OUTCOME ASSESSMENT

INDUSTRIAL DEVELOPMENT PROGRAMME (IDP)

(2016-2020)

Outcome Assessment of the Industrial Development Programme (IDP) produced on behalf of Information and Communication Technology Agency (ICTA), Sri Lanka

by;

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Outcome Assessment of the Industry Development Program (2016-2020)

Executive Summary

Industry Development Program (IDP) has been implementing series of initiatives with a common objective of promoting IT/BPM sector as the 'growth engine' of the country's economy, focusing on increased contribution to export earnings, employment and overall improvement in the economy. Its primary role has been to be a catalyst of change in ensuring future readiness of the technology ecosystem. Projects have been designed to align local tech ecosystem with global trends to support the growth of IT sector in the country.

The main purpose of this assignment was to undertake an evidence-based study to gauge the extent of success in achieving the strategic objectives (especially the immediate and intermediate ones) of IDP, validate its contribution towards achieving targeted strategic objectives, identify any implementation gaps and/or reasons for non-achievement of desired results and recommend further improvements to enhance the effectiveness of these initiatives. Though IDP has implemented numbers of initiatives during past years the study will focus on main initiatives such as the Sporulation, Disrupt Asia, Startup SL, LEAP and Imagine IF implemented during the past five years (2016-2020).

The key sources of data and information for the assessment were obtained by conducting one-on-one online interviews with the relevant key beneficiaries of those initiatives. Queries were made to measure the respondents' perceptions, opinions, attitudes and benefits accrued to them as a result of participating in these initiatives conducted by IDP. Wherever possible representative unbiased samples were used to ensure validity and reliability of the findings. In addition, all available and relevant documents were reviewed and interviews were also conducted with relevant ICTA officials who were responsible for the implementation of these initiatives. Wherever one-on-one interviews were not possible with the beneficiaries, self-assessment questionnaires were emailed to get their responses. Collected data and information, both quantitative and qualitative, were carefully entered into databases to analyze and generate appropriate statistics and findings.

The survey generated a wealth of information and the results and major findings are presented in Chapter 4 of the report. These findings were further discussed, incorporating qualitative information gathered during the interviews are presented in Chapter 5.

The following conclusions have been made about the outcome achievements of these initiatives on the basis of knowledge and understanding gained during the study and above mentioned processes.

1. Tech Startup Support program (Spiralation)

- Tech Startup support program has been instrumental in setting up 58 new technology-based businesses in the country during last five years which had adopted new innovative and disruptive technologies.
- The 'Spiralation' has provided necessary initial startup funds on a 'grant' basis to 47 new startups while providing training and empowerment to 58 entrepreneurs to take their businesses off the ground.
- Through these new startup businesses, fair number of new job opportunities have been created in the country mainly for IT personal.
- Although it was not explicitly investigated during the study, considering the nature of some startup businesses, we can safely assume that these startups have contributed even marginally towards the country's increased export earnings from the IT/BPM sector during the study period.

2. Disrupt Asia: International Startup Conference and Innovation Exhibition Festival

As a result of four Disrupt Asia events held during the period, following outcomes had been achieved by the startups.

- Local startups had been provided with an unique opportunity to enhance their knowledge, showcase their products, meet other exhibitors, build strategic partnerships, meet investors, listen to local and international speakers and receive mentoring support from leading local and international personalities.
- The local startups had also benefited immensely from the events which had contributed to their business growth and expansion.

3. Startup SL; national platform for Startups in Sri Lanka

- National online platform operated by ICTA for startups and ecosystem partners had contributed towards getting a proper international and local exposure and recognition to these companies.
- However, the expected increased access to financial assistance, partnerships and market access have not been realised yet.

4. Learn Engage Aim Prosper (LEAP): Digital Business Clinics for Regional Tech Companies

- Initiative has conducted digital business clinics (LEAP) successfully for 40 reginal tech IT SMEs with the objective of expanding their business locally and scaling-up to break into global markets.
- Trainings on business improvements have contributed significantly to increased the business knowledge and skills, which had helped them to expand their business locally.
- Additional job opportunities had been created within these SMEs as a result of business expansion.
- Though, it was expected for local IT SMEs to break into global markets, this has not been realised yet.

5. Imagine IF: Entrepreneurship Development for Undergraduates\

This initiative has been conducted as a 3-day boot camp to create awareness of the startup eco-system in Sri Lanka and the supporting structure for the aspiring entrepreneurs and transfer the necessary basic knowledge to start their first business with a more feasible business plan. Altogether 14 programs had been conducted in 14 state universities for 1564 participants, proper outcome assessment was not possible due to the inability of the consultants to get the beneficiaries to participate in the email survey.

