FabLab Feasibility Study

Fab Foundation Ireland

Secretariat (5 Churchill Street, Belfast, BT15 2BP)
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Terms of reference

FFI will provide a robust feasibility study to investigate the viability of establishing a FabLab at Creative Spark based on reaching the following objectives. The consultants will focus on the needs and context of the client in delivering a feasibility study that allows the clients use the findings to assist in their next steps.

The study would scope:

- Degree of fit with development strategies for innovation and manufacturing;
- Examples and key success factors of similar projects elsewhere;
- Likely levels of demand and the cost basis for same;
- Outline financial projections for the operation of the facility in its first three years
- Potential sources of funding;
- An overall assessment of the long-term viability of the project;
- Key steps in the development and operations of the project.

Methodology

The methodology was agreed with Creative Spark in advance of carrying out the feasibility study. An online survey and telephone interview would be undertaken to assess the likelihood of potential customers:

a) Using a FabLab at Creative Spark for product design, prototyping, 3D modelling, education & training and consultancy and the viability of this on a commercial basis.

b) Using FabLab to enhance and develop a community of makers within Co. Louth.

b) Using FabLab as an innovative resource in the wider Louth community, what might likely engagement be, how partnerships and projects might be structured within the statutory and third sector.

A questionnaire was designed and piloted, and then used to carry out the online survey which was circulated to 343 existing Creative Spark contacts and had a response rate of 11%.

The consultants were provided with a broad spread of local potential users and stakeholders and used contacts with the Fab Foundation Ireland Network; from this 57 were identified as influencers and potential stakeholders. The consultants contacted these people to invite them to participate in telephone interviews; the response rate was 32%.

The telephone interviews were semi-structured to ensure each respondent was being asked the same questions, but to allow flexibility for follow up and further questioning. The purpose of this was to ensure the feedback was comprehensive and reflective of the market place.

A copy of the telephone survey used is included in Appendix 1.
Companies
The companies surveyed are from a variety of sectors. We spoke to the following organisations:

Enterprise Ireland
MCOR Technologies Ltd
DkIT
Michael Curran Consulting
Open Hydro
Drogheda CoderDojo
Design & Crafts Council of Ireland
DkIT
Valley Forge
Louth County Council
Monaghan Institute
Garda Diversion Project
Craobh Rua Community Project

Background to Creative Spark

Introduction
Co Louth has a population count of 128,378 according to the census and the two main urban areas are the 6th and 7th largest urban areas in Ireland.

The population of Dundalk now stands at 34,496, according to the latest Census, although Drogheda remains the county’s biggest town with a population of 42,347.

Creative Spark
Creative Spark, a centre for creativity and innovation, launched in October 2012 with the goal of providing dedicated creative training and workspace facilities for new and established enterprises in County Louth – a place to work and a place to learn. Creative Spark was conceived with a clear focus on the development of the creative and innovative enterprise sector in this region and the use of creative practice to promote social engagement. The strategic objectives are as follows:

1. Support creativity, innovation, enterprise and job creation in Louth and the north east
2. Position Creative Spark as a regionally recognised centre for the provision of creative facilities and the delivery of creative and innovative enterprise opportunities
3. Cultivate local community creativity, innovation and enterprise capacity
4. Build a Sustainable Organisation

With an investment of just under €1.8 million in construction and fit-out costs from its funders (Enterprise Ireland, the International Fund for Ireland, Louth County Enterprise Board, PEACE III, Dundalk Credit Union, Oriel Developments, Louth County Council, Create Louth and Sustainable Energy Authority of Ireland) Creative Spark has state of the art facilities comprising twenty small business units, a suite of meeting and training rooms and creative production workshops which are available for entrepreneurs, innovators, business organisations and community groups to use. The offer includes:
• Providing affordable workspace; permanent and sector specific workspace creating an enabling and connected environment. 20 studio/workspaces are available, of which 95% are currently occupied.
• A supported environment through hot-desking and virtual office services.
• Joint meeting/training rooms providing the opportunity to network and collaborate.
• Artist-in-Residence Programme – currently visual artists with printmaking focus.
• A fully equipped Print Studio and a Ceramics Studio provide specialist facilities for collaboration, R&D, production and training.

Creative Spark provides practical opportunities for the unemployed or under-employed through the provision of training and opportunities within the creative industries, technology and sustainable energy sectors. Creative Spark offers a collaborative environment where learners, start-ups, SMEs and the local community can meet and exchange ideas, knowledge and best practice.

Creative Spark launched its Ceramics Studio and Fine Art Print Studio in May 2014 and has, since then, been exploring the option of adding 3D printing and digital fabrication facilities alongside. In autumn of 2014 it ran a two-day taster workshop in 3D modelling and printing.

As part of ID2015, Year of Design in Ireland, Creative Spark delivered a 3D Printing Conference which explored themes of collaboration and social innovation through design; it looked at how designers, makers, businesses and communities are currently engaging with the 3D print revolution and how it can maximise the benefits to industry, education and community.

The conference took the format of a one-day symposium accompanied by a four-day series of workshops which offered hands-on experience of 3D printing, 3D modelling and digital fabrication. The conference was supported by Design & Crafts Council Ireland, Local Enterprise Office Louth and MCOR Technologies.

In 2016 Creative Spark delivered a Design Thinking programme supported by Local Enterprise Office Louth. The workshop formats presented a range of product and service development tools using design thinking methodologies which participants then applied to a given product/service.

**Background to FabLabs in Ireland**

Fab labs provide widespread access to modern means for invention. They began as an outreach project from Massachusetts Institute of Technology (MIT) Center for Bits and Atoms (CBA). CBA assembled millions of dollars in machines for research in digital fabrication, ultimately aiming at developing programmable molecular assemblers that will be able to make almost anything. FabLabs fall between these extremes, comprising roughly fifty thousand dollars in equipment and materials that can be used today to do what will be possible with tomorrow’s personal fabricators.

FabLabs have spread from inner-city Boston to rural India, from South Africa to the North of Norway. Activities in FabLabs range from technological empowerment to peer-to-peer project-based technical training to local problem-solving to small-scale high-tech business incubation to grass-roots research. Projects being developed and produced in FabLabs include solar and wind-powered turbines, thin-client computers and wireless data networks, analytical instrumentation for agriculture and healthcare, custom housing, and rapid-prototyping of rapid-prototyping machines.
FabLabs share core capabilities, so that people and projects can be shared across them. A FabLab is a technical prototyping platform for innovation and invention, providing stimulus for local entrepreneurship. A FabLab is also a platform for learning and innovation: a place to play, to create, to learn, to mentor and to invent.

**FabLabs worldwide**

There are over 800 FabLabs worldwide with an estimation that they are growing globally at 10% per year. The map below illustrates the global spread of FabLabs, with the greatest concentration in North America and Europe. The Fab Foundation based in Boston to facilitate and support the growth of the international FabLab network as well as the development of regional capacity-building organisations.

**Growth of FabLabs in Ireland**

The concept of FabLabs across the island of Ireland was first introduced in Northern Ireland in 2012: the Ashton Community Trust and the Nerve Centre established a Lab in Belfast (New Lodge) and Derry/Londonderry (city centre) respectively, funded by the EU SEUPB Peace III Programme (Priority 2 Contributing to a Shared Society; Theme 2 Key Institutional Capacities are Developed for a Shared Society).

The Ashton Centre’s FabLab is integrated into an urban regeneration framework led by the social enterprise to improve skills, stimulate innovation and to strengthen children’s digital literacy. The Nerve Centre is Northern Ireland’s leading creative media arts centre and uses digital technology to develop the sonic arts, training and creativity through the FabLab.
The project facilitated over 13,000 people over the project lifetime, greater than the anticipated number of participants. 108 NIOCN level accreditations were delivered and 754 qualifications and accreditations were supported through the programmes with, group, schools, training organisations and educational institutions.

This was closely followed by two FabLabs being established in the Republic of Ireland. A FabLab was created within the School of Architecture at the University of Limerick by self-building digital fabrication tools with undergraduate students. In 2014, all these machines were moved into an abandoned public building in Limerick city centre and FabLab Limerick was opened to the public. FabLab Limerick offers an extensive cultural and educational programme on STEAM (Science, Technology, Engineering, Arts and Maths) including digital fabrication summer camps for kids, primary and secondary school visits and workshops, introduction tutorials to digital fabrication technologies and much more.

The same year also saw WeCreate establish a FabLab based in the Cloughjordan Ecovillage, an award winning community pioneering in the areas of green building, renewable energy and local food. The FabLab supports projects in these areas and aims to share open source hardware and software solutions that enhance community resilience and have helped support new commercial entrepreneurs develop product based enterprises that can be manufactured locally.

FabLab Manorhamilton was started in late 2014 by a collective of Designers, Engineers and Makers providing enterprises, creatives, schools and hobbyists access to a wide range of fabrication technologies that allow them to turn their ideas into new prototypes and products. They have created the FabLab to service the whole of the North West of Ireland, an area renowned for innovation in the Arts and Industry and boasting some of Irelands leading design, manufacturing and artistic organisations and individuals.

Most recently, in 2016, a FabLab was established in U-Casadh, a social inclusion project and charity on the Waterford-Kilkenny border. Their mission is to be a catalyst for change in attitudes to crime, social exclusion, rehabilitation and justice, through hands on training programmes. The FabLab adds a high tech dimension to their work where users can experience cutting-edge digital tools and their enterprise programmes assist users developing ways to build social enterprises from the products they develop.

**Highlights from FabLab NI**

The partnership project between The Ashton Community Trust and Nerve Centre undertook an in-depth independent evaluation after three years of operating to assess the impact. The following highlights some impacts and outcomes of note:

1. Over £500K of additional capital and revenue income to the £1m provided by SEUPB, was raised from local government within the first three years. This has included equipping FabLab in Belfast and Nerve Centre will full mobile FabLabs enabling reach across the island of Ireland.

2. 80% of users rated FabLab Belfast and FabLab Nerve Centre as effective at innovative thinking, building skills in design and digital fabrication, widening access and increasing use of digital technologies.
3. 72% of users at FabLab Nerve Centre and 60% of users in Belfast rated effective or very effective in helping start new business.

4. FabLab NI supported two tech start-ups PatchBlocks programmable mini-synthesisers [www.patchblocks.com](http://www.patchblocks.com) and Brewbot – sensor based robot beer brewer [www.brewbot.io](http://www.brewbot.io) - both of which have developed strong international sales. This is in addition to several craft businesses and supporting designer Karishma Kusurkar, the INVENT 14 Student award winner in her accessories [www.karishmasworld.com](http://www.karishmasworld.com) and jewellery designer Grainne Maher [www.grainnemaher.com](http://www.grainnemaher.com) in her prototypes for London Fashion Week.

5. 3 Accreditations (NIOCN) developed in digital fabrication and 108 gained in initial three years. Over 754 qualifications were supported across post primary school and FE colleges.

6. The programme was recognised as innovative and the next phase of growth should be directly aligned with social innovation and supporting new-start social enterprises in the tech sector. There is an opportunity to offer technical assistance, especially on business and product development and there is considerable potential for commercialisation and to develop this in order to diversify income and support broadly based local regeneration.

7. High level media coverage including BBC radio 4 Feature: In Business with Peter Day on the future of manufacturing & RTE feature on ‘Temple’ Project as media highlights. A 30 minute BBC NI TV documentary featuring FabLab Belfast is due to be aired in early 2017.

**Fab Foundation Ireland**

Fab Foundation Ireland (FFI) is an all-island network of digital fabrication laboratories (Fab Labs). The principal objective of FFI is to encourage and support the establishment of FabLabs on the island of Ireland. This will include undertaking and commissioning relevant research related to the setting up and operation of FabLabs, facilitating the establishment of community based FabLabs and contributing to the advancement of industry, commerce, and enterprise aimed at the creation of employment and training opportunities, social enterprises and sustainable economic development.

FFI will provide FabLab host organisations with advice, information, consultancy and management services. It will also provide and maintain a forum where members can join together to find mutual support, exchange views, share common issues and information and work in partnership with statutory and educational agencies, authorities and institutions.

Fab Foundation Ireland is an open membership organisation for individuals or companies, who own a FabLab, are developing a FabLab or are interested in the concept and wish to advocate. Creative Spark has been a member of Fab Foundation Ireland since 2015 and Sarah Daly is a member of the Board of Directors.

**Highlights of Fab Foundation Ireland**

1. In 2016 Fab Foundation Ireland secured €100,000 in funding from the Science Foundation Ireland Discover Programme and was successful in being awarded €12,000 in funding from the DFAT Reconciliation Fund for network activities.
2. Presentation at the recent Small Advanced Economies Initiative (SAEI) in Dublin Castle. This was organised by the Department of Foreign Affairs and Trade and co-sponsored by the Department of Jobs, Enterprise and Innovation (DJEI) and Science Foundation Ireland (SFI). Info on SAEI can be found here [http://www.smalladvancedeconomies.org/](http://www.smalladvancedeconomies.org/)

3. Fab Foundation Ireland has grown its network to include the following organisations from across the island or Ireland.

| Ashton Community Trust / FabLab Belfast | TOG Dublin | Lifetime Lab, Cork City |
| FabLab Nerve Centre | Innovate Dublin | Next Education Ltd |
| FabLab Limerick | Sligo IT | Creative Spark |
| WeCreate FabLab Cloughjordan | South East Regional Drug & Alcohol Task Force | Cavan ITC |
| Manorhamilton Fab Lab | Kildare County Council Arts Service | South West College |
| FabLab U –Casadh / Waterford | Maker Hub Dublin | Letterkenny Institute of Technology |
| Portarlington Enterprise Centre | | |
Relevant Development Strategies – Local, National, European

The concept of a FabLab at Creative Spark appears to have a number of fits with several regional and national strategies:

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Relevance</th>
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<tbody>
<tr>
<td>Creative Spark Strategic Plan 2015 - 17</td>
<td>The concept of a FabLabs complements much of Creative Spark’s current offer as a place to work (test products and concepts, provide new facilities for existing users &amp; members) and Learn (digital design and fabrication tools integrated into training programmes, technical &amp; skills training programmes). A FabLab would encourage new design and creative businesses to consider locating at the venue, increasing demand for workspace and growing an innovative entrepreneurial culture through the use of these digital tools. FabLabs have been proven as attractive models of education particularly in the STEM/SETAM arena and as places to conduct low cost R&amp;D. The equipment a FabLab provides allows training in a wide range of areas from design thinking through to product development, allowing Creative Spark to develop numerous learning offers for new and existing clients. There is a clear FabLab fit with the sectoral focus of the Creative Industries, Technology and Sustainable Energy all of which have direct links to the offer a potential FabLab would make. The FabLab movement has a history of supporting new creative industries, particularly in using digital tools to support crafts (Ceramic 3D printing/Jewellery Making/Furniture/Homeware), design (Product Nifty Drive etc.), architecture (modelling/community consultation) and film/TV (prop making/Modelling/Content). Several FabLabs (incite Focus, Detroit, Green Lab, Barcelona) also have dedicated areas to renewable and sustainable energy. It is anticipated that the Creative Spark FabLab could also drive the local community into new innovative activity – particularly engaging those who would not usually consider themselves innovative or enterprising.</td>
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A Study of the Role and Importance of Design in Firms based in Ireland in Non Design-intensive Sectors

Department of Jobs, Enterprise and Innovation

The establishment of a FabLab at Creative Spark very strongly supports a number of the requirements identified in the DJEI report, which highlights the crucial role of Design in underpinning virtually all industrial economic activity in Ireland. The report identifies innovation and access to design tools as being of critical importance to the R&D of a wide range of non-design businesses, but that such interaction is often sporadic and difficult to access. The report concludes that ‘design is key to Irish competitiveness & innovation, customer satisfaction and Ireland’s business reputation’. Businesses surveyed in the report cite the cost and time requirements of access to design expertise as the limiting factors in its adoption. The Creative Spark FabLab would directly address this issue of access and provide a dedicated facility for design and innovation that would service both existing and many more client companies of Creative Spark. The FabLab would become a hub for the regional economy to innovate in design in a locally accessible, affordable centre which understands business needs and is itself, a key actor in the business community.

