifications, Vocational Qualifications and equivalent qualifications from other awarding bodies may also be acceptable, as would suitable vendor qualifications at an appropriate level.

Mature candidates with suitable work experience may be accepted for entry provided the enrolling Centre believes that the candidate is likely to benefit from undertaking the award.

It would be advisable for all candidates to have some prior knowledge of computing or information technology although formal qualifications may not be necessary if suitable experience had been gained informally or through work experience.

Such work experience may provide inferred or actual evidence of a candidate's skills and knowledge as they apply either to particular units.

Some examples of appropriate formal entry qualifications are specified below. They are not exhaustive or mutually exclusive and may be offered in a variety of combinations.

RECOMMENDED ACCESS TO THE PDA IN COMPUTER SUPPORT

Candidates should possess one or more of the following:

- Scottish Group Awards in Computing or Information Technology at Higher Level.
- Any other relevant Scottish Group Award at Higher Level.
- Any two relevant National Courses at Higher together with three Standard Grade passes at level 3 or above.
- An SVQ at level 2 or 3 in Computing, Information Technology or other relevant area.
- Relevant National Units at appropriate levels (e.g. core skills units at Intermediate 1 or 2) combined with any of the above.

**RECOMMENDED ACCESS TO THE PDA IN DATABASE PROGRAMMING
ADMINISTRATION**

Candidates should possess one or more of the following:

- Scottish Group Awards in Computing or Information Technology at Higher Level.
- Any other relevant Scottish Group Award at Higher Level.
- Any two relevant National Courses at Higher together with three Standard Grade passes at level 3 or above.
- An SVQ at level 2 or 3 in Computing, Information Technology or other relevant area.
- Relevant National Units at appropriate levels (e.g. core skills units at Intermediate 1 or 2) combined with any of the above.

RECOMMENDED ACCESS TO THE PDA IN NETWORK TECHNOLOGY

Candidates should already have completed the PDA in Computer Support and should possess one or more of the following:

- Scottish Group Awards in Computing or Information Technology at Higher Level.
- Any other relevant Scottish Group Award at Higher Level.
- Any two relevant National Courses at Higher together with three Standard Grade passes at level 3 or above.
- An SVQ at level 2 or 3 in Computing, Information Technology or other relevant area.
- Relevant National Units at appropriate levels (e.g. core skills units at Intermediate 1 or 2) combined with any of the above.

STRUCTURE

OF THE GROUP AWARD(S)

CONDITIONS OF AWARD

PDA IN COMPUTER SUPPORT @ SCQF LEVEL 7

Candidates are required to take both mandatory units to achieve the PDA.

MANDATORY UNITS

UNIT TITLE	CODE	CREDIT VALUE	SCQF LEVEL
Computing: PC Hardware and Operating System Essentials	F1XA 34	1	7
Computing: PC Hardware and Operating System Support	F1X9 34	1	7

PDA IN DATABASE PROGRAMMING @ SCQF LEVEL 8

Candidates are required to take all four mandatory units to achieve the PDA.

MANDATORY UNITS

UNIT TITLE	CODE	CREDIT VALUE	SCQF LEVEL
SQL: Introduction	DH3J 34	1	7
Software Development: Relational Database Management Systems	DH3D 35	2	8
Software Development: Structured Programming	DH3E 35	2	8
Software Development: Object Oriented Programming	DH3C 35	2	8

PDA IN NETWORK TECHNOLOGY @ SCQF LEVEL 8

Candidates are required to take all four mandatory units to achieve the PDA.

MANDATORY UNITS

UNIT TITLE	CODE	CREDIT VALUE	SCQF LEVEL
Networking Technology	DF9X 35	2	8
Routing Technology	DF9Y 35	2	8
Switching Technology	DG09 35	2	8
Internetworking Technology	DG0A 35	2	8

APPROACHES TO DELIVERY & ASSESSMENT

OF THE GROUP AWARD(S)

CONTENT AND CONTEXT

Although conditions will vary between centres in terms of resources, staff and student profiles, timetabling constraints, etc., the assessment context of individual units has been set within a typical assessment loading for a PDA. In the majority of units there will be normally one assessment set within a closed book setting which will test the underpinning knowledge and skills. This ensures that some student work is objectively known to be authentic and sets out to ensure that candidates attain the necessary standard to use units being studied as building blocks which enable them to progress through the particular award they have elected to study.

