Growth and Innovation Pilot Initiative Project

Project Proposal

Prepared for the Tertiary Education Commission

Resulting from the workshop held by IPENZ on 9 May 2007

Developing Well-qualified Information and Communications Technology (ICT) Professionals

August 2007

IPENZ
ENGINEERS NEW ZEALAND

CONTENTS

ACKNOWLEDGEMENTS

The Institution of Professional Engineers New Zealand Inc (IPENZ) gratefully acknowledges the contributions from members of the Advisory Group to this project – Information Technology Association of New Zealand (ITANZ), New Zealand Software Association (NZSA), New Zealand Computer Society (NZCS), EDS New Zealand, The HiGrowth Project, Milner Consulting, Ignition Partner, Electrotechnology Industry Training Organisation (ETITO) and the New Zealand Council of Engineering Deans (NZCED). Members of the Advisory Group have provided advice and access to members of their industry associations or staff of their companies for research to be conducted.

Massey University, represented by Professor R M (Bob) Hodgson, advisor to the Pilot, has taken on the role of primary contractor to the Tertiary Education Commission (TEC) for this Pilot.

The HiGrowth Project was subcontracted to deliver the final workshop consultation and write the resulting project proposal on behalf of the Advisory Group.

In representing this group I would like to acknowledge the work completed by Sharon Wagg and the enormous contribution she personally made to the overall project. I would also like to thank the participants in the workshop and everyone who informed the development of this proposal.

Jane Smallfield
Programme Manager
The NZ HiGrowth Project Trust

BACKGROUND – A PROGRAMME FOR CONTINUING EDUCATION AND TRAINING FOR THE ICT INDUSTRY

This project proposal is part of a Growth and Innovation Pilot Initiative project for the ICT sector funded by TEC in August 2006. The project is due for completion at the end of July 2007.

The consortium responsible for the project consists of IPENZ, ITANZ, NZSA, NZCS, EDS New Zealand, The HiGrowth Project, Milner Consulting, Ignition Partner, ETITO and NZCED.

The NZCED consists of representatives from the tertiary education organisations (TEOs) which offer four-year accredited engineering degrees (the University of Auckland, University of Waikato, Massey University, the University of Canterbury, Auckland University of Technology, UNITEC and Manukau Institute of Technology). The project has been facilitated by IPENZ with members from each organisation forming the Advisory Group to the project.

The project has been divided into two parts. The first part was to conduct research in the ICT sector to identify the knowledge and skill gaps of people in engineering and computer science-related roles that need to lift their capability to graduate level. A report was produced based on this research, which informed the second stage of the project – the design of a solution to deliver the recommendations made by the report.

The research report's recommendations were:

- *That a flexible qualification, compatible with continuing employment, using a blended learning approach and combining technical and business topics is explored with the Institutes of Technology and Polytechnics (ITPs) to staircase ICT workers to graduate level. Such a qualification should be compatible with an international quality marking scheme.*
- *That tertiary education organisations continue to liaise closely with companies in the ICT sector, encouraging teaching staff to spend time in companies to keep abreast of developments in technology and the ICT sector and to contribute their expertise to companies as required.*
- *That industry associations in New Zealand with members in the ICT sector who have computer science and communications backgrounds need internationally benchmarked qualifications and competence quality marks. They should link into the international developments for recognition of ICT professionals and use established assessment processes of like-minded professions such as engineering for certification schemes which is the case internationally.*
- *That knowledge of international standards is included in the curricula of qualifications at all levels.*
- *That professional bodies, industry associations and industry training organisations encourage companies to take a more strategic view by communicating the importance of further education and training in the ICT sector, and how a highly-skilled workforce will impact on their bottom line and their company's international competitiveness.*

After the report was produced, discussion was held with TEC to change two of the deliverables which had been developed at the start of the project. Initially it was proposed that the research would lead towards the development of a new qualification. However, the research showed that industry, industry associations in the ICT sector, and TEOs perceived greater value in developing more flexible methods for the delivery of qualifications and a quality mark for ICT professionals, both of which would be internationally recognised.

As a result two of the deliverables were changed to:

- Through Massey, the IPENZ-led consortium aims to engage with four or more TEOs on the design of a graduate profile; more flexible delivery methods for current qualifications; and internationally benchmarked qualifications and a quality mark for ICT professionals. TEOs form a steering group to provide ongoing commitment to their further development.
- Thirty companies, five professional bodies and industry associations, and six or more TEOs are invited to attend a national workshop to develop an action plan based on the outcomes of the research. Through Massey, the IPENZ-led consortium aims to have representatives from at least 15 companies, five professional bodies and industry associations, and TEOs who are members of the steering group attend the workshop. The workshop participants commit to the design of a graduate profile; more flexible delivery methods for current qualifications; and internationally benchmarked qualifications and a quality mark for ICT professionals.

The research results were circulated to a group including industry, industry training organisations, education providers and government representatives. Following circulation of the research results a workshop was held with wide-ranging participation from these organisations to develop the solutions contained within this proposal. (See page four for a complete list of workshop participants.)

After the workshop, the recommendations of the participants were collated and form the basis of this proposal document.

The clear overall theme at the workshop was the need for a national organisation to take responsibility for a programme of continuing education and training for the ICT industry. This organisation would be responsible for delivering the recommendations of the initial research report.