Enterprise 2025 Ireland’s National Enterprise Policy 2015-2025

The DJEI Enterprise 2025 report seeks to drive export growth, create full employment, increase the competitiveness of the Irish Economy, optimise regional potential, embed innovation and increase connectedness in the economy – both locally and internationally. The digital economy is a key...
driver identified in the report. Other key areas of focus include realising untapped potential (though the encouragement of new entrepreneurs) and Leveraging the Importance of Design (as articulated through the Role & Importance of Design report above).

The Creative Spark FabLab would make tangible contributions across these goals. The evidence of the FabLabs in Northern Ireland has shown clear benefits in inspiring new entrepreneurs and new products into the market (Brewbot, Piecemakers); providing focused Job skills/Upskilling training to labour market entrants (Prince’s Trust, DfC). The FabLab model is built around an international network of over 1000 labs in 80+ countries. It is inherently geared towards both developing export potential for clients and importing knowledge and expertise through the network. Across the world FabLabs drive innovation and digital skills in learning, in communities and in business. The Creative Spark FabLab would further embed these qualities in Ireland.

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<tr>
<th>Assessment of the Macro-Economic Impact of Internet/Digital on the Irish Economy</th>
<th>The DCENR report concludes that the ‘internet economy’ accounted for 4.1%-4.8% of Irish GDP in 2012, responsible for up to 51,000 jobs and €6 Billion Euro of spend. It further concludes that this sector is set to expand, certainly on the consumption side. The report underlines the reality of the digital age and its strategic economic role in Ireland. However, it also highlights the level of digital adoption by Irish citizens as consumers. A Creative Spark FabLab could not only build upon these high and ever-growing levels of digital usage, but offers the potential to play a key role in the shift from consumption to production. FabLabs build upon the inherent interest in digital tools and transform it into a skill set that allows for the design and building of actual products and local solutions to problems. FabLab can be part of a process of adding wider value and purpose to the ‘internet economy’ and driving digital innovation in Ireland.</th>
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<tr>
<td>Innovation 2020 Ireland Strategy for research &amp; development, science &amp; technology</td>
<td>The DJEI Innovation 2020 report sets out Ireland’s strategy to become a Global Innovation Leader. This strategy is underpinned by Research &amp; Development, Workforce Development &amp; a collaborative ecosystem. One of the core drivers in delivering the strategy is identified as education, to include access at all levels to the best quality equipment and facilities. A Creative Spark FabLab could fit strongly with the wider mission of Innovation 2020 but the most tangible impacts can been seen around education. The provision of state of the art digital manufacturing facilities at the local level and with access across all spheres of society literally embeds technologies such as 3D Printing within communities. This access is further underpinned by structured training programmes for all levels and backgrounds of users, from Primary Schools to Post graduates and business. Innovation is driven by inspiration and opportunity and FabLab provides both. The development of FabLab type facilities in Ireland will help ensure that the vision of Innovation 2020 is delivered upon.</td>
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<td>Digital Foresight Report: DKIT</td>
<td>The Digital Foresight Report provides an analysis of the digital economy in the 6 Southern Border Counties and a vision for development going forward. The report identifies a growing digital sector but with issues of fragmentation and disconnection that may limit future growth. It advocates for the development of a digital eco-system in the region, led by the third level educational institutions with Hubs in Dundalk, Letterkenny and Sligo.</td>
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The Hubs will provide training & education but resource Innovation and specialist skills. The DkIT Hub will lead in digital content although not specifically through a FabLab. This report really lays the foundations for the development of the FabLab at Creative Spark. As a catalyst for innovation and provider of specialist training, FabLab is a powerful tool which draws on international networks in achieving these goals. Students of the Fab Academy can learn directly from MIT Professors specialist techniques in digital manufacturing and Innovation is the core rationale of the project. The Digital Foresight report makes a strong case for the creation of projects such as FabLab in locations such as Dundalk and provides a firm evidence base for the Creative Spark proposal.

The WEO report lays out the ways in which disruptive changes in established business models will have a major impact on the employment landscape in the next decade. We are witnessing the beginning of 4th industrial revolution, where the convergence of artificial intelligence, robotics, 3D printing, nanotechnology and genetics that will amplify each other effects. This will remove the need for some existing jobs and grow new opportunities in STEM, computing, advanced manufacturing, design and engineering. This will have impacts on the workforce over the next 15 years and WEF expect that up/re skilling, training and redeployment within many existing sectors as an adaptive action. This provides opportunities for a FabLab within Creative Spark to be able to prepare a new workforce in some elements of this rapid technological change (Fab Academy/Training) and providing alternative educational models that link humanities and science with business and practical, tangible hands on learning of content. A FabLab will also provide a key environment for people and organisations to collaborate using disruptive technologies, particularly through structured design thinking and innovation training which will be key to the success of future business innovation strategies.

The national policy framework for children and young people includes amongst its core priorities the goal to ‘Enhance Job Opportunities for Young People’. In pursuit of this goal the Youth Guarantee seeks to improve the quality and frequency of employment opportunities for young people. The FabLab model, which provides new and engaging opportunities for training and education for young people, makes a substantial contribution here and the proposal for a Creative Spark FabLab would offer very strong support for the strategy.

The Creative Spark FabLab proposal could support each of these Outcomes and Objectives through its uniquely engaging educational offer, which develops core job skills for the digital economy as well as fostering innovation and creativity. As a global network of interconnected Labs working on real and meaningful projects, the FabLab offers a compelling
model for developing global awareness and real connectedness between learners and users across the world.

**Louth County Council Local Economic & Community Plan 2016-2022**

The Plan highlights Prosperity & Job Creation; Access to Education and Skills, Entrepreneurship; & Innovation and Enterprise as Core Priorities and places a high value throughout on Innovation and Creativity throughout. It highlights some specific gaps in educational provision – most notably for those school leavers who do not progress to DKIT and for those seeking an integrated approach to enterprise development. The Plan goes on to highlight the innovation culture of the County, exemplified by Mcor Technologies and identifies Creative Spark as a key driver of knowledge in the County.

The FabLab proposal extends the innovation capacity of Creative Spark and provides proven interventions in the education, enterprise and skills sectors. It is a very strong fit with the LECP Plan.

**Manufacturing Skills Audit (Regional Skills North East)**

Regional Skills North East conducted a Manufacturing Skills Audit of 28 companies in the region (Cavan, Monaghan, Louth) where they stated the need for digital skills, professional 3D design programmes. (Auto CAD / Solid Works) were particular areas where skills were deemed essential. Also, 14 of the 28 companies referred to Prototyping and/or 3D Printing as design areas that they currently have skills needs in or they will have skills needs in this area in the next 12-18 months. In this case a FabLab could provide direct services to business.
Overview of Existing Provision

This section will examine offers by other FabLabs and similar projects across the island of Ireland and further afield, highlighting current provision and relevant critical success factors. This examination reveals a wide and dynamic cluster of organisations, however each have slightly different ways of operating and utilise different strengths to ensure their FabLab project remains a success and thrives within its own environments. These common features have been highlighted below.

| FabLab Belfast | FabLab Belfast at the Ashton Community Trust was established in 2012 in partnership with FabLab Nerve Centre. Initially the project was supported by the European Union’s PEACE III Programme managed by the Special EU Programmes Body. FabLab Belfast currently has 4 Full time members of staff and 1 Full time volunteer and 1 Artist in residence P/T.

It has a dedicated accredited training programme for young people not in education, training or employment (NEETS) (Creative Opportunities for Real Employment), a north Belfast good relations programme, public training programme (3D Design & fabrication) and will be growing a dedicated business to business service and corporate training entity. It has full mobile FabLab facilities.

Ashton Community Trust is an award winning charity that prides itself on delivering real benefits for local people. It is known for its ability to consistently deliver quality services and over the last 12 months Ashton gave yet another strong performance both financially and organisationally in terms of service delivery. It employs more than 180 people with a large majority from the local area and its annual turnover is over £3.5 million. |
| FabLab Nerve Centre Derry | FabLab Nerve Centre was established in 2012 in partnership with FabLab Belfast at the Ashton Community Trust. Initially the project was supported by the European Union’s PEACE III Programme managed by the Special EU Programmes Body. FabLab Nerve Centre has 3 full time members of staff.

Its programmes range from Fab Farm as social enterprise programme with children with special learning needs through to Fab Social, a programme to develop a working FabLab in Shantallow area of Derry/Londonderry. It has full mobile FabLab facilities.

The Nerve Centre is Northern Ireland’s leading creative media arts centre. More than 120,000 people a year benefit from the Nerve Centre’s wide-ranging |
programme of arts events, cutting edge projects, creative learning centres, training opportunities, and state-of-the-art production facilities. A successful social economy enterprise, the Nerve Centre employs more than 40 staff at sites in Derry/Londonderry and Belfast.

**Success Factors:**
- Part of an established community organisation with clear strategic focus
- Broad/wide remit
- Offers accredited training
- Links activities across organisation
- Partnership and collaborative working
- Trained experienced staff team
- Financial and administrative procedures in place
- Responsive to opportunities and offers

**FabLab Limerick**

FabLab Limerick started in 2012 as an elective course at the School of Architecture, UL in which undergraduate students built open source 3D printers, CNC routers and laser cutters. In 2014, as part of Limerick City of Culture, this self-build equipment was moved to an empty building in the city centre owned by Limerick City Council.

Since then, FabLab Limerick has evolved into a fully functional digital fabrication laboratory that offers cultural, educational and research programmes on digital fabrication, bridging the gap between these technologies and creatives from all disciplines. Its team consists of a Director, Coordinator, Education Officer and 3 Volunteers. FabLab Limerick offers various tutorials, workshops, talks etc. Every Thursday night is Makers Night which is open to makers, crafters and digital fabrication enthusiasts. This is a free event with use of all the equipment in the lab to support any project. The first Saturday of every month is their Equipment Introduction Day which consists of three courses, that may be taken separately or over a single day. This includes learning about the laser cutter, CNC routing and 3D printing. Each class is €18 for students and €30 for adults. For booking 3 classes together, prices are €45 for students and €75 for adults.

FabLab Limerick opens Monday to Friday 9am – 5pm and Thursday late night 7:30pm – 9:30pm.

**Success Factors:**
- Part of an established Academic organisation with clear strategic focus
- Community Focused and has buy in from institution and Public
- Experience in partnership and collaborative working
- Trained experienced staff team
- Responsive to opportunities and offers

**WeCreate**

WeCreate is based in Cloughjordan Ecovillage, an award winning community pioneering in the areas of green building, renewable energy and local food. WeCreate supports digital fabrication projects in these areas and aims to share open source hardware and software solutions that enhance community resilience. This Project has been part-funded by North Tipperary LEADER Partnership under The Rural Development Programme 2007-2013 which is financed by the EU through the European Agriculture Fund for Rural Development.
Development and by the National Exchequer through the National Development Plan.

WeCreate is hosting a laser cutting introduction and an open day to coincide with European maker week. They offer Co working spaces as well as business services such as consultations and prototyping.

**Success Factors:**
- Part of an established organisation with clear strategic focus
- Specific targeted areas of work
- Offers accredited training
- Partnership and collaborative working
- Trained experienced staff team
- Community buy in
- Financial and administrative procedures in place

| FabLab U-Casadh                  | The U-Casadh Project was established in 2008 by former prison officer, Stephen Plunkett in Waterford. Having become disillusioned with seeing the same people coming through the 'revolving doors' of the prisons in which he worked (St. Patrick's Institute, Wheatfield and Clover Hill) and decided to work with people in the community, providing them with "occupation with purpose" in order to reduce their chances of returning to prison.

The project was originally set up to work with ex-prisoners, aged 24 and over, and their families. Since then, the project has broadened out its service provision (through the addition of their Department of Social Protection-funded Community Employment scheme) to people over the age of 18, referred in by the Probation Service, Drug Treatment Services, Homeless Services and others.

They have a strong focus on Social Inclusion, through encouraging entrepreneurship. U-Casadh is a registered charity and is developing its own social enterprise, as they’ll as supporting others to develop theirs. Equipment consists of many wood working machines, and a newly acquired laser cutter Zing 24 and a ShopBot PRS Alpha.

**Success Factors:**
- Part of an established organisation with clear strategic focus
- Community buy in
- Strong social benefit within local area and user group
- Enterprise and business focused to ensure sustainability
- Potential to demonstrate longer term impact of FabLab programmes on client group

| FabLab Manorhamilton            | FabLabs Manorhamilton was started in late 2014 by a collective of Designers, Engineers and Makers. It is a digital fabrication facility providing enterprises, creative’s, schools and hobbyists access to a wide range of fabrication technologies that allow them to turn their ideas into new prototypes and products.

FabLab MH has been created to service the whole of the North West of Ireland and this area is renowned for innovation in both the Arts and Industry and boasts some of Irelands leading design, manufacturing and artistic organisations and individuals. Users have an unprecedented opportunity to access state of the... |
art digital tools within a community setting and the addition of the Fab Lab to the area will provide a source of innovation, empowerment, education and new business development. Located in the new ManorHUB Enterprise Centre, FabLab Manorhamilton works with Start-Ups & Industry, Artists & Makers, Primary/Secondary Education and the community.

