INSTITUTE OF TECHNOLOGY BLANCHARDSTOWN

SCHOOL OF INFORMATICS & ENGINEERING

DEPARTMENT OF ENGINEERING

NEW PROGRAMME VALIDATION REPORT

Bachelor of Science (BSc)

in

Data Centre Operations and Management

(Programme BN309)

Institute of Technology Blanchardstown,

Blanchardstown Road North, Dublin 15,

D15 YV78 | www.itb.ie

VALIDATION PANEL DATE: June 19, 2018

Introduction

The Institute of Technology Blanchardstown has the Delegated Authority from the [Quality and Qualifications Ireland](#), to; develop, validate, implement and continuously improve its existing taught higher education and training programmes up to and including programmes in Level 9 of the [National Framework of Qualifications](#).

The purpose of this document is to report on the findings of the Peer Review panel that was established to validate this proposed programme against the criteria for the validation of programmes as stipulated in the Institute Policy Document 2MP01[1].

Programme Overview

The data centre industry in Ireland has experienced rapid growth in recent years, backed by considerable investment in infrastructure. *Host in Ireland*[2], an industry-led initiative specifically developed to generate awareness and recognition of Ireland's benefits as an optimum location to host digital assets, and in conjunction with Bitpower Energy Solutions and Sustainable Energy Authority of Ireland (SEAI); published a report that lists 41 data centres currently operating in the Dublin area alone. Of this number, 17 are under *Hyperscale Providers*; large companies that manage the hosting of data for clients, e.g., Microsoft, Amazon, Google, and Facebook[3].

The current and expected future investment in data centre facilities are significant. For example, the report estimates that '*by 2016, €3 Billion had been invested in data centres. There were €1.1 Billion facilities under construction in 2017. A further €1.6 Billion have secured planning permission, and there are approximately €2 Billion indicated in various masterplans.*' It is anticipated that investments in data centre infrastructure in the area averaging €1 Billion per annum will continue for the next 3-4 years. It is estimated that more than €1.1 billion will be invested in data centre construction in Ireland this year, bringing the cumulative investment for data centres in the country to €5.7 billion, with the potential to reach €9 billion by 2021.

Investment in personnel is a significant proportion of the overall investment in data centre services in Ireland. Analysis of the key factors driving big data strategies reported that, over 70% of data centre providers consider support personnel, after facilities and technology assets, as the most frequent form of data-driven investment for expansion[4]. Currently, data centre companies investing in Ireland are cognisant of the need for bridging knowledge gaps for support workers and attracting and retaining new employees.

In 2017, the Technology Ireland ICT Skillnet[5], in an effort to address the growing need for competency-based education and training to ensure a sustainable pipeline of data centre operations technicians, issued a public call for tender[6] for a suite of QQI-validated programmes covering different aspect of data centre operations and management as proposed by its members. The institute was awarded the tender to deliver a suite of programmes on the National Framework of Qualifications (NFQ) Levels 6, 7 and 8, subject to securing QQI accreditations. The NFQ Level 7 BSc in Data Centre Operations and Management that is the subject of this validation is intended to be the initial offer, with plan to develop and accredit the associated Higher Certificate in Science (level 6) and Bachelor of Science (level 8) in subsequent years. It is envisaged that that development of the level 6 and level 8 programmes will be informed by feedback from the BSc programme that is the subject of this validation process.

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[1] 2MP01 Design, Validation and Accreditation of New Academic Programmes

[2] http://hostinireland.com/

[3] http://hostinireland.com/_assets/2017/12/HII-Ireland%E2%80%99s-Data-Hosting-Industry-2017-Outlook.pdf

[4] William Fry. 2016. Europe for Big Data—An analysis of the key factors driving big data strategies, 24 pp. Available at: https://www.williamfry.com/docs/default-source/reports/william-fry-europe-for-big-data-report.pdf?sfvrsn=4

[5] https://www.ictskillnet.ie/

[6] Technology Ireland ICT Skillnet E-tender reference: RFT 124531

Validation Panel Composition

Chair:	Aedín Ó hEocha, Assistant Registrar, Galway-Mayo Institute of Technology (GMIT)

Member(s): *Academic*   Dr Cathal Nolan,
Head of Department, Aerospace, Mechanical & Electronic Engineering, IT Carlow.

Joe Lawless,
Head of Department of Polymer, Mechanical, Civil Engineering & Trades,
Athlone IT.

Member(s): *Business/Industry*
Michael Creamer, Senior Data Centre Manager (EMEA), Equinix

In attendance: Dr Larry McNutt, Registrar, IT Blanchardstown (Panel Secretary)

Dr Philip Owende, Academic Quality Manager, IT Blanchardstown

Date of Panel Meeting: June 19, 2018.