Workshop Participants

Organisation	Representative	Classification
Airways Corporation	Dave Cooper	Company
AUT	Graham Bidois	TEO
CPIT	David Weir	TEO
CPIT	Chris McCarthy	TEO
Department of Labour	Teena Abbey	Government
Downer Engineering	Bryan Tocker	Company
Eaton	Simon Lock	Company
ESITO	Chelydra Percy	Industry Training Organisation
ETITO	Marilyn Brady	Industry Training Organisation
Fonterra	Peter Wilding	Company
Foodstuffs	John Davy	Company
Humanware	Adam Palm	Company
ICTNZ	Garth Biggs	Membership organisation
IPENZ	Regan Hoskin	Membership organisation
Manukau Institute of Technology	Jim Cater	TEO
Massey University	Prof Bob Hodgson	TEO
Media Design School	Frances Valentine	Private Training Enterprise
NACCQ	Garry Roberton	TEO
NZCS	Doug White	Membership Organisation
NZCS	Richard Donaldson	Membership Organisation
NZCS	Peter Miller	Membership Organisation
Open Polytechnic	Gerry McCullough	TEO
Optimation	Ola van Leeuwen	Company
Otago Polytechnic	Samuel Mann	TEO
TEC	Greg Coyle	Government
TESSO	Chris Jones	Membership Organisation
The HiGrowth Project	Jane Smallfield	Industry Organisation
Transfield Services	Denis Orme	Company
Unitec	Donald Koh	TEO
Whitireia	Diane Strode	TEO

Invitees to Workshop – Unable to Attend

TEOs	Contact
BOP Polytechnic	Mike Gorinski
Tai Poutini	Paul Wilson
UCOL	Sarah Snell

Membership Organisations	Contact
IPENZ	Brett Williams
Auckland Cluster Group	Simon Fawkes
Electronics South	Janes Saruchera
Health IT Cluster Canterbury	Gavin Wright
NZSA	Jeff Jackson
TESSO	Kirsten Lloyd
Wellington Cluster Group	Frances Mainwaring
Women in Technology	Cheryl Horo

Companies	Contact
Ace Training	Tony Skelton
Alcatel	Eric Evans
Alcatel	Ian Greenbank
Catalyst	Mike O'Connor
Chch Casino	Tom King
Compudigm	Garth Searle
Datacom	Anne Palmer
Datacom	Vernon Kay
Datacom	Mark Ellis
Downer Engineering	Bryan Tocker
Downer Engineering	Ian Russell
EDS	Duncan Hall
EDS	Chris Morrison
Gen-I	Steve Manners
GPC Electronics	John Watt
IBM	Carl Klitscher
Ignition Partner	John Cunningham
Infinity Solutions	Sally Morris
iServe	Joy Cottle
Kordia	Chris Giles
LANSmart	Glen Houlihan
Media Lab	Phil Shepherd
Priority One	Annie Hill
Rakon	Oleg Sheynin
Rakon	David Grant
Run the Red	Deborah Crowe
Tait Electronics	Trevor Laughton
Tait Electronics	Richard Copeland
Telecom	Brighid Kelly
Telecom	Vince Jennings
Telecom	Elliot Bonnett
Telstraclear	Dave Schroder
Trimble	Steve Davis
Vodafone	Cobus Brand

EXECUTIVE SUMMARY

This proposal is the result of a two-part project. The first part was to conduct research in the ICT sector to identify the knowledge and skill gaps of people in engineering and computer science-related roles that need to lift their capability to graduate level. A report was produced based on this research, which informed this second stage of the project – the design of a solution to deliver the recommendations made by the report. The solution has been developed through consultation and a workshop held with key stakeholders. The results were formed into a proposal, which has been subject to further stakeholder scrutiny before being finalised.

The proposal's aim is to establish a programme which will attract and retain top-class people as ICT employees in New Zealand. The programme would aim to achieve this through enhancing the status and standing of ICT careers and qualifications in New Zealand by the promoting standards and competencies that meet international benchmarks and the needs of New Zealand employers.

It was clearly identified by both the research project and workshop that the resulting programme of work required ownership by a national organisation capable of leading its establishment and promotion. Wherever possible, existing courses, projects and initiatives would be mapped into the programme, creating a collaborative as opposed to competitive working environment.

The proposed programme has four main parts:

1. **ICT competence framework**
   The establishment of an internationally benchmarked framework defining the competencies expected of both competent practitioners and ICT graduates would form the basis for the development of a quality mark for ICT professionals. It would encourage a national approach to creating courses leading to the development of framework competencies (or graduate attributes) and could form the basis for a professional accreditation process, or provide a greater outcomes focus for existing academic accreditation processes. Wherever possible, specialist technical courses would be developed by expert providers and shared through a blended delivery model on a national basis. Qualifications could be gained in "bite-sized" chunks with employers clearly able to recognise the skills and competencies gained when employees achieve each course. Industry experts would be engaged to assist with course delivery and a means of moderating their input would also be developed.

2. **Resource centre**
   An independent advisory resource would provide both online and over-the-phone expert advice to employers and employees on issues like assessing current skills, deciding which courses they should be taking or providing, and supporting the introduction of training, scholarships, mentoring etc. The centre would support a comprehensive web-based resource including some form of register of courses that are aligned to the framework.

3. **Advisory council structure**
   Regional advisory councils would include representation by stakeholders from education, industry, recruitment, careers advisors and appropriate government agencies. These councils would be established according to a best practice model based on existing advisory boards and feed into a national advisory council which would meet annually and create future strategic direction for the programme.

4. **Marketing programme**
   The workshop gave clear direction that not only did ICT careers and qualifications need promotion but the ICT brand itself needed to be given a greater profile. The marketing initiatives would support raising the status of ICT careers and training with all stakeholders and include promotion of the programme itself.

The cost of delivering the programme has many variables dependent upon the lead organisation's ability to provide operational infrastructure. An indicative budget estimates the cost at around $700,000 to $800,000 per annum; however, some of this may be covered by the lead organisation and industry sponsors. It is quite probable that different aspects of the programme may be picked up by more than one funder or covered under an existing programme of work.

Summary Observations

New Zealand's ICT skill shortage is well documented. The best possible solution is to attract more top-level people to ICT careers within New Zealand and then retain them. Lifting the status of ICT careers and enhancing ICT's professional standing is a major part of this, as is the development of a programme of "life long learning" following meaningful career pathways for both employers and employees.