**Success Factors:**
- Innovative and agile approach operating a FabLab in a rural environment.
- Trained experienced staff team
- Community buy in
- Responsive to opportunities and offers

### UK Provision

| MAKlab | MAKLab is an independent, charitable organisation which provides resources for people from all backgrounds, all ages and all abilities to use making as a tool for social empowerment, regeneration, inclusion, and social capital whilst supporting local enterprise and economic development. MAKlab has a staff team of 10 people over several sites.

MAKLab was founded in 2012 to allow people to access the latest disruptive technologies but since then they have grown and now deliver teaching workshops, community outreach programmes, professional development and accredited learning for a wide demographic across Scotland. They are delivering across a network of MAKlab spaces (Wick, Glasgow, Dundee, Dumfries as well as a mobile lab), that trade skills and resources with each other, across Scotland alongside strong links to resources across the world. MAKLab provides access to specialised equipment and facilities to experiment with new materials.

**Success Factors:**
- Broad and wide remit of operations
- Self started charity
- Sustainable – focused on generating income from FabLab services and external funders
- Partnership working across several organisations
- Strong Brand Identity
- Trained Skilled staff team
- Accredited Training |

| FabLab Devon, Exeter | Opened in May 2014, FabLab Devon is the only digital fabrication laboratory in a UK public library. FabLab Devon is housed within Exeter library and delivers outreach activities across Devon. The Exeter space is the part of a wider project to ensure there is access to digital making across Devon. This includes the development of a FabLab Totnes at KEVICC, and pop-up FabLabs elsewhere. 4,500 people used the FabLab in 2015.

The FabLab project is funded by Devon County Council, the ACE Bridge |
**Challenge Fund** run by the Real Ideas Organisation and the Digital Makers Fund (run by Nesta and Nominet Trust, in partnership with Autodesk). The University of Exeter and Exeter College also support the FabLab. It is member based, accepts volunteers for 2 and half days per month and runs embroidery taster days as well as dye sublimation taster sessions alongside digital fabrication sessions. They have a subscribed membership system with reduced rate on training and machine hire.

They have collaborated with Plymouth College of Art to deliver a series of free workshops for adults and young people alike and introduce them to the world of digital fabrication.

**Success Factors:**
- Integrated FabLab along other Council and library services
- Partnership working across several organisations at a county and national level
- Accessible inclusive digital making
- Ambitious project vision
- Strategic approach to sustainability (EU and county level funding) and membership scheme for individuals
- Links with HE across south west of England

**FabLab London**

FabLab London is the City of London’s first purpose built digital fabrication and rapid prototyping workspace based at 1 Frederick’s Place in the City with founding partners Bathtub2Boardroom and the RSA Great Recovery initiative. It has a 4000 sq. ft. creative space that provides open and membership based access to digital fabrication tools, an electronics lab, education workshops, making events and a vibrant community. It helps individuals and companies learn about the application of digital technologies, rapid hardware prototyping, 3D printing and sustainable design practices. It has a range of fabrication platforms and tools on site including laser cutters, 3D printers, milling machines, sewing machines, 3D scanners, traditional hand tools (saws, drills, hammers, chisels etc) and CNC machines. Complementing the physical and mechanical design it provides access to an electronics lab with the latest platforms, design tools and test equipment.

FabLabs London is home to the RSA The Great Recovery initiative, a project supported by the Technology Strategy Board – based on the insight that our linear ‘take-make-dispose’ model of manufacturing is throwing up major economic and environmental challenges, The Great Recovery aims to facilitate a shift toward more circular systems, and considers the design industry as pivotal to this process.

**Success Factors:**
- Commercial minded – operates with minimal subsides and generates own income
- Rents business incubation spaces within lab to grow creative businesses.
- Supports new businesses in product design and manufacture
- Agile and experienced team (owners & investors)
- Responsive to opportunities and offers within their locality (city of London)
### Maker & Hack Spaces in Ireland

<table>
<thead>
<tr>
<th>Space Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOG Dublin</td>
<td>TOG Dublin was started in January 2009. TOG is a community-operated physical space run by its members to provide a shared space. The members have a place to be creative and work on their projects in an environment that is both inspiring and supportive of both new and old technologies. The space is funded for by its members and allows members 24-hour access to a place equipped with shared equipment supplied or donated by members or friends of TOG. TOG allows for a community that would usually be based through virtual media to come together to form a meeting place for similar minded individuals in a physical space. TOG allows people to collaborate on projects in a centralised place to bring the skills of many people together to get a task or project done.</td>
</tr>
<tr>
<td>Lightbox Labs, Co Louth</td>
<td>Lightbox Labs started in 2012 with the aim of creating a hackerspace or makerspace in the Drogheda area to support people interested in all aspects of technology. Whether their interests be in exploring, inventing, to work on projects with likeminded people or just to hang out and learn new skills, the aim is to have a space run and paid for by its members. Millmount Development Centre provided the Lightbox Lab with space for a number of years to help achieve this aim. However they found that to be very difficult to sustain and build upon their membership. They found over the few years that although they were actively running workshops, tutorials, attending events that the interest in the project did not seem to be out there or at least they were not reaching enough people. And so they eventually closed shop in Millmount RDC. They do still meetup on a monthly basis to discuss what projects they are working on and they discuss the ultimate aim of having a hackerspace in Drogheda.</td>
</tr>
<tr>
<td>Maker.ie</td>
<td>Maker.ie is a collective of electronic engineers, musicians and educators. As well as designing unique and useful audio equipment aimed at electronic musicians (which they provide as Do It Yourself kits) they also teach musicians, artists and young people creative technologies, utilising the responsive and immediate nature of audio. They firmly believe everyone is capable of understanding technology and learning electronics, it just needs to be presented in a format that people can relate to. Their aim is to translate the often impenetrable technical jargon into a language everyone can understand. They also strive to make learning as simple, efficient and fun as possible and this philosophy is the foundation on which their offline workshops, video tutorials and DIY kits are built on. They are based in Dublin, Ireland and over the last 4 years they have worked directly with over 500 musicians through workshops throughout Ireland and occasionally in the UK. They also work with students from education, cultural...</td>
</tr>
</tbody>
</table>
and outreach organisations to develop workshops that are designed to impart the independent learning skills and educational benefits that can only be realised through hands-on workshops building tangible, useful things.

Organisations that have hosted their workshops include Trinity College Dublin, Limerick IT, NUI Maynooth, The Science Gallery Dublin, NI Science Festival, CultureTECH Derry/Londonderry, The Chester Beatty Library, the Centre for Talented Youth Ireland, and NUIG and UCC students unions. All their DIY kits and pro-audio products are designed in-house from original concept through to final result. Where possible they try to assemble, source and manufacture all products and kits in Ireland. They have currently started manufacture of Eurorack Patchblock in Ireland, in Ashbourne by Beta Electronics.

### Existing Local Business

<table>
<thead>
<tr>
<th>Business</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mcor</td>
<td>A 3D Printer manufacturer based in Co Louth which offers a range of 3D printers to a global market.</td>
</tr>
<tr>
<td>We Print</td>
<td>A printing service that offers 3D printing alongside a more recognisable printing services, based in Drogheda.</td>
</tr>
</tbody>
</table>
Case Studies
The Case Studies below highlight potentially similar provision and business models which could be adopted by Creative Spark.

Case Study 1: Making Rooms (http://makingrooms.org/)
The Making Rooms is a unique facility that brings together art and technology. The Making Rooms is a state of the art technology and manufacturing hub that aims to place Blackburn (UK) back on the map as a place for start-up businesses and manufacturing innovation. Lancashire has a long and proud manufacturing heritage; formerly it was the centre of the world’s cotton industry and has a long tradition of machinery manufacture. With 12.9% of the County’s jobs in manufacturing, it is still one of the UK’s highest concentrations of manufacturing industries. Lancashire is also home to a growing creative sector and the number of jobs in creative industries rose by 15.8% from 2011-2014, 3 times the national average.

The key aim is to make Blackburn and Darwin the Digital Making and Creative Hub for the North West of England. The building is a three story city centre location and aims to quickly be known as a creative, digital, accessible hub for emerging talent in the region. It also creates opportunities for Lancashire partners to learn and be inspired by other economic, regeneration and engineering collaborations. The potential for creative digital collaborations is exciting to the creative, education and health sectors. The facility opened in late 2016 and has begun trading with a programme aimed at services to local business and industry and education establishments.

The Fab Lab
The Making Rooms is home to FabLab Blackburn, a digital manufacturing facility with the focus of helping people learn new skills, develop ingenious ideas and manufacture beautiful products. The lab is a complete FabLab with full equipment inventory.

Conference Facilities
There is a range of rooms set up for conferences, including boardroom style meetings with capacity for 20 people or training rooms for 12-15 delegates. These rooms have a projector, flip chart and free Wi-Fi. Refreshments and catering are available on request, with a wide range of catering options.

Rooms to Let
The Making Rooms has two floors of office, workshop and studio space for flexible renting. The rooms are equipped with brand new furnishings and finished to the highest quality. Tenancy for offices, studios (including wet/messy space) and workshops is based on a one-month notice easy in, easy out basis.

Coffee Shop / Exhibition Area
This area comprises of a business lounge, gallery space, live performance area and a cafe available for use for tenants, the public and private hire.

Outcomes of the project
The Making Rooms will provide learning, creating and making space where people can bring their ideas and creativity and turn them into innovative products, artworks and ways of working. The project will achieve the following outcomes:

- Create new businesses for the manufacturing and creative sectors through proactive start-up generation and support
- Increase employment, skills and training opportunities for the creative and advanced manufacturing industries; therefore strengthening and supporting two of the fastest growing sectors in Lancashire.
- Increase accessibility and engagement with SMEs in additive and digital manufacturing technology
- Provide a town centre location where local people and visitors can meet, design and create; a home to the creative industries in Blackburn and Lancashire.
- Create new business opportunities by combining the arts, creative, digital, manufacturing and technology to generate new innovative products, collaborations and start-up businesses.
- Provide an innovative and engaging learning environment for pupils, students and anyone who wants to use the facilities.
- Provide students, graduates and emerging practitioners with space and further training and commissioning opportunities with larger organisations in Lancashire, and increase student retention.

**Programming**

The programme for The Making Rooms will encompass the following activities:

- Deliver training, activities and events to stimulate new product and business ideas and provide the space and support for business start-up and growth
- Provide technical expertise and support to businesses to enable them to produce 3D prototypes and/or parts for their business processes
- Rent 3D printing and machinery and equipment to established businesses across Lancashire to enable them to produce prototypes and parts
- Deliver educational workshops for schools
- Develop a Service Level Agreement (SLA) with colleges and schools across Lancashire to provide pupils and students with access to digital manufacturing workshops and programmes
- Rent hot desks and spaces for exhibitions, meetings and workshops
- Create projects and programmes of work that directly impact on the regeneration of the town centre
Host artist and design residencies (the residencies will be hosted by Lancashire based businesses who will have access to The Making Rooms facilities)

Costs

The total capital costs of converting identified buildings The Making Rooms is £812,000

- Blackburn with Darwin Council £86,000
- Arts Council England £275,000
- Lancashire Enterprise Partnership £451,000

Running Costs

<table>
<thead>
<tr>
<th></th>
<th>Year One</th>
<th>Year Two</th>
<th>Year Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>£140,024</td>
<td>£148,477</td>
<td>£156,800</td>
</tr>
</tbody>
</table>

Income includes

Membership Fees, External Grants, Council SLA contribution, Casual User Fees, Technical services (consultancy), Training & workshops, shop income.

Excludes: Cafe Lease, Business Lounge Hire, Office Rent (6 Offices), Room hire (7 Rooms)

Case Study 2: Makerversity London (http://makerversity.org/)

Makerversity is positioned in the New Wing section of Somerset House. Somerset House Studios is a new experimental workspace in the centre of London connecting artists, makers and thinkers with audiences. The Studios are a platform for the development of new creative projects and collaboration, promoting work that pushes bold ideas, engages with urgent issues and pioneers new technologies.

The Studios are home to Makerversity, an organisation that works with a number of groups and individuals involved critical design and emerging technologies. Makerversity is located at Somerset House, a 400 year old neoclassical building situated in central London overlooking the River Thames and has a team of 6 staff.

Makerversity is a welcoming, busy, thriving space, with a strong sense of community. The space is large, with many different rooms branching off a main arterial room which is their main Co-Working space. They also have a second floor, dedicated to Co Working. The maker space is spread over different rooms in different parts of the building dedicating each space to a specific technology that is both digital and traditional. Additional units are housed in the ‘Vault’, a narrow avenue of individual units full of creative businesses, also home to Makerversity wood working rooms.

Costs and income generation

Commerically Makerversity uses a co working as a driver for income.
Makerversity has 250 current members, which equates to about 80 businesses using the space each day. Their next main income driver is renting event space and meeting space. They have a small meeting space that is used for private meetings and event space that can hold public seminars and lectures. These are often used by private organisations that are looking to have a working event in a vibrant location.

In addition, regular corporate team building workshops utilising 3D scanning and laser cutting are being developed as an additional source of income. They have a partnership with The Princes Trust to deliver workshops twice a year.

Makerversity DIY is an educational programme established 2 years ago to offer teachers downloadable lesson plans to enable and support the inclusion of making and hands on activities into core curriculum subjects. These lesson plans also work as a generic base to adapt for team building sessions.

Their main partners are Autodesk - they pay for a desk where one of their employees works and all Makerversity members get Autodesk software. They are also partnered with Ultimaker 3D printers, who donated a number of 3D printers and in return hold events and meetings within the space.

**Success factors**

Analysis of the success factors demonstrates some common themes across the current FabLabs in Ireland; however it would be prudent to acknowledge that the FabLab concept is still relatively new to the island of Ireland making any longer term predictions of success difficult.

- There is no obvious single business model for FabLabs or maker spaces, most FabLabs use a mixed model of funding, private investment and self generated income to sustain the resource and activity programmes.
- A FabLab closely linked or joined to larger organisation with a broad remit that is well placed to provide support in establishing the FabLab in its inception will see FabLab activities develop outside of the narrow focus of exclusively using design and fabrication tools to prototype, into education programmes, community development, social impact, health and well being, supporting micro business and social enterprise, rehabilitation and research. A FabLab can bring added value to many parent organisations with a visible digital/technical innovation presence that can influence other established programmes offered by the organisation including: design & prototyping services, accredited training courses, new members, youth engagement programmes etc.
- This organisational relationship will influence the programme of the FabLab; although spaces have broadly similar outputs, how this is weighted in each will be influenced by a potential parent organisation. In Creative Spark’s instance, a FabLab may have a greater emphasis on supporting new creative tech business rather than schools programmes.
• The environment and geography in which the FabLab operates plays an influential part. A FabLab located in a commercial district of a city may create a different programme of activities from one in a residential area. In this instance the FabLab will be responding to the immediate community in which it is located in. In turn, a rural FabLab will develop programmes that suit their geography and population size and community need which may differ from that of an urban environment.