Some of the evidence requirements for units may be produced using e-assessment. This may take the form of e-testing (for knowledge and understanding) and/or e-portfolios (for practical abilities). This use of an e-portfolio approach to assessment is being encouraged.

ASSESSMENT STRATEGY

Assessment will cover a variety of knowledge and practical skills as well as the more intellectual skills of planning and evaluating which is part of many units. This means that a large number of different methods can be employed to ensure that a student 'can do what s/he is supposed to do' and 'knows what s/he is supposed to know'.

All the units comprising these PDAs are generally assessed by means of two components: a set of restricted-response (multiple-choice) questions, used to assess the candidate's knowledge and skills and a Logbook, used to assess practical skills and record the practical tasks carried out by the candidate.

Where practical, a holistic approach is encouraged to be taken by centres in assessing across a number of outcomes within units.

USE OF E-ASSESSMENT

The opportunity/decision for a centre to utilise a VLE/MLE remains within the organisation and management of each centre. However, the use of e-assessment is encouraged and could be managed in a number of ways. In order to encourage and support such innovations, a common phraseology has been used throughout the units and in which such e-assessment seems feasible.

OPEN LEARNING AND DISTANCE LEARNING

These awards may be delivered by open and distance learning methods, provided that adequate preparations are made. There is an intrinsic difficulty if specialised equipment is required, but companies, other agencies and even the student he or she may be able to make suitable equipment available. While learning may often progress well, it is often the case with practical skills assessments that a centralised testing facility is needed - for example the FE College or centres itself. Alternatively, as with on-job assessment in SVQs, an assessor may need to visit the candidate's work location and administer the test, having first had time to check and prepare the

local equipment. On some occasions a mix of conventional and innovative assessment may be used. Whichever method is employed, additional planning and resources will be required for candidate support, assessment and reassessment.

Quality assurance procedures must also be sufficiently robust to fully support open and distance learning. Further advice and guidance is contained in the SQA publication '*Assessment and Quality Assurance for Open and Distance Learning – SQA February 2001*'.

TRANSITION ARRANGEMENTS & CREDIT TRANSFER

For those centres who choose to use vendor certifications as proof of assessment the following table will give guidance on the vendor exams associated with each unit within each PDA. All vendor exams are normally held in controlled conditions and evidence generated is an exam score report, supplemented by an examination certificate for each examination passed. Either or both the exam score report, or examination pass certificate must be produced as evidence of assessment for each unit.

It should be noted that, in general, passing a vendor examination will only give credit transfer for the Knowledge and Skills component of an SQA unit. Candidates will also need to produce evidence to demonstrate that they can also meet the Practical requirement. This can be done by completing the SQA Log Book for the relevant unit, or by producing alternative evidence, such as a course completion certificate. Please refer to the SQA website for the most up-to-date vendor credit transfer document.

GUIDANCE FOR CANDIDATES AND PROGRESSION ROUTES

It is possible for students who wish to progress to articulate into the HN Computing, or HN Computer Networking award after undertaking one or some of these Professional Development Awards.

Students may also articulate into several vendor certifications, if undertaking multiple Professional Development Awards.

If undertaking the ***PDA in Computer Support***, a student who passes the required CompTIA examinations will gain industry recognition with the CompTIA A+ and Network+ or Server+ certification, and have completed two core units from the HN Computing and HN Computer Networking awards and one optional unit from HN Computer Networking.

If undertaking the ***PDA in Database Programming***, a student who passes the required Oracle examination will gain industry recognition with the Oracle Certified Associate certification and have completed some mandatory/optional units from the HN Computing awards.

If undertaking the ***PDA in Network Technology***, a student who passes the required Cisco examinations will gain industry recognition with the Cisco Certified Network Associate (CCNA) award have completed some mandatory units from the HN Computer Networking award or some optional units from HN Computing.