Consultation

Management Team consulted during the panel meeting:

Dr Anthony Keane	Head of School of Informatics & Engineering
Richard Gallery	Head of Department of Engineering
Daniel McSweeney	Head of Department of Informatics

Academic staff contributing to programme development and consulted during the panel meeting:

Dr Garret Brady	Lecturer in Engineering (Team Lead)
Damian Cox	Lecturer in Mathematics
Niall Campbell	Lecturer in Mechatronic Engineering
David Powell	Lecture in Mechatronic Engineering
Jerry Bradley	Lecturer in Engineering
Douglas Hynes	Lecturer in Engineering
Ivan Smyth	Lecturer in Engineering
Peadar McKenna	Lecturer in Engineering
Tom Maher	Lecturer in Engineering

Industry/Education and Training Partners Representative in attendance:

Tony Devlin	Chairperson, ICT Ireland Skillnet
Niall Morris	Engineer Operations, Amazon Web Services
Philip Duignan	Data Centre Engineering Operations Learning & Development, Amazon Web Services

Validation Panel Findings

In evaluating the appropriateness, quality and proposed operation of this programme the following criteria were considered and are hereby reported upon.

Strategic planning

The panel was satisfied that the programme and the design are in keeping with the Institute's mission, do not constitute redundant provision, and consider efficient deployment of associated resources.

Evidence of consultation

The course proposal is the outcome of a successful tender made in 2017 by ITB to Technology ICT Skillnet, in partnership with Amazon Data Services Ireland. ICT Skillnet is the primary supporter and promoter of the proposed programme and has articulated industry demand for graduates of programmes such as those proposed here. Several industrial stakeholders also provided individual feedback on the proposed programme. Through the structured discussions with the management, and the programme design and delivery teams during the validation panel visit, the panel established evidence that comprehensive research/consultation efforts were undertaken with both internal and external stakeholders to validate the rationale and the adopted structure, pathways and characteristics of the proposed programme.

Graduate employment potential

The panel was of the opinion that there are significant career opportunities for graduates, and based on core knowledge and competence outcomes of the proposed programme, such graduates would be of immediate value to industry.

Protection of enrolled learners

Part 6 Section 65(1) of the Act[7] does not apply.

Provisions for quality assurance

The panel was informed of how the programme submission had been proposed, developed and approved internally, in compliance with the Institute's quality assurance policies and procedures. The Institute's policies and procedures for programme development, monitoring and continuous improvement complied with the current national guidelines.

Programme title and award title

The panel questioned whether there is sufficient management content in the proposed *Bachelor of Science in Data Centre Operations and Management* to justify the proposed programme title and recommends that the proposing team review the proposed programme title.

Ethics

The panel was satisfied that the Institute has internal policies and procedures in place to ensure appropriate ethical oversight in respect of teaching, learning, and research activity across all programmes in the NFQ levels covered.

Consistency

The panel found that the programme design is consistent with QQI policy on accumulation of credits and certification of subjects, that it has an underlying unifying theme with both implicit and explicit linkage of modules. The panel was contented with expectation in progressive development of the learners' standards of knowledge, skill and competence throughout the individual modules and the integrated programme outcomes.

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[7] Qualifications and Quality Assurance (Education and Training) Act 2012

Teaching and learning
The panel discussed with the programme development team about the range of interactions used with learners in the course of programmes delivery. Course management arrangements were also discussed and deemed adequate. The panel observed clear evidence of planned interactions with and comprehensive academic and technical support arrangements for learning.   The panel recommends that opportunities for work based learning are further considered and clearly articulated.

Learner assessment
Through discussion with the programme design team, the multiple modes of assessment to be employed (both formal and informal) were articulated. The Institute's policy on continuous assessment, based on objective development/enhancement of learners' application of knowledge and critical analysis and problem solving skills within specific timeframes were highlighted. The panel encouraged the consideration of cross-modular assessment events to minimise the volume of assessment across the taught modules. The panel further recommended that the assessment weighting in a number of modules be reviewed and that reassessment opportunities for all modules are clearly articulated.

Standards of knowledge, skill and competence
Having reviewed the syllabi and assessment methods as proposed, the panel was of the opinion that learners would be capable of attaining the standards of knowledge, skill or competence relevant for the award of *Bachelor of Science in Data Centre Operations and Management*.

Access, transfer and progression
The panel confirmed that the programme incorporates well-established procedures for access, transfer and progression. These are provided for per the Institute's Policy *3AD08 Admissions Policy*.