• A trained and skilled team is essential in establishing and growing a successful FabLab, there are key technical skills required in addition to having a customer focused approach and understanding of modern pedagogic approaches. New staff members can avail of FAB Academy, a global online training programme run by the Fab Foundation that allows for learning across the technical and machine processes. Local FabLab networks can also provide necessary training in both technical and operational aspects of FabLab. The consultants have highlighted the skills needed in potential new staff members in the appendix.

• Partnership and collaborative working is a common theme amongst the established FabLabs where resources and knowledge are pooled with other one another and separate organisations for mutually beneficial impacts.
Setting up a FabLab

Equipment Required

A FabLab requires a core set of equipment to allow certain processes to take place; equipment is designed to maximise the breadth of functionality, be robust and maintainable and offer leverage across processes to develop skills and opportunities. It is expected that the equipment needs will evolve over time and the following table is a general guide to costs and amount of FabLab equipment required.

<table>
<thead>
<tr>
<th>Proposed FabLab Costs</th>
<th>Unit Cost</th>
<th>Amount</th>
<th>Sub-total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP Pavilion 15-au071sa 15.6&quot; Laptop - Blue</td>
<td>€479.99</td>
<td>20</td>
<td>€9,599.80</td>
</tr>
<tr>
<td>Epilog Mini 24 (50 watt)</td>
<td>€16,763.74</td>
<td>1</td>
<td>€16,763.74</td>
</tr>
<tr>
<td>BOFA AD350 Extraction Unit</td>
<td>€1,095.23</td>
<td>1</td>
<td>€1,095.23</td>
</tr>
<tr>
<td>Air Assist</td>
<td>€329.69</td>
<td>1</td>
<td>€329.69</td>
</tr>
<tr>
<td>Shopbot PRS Alpha (complete)</td>
<td>€23,000.00</td>
<td>1</td>
<td>€23,000.00</td>
</tr>
<tr>
<td>Uprint SE Plus (Complete system)</td>
<td>€20,000.00</td>
<td>1</td>
<td>€20,000.00</td>
</tr>
<tr>
<td>Roland GX300</td>
<td>€2,682.20</td>
<td>1</td>
<td>€2,682.20</td>
</tr>
<tr>
<td>Stahls Clam Heat Presses</td>
<td>€504.00</td>
<td>1</td>
<td>€504.00</td>
</tr>
<tr>
<td>MDX 40</td>
<td>€6,328.26</td>
<td>1</td>
<td>€6,328.26</td>
</tr>
<tr>
<td>Digital Embroidery Machine</td>
<td>€2,000.00</td>
<td>1</td>
<td>€2,000.00</td>
</tr>
<tr>
<td>48W Mains Solder Station</td>
<td>€29.00</td>
<td>4</td>
<td>€116.00</td>
</tr>
<tr>
<td>Arduino Starter kits</td>
<td>€80.00</td>
<td>10</td>
<td>€800.00</td>
</tr>
<tr>
<td>Basic Learning Kit for Raspberry Pi B+</td>
<td>€35.00</td>
<td>10</td>
<td>€350.00</td>
</tr>
<tr>
<td>Ultimaker 2</td>
<td>€2,250.00</td>
<td>1</td>
<td>€2,250.00</td>
</tr>
<tr>
<td>Misc. Electronic components</td>
<td>€500.00</td>
<td>1</td>
<td>€500.00</td>
</tr>
<tr>
<td>Axminster Trade Series T-2000CK 1hp Cyclone Extractor</td>
<td>€960.00</td>
<td>1</td>
<td>€960.00</td>
</tr>
<tr>
<td>Acer Projector</td>
<td>€400.00</td>
<td>1</td>
<td>€400.00</td>
</tr>
<tr>
<td>Makita hammer drill</td>
<td>€200.00</td>
<td>1</td>
<td>€200.00</td>
</tr>
<tr>
<td>BAS 317 Bandsaw Precision Package</td>
<td>€542.18</td>
<td>1</td>
<td>€542.18</td>
</tr>
<tr>
<td>Miscellaneous Tools (Glue Gun/Saw/Levels/Sockets/drivers/Bits/Clamps/vice.) etc</td>
<td>€500.00</td>
<td>1</td>
<td>€500.00</td>
</tr>
<tr>
<td>Miscellaneous Consumables (Laser wipes/ PVA &amp; Adhesives/Batteries/Screws)</td>
<td>€200.00</td>
<td>1</td>
<td>€200.00</td>
</tr>
<tr>
<td><strong>Equipment Total</strong></td>
<td><strong>€89,121.10</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Physical requirements and development options for a FabLab

Physical space
The physical requirement of a basic FabLab is that the equipment is housed in approximately 2000sq ft of space with dedicated plumbing and options for extracting externally. FabLab Graz in their study *A FabLab as Part of a new kind of Business Incubator for Hardware Start Ups* found that 45% of European FabLabs were 2690sq ft. or smaller. The concept of a FabLab is to house all the equipment in a single room to allow people using the machines to do so together, opening up potential collaboration and learning possibilities. Many FabLabs will also include additional space to accommodate optional areas such as dedicated design and learning studio, dedicated electronics room, construction/mixed use/messy area, additional materials storage area, reception area and exhibition area. In this scenario it is likely a FabLab will increase its footprint significantly from the above approximation of 2000sq ft.

Ideally a FabLab will have a dedicated entrance of a suitable size for users and large materials deliveries, preferably all located on the ground floor.

Development Options
The consultants were asked to consider two projected options and to outline the financial operational costs over a three year period and the benefits and concerns of each. The full financial projections can be found in the Appendix.

Option 1
The costs of a building a full FabLab programme at Creative Spark over a three year period.

In this scenario the organisation would take a graduated approach to establishing the FabLab over a three year period, which is popular with many organisations and has been chosen by U-Casadh, Waterford, as a preferred model for development. In this case certain key pieces of equipment are bought allowing basic operations, and then added to as capital investment becomes available. Please see Appendix for additional detail.

Advantages

- Less upfront investment required at initiation.
- Equipment is procured and bought as necessary.
- Physical growth can be planned and adapted accordingly as need for service develops.
- Less disruption on Creative Spark existing services, less impact
- Targeted staff training on fewer machines streamlining competences allowing quicker opening. Additional staff training on newer machines as and when necessary.
The consultants would also suggest that this option requires a minimum period of 5 weeks of installation, trouble shooting and staff training to fully utilise the benefits of the FabLab. A new FabLab can be supported by an established FabLab in the Fab Foundation Ireland network, with support for staff training to potentially shorten the usual time frame in being operationally ready.

However, it would be prudent to note that this option would have an impact on the availability of rentable units at Creative Spark and potential income, with a FabLab utilising some of this space.

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub Total Equipment &amp; Capital</td>
<td>€93,105.10</td>
<td>€4,016.00</td>
<td>€22,000.00</td>
</tr>
<tr>
<td>Sub Total Operations</td>
<td>€64,850.00</td>
<td>€79,350.00</td>
<td>€79,350.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>€157,955.10</strong></td>
<td><strong>€83,366.00</strong></td>
<td><strong>€101,350.00</strong></td>
</tr>
</tbody>
</table>

Please note that year two contains an additional capital costs regarding build a purpose built extension to Creative Spark that will house the new FabLab. For details please see section Option 2

**Building/Extension**

This option explores building a full extension in which to house a FabLab at Creative Spark and outlines the costs of setting up a fully functioning FabLab in a bespoke extension additional to the current building. This option would see a 2,500sq ft. extension to house a new FabLab at the rear of the existing building. In this scenario Creative Spark could have a graduated approach to establishing FabLab over a period of time, as in option one or also purchase and install all the necessary equipment as in option two once the build is complete. Please see Appendix for illustration of potential extension.

An advantage of a purpose built extension is as follows:

- Creative Spark can design a physical space in which the equipment, staff and user working space that would meet their designated purpose as opposed to retro fitting existing space in the building. Creative Spark can build a larger and more comfortable FabLab that is fit for purpose.
- This option also allows for Creative Spark to reconfigure the existing layout of the building and consider moving existing resources such as the Print Studio to a new area of the building. This may require a double story extension to allow for a FabLab and a Print studio to be housed in an efficient way.
- In this scenario Creative Spark is also able to look at both option one and option two combined.
- This would allow for digital and conventional making to be housed in one single area providing an area with complementary processes for users. A purpose built extension would also allow for the required electrical, extraction and plumbing required to be purpose built as opposed to retro fitted into an existing space.
• The extension could have a new entrance allowing after-hours access to the FabLab without access to the rest of the existing building, offering a secure way to operate FabLab as stand-alone entity with its own operating hours.
• This option may free up existing space (Print Studio) in which to allow Creative Spark new income generation or project opportunities.
• This would also minimise disruption within the existing building for staff and users and all future operational impacts (machine noise, material debris, traffic from new users and groups etc.) would be contained.

The minimum footprint for a full suite of FabLab equipment is approximately 2000 sq. ft., however this is only to be considered is a guide for locating the suite of digital fabrication equipment and comfortable working space for users. Often FabLabs are located in large open mixed purposed spaces that give options to integrate with other services and processes and it would be prudent to consider that with increased usage and growth, additional physical space maybe required, examples are below;

• Additional manufacturing machinery
• Group facilitation space
• Meeting room/video conferencing
• Additional making/construction spaces
• Staff working area

A full extension to house a new FabLab at Creative Spark at 2,500 sq. ft. using the following estimate would require the following investment and assumes ownership of existing land:

<table>
<thead>
<tr>
<th>Space</th>
<th>Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,500 sq. ft.</td>
<td>€140 per sq. ft.</td>
<td>€350,000</td>
</tr>
</tbody>
</table>

The consultants advise that this is an estimate and would require that Creative Spark consult the appropriate architects and building control specialists extensively to gain accurate insights into the full cost implications of this option. An extension would need to be calculated accurately as this option costs considerably more than the previous options. For a full cost breakdown please see appendices.

**Equipment**

The costs of setting up a fully functioning FabLab at Creative Spark in a purpose built extension are below. In this scenario Creative Spark would invest in a full FabLab complement of equipment, staffing and any necessary building works upfront to establish the lab quickly and efficiently.

<table>
<thead>
<tr>
<th></th>
<th>Year One</th>
<th>Year Two (inc. Extension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub Total Equipment + Capital</td>
<td>€119,121.10</td>
<td>€350,000.00</td>
</tr>
<tr>
<td>Sub Total Operations</td>
<td>€89,350.00</td>
<td>€89,350.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td>€208,471.10</td>
<td>€439,350.00</td>
</tr>
</tbody>
</table>
Advantages

- All the necessary equipment and processes in place so projects, income generation and work towards any associated outputs, targets or impacts that may have been agreed can begin immediately
- Staff training in all processes can begin so a fully competent team can be established
- A greater number of workshops and manufacturing processes can be offered to new clients
- Disruption to existing services is contained to a specific period. Additional growth is most likely to be beyond the three year consolidation period.

The consultants note this option requires several months of installation, trouble shooting and staff training to fully utilise the benefits of the FabLab. A new FabLab can be supported by an established FabLab in the Fab Foundation Ireland network, with support for staff training to potentially shorten the usual time frame in being operationally ready.

Applications for FabLab

The breadth of the applications of a FabLab is wide and far reaching; in this section we will explore several models of how they have been used and the associated benefits of each. These approaches are not mutually exclusive and can be employed simultaneously, however rapidly changing market needs may stipulate that certain emphasis is place on a particular model to accelerate sustainable growth.

Enterprise Development

In this application the FabLab is focused on its use as a facility for accessible digital fabrication and prototyping; supporting members, individuals and companies in the production process. In addition the enterprise model will focus on developing innovation, helping users increase the effectiveness of their innovations through associated service support; hot desking, incubation space, research, marketing and networking. In this scenario the FabLab looks to create value for both the organisation and user. The stakeholders in this area are most likely to be individuals/entrepreneurs, Start ups, micro business, SME, industrial enterprises and social enterprises. In this scenario the individual or start-up will benefit from knowledge transfer, a community of makers and entrepreneurs and access to production facilities whilst retaining control of product development.

An example of this is FabLab London which principally offers a creative environment for innovative early-stage companies to design, prototype and go to market with their concept, supporting companies who make objects and devices that are part of the Internet of Things (IoT), cloud computing, machine learning and virtual reality. FabLab London has provided fabrication services to industry and developed a suite of incubation spaces to house new tech start-ups.

Educational Resource

In this model FabLab machines and skilled personnel are a resource for learning for children, young people and adults with resources being used for different types of workshops and hands on learning experiences directly applicable to the targeted learner. Stakeholders typically range from Schools, Colleges, FE, HE, adult & lifelong learning, community organisations and individuals. Educational activity may include themed workshops for schools in STEM/STEAM, developing educational
resources and accreditations, supporting FE and HE specialised training (Robotics/Digital Craft/Product Design/3D Printing etc.), teacher training and networking and peer to peer learning experiences. FabLab Nerve Centre has successful integrated digital fabrication teacher training into its schools programmes that trains over 400 teachers across Northern Ireland per year.

Research & Development
FabLabs have found success in applying design led solutions and digital fabrication technology as means of research and development on a wealth of areas. The breath and flexibility of the processes and technology contained in a lab means that FabLabs have a unique offer when partnering with other institutions of research and development projects. We Create in Cloughjordan has been successful in partnering in citizen science programmes, where the direct access to technology has been a USP, which have been the subject of successful Interreg Horizon 2020 applications. FabLab at U –Casadh also embeds master and doctoral students within the lab to conduct active research projects and assimilate data.

Community Development
FabLabs have been proven to be innovative models of engaging communities including creating opportunities for peacebuilding, labour market integration, accelerating new start social enterprises and building collaborations between the social economy, the private sector and intermediaries in finance, mentoring support and skills. This has seen children, young people, students, adults of all ages and abilities discover ways to participate. A dual approach to building people’s skills, understanding and knowledge sit alongside personal development, encouraging imagination and confidence. There is considerable interest in the concept of social innovation across Europe and more recently in Northern Ireland (Murray et al, 2010). Walter-Herrmann and Büching (2013) argue that FabLabs can be identified as a driver of genuine social innovation by offering a space for creative problem solving, replicating and scaling innovative practices and thinking through more ambitious approaches to social problems. Kickul and Lyons (2012, pp.45-46) also identify different types of innovation that are directly applicable to the FabLabs:

- The potential creation of new services; a new process for producing or delivering a local development product, service, programme or project.
- The potential or capacity to build on existing organisation or project to a new or previously underserved market.
- Utilising a new source of labour or other production inputs, by using digital hard and software to create new pathways to employment and training.
- Implementing a new organisational structure and implementing new ways of engaging target beneficiaries.
Demand for Services (Analysis)
At time of writing there is no FabLab facility within Dundalk, Drogheda or Co Louth with indicates very little risk of duplication of services and little in the way of provision that will displaced if a FabLab were established. This provides an opportunity for first move status and the advantages that this will bring.