This project has already delivered an unusual and positive level of collaboration and agreement through the research, consultation and workshop process. There is a very real opportunity to harness this, so long as there is a lead organisation to take overall responsibility for facilitating collaboration on the work programme on a national basis.

Rather than develop something new, there was a clear mandate to create a framework to enable better and more cost-effective delivery of what already exists. To this end, it is possible that various components of the programme could be funded and supported by a range of agencies – public and private – united

under the umbrella of a lead organisation. Some components of the proposed programme may already exist and require very little assistance to be lifted from a local to a national initiative. Identifying these opportunities would be an important part of the initial framework development.

Establishing the proposed programme should enable any ICT employee – regardless of location – to access the same level of professional development and training and have their achievement recognised by all future employees both within New Zealand and internationally.

It should be remembered that we are interacting with and participating in a global market. To remain internationally competitive New Zealand needs to be developing skilled ICT employees that can match the best of our global competitors. The skill level of every ICT employee, whether a recent graduate, a technician, marketer or project manager, should be benchmarked with international standards. This international competitiveness is not just an issue for the ICT industry but an economic imperative for New Zealand as it becomes increasingly reliant on the provision of ICT skills, goods and services to remain globally competitive as a nation.

PROGRAMME RATIONALE

Goal

To attract and retain top-class people by enhancing the status and standing of ICT careers and qualifications in New Zealand through the promotion of standards and competencies that meet international benchmarks and the needs of New Zealand employers.

Focus of the Programme

- To develop an internationally competitive ICT Industry through the:
  - development of internationally competitive qualifications that are benchmarked against international best practice
  - creation of meaningful quality marks that give status and standing to ICT practitioners and attract and retain employees in whom there is a significant investment
  - national standardisation of qualifications and assessments to give a meaningful evaluation of qualifications for employers
  - development meaningful career pathways for graduate and non-graduate employees
- To help those employed within New Zealand's ICT Industry (producers of software, electronics, telecommunications and digital content) and those that work within ICT roles for companies within other industries, including government.
- To deliver qualifications and skills development to those currently in employment, ranging from certification to degree and postgraduate training.
- To develop a sustainable model which is not-for-profit but contributes to the well being of the industry and New Zealand's digital future.
- To create flexible pathways leading from school to internationally competitive ICT careers and qualifications achievable while living and working in New Zealand.

Imperatives

- Use of existing resources and capabilities wherever and whenever possible.
- Local intelligence feeding national knowledge – a collaborative model that brings together education providers, industry, recruitment providers, careers advisors and government at a regional and national level.
- Rationalisation of resources – education providers working together, to their individual and collective strengths, to remove duplication of effort and improve the cost-effectiveness of courses through a national delivery model.

Proposal Development Process

The workshop held on 9 May 2007 addressed four questions formed from the research recommendations:

1. How can we make qualifications compatible with continuing employment? What are the current barriers and possible solutions?
2. How could the tertiary education sector liaise more closely with the ICT industry sector? Can you identify examples of "good practice" and how these could be more widely adopted?
3. How do we gain wider recognition of ICT as a professional occupation and move to having New Zealand-based qualifications benchmarked with international quality mark standards?
4. How do we get ICT companies to better understand the benefits of professional development in the sector and their employees to participate more widely in training and professional development? What are the current barriers and possible solutions?

Attendees split into four groups and addressed these questions in coming up with a range of solutions which were aggregated in a plenary session. All of the aggregated solutions were used in the development of this programme and many of the other suggestions from the workshop and a previous workshop with representative TEOs (held on 27 April 2007) have also been included. The aim has been to be as practical as possible in bringing together solutions that can be rapidly introduced and have the best chance of succeeding. This proposed model would require further development prior to delivery but should provide enough detail for stakeholder engagement and commitment.

A full summary of the workshop results is on page 17.

PROGRAMME DELIVERABLES

1. Development of Competence Framework

To establish a workable, internationally benchmarked, competence-based framework for ICT qualifications and the ongoing professional development of ICT professionals.

The framework will be used as the basis for:

- formally recognising and accrediting academic qualifications and courses that are aligned with the framework
- formally recognising the competence of ICT practitioners through the development of an appropriate quality mark and/or registration process

Such a competence based framework would promote:

- Staircasing – each "bite" of learning is able to be recognised and contribute to an achievable qualification or quality mark of international standing which can then, in turn, be credited to a higher qualification. As it takes at least five years to complete a part-time degree qualification, it is particularly important that each course and interim qualification (eg certificate, diploma) is able to be recognised and valued. The framework will also ensure that we can be confident of what an employee has gained from taking a course, regardless of provider or location. As education progresses the "bites" will become larger, but the value of that learning should also increase.
- Blended learning – courses delivered through an appropriate mix of:
  - Internet-based delivery
  - CD and/or DVD delivery
  - block courses (inside and outside of employment commitments)
  - workplace-based learning
- Prioritisation – working with appropriate agencies to identify future skill gaps and give priority to promoting the development of new courses to address them.

A standards co-ordinator would act as the independent custodian of the quality mark(s), standards and benchmarks. The co-ordinator would ensure all framework qualifications and competency standards are aligned and would facilitate the creation of:

- General course modules that meet the established competence standards for delivery by all TEOs. This would cover the "soft skills" identified by the research project (such as client relationship management, interpersonal skills, communications, problem solving, research) that are largely available as part of a general business course.
- Technical course modules that would be developed by specialists located within TEOs that are suitable for distance-learning delivery with support from local providers. This should provide a very cost-effective programme development model for all participants and the development of modules through collaboration between a number of different TEOs would be encouraged. The key to its success would be having an independent co-ordinator capable of facilitating effective collaboration and managing the delivery contracts.
- Assessment of courses to allow for a mix of different delivery methods to be equably assessed and recognised, ie workplace based learning would be included within the framework with clear requirements and guidelines. Internships, apprenticeships and scholarships could all be supported by the framework.
- Use of research specialists to provide input on emerging technologies for course content and delivery.
- Use of industry experts to provide specialist knowledge to the course providers. This would require establishing some form of programme of assessment and moderation to ensure a consistent standard of delivery was achieved by the industry experts. Again, the programme would employ someone to manage this process.

