INDUSTRY EXCHANGE NETWORK

National Framework for IXNs
Guidance Document (2020 collection)

The Student Journey

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1. Introduction

This document provides guidelines for managing students on modules or programmes at university level that include Industry Exchange Projects (IXN) projects with partner companies and organisations (referred to as 'IXN hosts' from now on).

2. Starting a Project

Prior to starting an IXN project a student should have met the following requirements:

- They have the pre-requisite knowledge for the project and the module including the project. Pre-requisites might include computer science knowledge, transferrable skills, and passing earlier modules.
- They know that they are expected to sign a document to relinquish the Intellectual Property, (IP) of their project work to their IXN host. This may take the form of reassigning the IP to the university, which then has a legal obligation with the IXN host to properly manage the IP.

A student can elect to not work with some or any IXN hosts but will not obtain the full industry experience assumed by the project module. Alternative assessment might be required to evaluate their work.

Students should understand that all projects are Proof of Concept (PoC), not intended for immediate deployment unless the partner has met their own validation, testing and publication processes.

Students working on IXN projects are considered consultants in training with their assigned IXN host, being officially recognised as enrolled in the university and collaborating with the host. They are not formally employed by the IXN host or by the university. No monetary remuneration is to be expected in exchange for access to IXN industry technical mentorship, and access to methods and data.

Students may work on multiple IXN projects throughout their degree programme.

There are three progressive levels of complexity to IXN projects (ref. Mohamedally, 2011). Please refer to the guideline document on this. These are known as the Scaffolding, Discovery, and Innovation (SDI) levels:

1. **Scaffolding** – early first-principles development and experience of industry methods.
2. **Discovery** – proof of concept development and demonstration of the application of industry methods.
3. **Innovation** – delivery of close-to-production systems and dissemination of the results back to industry via open sourcing and publication.

At each level there are three project pathway types for students allowing them to work on one or more of them. Please refer to the guideline document on this. These are known as the Interoperability and Standards, Efficiency, and Innovation (IEI) pathways.

1. **Interoperability and Standards pathway** – insuring that systems work together and meet compliance guidelines. This includes building infrastructure for legacy systems.
2. **Efficiency pathway** – working with existing systems, processes and industry workflows, to build more efficient pathways, and demonstrating effectiveness, robustness and resilience.
3. **Innovation pathway** – developing new solutions using technologies not used before in each context. An Innovation pathway still has to go through Scaffolding and Discovery complexity levels, and becoming an Innovation level project. This usually is the case ISN projects in advanced Masters Degrees.

Undergraduate and MSc students on a group project-based IXN module are assigned to an IXN host rather than given a free choice of project. A student Motivation Tracking system should be used to help identify the right combination of group members, matching them with a project in a relevant subject area, and allowing the module leader to confirm that a suitable project is assigned. Leadership or key technical roles are chosen using the tracking information and other criteria such as prior grades. Students cannot leave their team without good reason.

Students are given 3 weeks to confirm they are happy to take on a specific project, seal the requirements to prevent unnecessary changes, and return the required signed documents confirming they accept the IP conditions and other arrangements. If a student is not happy with the project they must get notify the relevant module leader as soon as possible. Where needed, the module leader is responsible for allocating internal project where the host is a member of academic staff in the department. There are guideline documents on this.

The need for sealing the requirements is important to ensure that the requirements are properly documented and to prevent project scope creep as the project progresses. Students need to understand that they should not automatically agree to new or changed requirements without full consideration of the consequences, and that there is a point in the project timeline where no scope changes can be accepted at all.

Students working individually on an IXN project, including finalists and MSc summer projects, can have more choice in selecting which IXN project they want to work on. Again, Motivation Tracking is used to guide this process. There are guideline documents on this.

Undergraduate students should fill in a Motivation Tracking survey each year to build a record of their interests and motivations. This is useful for other activities as well as IXN project selection.

Where projects are in teams, the team sizes are determined by the module leader, who will know about the size and challenge of each project having reviewed the initial project proposals.

IXN projects should have a technical mentor from the host organisation wherever possible. A mentor can work with multiple projects and ideally participates over multiple years to build up experience of good mentoring.

Projects may be part of a larger theme or solution architecture for that industry client.

A new project may be a continuation of a prior project from the same or other IXN partners. However, a new project should not be waiting for a prior project to be completed.

Referenced from the IXN Guidelines Documents:

The IXN rule of 4 lists the obligations towards students:

1. For the duration of the project students should have an academic supervisor and an industry technical mentor in the IXN host to guide the students with their materials and processes. Where an IXN host does not provide an industry technical mentor, either a tri-party agreement with a technical company is needed, or a university allocated technical mentor.
2. Data sets used by projects must be made either in synthetic form or sampled under GDPR and University Ethics guidelines. There should not be any data that can identify individuals or contains sensitive or confidential information of any kind, and the data should not concern sensitive subject matters. In some cases rather than supplying data a field specialist should be available to explain the data schema and data, allowing synthetic data to be generated.
3. Weekly calls between the technical mentor and the students, with the students taking the initiative to arrange calls and document the results.
4. Attendance by the industry technical mentor and University supervisor to project presentations.

3. During the Project

There should be weekly internal team meetings for each project, either with a member of academic staff or with a Teaching Assistant (TA). In addition there should be regular, preferably weekly, meetings with the host organisation or mentor.

One-to-one communications outside of the weekly team meetings should be through the student team leader where students are working in teams. It is their responsibility to ensure effective information dissemination to their team.

4. Assessment

Formal assessment is always done by academic staff following the relevant assessment regulations for the project module as specified by the university. IXN hosts and mentors can be asked for feedback, which can be used to inform the marking, but are not involved in the formal assessment process.

It is optional but recommended to adopt a weekly progress evaluation for each project. For example, using the IXN traffic lights model where the progress of each student is rated as Red, Amber, or Green. This can be done either by the module staff, teaching assistants or peer driven by the team. A student rated Red needs immediate intervention to determine why their progress is inadequate and how to help them get back on track. Traffic light scoring can also be used to promote and identify

skills and needs in students at key syllabus points as well as tracking general progression of the all projects at different phases during the project lifecycle.

4.1. Deliverables

Each IXN project should deliver:

- An approved abstract checked by the IXN industry technical mentor or module leaders, for publication by both the university and IXN collaborators.
- A handover process to the project host, including a thorough source code walk through for the software that has been developed during the project, documentation, reports and any other relevant items.
- Access to the source code version control repository, typically via a GitHub URL or similar. Source code should be open source where possible.
- A 30 second (minimum) video with audio showing the key features of the project, for use during assessment (the video does not have to be public but must be accessible to the markers).
- An optional poster that can be used in showcasing the students work. A suitable template for creating official posters with the university and IXN host.