Target Audience
The FabLab at Creative Spark would target a range of groups and beneficiaries including:

- Businesses
- Enterprise organisations
- Universities / Colleges
- Individuals
- Schools (Primary & Post Primary)
- Community groups
- Youth clubs

Consultations have been undertaken with a range of potential target audiences, and have developed an indicative profile of the participants who are most likely to use services. The following table shows the projected breakdown of potential users of the FabLab at Creative Spark, by way of an indicator, over a one year project period. The forecast participant numbers shown are based on a fully functioning FabLab with 1.5 dedicated staff members, showing potential usage over the first year. It is anticipated that user numbers will grow in years 2-3.

<table>
<thead>
<tr>
<th>User Group</th>
<th>Forecast Participants Per Annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Consultations</td>
<td>100</td>
</tr>
<tr>
<td>Business/Corporate Clients</td>
<td>15</td>
</tr>
<tr>
<td>New Start Up/Enterprise support</td>
<td>10</td>
</tr>
<tr>
<td>DKIT</td>
<td>150</td>
</tr>
<tr>
<td>Individuals Members</td>
<td>50</td>
</tr>
<tr>
<td>Drop –In / Events</td>
<td>500</td>
</tr>
<tr>
<td>Lightbox Labs</td>
<td>15</td>
</tr>
<tr>
<td>The Friary Youth Club</td>
<td>20</td>
</tr>
<tr>
<td>The Outcomers</td>
<td>15</td>
</tr>
<tr>
<td>Louth Volunteer Centre</td>
<td>30</td>
</tr>
<tr>
<td>Craobh Rua Community Project</td>
<td>20</td>
</tr>
<tr>
<td>Seatown Men’s Sheds</td>
<td>10</td>
</tr>
<tr>
<td>An Tain Arts Centre</td>
<td>20</td>
</tr>
<tr>
<td>Redeemer Family Resource Centre</td>
<td>25</td>
</tr>
<tr>
<td>Dundalk Youth Centre</td>
<td>60</td>
</tr>
<tr>
<td>Foroige</td>
<td>50</td>
</tr>
<tr>
<td>The House</td>
<td>25</td>
</tr>
<tr>
<td>Wellington Hall</td>
<td>25</td>
</tr>
<tr>
<td>Dundalk Sports Centre</td>
<td>10</td>
</tr>
<tr>
<td>The House Coxes</td>
<td>10</td>
</tr>
<tr>
<td>Organisation</td>
<td>Members</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Garda Youth Diversion Project Muirhevnamor</td>
<td>15</td>
</tr>
<tr>
<td>Nestling Project</td>
<td>20</td>
</tr>
<tr>
<td>Special Needs Active Parents (SNAP)</td>
<td>22</td>
</tr>
<tr>
<td>Drogheda CoderDojo</td>
<td>15</td>
</tr>
<tr>
<td>Drogheda Schools</td>
<td>100</td>
</tr>
<tr>
<td>Dundalk Schools</td>
<td>450</td>
</tr>
<tr>
<td>Co. Louth Schools</td>
<td>200</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1982</strong></td>
</tr>
</tbody>
</table>

**Members**

It is envisaged that potential Creative Spark FabLab members will be drawn from a range of individuals and organisations from across Co. Louth. In addition Creative Spark may choose to promote the benefits of FabLab membership or combine this with existing Print studio membership for an added value package.

**Drop In Users**

Users for drop in sessions will be drawn from individual participants who might have previously participated in events of programmes at Creative Spark. Drop in users also give Creative Spark a way in which to up sell services and training opportunities that maybe planned as part of the programme.
Stakeholder Views on Demand for Services
An Online Survey was conducted (See Appendix for full questions) with stakeholders from the Creative Spark database.

FabLab Awareness
The survey showed that:

- 70% of respondents had heard of FabLab before
- 16% had used a FabLab before
- 2% of those users would not use them again

The chart below shows that 49% of respondents stated that digital fabrication was either important or very important to them and 26% of people indicated they would use digital fabrication in the next year.

How Important is digital Fabrication to you ?

- Very Important
- Important
- Moderate
- Somewhat
- Not at all

Do you expect to be using digital design and/or manufacturing in the next year?

- Not at all
- Somewhat
- Yes

Purpose of a FabLab
The respondents gave a very balanced view of what they perceived the primary purpose of a FabLab to be as the table below shows. Providing skills training, access to tools & tech support, supporting new creative tech start ups and developing a community of makers were give slight preference.
What do you think the primary purpose of FabLab at Creative Spark is?

- Provide skills based training in new technologies
- Access to digital maker tools and technical support
- Supporting new creative tech start up and enterprises
- Develop a creative community of maker practitioners using digital tools
- Provide and innovative community resource
- Create new employment opportunities within the North east
- Promoting maker Technology and a learning experience
Using a Fab Lab and digital fabrication

74% of people stated that they would expect to use digital design or fabrication within the next year.

20% of respondents reported that their business requires a design and fabrication service, with the majority requiring this on a monthly basis.

The survey responses show that most respondents if using external providers for digital design and fabrication use this for 3D design, prototyping and 3D printing. 67% using a private sector provider and 25% using a 3rd level institution to do this. When asked whether they would consider using a FabLab for this service,

96% said that they would consider using a FabLab for 3D design, prototyping and 3D printing

Over 92% of respondents were interested in potential training workshops if there were a FabLab at Creative Spark, with 77% expressing interest in 2D & 3D design training.

62% stated their organisation/profession would be in interested in partnering with a FabLab

64% saw that there was wider strategic fit within County Louth.

Income and membership

87% of respondents said that they would pay for a service at FabLab
77% of people were interested in being a member of a FabLab.

A majority of respondents stated annual spend for respondents on digital design and fabrication was stated at under €1000, the monthly costs are expectations recorded below.

**How much for a monthly membership?**

**What would you expect from membership**

Respondents identified the lowest cost option as preferred and we can see that the technical supervision and 24 hour access were preferred as membership benefits. Hourly and daily rates that respondents identified are recorded below:
In all instances the preferred option was the lowest cost option available by respondents.

Online Survey and Telephone Interviews

12 Telephone interviews were held with key stakeholders to gain a more in depth response to the proposal of establishing a FabLab at Creative Spark. The survey questions were used however the nature of the interviews allowed for more conversation to occur and a greater stakeholder understanding. A number of comments have been highlighted to illustrate some points around demand and potential impacts. Most respondents would indicate that they would use FabLab as an individual their organisation or something to recommend to those they work with.

What would you be most interested in?

Most of those interviewed were interested in access the tools and technical support that would be available within the FabLab. This was also coupled with learning or instructional elements so that many more people could benefit from the resource who weren’t directly looking to design or manufacture artefacts.

- **Access to tools and skills based learning – especially learning and awareness for young people.**

- **Allow access to tools and devices for the development of smaller, more creative pieces**

- **Access to different tools for hardware development – this would help with the early stage development support for new products**

- **A Prototyping service for companies in the early stages of product development**

- **Educating my students to help them – preferably something that’s an experience and not a course**
Primary purpose of FabLabs?

The responses were represented the multifaceted nature of what a FabLab can provide and in addition some questions over what Creative Spark saw as the primary purpose. There was a leaning towards FabLab supporting new tech start ups, creative business, 3D design & printing and a resource for young people.

*To provide access to tools and technical support for individuals and business*

‘I’d like to see a strong commercial focus from the start with the key users being Start ups, entrepreneurs and college students’

*I’d imagine this would be attractive to new entrepreneurs within the Co. Louth Region*

It depends on what equipment the lab will purchase – it will be a great test bed for exploring ideas and the skills and training will help facilitate people to make new products. Certain pieces of equipment will give Creative Spark a USP

*I’d ask the question – why does Creative Spark want a FabLab – can they articulate this would be for?*

*Open access to tools and processes – this is very powerful*

I think FabLab should be used for prototyping for companies in the early stages in development. MCOR would really have benefitted from a facility like this as we were starting out. Also – we’d be supportive of a FabLab being used for education and teaching fabrication techniques.

*(Digital Fabrication) is ONE of the things CoderDojo would want to expose young people – it’s not our primary purpose but sits alongside what we do.*

Who should FabLab activities be aimed at?

Activities were a broad split, demonstrating the number of sectors that could potentially benefit from a FabLab being housed at Creative Spark.

*Business, Professionals, Young people and schools – the 3D printing course that was run last year showed the diversity of backgrounds attracted to this. I was from an engineering background and was paired up with a jeweller!*

*Education – not as competition to DKIT but as a lead that may feed students into the college. FabLab would also be able to give students a chance to mix with people from other backgrounds and professions in a working environment. We are preparing students to do more digital work – not just heavy engineering – so it would be great to be able to link together.*

*FabLab put people first – not subject first - like ‘I have an idea and I want to try this out...’*

*Practitioners, designers and creatives from the Co. Louth area.*
Business will need a focused training programme to help new start ups

Creative Spark is community focused, so a FabLab there is better suited to smaller start ups perhaps with less technical experience.

What services would you be interested in?

The responses often mirrored the interviewees’ background or areas self-interest. However, most respondents noted that they would be interested the learning aspects of FabLab – whether as an individual, for business or educational establishment.

Accessibility to expertise – especially over the summer when the regional development centre is difficult to contact – we need a start-up culture – not a term time culture.

Something that is more than just one off – a longer exposure as kids our age want project work using 3D printing or Arduino

‘Learning and skills based experiences in digital fabrication’

Rapid Prototyping products – This would enable me to extend my offer as a graphic designer as I’m now being offered jobs involving 3D printing. It would broaden my offer as a graphic artist – this changes what I can bring to the table to businesses.

Rapid Prototyping products and concepts – this will give students something to hold and not just a picture on a screen.

‘24 hour access to the machines’

‘3D design and Solid Works training’

What benefits & impacts do you think a FabLab will bring?

A broad spread of benefits were recorded that spanned business and commerce, educational and social benefits;

Joint project work, having the students experience manufacturing products, new opportunities on their doorstep and people considering things they wouldn’t had the lab not been there.

Working with a FabLab would bring us problem solving, 3D Design and networking advantages – and hopefully vice versa.

My students like to be hands on – they haven’t taken to software programmes or digital tools – I can see FabLab helping with this.

It’ll help our 3D design engineers – we have 60 employees – but not one 3D printer. If we could work with FabLab our design engineers could then visualise components. We manufacture huge components for the energy sector so 3D printing can scale these down and model these for our clients.
Costs & Expectations

Most interviewees were content to pay to use FabLab services; however the specific offer would determine the actual pricing.

How would I have to pay to make this worthwhile? I’d prefer to have a full day for a more immersive experience

I’m a print studio member – so I’d not pay an additional monthly fee – but perhaps a top up for use the lab

Coder Dojo has free to ‘access to all’ as a Core principle, it’ll be great to have some subvention so that we can have access. We’d pay for one off event if we thought it was relevant to our programme

I think there would be corporate nationally and locally who’d support FabLab under their CSR objectives

We have an R&D unit – but we would consider using FabLab and paying for the service if it helped us develop our new products quicker.

Strategic Fit

Most interviewees suggested a FabLab would have a strategic fit with many other initiatives across Co Louth and that a FabLab would add value to research projects and, enterprise programmes. Several recognised that Dundalk was located between Belfast and Dublin allowing business opportunities for local organisations that have not previously had outlets for creative use of technology. There were several comments referring to the belief that Co. Louth was a creative, innovative and industrious area and a FabLab would be a beneficial addition to the area. It was also recognised by respondents that Dundalk now has a smaller high tech industry rather than big manufacturing companies and a FabLab would seem to sit alongside this trend.

I think there is a strategic fit, however it would need to be linked to with DKIT – and also needs to make sure FabLab at Creative Spark differentiate themselves from other similar services.

There are rapid prototyping services already – but these are not community led. If we develop a creative community with a FabLab as a cornerstone this could generate future job opportunities within the area.

.... join up communities that already exist without displacement and share our expertise, a FabLab could catalyse this happening...

There are plenty of people with ideas from all over the county, but it’s really hard for them to make these in reality – we need a place where you can go and tinker.

It’ll be good for Dundalk and across the county as there isn’t this facility in Dublin yet – it’s an opportunity as the north east is producer and half way between Belfast and Dublin.
There would be opportunities locally for business; previously they’d not had the outlets for their creativity. A FabLab would go some way to develop a knowledgeable creative community that could generate new jobs, there are rapid prototyping services but these are not community led and don’t support innovation.

Dundalk was once had big manufacturing – now it’s more high tech industry and I can see how a FabLab is beneficial to this.

We have lots of renewable energy companies and engineering skills – but adding design and creativity to this will help stimulate growth and new products.

I don’t believe the technology is fully embraced within the county – there is the interest – as seen by last year’s 3D printing symposium – but it’s still new and has the chance to develop. If there spaces like FabLab it will help as our knowledge of this tech is missing.

Post primary schools have leaving certs in Technology, graphics design, engineering, metal work – these don’t necessarily link to the technology readily available in industry – FabLab can be this bridge to technology used in current industry.

I’d love to become a tutor at FabLab, to inspire people into new forms of engineering and connect what happens inside a classroom with outside a classroom.

Partnerships & Collaboration

Most respondents were interested in a potential partnership with a FabLab at Creative Spark; ideas suggested were wide and varied and represented the individuals or organisational perspective. DKIT was seen to be a natural partner, rather than competitor as they’d operate in different spheres and a key recognition is that FabLab would give access to tools that only the student population can access a DKIT.

We’ve worked with FabLab Limerick and would be interested to work again particularly on a UI interface for 3D CAD programmes that suit new maker appetite for CAD

We’d partner on design training programmes and different types of projects. I’d see opportunities in education for product designers and collaboration between disciplines.

Coder Dojo’s would want to expose young people to digital fabrication, although it’s not our primary purpose. We can see many opportunities to work together...

Joint project work with students, having students manufacture products, and also opportunities to design in conjunction with others – perhaps community or social groups.

Sustainability

There were some questions over how Creative Spark would financially sustain a FabLab at Creative Spark.

‘How many people will you need to get paying €50 per month to be sustainable? The real issue will be subvention or support so we can have access to the FabLab.’
“How does adding a FabLab to Creative Spark assist in the overall sustainability of the organisation? Any FabLab at Creative Spark needs to be commercial – with business guidance on the board – to bring in revenue money so it can support itself.’