Important Note: It is not the intention of the framework to introduce any new activity but to link existing initiatives more effectively and to creaste a bird's-eye view of what is available to better inform all stakeholders including employers, employees, providers and government. It will probably not be necessary to introduce any "new" courses to meet industry needs; the emphasis is on improving the national delivery of existing qualifications and enabling organisations to make their offerings more widely available within a collaborative framework.

The framework would:

- enable providers to gain recognition of ICT courses or qualifications which contribute to the development of core competencies that are internationally benchmarked and consistently delivered, recognised, assessed and updated on a national basis
- guide students on courses and qualifications that are most relevant in developing a career in the ICT sector, irrespective of where that student may be located
- guide employers on the relevance of qualifications and quality marks achieved
- encourage the rationalisation of existing qualifications to make them more financially viable for providers and far more visible, desirable and accessible for potential students

It is likely the framework would be developed under contract as a one-off project then updated through the programme's

national and regional advisory committees (refer National Leadership section). The framework would encourage the concept of "life long learning" to support qualifications that continue to build on work completed.

Completing a register of courses that align with the framework would be desirable to maximise its benefit. However, it is recognised that this is a very difficult task as courses change rapidly and are almost impossible to map.

It would also be important to establish some form of assessment for courses that address specific framework competencies, so that relevant courses can be easily sourced and identified. It may be that individual providers create their own register which is linked to a central register owned and maintained by the programme and promoted through its resource centre. This may require a registration and assessment process for providers as opposed to individual courses.

2. National Leadership for the Framework

To develop a bridge to the industry that will provide the information employers and employees need and a vehicle for giving TEOs access to relevant, practical, sustainable input from industry participants. This falls into two parts.

2a. Resource centre

An independent resource centre would have no direct or perceived alliance to any education or training provider and be equally representative of all providers. Ideally it would be a national centre with two resource staff supporting web-based delivery and eventually with regional face-to-face providers if funding allows. The resource centre would work closely with the standards co-ordinator to inform what it delivers to employers and employees. It would provide the following capability:

- Employer assessment:
  - gap analysis of current workforce skills and qualifications
  - recommendations about courses and training that would enable the employer to achieve their future goals, using its current employees as much as possible
  - assistance with establishing a training plan, including:
    - provision of incentives for employees
    - a time management plan – flexible work and learning schedules
    - exploration of workplace-based delivery options for at least some of the courses
    - administration of scholarships paid for by employers
- Employee assessment:
  - analysis of current skills, capabilities and qualifications (could be online)
  - ability to determine equivalence and award existing qualifications towards a higher-level target
  - development of a personal plan with recommendations on how that target could be reached
  - assistance with:
    - applications for financial and/or other assistance from employers
    - mediation with employers to secure approval to take courses
    - time management plans
    - mentoring
    - networking with others taking similar courses
    - identification of courses that provide the greatest employment opportunities (areas of skill shortage)
    - computer skills (for those returning to the workforce or transferring from another industry)
- Online resource material covering (but not limited to):
  - what the various qualifications mean
  - career pathways and how to follow them
  - scholarships and other support being offered
  - blog for information change
  - course register

As discussed earlier, maintaining a register of all recognised courses being offered by TEOs would be desirable but virtually impossible. The resource centre manager would need to consider all options to when deciding how such information is best provided. Such a resource would be invaluable for not only informing prospective course attendees but also to avoid unnecessary duplication.

The register could be expanded to cover other aspects of ICT education, ie postgraduate and secondary school qualifications. Ideally the resource centre would provide all the information a person might need if they were interested in transferring to the ICT industry. It would also provide proactive support for parents and students wanting an independent view of ICT study options as a standalone career or in combination with other options such as law and accounting.

The online resource could be structured to generate income from some of the services being offered and be

integrated with the framework and marketing workstreams of the programme.

Some of these services are already provided by initiatives within the market such as Manukau's Centre for Assessment of Prior Learning[1]. The aim would be to build on these services, promote them, and implement them on a national basis, rather than introducing a competing product to the market.

2b. Advisory committee structure

An administrative/project management (programme sdministrator) role would oversee the establishment of an effective consultation network between educators and trainers, government and industry. The first consideration would be to develop a good-practice model based on existing effective advisory groups. This would cover such aspects as:

- membership structure
- reporting
- planning
- meeting schedule and format
- facilitating industry engagement in student projects
- facilitating tutor and lecturer engagement in industry projects
- assistance with course assessment
- assistance with course content development

2bi. Regional advisory committee

The programme administrator would work with the project stakeholders to identify participants in a regional advisory committee (RAC) comprising of:

- ICT industry representatives
- recruitment agents
- careers advisors
- secondary School ICT subject teachers
- TEO tutors or lecturers andmanagers
- Industry training organisations
- NACCQ and other organisations as regionally appropriate

These RACs would have the potential to not just contribute to courses and issues for employees within ICT but the entire pipeline, from secondary schools through to tertiary, employment-based and postgraduate courses in the region. RACs would be populated by volunteers but professionally co-coordinated and managed by the project manager. The RACs would play a key role in disseminating information from national initiatives to industry and provider participants and vice versa.