6. Educate to Innovate program for teachers

Outcome assessment was not possible due to non-availability of contact information of beneficiaries who had participated in these programs, since the programs had been arranged by the Ministry of Education and ICTA did not have the participants' contact details.

On the basis of the study findings, and the conclusion derived, the following recommendations are made for further improvement of the IDP initiatives to ensure the achievement of envisaged outcomes.

1. Tech startup Support program needs to be scaled up to accommodate more startups especially the deep-tech startups that have the potential to meet the global demand.
2. Considering the initial cost of the startups and involvement of imported hardware components in some of the project, quantum of seed fund increased.
3. ICTA should explore the possibility of some intervention with related government institutions to get their projects to suitable and proven tech startups of the 'Spiralation' program.
4. 'Disrupt Asia' should continue as an annual national event with more foreign investors and participants.

5. Startup SL should be expanded to include all the startups in the country and offer more incentives to registered companies.
6. LEAP program for regional IT SMEs should continue with better focus on selecting more SMEs using deep techs that have the greater potential to penetrate the global market.
7. Imagine IF program for enhancing entrepreneurial knowledge and skills of the undergraduates should continue with better focusing and targeting mainly on final year IT, Computer Science and Electronic and Electric engineering undergraduates who have the potential of scaling up their undergraduate research project to a successful startup business.
8. 'Educate to Innovate' program is also an important and relevant initiative to increase the STEM literacy in the country and increase the Gross tertiary enrolment rate in STEM fields in Sri Lanka. This is essential to increase the supply of required IT workforce for future expansions in IT/BPM sector in the country.

Table of Contents

List of Tables

List of Figures

1.1 Introduction

Over the years, Sri Lankan economy has transformed towards an industrial and services-based economy, shifting from its traditional agriculture-based society. The leading sectors are the apparel sector within the industrial sector, and two services sectors–the tourism sector and the information and communications technology/business process management (ICT/BPM) sector. ICT/BPM sector that turned up at the beginning of the new century, has already emerged as one of the country's key growth sectors for country's future economic transformation. IT/BPM sector is one of the highest growth sectors in the country which also commands high value addition compared to many other sectors in the economy.

In 2019, ICT-BPM and Telecom services sector was the third most important foreign exchange earner to the country after tea and the apparel sectors. Even in 2020, when most of other sectors of the economy showed negative growth as a result of the global pandemic situation, ICT services have recorded an 8 per cent increase in export earnings in 2020. As pointed out in the Central Bank of Sri Lanka- Annual Report 2020, "The country's IT/BPO sector possesses enormous undiscovered potential to become a global industry, benefiting from the ongoing global digitalization, with its commercial attractiveness, and access to skilled labor coupled with improving Information and Communication Technology (ICT) related infrastructure."

However, in Sri Lanka, earnings of this sector remained relatively low compared to regional peers with similar capabilities, probably due to the lack of aggressive promotion and branding of Sri Lanka as a digital nation. Building such an image would help promote FDIs and attract leading global IT firms to set up regional headquarters in Sri Lanka, which would substantially enhance foreign exchange inflows to the country.

Information and Communication Technology Agency (ICTA), the apex government institution responsible for formulating and implementing all ICT-related policies and government-initiated projects, has carried out number of initiatives to improve the ICT accessibility, availability and application in all sectors in the country. ICTA and other relevant agencies have been striving hard to create a conducive environment for ICT/BPM companies to expand and develop businesses with increased international recognition of Sri Lanka as a prime outsourcing destination for ICT/BMP services.

The Information and Communication Technology Agency (ICTA) has recently developed a five-year roadmap to transform Sri Lanka's economic landscape towards a creative and knowledge-based society through digitally transformation. The digital economy is expected to bring new opportunities to the citizenry as it transforms businesses, industries, services, jobs and lifestyles of the people.

The current 'Digital Economic Strategy' of the ICTA looks at utilizing existing programs and all relevant partners in the ecosystem to develop and implement an integrated digital economy transformation process in Sri Lanka that will pave the way for a thriving and effective digital economy in the country by the year 2024. This Strategy is built on four main pillars, namely, Technology Industry Development, Technology Diffusion, Capacity Building and Regional Cluster Development.

The Technology Industry Development is an important pillar of the proposed digital transformation process with following ambitious goals to be achieved by the year 2024.

Among them are:

1. To achieve a target of US$ 3 billion of annual foreign exchange revenue from knowledge services sector and electronics sectors.
2. To establish 1000 tech and tech enabled start-ups in operation.
3. To Increase the total number of technology companies (IT + BPM + Electrical & Electronics) in operation in the country to 700.

In this regard the Industry Development Program (IDP) of ICTA has a pivotal role to perform acting as the catalyst of change in ensuring future readiness of the technology ecosystem. All along the IDP has acted with foresight and had designed and implemented projects to align Sri Lanka's tech ecosystem with global trends with an overall objective of enhancing the growth of the IT-BPM sector to emerge as a strategic growth engine for the country.