Suggestions

Several respondents we able to make suggestions as to how any potential FabLab might develop its programme offers:

‘Having something for people for don’t go to DKIT, because they may feel intimated, is important. The experience people have in FabLab and the support they receive is crucial as lot of people’s experience at school puts people off FE. A positive experience may make people believe STEM is for them.’

‘A regular collaboration between Dojo’s and FabLab – a bit more than just one off exposure.’

‘A FabLab as Creative Spark could be unique using their relationship with MCOR’

‘Develop a design ‘Dojo’ with DCCOI’

‘Tie in with Fab City Initiative in Barcelona and Amsterdam – FabLab can move away from plywood furniture and expand as an innovation platform, responding to industry needs and responding to the enterprise culture within Dundalk.’

‘Link with Open source maker movement – open desk & wiki house’

‘Use DKIT students as a resource – can they help the community in building business’ or social programmes?’

‘I’m sure FabLab would be a valuable resource for the county, Enterprise Ireland could point clients to the FabLab for particular services, like a referral. I think it would add to the enterprise culture within Dundalk.’

‘You could link with the local enterprise offices and DKIT to help support the commercialisation of student projects.’
Staff Responses
Creative Spark currently has two full-time employees (Sarah Daly, Executive Director and Heather Cassidy, Print Studio Development Officer), a part-time bookkeeper, a JobBridge Intern and 4 Tús placements. Existing Creative Spark staff team was assessed to see what competences relevant to a FabLab existed.

Whilst some staff have good to proficient levels of competency in craft, art, design and IT skills, it is clear that there is a lack of the specific skill sets needed to run a FabLab which would encompass multiple disciplines including education, arts, mechanical engineering, electrical engineering, computer science and manufacturing engineering.
Creative Spark FabLab Feasibility
If Yes have you ever used Fablabs Before?

- Yes: 14%
- No: 86%
Potential Sources of Finance and future model of sustainability

Self-Generated Income Models
Self-generated income models are ways in which Creative Spark can use equipment and expertise with a FabLab to build revenue streams.

**Machine Hire/Fabrication service** – Charged at hourly or daily rates for individuals or organisations to use equipment in the lab under both commissioned and unsupervised circumstances.

**Design Service** - A 2D or 3D design service to prepare drawings for manufacture within the Lab or for other external processes. This requires access to skilled staff members (employees or freelance) who are experienced in a range of relevant software packages.

**Membership models** – Drawing on Creative Spark’s membership model of the print studio, a similar scenario would have individuals paying monthly or annually a fee to use FabLab services with an element of exclusivity. These maybe limited to an upper limit dependant on the space and resources FabLab has to offer and will be grown over a three year period to maximum capacity.

**Training & workshops** – A range of knowledge transfer experiences for groups or individuals to learn new techniques related to design and fabrication. There are numerous ways in which to deliver these, being short and temporary, one off masterclasses for example or longer term with an option of accreditation, a six week 3D design class for example.

**Corporate Engagement** – This will involve training/team building experiences for staff teams within SME and larger corporations delivered as a half day or full day experience using design and fabrication tools. This can involve entrepreneurial thinking and action, teambuilding and design led problem solving with established teams/companies.

**Small Business Incubation spaces** – (Space dependant) locating small micro businesses in or close to the FabLab to attract product orientated/tech start ups space to grow. Rent would be charged over a12 moth period.

The following tables indicate the typical prices charged through the hired use of FabLab equipment & expertise, memberships and training and workshop delivery as a means of generating income for the sustainability of FabLab at Creative Spark.

<table>
<thead>
<tr>
<th>FabLab Machine Hire</th>
<th>Per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser Cutter (Mini / Zing)</td>
<td>€30</td>
</tr>
<tr>
<td>Laser Cutter (Fusion)</td>
<td>€40</td>
</tr>
<tr>
<td>ShopBot</td>
<td>€50</td>
</tr>
<tr>
<td>Vinyl Cutter</td>
<td>€20</td>
</tr>
<tr>
<td>Item</td>
<td>Price</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Modella MDX 20</td>
<td>€15</td>
</tr>
<tr>
<td>Modella MDX 40</td>
<td>€20</td>
</tr>
<tr>
<td>Ultimaker/Makerbot</td>
<td>€0.6 per gram</td>
</tr>
<tr>
<td>U Print 3d printer</td>
<td>€1.2 Price per cm³ (+£10 Admin if under £100)</td>
</tr>
<tr>
<td>CNC Lathe</td>
<td>€20</td>
</tr>
<tr>
<td>Electronics Bench (soldering Iron + components)</td>
<td>€15</td>
</tr>
</tbody>
</table>

**Support, design and prototyping service**

<table>
<thead>
<tr>
<th></th>
<th>Design</th>
<th>Machine Usage</th>
<th>Technical Support (min 1 hr)</th>
<th>Lab Hire (P/day inc Tech Support)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual usage (open Access days)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Social Enterprise or Charity</td>
<td>€40 p/h</td>
<td>Per hr costs</td>
<td>€25 p/h</td>
<td>€500</td>
</tr>
<tr>
<td>Business (individually operated)</td>
<td>€50 p/h</td>
<td>Per hr costs</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Business Bureau Service</td>
<td>€50 p/h</td>
<td>Per hr costs</td>
<td>€35 p/h</td>
<td>€700</td>
</tr>
<tr>
<td>Business Commercial Use</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>€1500</td>
</tr>
</tbody>
</table>
Membership (based upon current Print Studio)

<table>
<thead>
<tr>
<th>Type</th>
<th>Cost</th>
<th>Access to full suite of FabLab equipment (after induction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Membership</td>
<td>€360</td>
<td>50% Reduction on Machine hire costs (1hr booking minimum)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paid monthly/Annually</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Priority Booking for Training &amp; Masterclasses</td>
</tr>
<tr>
<td>Monthly membership</td>
<td>€40 p/month</td>
<td>As Above</td>
</tr>
</tbody>
</table>

Training & Workshops

<table>
<thead>
<tr>
<th>Type</th>
<th>Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Classes</td>
<td>€30 p/head</td>
<td>2hr workshop in digital fabrication techniques</td>
</tr>
<tr>
<td></td>
<td>€70 p/head</td>
<td>Full day workshop. Typical Activity may include Laser Craft Workshops, Lamp Making, Basic Arduino</td>
</tr>
<tr>
<td>Summer Camps (10-16yrs)</td>
<td>€100 - 200 p/head</td>
<td>5 days. Typical Activity - Digital craft, Robotics, Jewellery Making, Fab Fashion (wearable's)</td>
</tr>
<tr>
<td>Accredited Training (to be developed by provider)</td>
<td>€400 p/head</td>
<td>5 days hands on accredited learning programmes: ‘Introduction to digital Fabrication’</td>
</tr>
</tbody>
</table>

Corporate

<table>
<thead>
<tr>
<th>Type</th>
<th>Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsorship/ SCR Partnership</td>
<td>€2000 per sponsor</td>
<td>Corporate Partner to support FabLab events and or programme</td>
</tr>
<tr>
<td>Corporate Training</td>
<td>€800 per event</td>
<td>Teambuilding and or Staff development days using design thinking and digital fabrication techniques</td>
</tr>
</tbody>
</table>

Creative Spark Resources

The consultants can recommend that a full audit of existing resources (Human, revenue and capital) to assess the viability of using surplus resources or repurposing resources into a FabLab at Creative Spark. Creative Spark has an existing cohort of members, users and course participants who will be the initial target audience for FabLab activities and facilities. It has a database of over 1500 past participants and a further 1000+ local businesses and organisations with which it regularly communicates and interacts. Existing arrangements and procedures for PR, course bookings, facilities bookings, accounts, day to day management, etc. could be expanded to support the development of a FabLab at Creative Spark.
Local Authority and State Authority Grants

1. REDZ Funding

Rural Economic Development Zones (REDZ) are functional, rather than administrative geographic, areas that reflect the spatial patterns of local economic activities and development processes. They are, in effect, the sub-county zones within which most people live and work. Research supporting the 2014 report of the Commission for the Economic Development of Rural Areas (CEDRA) identified potential Rural Economic Development Zones in all areas of Ireland and recommended the implementation of a pilot initiative to support a localised approach to the development of REDZ.

The central objective of the REDZ model is to utilise the synergies and interdependencies between rural towns and their hinterlands to generate economic activity in the local area. The involvement of local communities, including the business community, is a key element in the REDZ model. Collaboration between Local Authorities, local communities and business interests will be an essential part of the scheme and the involvement of other State agencies, Regional Skills Fora, etc., is also encouraged where they have a role in supporting local economic development.

It is worth noting that in 2016 a manufacturing unit in Portarlington Enterprise Centre received REDZ funding for conversion into a training/hot-desking area, equipped with a FabLab. While it is not certain that there will be a 2017 iteration of REDZ funding it is recommended that Creative Spark stay informed through the relevant department.

2. Local Enterprise Offices

Local Enterprise Office Louth (LEO Louth) exists to stimulate economic and entrepreneurial activity in County Louth, and to develop local indigenous enterprise potential in the micro-business sector.

LEO Louth seeks to harness collective effort across a broad spectrum of the local community with a view to generating a local economy of real strength and durability, through growth in employment and wealth as well as improved competitiveness. In order to achieve its objectives, the Local Enterprise Office Louth has a range of support instruments, both financial and non-financial, at its disposal to assist viable proposals for business start-up and expansion projects.

LEO Louth offers advice, counselling, training, networking and financial support to budding entrepreneurs and existing enterprises in support of the generation of employment and economic growth in County Louth, for the benefit of all its citizens. Here they may be opportunities to a FabLab to partner on LEO initiatives support it in the achievement of its objectives.

3. Louth Leader Partnership

LEADER can support micro, small and medium enterprises as defined in Commission Recommendation 2003/361/EC. Louth Local Enterprise Office (LEO) has primary responsibility for micro-enterprise in County Louth. LEADER must complement rather than compete with LEO activity; effective systems of collaboration and consultation are required to ensure a co-ordinated and effective allocation of resources.

Areas that might benefit most from LEADER support:
- Artisan and other food businesses;
- Renewable Energy;
- Agri diversification;
- Marine diversification (to complement support provided by Fisheries LAGs funded under the European Maritime Fisheries Fund);
Social Enterprises; and
Creative Industries, such as traditional crafts, new media and design.

Supported projects might include investment support or sector-specific training programmes for aspiring entrepreneurs, early stage promoters, social enterprises, start-ups and established SMEs. In the context of LEADER, developing inclusive models of business support will be key to realising the potential of groups who are underrepresented in enterprise, e.g. women, young people and people with disabilities.

This programme appears to have a fit with a proposed FabLab at Creative Spark and the consultants recommend that

4. Enterprise Ireland

Enterprise Ireland is the government organisation responsible for the development and growth of Irish enterprises in world markets. It works in partnership with Irish enterprises to help them start, grow, innovate and win export sales in global markets. In this way, it supports sustainable economic growth, regional development and secure employment.

Enterprise Ireland administered the Community Enterprise Initiative 2015-2017 which was open to new and existing organisations, groups and alliances, who collaboratively sought to promote entrepreneurship, create jobs, foster innovation and enhance export opportunities for small business. A prerequisite for proposals was the need to demonstrate innovative solutions to fostering and creating employment. It is anticipated that a similar scheme may be launched in 2017.

It is likely that Enterprise Ireland would drive potential sales to a new FabLab at Creative Spark depending on the range of services offered. Creative Spark should also keep abreast of Enterprise Ireland developments in this area.

5. Creative Ireland

Creative Ireland is the Government’s Legacy Programme for Ireland 2016 – a five-year initiative, from 2017 to 2022, which places creativity at the centre of public policy.

There are five pillars in the Creative Ireland initiative including the following which may be of direct relevance to a FabLab proposal: Ireland as a Centre of Excellence in Media Production.

The overarching, long-term objective of this pillar is to elevate the creative industries including media, architecture, design, digital technology, fashion, food and crafts drawing together, on an all-of-government basis, State agencies, industry partners and those engaged in fostering innovation in enterprise.

EU Funding

1. ERDF Funded Cross Border Cooperation Programmes –
   a. PEACE IV – contact with representatives of Managing Authority indicate that there is little or no likelihood of funding being available for a one-off Fab Lab set up project. Potential may exist under the Children and Young People and the Creating Shared Spaces themes in the programme for partnership based projects that are focused on the reconciliation aims of the programme. This is not likely to fit with Creative Spark’s timetable or priorities.
   b. INTERREG V – contact with representatives of Managing Authority indicate that, while there is potential for funding under the Research and Innovation theme, the timing for
these calls is not likely to suit Creative Spark’s timetable. There would also be a requirement for strong cross border partnerships to have been set up specifically aimed at initiatives that are eligible under this programme.

2. **ERDF Programme for the NWRA (Northern and Western) Regional Assembly – formerly BMW Region)** – Two priorities in the Operational Programme may be of relevance: (1) Strengthening RTDI in the BMW Region and (2) SME Support, promotion and capability development. The Managing Authority is the NWRA Regional Assembly and can be contacted at *The Square, Ballaghaderreen, Co Roscommon, Ireland, +353 94 986 2970*. Prospects for funding for capital build and ongoing core funding are slim as much of this programme has already been earmarked for large scale projects in less developed parts of the region.

3. **Territorial Cooperation Programmes – Trans National and Interregional** – It would be good to list the relevant ones. Opportunities may exist under these programmes for some funding as part of a wider partnership group involving partners from a number of member states / regions. The timing of these opportunities is not likely to suit Creative Spark’s immediate needs. The likelihood of capital funding being available is very small.

4. **ESF Programme** – Managing by the Department of Education and Skills, these funds are predominantly aimed at the provision of education and training opportunities and are distributed through a wide range of agencies in that sector. It is highly unlikely that Creative Spark would qualify for funding for this kind of project.

5. **Horizon 2020** – Funding for research and innovation available for high level post-doctoral research involving wide ranging partnership structures across a number of member states. Not applicable to a single Fab Lab project. Opportunities to participate in partnership structures in the future will open up if a Fab Lab is created in Dundalk.


**Other Income**
The following illustrates the potential sources of other income available to FabLab at Creative Spark once a FabLab is established.

**Corporate/Business Sponsorship:** Income generated through CSR sponsorship from appropriate businesses. With several large corporate business and indigenous local technology business located in and around Dundalk this is an option open to Creative Spark.

This may take the form of:

- Co-Financing capital expenditure
- Sponsored Activity; FabLab Summer Programmes, Educational and training Programmes
• Research Partner
• Naming rights; A key local business can be offered naming rights for the FabLab
• Key Donor; this may be by supplying equipment or revenue costs

Additional research is needed to assess actual demand and likelihood of this option.