2bii. National advisory committee

The national advisory committee (NAC) would meet annually – probably in the form of a two-day workshop – to align employers, employees and providers to an overarching strategy. The seats would be identified from the nominations made by RACs. The NAC would be structured to ensure a good mix of stakeholder and regional representation. It is envisaged that members would be paid to attend and charged with ensuring the outcomes are delivered back to their respective RACs and acted upon.

The programme's management staff would be responsible for:

- establishing and administering the group
- setting the agenda with input from RACs
- providing all relevant research and papers for the group to consider
- appointing an independent chair or facilitator to manage the group
- writing any minutes and reports that result from the annual workshop and ensuring that a summary of decisions and outcomes are delivered to the national organisation's board, RACs, relevant government agencies and Ministers

Each year the NAC would be charged with setting a clear strategic direction for the development of ICT training and education that government, industry and private providers should focus on. It would be responsible for matters including:

- ensuring established training and education "frameworks" are annually reviewed and refreshed
- considering regulatory and policy issues to support the programme, including issues such as:
  - provision of broadband
  - tax breaks for employers and employees
  - making industry liaison a prominent aspect of the Performance-based Research Fund requirement
  - greater flexibility for industry training organisations to purchase training beyond level 4 on the National Qualifications Framework
- identifying international standards that ICT training and education in New Zealand should be aligned to and promoting those standards as a required standard within course development (ISO 9000, ACM, IEEE, IEE, BCS etc)
- considering how we grow our own employees for the industry, for example the development of apprenticeship programmes

[1] www.manukau.ac.nz/programmes/capl/default.asp

- addressing employee retention issues with options such as sabbaticals, international job-swaps etc
- setting industry targets to be supported by government such as the percentage of employees engaged in professional development, the number of certified or graduate employees, the number of RACs etc

3. Marketing the Framework

Marketing would encompass four main strands.

3a. ICT brand development and promotion

(*Potentially in liaison with government agencies and programmes such as the Digital Strategy, Ministry of Economic Development and New Zealand Trade and Enterprise*[2].)

The national organisation would take responsibility for marketing the ICT Industry within New Zealand with the purpose of developing a brand that people want to work for. The brand:

- is people-centric – not all about the technology
- is high wage
- supports and grows **all** of the economy
- promotes lifelong learning
- promotes the concept of having a global career based in New Zealand

There needs to be consensus on what ICT is within the New Zealand context. It needs to be marketed in such a way that the average New Zealander understands what it is and would be proud to say that they "work for the ICT Industry" in the same way they now work in "health" or "education" or "law". The marketing programme needs to be built into popular culture so that every New Zealander becomes a vicarious knowledge age "expert" as they are with yachting and rugby.

3b. Developing the brand of the "ICT Professional"

(*Potentially in liaison with other relevant organisations such as IPENZ and NZCS*[3])

Consideration also needs to be given to what it means to be a "professional" within the ICT Industry context. This may need to be researched by the national organisation which would be charged with taking responsibility for establishing professional standards and having those standards promoted and honoured within the industry. The standards would need to have an international context and be relevant to all practitioners within the industry, regardless of what niche they are employed in or the requirements of their job. This "picture" of an ICT professional would then be nationally supported through the programme's marketing, national resource centre and the RACs. The aim would be two-fold: to build confidence in the integrity of the ICT industry for those that sit outside it, and to build the "mana" of the ICT industry for those that work within it. Government would need to play its part in recognising ICT as it does other professions, in terms of both communication and funding.

3c. ICT careers

(*Potentially in liaison with Career Services*[4])

As learning pathways are developed, responsibility will also lie with this programme to define and promote the pathways in a clear context. This needs to be consistently delivered through all marketing channels to create a far greater understanding of how to gain the necessary qualifications and competencies to take on a role. This would also incorporate establishing greater consistency and clarity in the terminology used to describe a role, and would also feed into the marketing programme.

3d. The programme

In order to be successful the programme and its various projects and associated initiatives will need to be effectively marketed to all stakeholders. This would be critical to the programme's success and sufficient above-the-line budget will therefore need to be allocated for national delivery.

4. Delivery Timetable (reference model on page 13)

Pre-delivery or year one:

- Establish the framework including competence standards at certificate, diploma, graduate and practitioner level and create a registered quality mark for ICT professionals based on competence standards. This could potentially be completed in advance of a two-year delivery programme or concurrently with the year one delivery programme.

Year one:

- through an open tender process, identify the body that will lead the development of the programme
- complete marketing deliverables
- register RACs and create the RAC network
- hold an end-of-year NAC workshop

Year two:

- accredit and register those courses and qualifications that align with the framework and meet the agreed

[2] www.digitalstrategy.govt.nz, www.med.govt.nz, www.nzte.govt.nz

[3] www.ipenz.org.nz, www.nzcs.org.nz

[4] www.careers.govt.nz

competency and academic standards

- launch the programme's marketing campaign
- establish the module development process
- establish the industry expert training process
- create a call centre and website

Years three to five:

- manage and maintain the established initiatives and processes
- move to being a sustainable model by year five