Other salient considerations
In the programme validation process, the panel interacted with Institute management team in the Programme Level Discussion, and with the programme development team in comprehensive Module Level Discussions. The programme level discussion enabled the panel to gain an overview of the proposal, and to confirm the strategic relevance and the inherent institutional support for the proposed programme. The timeliness of the proposed programme in the context of Institute's application for Technological University designation (under Dublin Technological University consortium, in partnership with DIT and IT Tallaght), hence, the validation process was discussed in detail with the management team.

The module level discussions considered the panel members' observations and queries related to the programme proposal, beginning with a justification of the overarching programme structure. It also covered a module-by-module analyses and discussions with the programme team. Some notable points of discussion, included:

(1) The relevance of the proposed programme to the Institute's regional remit and the opportune it affords to the envisaged transformation to a Technological University (with DIT and ITT partners)— the programme is responding to the market demands for graduate pipeline in the related sector.

(2) The panel noted the lack of clear handling of 'disaster recovery' protocols in appropriate modules in programme, specifically, planning for skills for data recovery, power or cooling loss, network loss, etc.

(3) The panel noted the mentioning and handling of 'Green' infrastructure and operations agenda in some modules, but lack of coherent threading across the programme.

(4) Noted that majority of entrants will be those employed already— as proposed, the programme may be missing out on the accorded opportunity for work-based learning.

(5) The panel noted substantive errors and omissions in the module descriptors, including assigned ECTS Credits weighting, assessment breakdowns, specification of relevant learning outcomes, and linking of assessment to learning outcomes.

Decision of the Panel

The panel recommends validation of the following programmes with Conditions[8]/Recommendations[9]:

Programme title: Bachelor of Science in Data Centre Operations and Management

Programme code: BN309

Award Title: Bachelor of Science

NFQ level: 7 (*Add-on*, 60 ECTS credits)

Programme title: Certificate in Data Centre Operations

Programme code: BN780

Award Title: Special Purpose Award

NFQ level: 6 (15 ECTS credits)

Conditions

(1) Document to be edited to eliminate errors and omissions, and update any agreed areas as discussed in the panel meeting. Particular attention should be given to the Programme Schedules to ensure that they accurately reflect programme requirements and that there is consistency between the proposed programme schedules and the module descriptors. Document to be resubmitted with the response to panel report.

(2) A Projects Handbook to be submitted with the response to panel report.

(3) The requirement and module make-up of the Special Purpose Award must be clearly defined and appropriate Programme Outcomes prescribed.

Recommendations

(1) The panel was of the view that there may be insufficient management content in the proposed *Bachelor of Science in Data Centre Operations and Management* programme to justify the proposed award title. Consider appropriate revision.

(2) Programme team to articulate 'disaster recovery' protocols in appropriate modules in programme. Specifically, to show the importance of having a disaster recovery plan should there be a loss of data/cooling/power/network on site which incorporates reporting, resolving the issue, post mortem analysis as well as remedial actions to be taken once issue has been resolved/stabilised. As well as how outages/data loss can have an impact on revenue generation in addition to reputation of a facility to look after its critical footprint.

(3) Consider 'Green' infrastructure and operations agenda in a coherent manner throughout the programme.

(4) The panel expressed the view that there is significant scope for the integration of work based learning and recommended that the design team consider the opportunities afforded for work based learning and further articulate how and where such opportunities have been exploited

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[8] A condition is an action, which in the opinion of the validation panel, must be undertaken prior to the commencement of the programme. Conditions are mandatory for programme approval.

[9] A recommendation is a proposed action, which in the opinion of the validation panel, must be given serious consideration.

(5)   Reassessment opportunities should be clearly articulated for all modules

(6)   Standardise all expected contact hours to clearly show how the indicated contact hours are met.

(7)   Ethos of programme is to create a graduate who can work as part of a multidisciplinary team. Programme to consider group projects. Consideration should also be given to the number of credits given to the Project module.

(8)   It is the view of the panel that scope exists to develop assessment strategies further, including consideration of cross-modular assessment and integrative assessment. It is also recommended that assessment weightings for individual modules be reviewed.

(9)   Reading resources to be updated in all modules.

(10) Provide for course-induction to interrogate and identify the level of support to be provided at individual student level (industry/academic mentorships).

(11) Consider how communities of learners will be developed to foster student engagement and group cohesiveness. Build upon existing experiences to implement learner community support through the programme.

(12) Consider the revision of modules as appropriate to ensure that there is sufficient Thermodynamics content included in the programme.

Commendations

(1)   ITB is delivering a unique programme that is responding to the market demands for graduate pipeline in the related sector.

(2)   The programme team engaged the panel in informative discussion on the proposed programme.

(3)   Programme links with industry, with scope for work-based learning.

Validation Report Sign-off

Chair

_____   _____
Aedín Ó hEocha   Date

Secretary

_____   _____
Dr Larry McNutt   Date