**Creative Business**: Increased rental income due to FabLab being located at venue.

**Social enterprise Business**: Creative Spark to launch its own tech/product/service enterprises through FabLab. Creative Spark can offer share capital for these to build investment opportunities in potential high growth concepts

**FFI Network Activity**: The Fab Foundation Ireland commissioning maker/research activities as a source of income and conducting feasibility studies into additional activities.
Viability assessment

Having considered the options the consultants and strategic background the consultants recommend the follow steps.

Housing a FabLab at Creative Spark

The consultants see option two, building an additional space within Creative Spark as the preferred option for establishing a FabLab at Creative Spark. Although more costly upfront, this option minimises disruption to existing services, does not lower income generation from having to repurpose existing units and offers better growth potential if expansion is required. The current occupancy is at 95% and therefore establishing a FabLab within the current physical space will interrupt current tenants and may lose valuable income from rentable space which would be reduced.

Option one, where equipment and staff are gradually developed over a three year period is lower upfront cost and allows the FabLab to develop and shape services unique to a FabLab Creative Spark as demand grows. An operational Lab would be in place to generate income and deliver on key strategic aims for the organisation.

Demand

There is wide ranging support for a FabLab among potential users and stakeholders. Written support should be gained from key corporate, voluntary & community and public sector bodies who may act as potential stakeholders or investors in a FabLab at Creative Spark. The management team may also look to build a partnership of organisations across county Louth and conduct further specific research into private business demand and possible corporate social responsibility options.

It appears that demand for FabLab services is in many cases linked to how activity will be financed, with schools and community engagement aligned to LA, or government agenda. Therefore demand and sustainability should be considered in tandem.

The consultants suggest that an initial balanced service offer is developed that reflects the needs of the wider community. Overleaf is a table with a breakdown of the areas which may reflect the initial focus of the programme.
<table>
<thead>
<tr>
<th>Table of Demand</th>
<th>Target Group</th>
<th>Weighting of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Support &amp; Enterprise development</strong></td>
<td>Private Businesses</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Individuals / Start Ups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterprise Agencies</td>
<td></td>
</tr>
<tr>
<td><strong>Individual access &amp; membership</strong></td>
<td>Whole Population</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Makers &amp; Creative Professionals</td>
<td></td>
</tr>
<tr>
<td><strong>Educational activity using digital fabrication tools</strong></td>
<td>Schools (primary, Junior &amp; Leaving Cert)</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Colleges (FE &amp; HE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Youth Groups (accredited Training)</td>
<td></td>
</tr>
<tr>
<td><strong>Community Engagement</strong></td>
<td>Youth &amp; Community Groups</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Older People Groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cross Border Initiatives</td>
<td></td>
</tr>
<tr>
<td><strong>Workshops and Training Experiences</strong></td>
<td>Individuals &amp; community interest groups</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Teachers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Youth Leaders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professionals</td>
<td></td>
</tr>
<tr>
<td><strong>Partnership Programmes</strong></td>
<td>County Council</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>National Networks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corporate (CSR Sponsorship)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arts /Tech/Enterprise residencies</td>
<td></td>
</tr>
</tbody>
</table>
Financing

The consultants recommend approaching key national and local authority bodies to secure the capital investment for a project of this scale using the cost profiling in this feasibility study. The likelihood of EU funding for capital investment in the short term for a project such as this is very slim. There is potential for future funding for ongoing activity and programme funding if partnership structures can be put in place.

The consultants would note that the creation of a Fab Lab opens up opportunities for future EU funding that would not exist otherwise.

Creative Spark, as an Enterprise Centre, has experience of supporting and growing new commercial business; initially developing the FabLab to serve this sector will give Creative Spark ways to finance activities and also generate income from services to this sector. There are strong innovation culture and support mechanisms already in place that alongside fabrication hardware and expertise will be attractive to new start-ups developing product. Semi mature start-ups can both develop product and accelerate within the existing business units. Creative Spark can also up sell training and new services to existing clients and draw new clients to both the new FabLab services and existing enterprise services.

A substantial Education and Community FabLab programme will require support in some form to allow for any meaningful impact. There appears to be limited scope for community organisations to pay for FabLab services on a project by project basis.

The research shows that participants are willing to pay for FabLab services that maybe offered by Creative Spark; this income generated from the uniqueness of the FabLab will need to be developed over a three year period to maximise potential.

At this stage the consultants recognise that this self generated income will need to be supplemented from other sources of income, including grants from central and local government and building support for FabLab in additional programmes Creative Spark may run. Partnerships should be immediately explored to maximise opportunities to build alliances that may open new funding opportunities. The objective will be to have a FabLab which is self-sufficient within a time period of three years.

The FabLab Membership model benefits would need extensive promotion within existing Creative Spark members although there is a need to test and quantify demand for this service with a concrete package. The table overleaf indicates potential income streams.
<table>
<thead>
<tr>
<th>Income Stream</th>
<th>Assumption</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership</td>
<td>£360 Per annum per member (€30 p/month membership per head)</td>
<td>€5,400.00</td>
<td>€7,200.00</td>
<td>€9,000.00</td>
</tr>
<tr>
<td>Equipment &amp; FabLab Hire</td>
<td>Full day Hire €500</td>
<td>€2,500.00</td>
<td>€5,000.00</td>
<td>€7,000.00</td>
</tr>
<tr>
<td></td>
<td>Machine Hire usage (per Hr/job)</td>
<td>€2,500.00</td>
<td>€6,000.00</td>
<td>€9,000.00</td>
</tr>
<tr>
<td>Training &amp; Workshops</td>
<td>Summer /Halloween/Easter Camp (12 y/p @ €250) x 3</td>
<td>€9,000.00</td>
<td>€9,000.00</td>
<td>€9,000.00</td>
</tr>
<tr>
<td></td>
<td>20 workshop Events (15 people each @ €30 p/h) increase 10% per yr</td>
<td>€9,000.00</td>
<td>€10,800.00</td>
<td>€13,050.00</td>
</tr>
<tr>
<td></td>
<td>20 Full day events (10 people @ €70 p/head) increase 10% per yr</td>
<td>€14,000.00</td>
<td>€16,800.00</td>
<td>€21,000.00</td>
</tr>
<tr>
<td></td>
<td>Corporate Partner to support FabLab events and or programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 x Sponsor = €2000 (double per year)</td>
<td>€2,000.00</td>
<td>€4,000.00</td>
<td>€6,000.00</td>
</tr>
<tr>
<td>Sponsorship</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corporate Training</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Teambuilding/ Staff development days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Full day event x €800</td>
<td>€1,600.00</td>
<td>€3,200.00</td>
<td>€6,400.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>€46,000.00</td>
<td>€62,000.00</td>
<td>€80,450.00</td>
</tr>
</tbody>
</table>

**Strategic Fit**

It appears there is significant strategic fit within internal, local and national plans. The argument to develop a FabLab is strong across many sectors and disciplines, however aligning Creative Spark to meaningful investment sources to realise their strategic vision would be an immediate concern.

**Staffing**

A key element will be ensuring existing staff are prepared for a FabLab; however the consultants recommend that any revenue financing includes recruiting dedicated management and technical staff to get a FabLab operational in a timely manner. This study revealed that the core technical competencies for operating the FabLab will need to be recruited externally as they do not exist in the current team.

A key element for Creative Spark is also to consider how the business model may influence recruitment. An Enterprise focused model will require a different skill-set to a Community/Education model.
Final Recommendations & Next Steps

Strategic & Development

• Louth County Council is supportive of the idea and can see some opportunities for financial support (capital) however there needs to be a clear sustainability plan to generate revenue income (from commercial sources) that clearly demonstrate where revenue costs will come from. This may impact the nature, direction and type of service offered by a FabLab at Creative Spark to one where income generation is the primary focus.

• Explore and develop the FabLab Enterprise model as the primary model of engagement, identify strategic alliances and investment streams for this.

• Explore and develop the Community & Education models as secondary models of engagement, build alliances with organisations which have strategic investment opportunities for this work.

• Identify appropriate organisations with which to begin to discuss financially supporting a FabLab at Creative Spark. Build project programme suitable to Creative Spark and the local community needs as the concept of a FabLab has a strong strategic alignment nationally and locally.

• Identify and build key partnerships to support a proposed FabLab with the wider community of Dundalk and Co Louth to minimise any potential replication of services being developed by enterprise centres, other consortiums etc.

• Ensure buy in from Creative Spark stakeholders including Board of Directors to agree a future FabLab plan.

• A full sustainability road map based on an indicative programme of activity for a Creative Spark FabLab should be developed alongside key stakeholders, including other enterprise Centres, DKIT, DCCOI, Louth Co Council. In addition Creative Spark should seek to secure a partner who can accredit work that takes places in a FabLab to develop an accredited training offer.

• Creative Spark should also explore the uniqueness of its offer and refine this to distinguish itself. This can be through their business model, equipment and processes or culture.

Operations

• Key success factors for the Enterprise model will require an experienced and passionate team of designers, electronics engineers and early-stage investors who can accelerate ideas to market

• Conduct full environmental impact analysis of the physical location of FabLab Equipment within existing Creative Spark building. Consult architects and relevant building control to explore options and costs.

• Identify core supports for FabLab within current Staff team where appropriate.

• Develop a FabLab training offer aligned to a nationally recognised accreditation that can be promoted at FabLab initiation.

• Be aware of disruption a proposed FabLab on existing services Creative Spark offers (noise, staff, storage for materials etc) An internal SWOT analysis should be conducted to mitigate risks.
A number of likely programme activities will need to be developed – this may be aligned to funding opportunities and the core mission of Creative Spark. These should also have a potential income stream attached to them, be they self-generated or subsidised.
### APPENDICES

1. **Costs for one Year**

<table>
<thead>
<tr>
<th>Proposed FabLab Costs</th>
<th>Unit Cost</th>
<th>Year 1 Sub-total</th>
<th>YEAR 2 Sub-total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Total</td>
<td>€89,121.10</td>
<td>€0.00</td>
<td>(Extension)</td>
</tr>
<tr>
<td>Building Works</td>
<td>€30,000.00</td>
<td>€350,000.00</td>
<td></td>
</tr>
<tr>
<td>Approximate yearly Material Cost (based on FabLab Belfast Usage patterns)</td>
<td>€9,000.00</td>
<td>€9,000.00</td>
<td></td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management (5 day p/m @ €200)</td>
<td>€12,000.00</td>
<td>€12,000.00</td>
<td>€12,000.00</td>
</tr>
<tr>
<td>Technical Manager/ tutor (FT)</td>
<td>€37,000.00</td>
<td>€37,000.00</td>
<td>€37,000.00</td>
</tr>
<tr>
<td>Technical Support Tutor (PT 20Hrs)</td>
<td>€15,000.00</td>
<td>€15,000.00</td>
<td>€15,000.00</td>
</tr>
<tr>
<td>Administration (1 day per week @€100 p/day )</td>
<td>€5,200.00</td>
<td>€5,200.00</td>
<td>€5,200.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>€69,200.00</td>
<td>€69,200.00</td>
<td>€69,200.00</td>
</tr>
<tr>
<td><strong>Overhead / Indirect Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>€0.00</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Heat Light Power</td>
<td>€3,600.00</td>
<td>€3,600.00</td>
<td>€3,600.00</td>
</tr>
<tr>
<td>Telephone Broadband</td>
<td>€550.00</td>
<td>€550.00</td>
<td>€550.00</td>
</tr>
<tr>
<td>Stationary</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td>Recruitment</td>
<td>€1,000.00</td>
<td>€1,000.00</td>
<td>€1,000.00</td>
</tr>
<tr>
<td>Marketing</td>
<td>€4,000.00</td>
<td>€4,000.00</td>
<td>€4,000.00</td>
</tr>
<tr>
<td>Audit</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td>Staff Travel</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td>Maintenance</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td><strong>Total Overhead / Indirect Cost</strong></td>
<td>€11,150.00</td>
<td>€11,150.00</td>
<td></td>
</tr>
<tr>
<td><strong>Sub Total Equipment + Capital</strong></td>
<td>€119,121.10</td>
<td>€350,000.00</td>
<td></td>
</tr>
<tr>
<td><strong>Sub Total Revenue</strong></td>
<td>€89,350.00</td>
<td>€89,350.00</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>€208,471.10</td>
<td>€439,350.00</td>
<td></td>
</tr>
</tbody>
</table>
## 2. Costs over three years

<table>
<thead>
<tr>
<th>Proposed FabLab Costs</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Equipment</strong></td>
<td>€63,105.10</td>
<td>€4,016.00</td>
<td>€22,000.00</td>
</tr>
<tr>
<td><strong>Building Works</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Works</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>€30,000.00</td>
<td>€350,000.00</td>
<td>€0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>€30,000.00</td>
<td>€350,000.00</td>
<td>€0.00</td>
</tr>
<tr>
<td><strong>Salary Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management (5 day p/m @ €200)</td>
<td>€12,000.00</td>
<td>€12,000.00</td>
<td>€12,000.00</td>
</tr>
<tr>
<td>Technical Manager/ tutor (FT)</td>
<td>€37,000.00</td>
<td>€37,000.00</td>
<td>€37,000.00</td>
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<td>Administration (1 day per week @€100 p/day )</td>
<td>€5,200.00</td>
<td>€5,200.00</td>
<td>€5,200.00</td>
</tr>
<tr>
<td>Technical Support Tutor (PT 20Hrs)</td>
<td>€0.00</td>
<td>€15,000.00</td>
<td>€15,000.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>€54,200.00</td>
<td>€69,200.00</td>
<td>€69,200.00</td>
</tr>
<tr>
<td><strong>Overhead / Indirect Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent</td>
<td>€0.00</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Heat Light Power</td>
<td>€3,600.00</td>
<td>€3,600.00</td>
<td>€3,600.00</td>
</tr>
<tr>
<td>Telephone Broadband</td>
<td>€550.00</td>
<td>€550.00</td>
<td>€550.00</td>
</tr>
<tr>
<td>Stationary</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td>Recruitment</td>
<td>€500.00</td>
<td>€0.00</td>
<td>€0.00</td>
</tr>
<tr>
<td>Marketing</td>
<td>€4,000.00</td>
<td>€4,000.00</td>
<td>€4,000.00</td>
</tr>
<tr>
<td>Audit</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td>Staff Travel</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td>Maintenance</td>
<td>€500.00</td>
<td>€500.00</td>
<td>€500.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>€10,650.00</td>
<td>€10,150.00</td>
<td>€10,150.00</td>
</tr>
<tr>
<td><strong>Sub Total Equipment &amp; Capital</strong></td>
<td>€93,105.10</td>
<td>€354,016.00</td>
<td>€22,000.00</td>
</tr>
<tr>
<td><strong>Sub Total Revenue</strong></td>
<td>€64,850.00</td>
<td>€79,350.00</td>
<td>€79,350.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>€157,955.10</td>
<td>€433,366.00</td>
<td>€101,350.00</td>
</tr>
</tbody>
</table>
3. Potential layout of FabLab extension.