5. The Lead Organisation

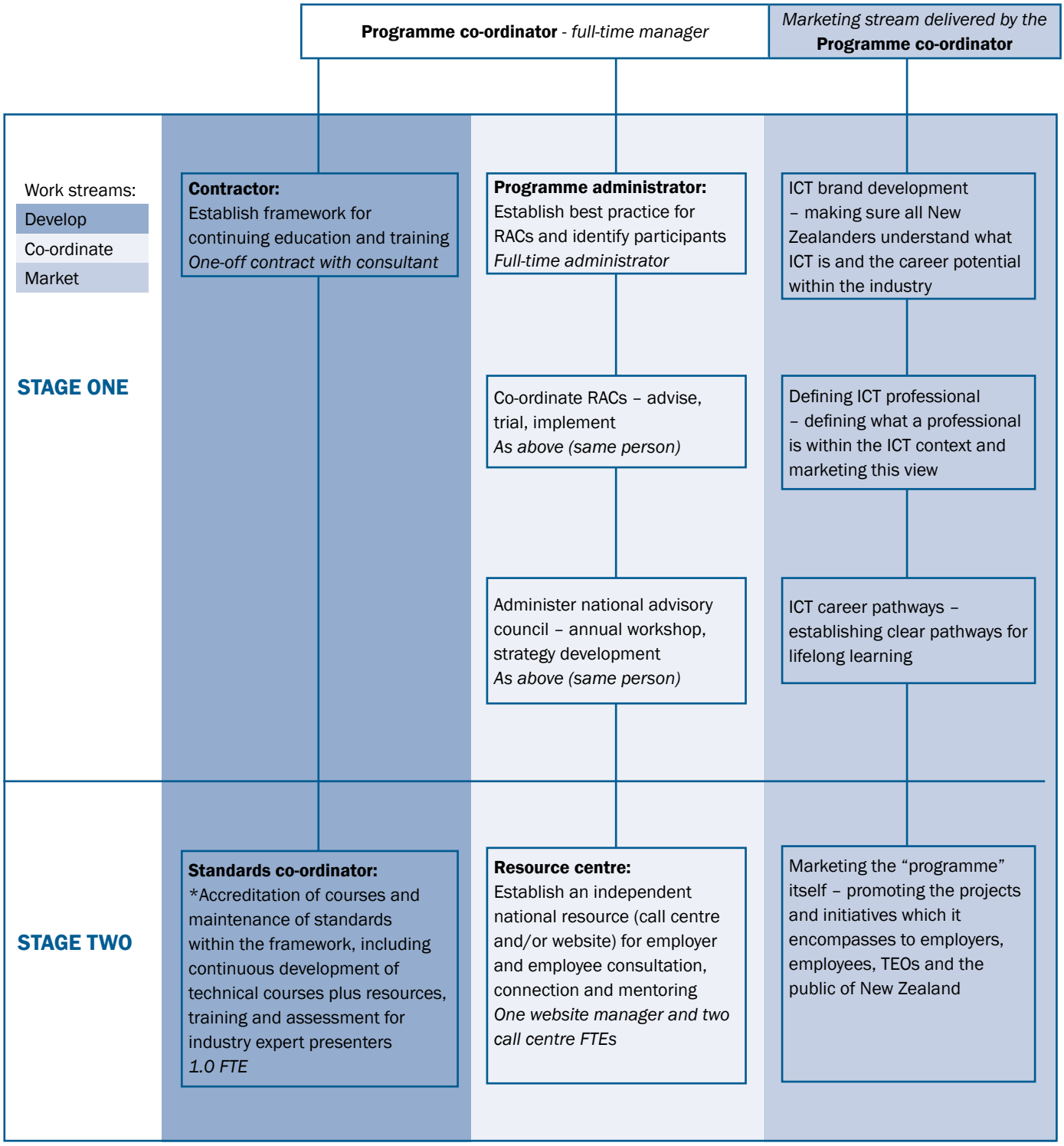
A suitable home will need to be found for this programme. It is likely that there is an existing national body in a position to give governance, infrastructure and administrative support to its delivery. Care has been taken to avoid stating possible options as an open and contestable process should be entered into. In providing a home for the programme it is envisaged that its physical infrastructure needs (office space, phones etc) would be provided by the lead organisation.

Adequate staffing would need to be dedicated to be responsible for project management and marketing, and ensure the various projects are delivered. It is therefore difficult to establish an indicative budget as there could be considerable variation based on the existing resources the identified leadership organisation may be able to contribute from within its infrastructure. A very top-level budget has therefore been established without making any assumptions as to the potential resources of the leadership organisation. It is very difficult to create a funding model at this point and potentially different aspects of the project may be funded from a range of different sources in a truly public-private partnership. One of the greatest challenges that the programme manager would face is establishing a compelling value proposition that would engage the ICT Industry in a long-term financial partnership supporting this venture.

The suggested programme has been created so it can be delivered in stages. Two are currently suggested, but the development of the framework could become a preliminary stage on its own. Further work is required to commercialise the model and determine the level of funding that would be required to establish the programme and potentially some continued support until it matured. Taking a wider view, there are a number of existing projects that could be worked into this programme and potentially create a shared funding model across a number of tertiary, industry and government agencies. It would also be possible for the work to be shared across a number of organisations under the umbrella of the appointed

POSSIBLE PROGRAMME DELIVERY MODEL

The lead organisation is responsible for hosting the programme of continuing ICT training and education, governance, infrastructure and administrative support.



INDICATIVE BUDGET

There is a considerable amount of work to be done at a professional level to successfully deliver this project and effectively "defrag" the supply of quality training and education to those working within the ICT Industry. The benefits derived from doing this, however, will directly outweigh any cost and should be viewed as an investment by both government and industry in New Zealand's economic future. The ability to align this programme with existing initiatives and use it to create an end-to-end supply chain for New Zealand-educated skilled ICT workers should bring further budget rationalisations and even greater economic benefits.