Please note: this sketch is for illustrative purposes only and is not an architectural drawing nor has an architect been consulted to validate this.
### Activity Table

<table>
<thead>
<tr>
<th>Activity</th>
<th>Content</th>
<th>Duration</th>
<th>Participants</th>
<th>Staffing</th>
<th>beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Consultations</td>
<td>These sessions are open to Business whether already established or in the infancy stage. These sessions usually centre around prototyping or possible research into using the technology. These sessions are about promoting the use of FabLab in Business. They vary widely from 3D printing to large manufacturing one-off jobs.</td>
<td>½ day each</td>
<td>Dependent upon needs</td>
<td>2 (coordinator and technician)</td>
<td>Micro businesses&lt;br&gt;Large businesses&lt;br&gt;Individuals and SMEs&lt;br&gt;New start up and creative tech companies&lt;br&gt;Local people/organic community groups</td>
</tr>
<tr>
<td>Design and fabrication training for young people</td>
<td>This training will enable young people to create and design using CAD. They will learn to fabricate their designs using the laser cutter.</td>
<td>Small groups (up to 10 participants) 2 hour session. Larger groups, split session over 1 full day.</td>
<td>10 participants or 20 split into either 2 sessions or 2 rooms.</td>
<td>2 – 3 staff members per group.</td>
<td>Primary and Secondary Schools–Community organisations&lt;br&gt;Youth organisations</td>
</tr>
<tr>
<td>Open Days / individual User session</td>
<td>An open day would consist of individual users of all abilities using the lab to make/create something. The number of members is directly proportional to the staff as usually we find it important to have help on hand should it be desired. The content would vary widely and be completely set by the user and their aims, from 3D design to fashion and woodwork etc.</td>
<td>½ day per session, running approx 2-4 sessions per week</td>
<td>Dependent upon needs can be up to 10 Users per day.</td>
<td>Dependent upon needs, usually all staff involved. E.g. 2-3 Co-ordinators plus volunteer staff.</td>
<td>Individuals&lt;br&gt;Local people/community groups&lt;br&gt;Government agencies&lt;br&gt;Potential Investors&lt;br&gt;Universities/colleges&lt;br&gt;Private sector/Local businesses</td>
</tr>
</tbody>
</table>
5. Job descriptions

Post:  Fab Lab Technical and Operations Manager

Objectives of the Post

The Fab Lab Technical and Operations Manager will devise manage the delivery of a programme of activities for users of FabLab and to ensure the smooth running of all technical aspects of the lab. They will help lead a delivery team, volunteers and participants in the delivery and implementation of education programmes that use the resources of the Fabrication Laboratory (Fab Lab). The Fab Lab Technical and Operations Manager will be responsible for maintaining, updating and safely operating the physical space and the equipment of the FabLab and for the supervision and delivery of the FabLab business focused activities to engage local creative and technical entrepreneurs, students and graduates, and industry partners.

Principal Duties

1. Engage with Large and SME manufacturing companies: Provide a vehicle for supply chain collaborative working projects and open innovation projects.
2. Work towards making the FabLab self-sustaining while balancing open access to tools machinery and
3. To devise and implement a programme of creative learning activities for people that satisfies current programme targets, objectives and outcomes. To generate additional opportunities for children and young people to access a wide range of high quality design, innovation and making activities.
4. To timetable project delivery staff and line manage as appropriate to ensure smooth and effective running of FabLab on a day to day basis.
5. To develop, author and deliver engaging, innovative models of digital fabrication training for community, educational and commercial users of the FabLab. Including curriculum linked resources for schools and software & hardware related training (2D & 3D design).
6. To actively represent and market the work of FabLab to as wide an audience as possible, locally and further afield.
7. To create and build upon existing relationships with local community partners and education providers, locating the FabLab at the centre of digital development in the area
8. To attend internal management group meetings and update FabLab staff on programme and project plans at staff meetings
9. To ensure that all relevant monitoring and evaluation procedures are completed in accordance with funders requirements
10. To ensure that all equipment and its use is well maintained, and all training and premises are fully compliant with all health and safety requirements and that an ongoing culture of Health and Safety is fostered throughout the FabLab.
11. To manage FabLab materials budget and ensure materials and hardware supplies are monitored and ordered through FabLab Administrator as and when required.
12. Ensure premises and resources are maintained to a high standard and accessible to relevant personnel and users.

13. Train, operate and maintain fabrication equipment to include a CNC Cutter/Lathe, Laser Cutter, Circuit Printer, 3D Printer.

14. To oversee all technical training of staff and beneficiaries on the project and to liaise with the international FabLab network on all technical, software and hardware issues within the FabLab.

15. Liaise with project manager and regularly update on progress of FabLab projects and FabLab programmes.

PERSON SPECIFICATION:

<table>
<thead>
<tr>
<th>Essential Criteria</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A university degree or an equivalent qualification in either of the following, manufacturing, engineering or product design based subject.</td>
</tr>
</tbody>
</table>

Experience Knowledge and Skills

- **Technical Experience and Knowledge**: At least 2 years actual hands-on experience as a teacher or professional practitioner in 3d Design.

- At least 2 years actual hands-on experience as a teacher or professional practitioner in physical fabrication techniques using cutters etc.

- Can demonstrate a good sound knowledge of electronics.

- **Understanding of Design Technology Education issues**: A proven awareness of the specific challenges of education around design technology and practical fabrication within a curriculum and/or community context.

- **Understanding of Creative Educational Approaches**: A proven knowledge of the role and application of technology based creative approaches to learning and education.

- **Health and Safety**: A proven knowledge and awareness of current Health and Safety legislation and best practice

- **Child Protection**: Provable specific knowledge relating to regulated activity providers for child and vulnerable adult protection purposes;

- **Communications**: Excellent oral, written and inter-personal communications skills in dealing with individuals and groups at all levels including the ability to develop and maintain relationships and networks.

- **Hours of Work**: A willingness to work flexible hours
Post: FabLab Technician

**DUTIES AND KEY RESPONSIBILITIES**

1. To support and assist registered users and business clients of the FabLab with the safe use of the machinery and structured training in its use
2. To support and assist the delivery of training in arts, curriculum and community contexts, within schools and outreach centres to learners across a range of abilities and backgrounds
3. To train in the operation and maintenance of fabrication equipment to include a CNC Router, Laser Cutter, Vinyl Cutter, 3D Printer and desktop milling machine
4. To support ongoing monitoring of all equipment and its use, and all training and premises to ensure full compliance with all health and safety requirements and that an ongoing culture of Health and Safety is fostered throughout the FabLab
5. To monitor hardware supplies in the FabLab and ensure sufficient stock levels and to reorder supplies through the FabLab Manager as and when required
6. To support the evaluation of programmes, register and induct new users in accordance with FabLab procedures
7. To perform any duties as reasonably requested by the FabLab manager

**PERSON SPECIFICATION:**

- A Higher Level qualification (HND/Certificate/Diploma/Degree/Postgrad etc.) **OR** a professional qualification/experience of an equivalent standard.

- Hands-on relevant experience in a teaching or facilitating capacity of 2d and/or 3d Design.

- Hands-on relevant experience in a teaching or facilitating capacity in physical fabrication techniques using cutters etc.

- **Health and Safety:** A proven knowledge and awareness of current Health and Safety legislation and best practice

- **Child Protection:** Provable specific knowledge relating to regulated activity providers for child and vulnerable adult protection purposes;

- **Communications:** Excellent oral, written and inter-personal communications skills in dealing with individuals and groups at all levels including the ability to develop and maintain relationships and networks.

- **Hours of Work:** A willingness to work flexible hours – evening and Saturday work will be part of this post
6. Respondents

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Job Title</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>Caldwell</td>
<td>Regional Development Executive</td>
<td>Enterprise Ireland</td>
</tr>
<tr>
<td>Deirdre</td>
<td>MacCormack</td>
<td>Marketing Manager</td>
<td>MCOR Technologies Ltd</td>
</tr>
<tr>
<td>Pat</td>
<td>McCormick</td>
<td>School of Computing</td>
<td>DKIT</td>
</tr>
<tr>
<td>Michael</td>
<td>Curran</td>
<td>Consultant</td>
<td>Michael Curran Consulting</td>
</tr>
<tr>
<td>Martin</td>
<td>Fitzgerald</td>
<td>CAD Resource Manager</td>
<td>Open Hydro</td>
</tr>
<tr>
<td>Graham</td>
<td>O’Rourke</td>
<td>Mentor</td>
<td>Drogheda CoderDojo</td>
</tr>
<tr>
<td>Louise</td>
<td>Allen</td>
<td>Innovation Manager</td>
<td>Design &amp; Crafts Council of Ireland</td>
</tr>
<tr>
<td>Fiachra</td>
<td>O’Cuinneagain</td>
<td>Creative Multimedia Lecturer</td>
<td>DKIT</td>
</tr>
<tr>
<td>Vincent</td>
<td>O’Hare</td>
<td>Art &amp; Technology Teacher</td>
<td>O’Fiaich College</td>
</tr>
<tr>
<td>Joan</td>
<td>Martin</td>
<td>Chief Executive</td>
<td>Louth County Council</td>
</tr>
<tr>
<td>Ruth</td>
<td>Mannion</td>
<td>Art Tutor</td>
<td>Monaghan Institute</td>
</tr>
<tr>
<td>Terence</td>
<td>Bannon</td>
<td>Youth Worker</td>
<td>Garda Diversion Project</td>
</tr>
<tr>
<td>Caroline</td>
<td>Flanagan</td>
<td>Youth Worker</td>
<td>Craobh Rua Community Project</td>
</tr>
<tr>
<td>Aisling</td>
<td>Rice</td>
<td>Art Teacher</td>
<td>O’Fiaich College</td>
</tr>
<tr>
<td>Barry</td>
<td>Finnegan</td>
<td>Print Studio Member</td>
<td>Thinking Cap</td>
</tr>
<tr>
<td>Abigail</td>
<td>O’Brien</td>
<td>Print Studio Member</td>
<td>Visual Artist</td>
</tr>
<tr>
<td>Francis</td>
<td>McCormick</td>
<td>Print Studio Member</td>
<td>Graphic Designer</td>
</tr>
<tr>
<td>Sandra</td>
<td>Bell</td>
<td>Print Studio Member</td>
<td>Sculptor</td>
</tr>
</tbody>
</table>
7. Questionnaire

Q1. Which of the following best describes the sector you operate in? *

- Private Sector
- Charity
- Local Government
- Central Government
- Individual

Q2. If Private, please specify size and sector *

Q3. Have you ever heard of FabLabs before? (if no go to Q7) *

- Yes
- No

Q4. Have you ever used FabLabs before?

- Yes
- No

Q5. If yes, are you likely to use their services again?

- Yes
- No

Q6. Why?

Q7. What you think the primary purpose of a FabLab at Creative Spark would be? (Please Rank from 1-7, 1 being the most important 7 being the least) *

Access to digital maker tools and technical support.

Supporting new creative tech start- ups & enterprises.

Promoting Maker technology as a learning experience.

Provide skills based training in new technologies.

Provide an innovative community resource.

Develop a creative community of maker practitioners using digital tools.

Create new employment opportunities with the North East

Q8. What services would you be most interested in? *
Use of FabLab

Q9. How important is digital design and manufacturing to you? (if not go to Q11) *

- Not at all
- Somewhat
- Moderate
- Important
- Very Important

Q10. If moderate or more in what way? *

Q11. Do you expect to be using digital design and/or manufacturing in the next year *

- Not at all
- Somewhat
- Yes

Q12. If no, why?

Q13. Who should a FabLab at Creative Spark activities be aimed at please pick the top 5.

- Individuals (open)
- Families
- Young People
- Schools (Primary and post Primary)
- Students
- Community organisations
- Businesses
- Creative Professionals
- Beginners
- Other:

Q13.a. If other please explain.

Training Workshops & FabLab Service

Q14. Would you or the clients you work with be interested in learning about digital design and fabrication through learning workshops? *

- Yes
- No

Q15. Ideal duration of this?

- 1 hour
- 2 hours
- 1/2 day
- Full day

Q16. What would you be interested in? *
Digital Design (2D & 3D)
- Masterclasses using maker tools & technology
- Creative thinking & Problem Solving
- Rapid prototyping & product development
- Introductory 'How to...' (3D Print, Programme Arduino, etc.)
- Maker Projects (e.g. Crafts, Electronics, robotics)
- Hackathons/Maker Schools (Summer Camps)
- Laser Cutting

Costs

Q17a. How much would you be prepared to pay for this? *

€25  €30  €35

1 Hour

Q17b. How much would you be prepared to pay for this? *

€50  €60  €70

2 Hour

Q17c. How much would you be prepared to pay for this? *

€100  €120  €130

Half day

Q17d. How much would you be prepared to pay for this? *

€130  €150  €160

Full day

Q18. Would you be interested in being a Member of a FabLab? *

- Yes
- No

Q19. How much would you pay for a monthly membership? *

- €35
- €40
- €45
- €50

Q20. What would you expect from this membership? *
o 24hr Access
o Technical Supervision
o Reduced Rates special for events (Masterclasses etc.)
o Reduced rates on machine hire
o Other:

Q21. Would you partner with a FabLab at Creative Spark if you are part of an organisation? *
  o Yes
  o No

Q22. How might you imagine this to be?

Q23. What benefits/impacts do you think working with FabLab will bring to you, or your organisation/clients?*

Q24. Do you think there is a wider strategic fit for FabLab within County Louth? * Mark only one.
  o Yes
  o No

Q25. If so, where?

**Business to Business**

Q26. Do you or your business require design and/or fabrication services? (if no go to Question 33) *
  o Yes
  o No
  o Maybe

Q27. How often would you expect to use this service?
  o Weekly
  o Monthly
  o Bi monthly
  o 6 Months
  o Annually

Q28. Would you pay for this Service?
  o Yes
  o No

Q29. Do you ever use external providers for the following?
  o Design thinking
  o 3D Design
  o Electronics Design
  o IoT Sensor Technology
- Prototyping
- 3D Printing
- Design Consultation
- Tech Start-Up

Q30. If yes then who?
- Private Sector
- 3rd Level Institution
- Other:

Q31. What is the annual spend on this?
- Less than €1000
- More than €1000
- More than €2000
- More than €5000

Q32. Would you consider using FabLabs?
- Yes
- No

Q33. Any other comments?
8. References