Given the wide range of budget variables based on the possible infrastructure that could be contributed by the lead organisation, it is very difficult to predict the total project budget at this stage; however, the following gives some indication of the scale of what could be required:

Description	Estimate year one	Estimate year two	Deliverables	Comments
Contractor	$120,000 including $20,000 management fee (see comment)	0.00	Establish the framework including competence standards at certificate, diploma, graduate and practitioner level and create a registered quality mark based on competence standards. This could potentially be completed in advance of a two-year delivery programme or concurrently with the year one delivery programme.	This could potentially be managed by the existing advisory board through IPENZ in advance of the programme establishment or by the lead organisation. The management fee would cover the cost to promote and manage the tender and resulting contract.
Advisory board	$15,000	0.00	Identify the body to take leadership of the development of the programme through an open tender process.	Covers costs to promote the opportunity, produce a paper to further develop and articulate the requirements, and interview prospective applicants. Honorarium to be paid for those on the selection panel. Appointment by existing advisory board.
Programme manager	$150,000	$150,000	• establish programme plan • appoint programme staff • overall responsibility for programme delivery • business development and sponsorship • complete marketing deliverables	This position would also provide support for all others within the team and act as spokesperson and promoter for the programme. The appointee would need sales and marketing skills.
Programme administrator	$50,000	$50,000	• establish RAC operating processes • create RAC network • organise end-of-year NAC workshop	Position would also provide administrative support for the programme manager.
Standards co-ordinator	$80,000	$80,000	• accredit and register those courses and qualifications that align with the framework and meet the agreed competency and academic standards • establish module development and accreditation processes • establish industry expert training process	Position would require knowledge of current ICT qualifications, standards and processes, and technical understanding.

Resource centre: manager plus two support staff	$250,000+	$200,000	• create and launch call centre and website • dynamically maintain the framework register • liaise with all relevant agencies and providers to refresh and renew available information • proactively develop business for the resource centre	The budget for this would vary depending upon adoption of existing website(s) and infrastructure provided by lead organisation.
Above-line marketing	$50,000	$150,000	Advertising, direct marketing, development of promotional material, costs to cover travel to promote the programme.	This could be a mix of funding and sponsorship.
Overheads	$115,000 (includes $45,000 in kind from lead organisation)	$125,000 (includes $45,000 in kind from lead organisation)	General operating costs of a business.	This is a guess only and could vary greatly depending on lead organisation's existing infrastructure.
TOTAL	$835,000	$750,000		
Funds to be found (less in kind)*	**$790,000**	**$705,000**		

***Note**: Industry stakeholders would be making a considerable pro-bono contribution to this project in fulfilling roles on the advisory groups and working with the programme team to bring together the processes and information required to make this initiative work effectively.

APPENDIX A: IPENZ CASE STUDY – ENGINEERING TECHNICIANS

An example of the impact of such an approach on curriculum design is the engineering technician education sector. Following the introduction of the National Qualifications Framework, the well recognised and respected New Zealand Certificate in Engineering was discontinued in the 1990s and individual polytechnics moved to offer their own "local" diploma qualifications. This sudden multiplicity of qualifications led to confusion over the merits of individual courses. Alongside this, the loss of the strong cadetship programmes with the privatisation of utilities services (works, electricity, railways etc) meant that technicians no longer had clear career pathways. These two factors contributed to a significant decline in the number of students entering technician education programmes or embarking on associated careers.

Moves by IPENZ to provide an avenue for the international recognition of diploma qualifications through a multilateral agreement called the Dublin Accord have provided an incentive for providers to work with industry training organisations to re-establish nationally offered qualifications. Recognition under the Dublin Accord is linked to a demonstration that graduates have developed the attributes defined in an internationally benchmarked Graduate Profile. This Graduate Profile has been a key document in the qualification redevelopment process that has taken place over the last few years as providers have sought to ensure that their qualification will satisfy requirements for Dublin Accord recognition.

APPENDIX B: SUMMARY SOLUTIONS FROM THE WORKSHOP HELD 9 MAY 2007

1. How can we make qualifications compatible with continuing employment – current barriers and possible solutions?

Solutions summary from workshop groups

- forming a central advisory body which is independent to give advice
- staircasing – a pathway for the qualifications – need support into tertiary environment
- blended learning – recognition of prior learning, internet, DVD, in-house training
- incentives – scholarship (make it a requirement to pass before you get it)
- open entry, never-ending qualification with credit granted often
- credit for on-the-job learning with assessment, mentoring and coaching
- make provision for more flexible, more work-based options:
  - more ready provision and access to short courses (accumulated credit)
  - changes in funding to ensure that what TEOs provide is actually what companies want
- partnerships to offer a mixture of delivery modes
- keep the image within reality – is corporate entirely appropriate
- real broadband access widely available
- making the transition to an e-learning environment as easy as possible:
  - computer skills
  - project and time management
  - family support

Summary solution: Establish an independent advisory board that acts in a broking and advisory role. Share development of courses for the whole industry that use staircasing and blended learning models. Use incentivising and marketing to improve the industry image.

2. How could the tertiary education sector liaise more closely with ICT industry sector? Can you identify examples of "good practice" and how these could be more widely adopted?

Solutions summary from workshop groups

- local advisory committees
- NACCQ – regional basis
- national strategy group:
  - am of aligning interests of employers and employees and tertiary providers
  - good way of channelling
  - brokering education training services into SMEs
  - website for individuals to search and find their own options – maybe even including a blog for information exchange
- teaching staff to participate in industrial projects and vice versa, ie industry speakers within lectures
- student projects joint with TEOs and employers
- make Performance-based Research Funding require industry and TEO liaison
- industry review panel to deliver lectures and then have first options on students (MDS)

Summary solution: Create a national body to broker education and training services into companies by industry cluster (eg software, communications etc).

- facilitate the acquisition of industry experience in leading-edge technology by teaching staff
- facilitate industry people teaching in TEOs
- facilitate the national and regional collaboration and alignment of stakeholders, ie employers, employees and TEOs
- develop a national strategy for continual professional development
- host a web-based blog site for peer training and education
- TEC to make industry liaison part of the Performance-based Research Funding requirement
- examples of good practice – local advisory committees and NACCQ

3. How do we gain wider recognition of ICT as a professional occupation and move to having New Zealand-based qualifications benchmarked with international quality mark standards?

Solutions summary from workshop groups

- branding for ICT and marketing of that brand. Making sure that it is people-centric and not about the technology – we are solving information problems
- Standards – leveraging those international standards which already exist, for example ISO 9000, ACM, IEEE, IEE, BCS, then link our education to world's best practice
- the "sector glue" is perceived as fragmented and the glue which could bind it together could be ICT-NZ, building a body of knowledge around the sector
- government support implementation of policy that 10 per cent of the industry needs to be certified
- maybe IPENZ could identify appropriate ICT qualifications – also reference to SFIA coming out of United Kingdom
- government needs to fund ICT as it does other "professions"

- an apprentice-type system for ICT workers that starts at the lower levels

Summary solution: Identify and develop a "brand" or "brands" for the ICT sector, and identify a group to do this.

4. How do we get ICT companies to better understand the benefits of professional development in the sector and their employees to participate more widely in training and professional development?

Solutions summary from workshop groups

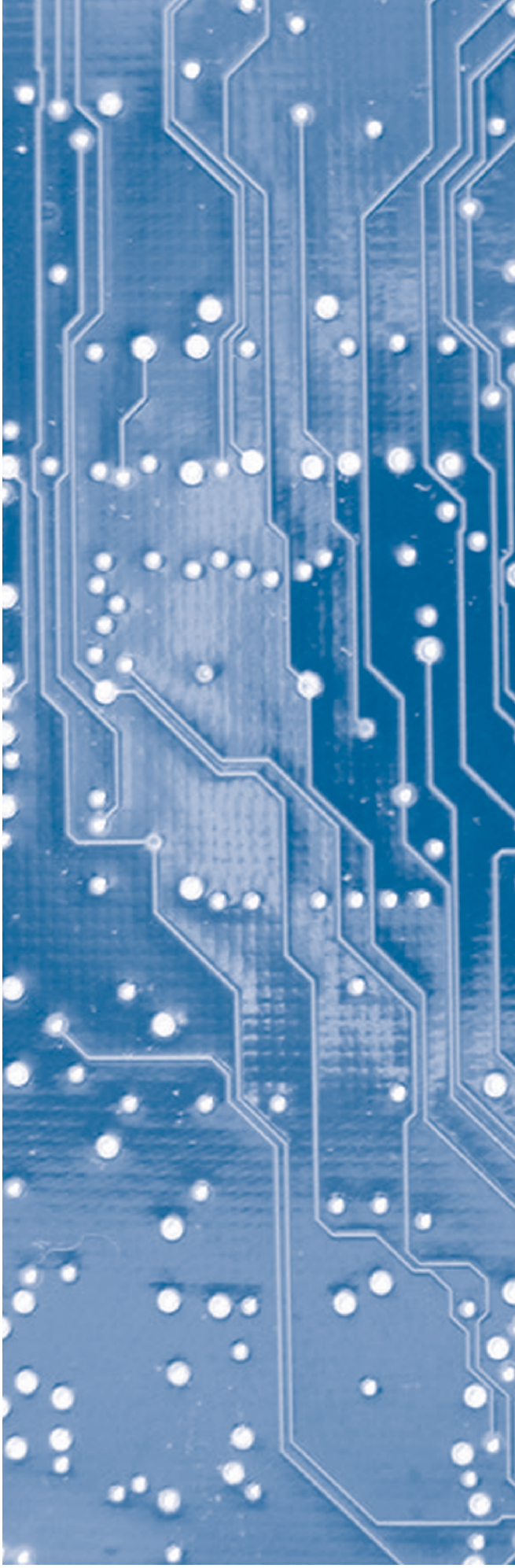
- value proposition "grow our own" needs to be associated with this whole process for employees and employers to buy into
- look to grow our own – employers looking to short-term gap filling from off-shore – ascertain the return on investment
- certification – do we offer certification of the organisation and then affiliate the employees to that (like Master Builders) to offer customers some kind of guarantee
- plethora of small businesses – how do they look to afford the investment required in training and professional development.
- add to the incentives – differential fee structures for ICT courses
- tax breaks for companies who train
- industry levy for investment into programmes
- selling the value of education – particularly qualifications – teaching firms to construct career paths
- to give jobs higher status and transferability of skills
- attracting women as a way to increase the recruitment pool and sending female role models into schools
- companies understand greater flexibility models such as. working 4 x 10-hour days
- offering incentives for everyone that is employed and being trained – not just restricted to ICT industry

Summary solution:

What to do?	Who?
Establish career progression for senior people in firms	ICTNZ
Ensure ICT workers in SMEs are catered for with ongoing career and skill development	Training providers
Remove barriers to tertiary education by tailoring courses for enterprises and individuals	TEC
Expand customer student base to include ICT workers below ICT professionals, for example establish an ICT ITO	ICTNZ

GLOSSARY

Term/Abbreviation	Definition
AUT	Auckland University of Technology
CPIT	Canterbury Polytechnic Institute of Technology
ESITO	Electricity Supply Industry Training Organisation
ETITO	Electrotechnology Industry Training Organisation
ICT	information and communications technology
ICTNZ	ICT-New Zealand (representative organisation)
IPENZ	The Institution of Professional Engineers New Zealand
ITANZ	Information Technology Association of New Zealand
ITO	industry training organisation
ITPs	institutes of technology and polytechnics
NAC	national advisory committee
NACCQ	National Advisory Committee on Computing Qualifications
NQF	National Qualifications Framework
NZCED	New Zealand Council of Engineering Deans
NZCS	New Zealand Computer Society
NZSA	New Zealand Software Association
TEO	tertiary education organisation
PBRF	Performance-based Research Fund
RAC	regional advisory committee
SME	small to medium enterprise
TESSO	Telecommunication Education and Skills Standards Organisation
UCOL	Universal College of Learning



For more information, contact:

IPENZ
ENGINEERS NEW ZEALAND

National Office
PO Box 12 241
Wellington 6144
New Zealand

T 64 4 473 9444
F 64 4 474 8933
E ipenz@ipenz.org.nz
W www.ipenz.org.nz