While the overall objective of the Industry Development is to promote Sri Lanka's IT/BPM industry, the following the objectives were considered when implementing various initiatives for the sector.

1) To improve visibility for Sri Lankan IT-BPM industry and promote country branding.
2) To support regional IT SMEs to improve the standards to meet the global market.
3) To create IT-BPM related jobs across all sectors.
4) To improve export growth through innovation and entrepreneurship.
5) To establish strong start up ecosystem in the country.
6) To promote an entrepreneurship culture among the undergraduates.
7) To promote innovative and STEM education among school teachers.
8) To design and conduct relevant studies and surveys to support the industry.

2.0 Purpose and Scope of the Study

2.1 Purpose of the study

The purpose of this outcome-focused assignment is to undertake an evidence-based study to gauge the extent of success in achieving strategic objectives (especially the immediate and intermediate), and assess the reasons for achievement or non-achievement and identify key constraints and make recommendations to improve the performances of these initiatives.

In case of training initiatives, the participants are expected to acquire new knowledge, attitudes and skills that can be applied or practiced successfully in their businesses to make positive changes to their operations and ultimately achieve the desired results. These behavioural changes are the immediate outcomes expected of a training initiative that contribute to the achievement of its short, medium and long-term goal. Among other things, the study will try to gain deeper understanding of particular challenges, implementation gaps, issues and constraints faced by the stakeholders that may have had negative impacts on the outcomes in the given context. Based on the finding, conclusion ad recommendations will be made regarding corrective actions or improvements to those initiatives to achieve the expected results. The assessment while trying to highlight the areas of accomplishments, will also identify any unintended or unexpected positives or negative outcomes of these initiatives.

2.2 The Scope of the study

The study will focus on assessing the immediate and intermediate outcomes of the beneficiary groups of various interventions carried out by the program. The study will clarify the various activities, related outputs especially the qualitative changes such as acquisition of new knowledge, skills and changes in attitudes that had occurred among the direct beneficiaries after the completion of these outputs. Study will be limited to beneficiary assessments related to initiatives such as Spiralation, LEAP, Disrupt Asia, StartupSL and Imagine IF.

3.0 Evaluation Methodology and Data Collection Tools

The purpose of the study was to assess outcomes achieved by various initiatives implemented by Industrial Development Program of ICTA during the past five years (2016-2020). The following initial preparatory studies were made to understand the objectives, target beneficiaries, program activities, outputs and results achieved by these initiatives so far.

For this purpose, the following activities were conducted;

1. Reviewed of all relevant documents related to all the project activities and outputs.
2. Conducted one-on-one interviews with IDP staff to understand various activities conducted, clarify relevant objects and provide the beneficiary list for the assessment study.
3. Developed survey instruments to conducted one-on-one interviews with direct beneficiaries.

In order to gather reliable and in-depth understanding of realized outcomes, conversational type of interviews was conducted online with the relevant direct beneficiaries to gauge their perceptions, opinions, attitudes and benefits accrued to them as a result of participating in various initiatives conducted by IDP. This method allowed the freer and frank exchange of views useful for the study.
Wherever one-on-one interviews were not possible, self-assessment questionnaires were emailed to the selected beneficiaries to get their responses. Representative samples were drawn wherever such applications were possible and practical.
Collected data and information-both quantitative and qualitative, were carefully entered into databases to analyze and generate appropriate statistics and findings.

4.0 Results of the Study and Major Findings

4.1 Tech Startup Support and Ecosystem Development Program: 'Spiralation'

Innovations and entrepreneurships are critical elements of transition when a country is changing over to knowledge-based economy and geared to meet future competitions. As often happens, startups are ignited by entrepreneurial and innovation spirit in an economy and play an important role in its growth and development. Whilst there are challenges, it is also a great opportunity for these startups to scale up and become truly global players. Though, there is no single definition, startups are the new tech businesses started by young entrepreneurs to create innovative and disruptive new products or way of doing things. Since these young entrepreneurs lack entrepreneurial experience and sufficient funds to commence business operations, they need external support and guidance to implement their innovative ideas successfully. Though, there are various programs to support the growing number of startups in the country, 'Spiralation' is the only government sponsored startup support initiative that provides the 'seed fund' as an outright grant. Started in 2010, the program has already supported up to 90 young ICT entrepreneurs to grow into big companies. The main objectives of the initiative are:

1. To increase the number new technology-based businesses which adopts innovative and disruptive new technologies in the country.
2. To provide necessary startup funding and training for entrepreneurs to take their businesses off the ground.

3. To create a conducive startup ecosystem in the country.
4. To create new job opportunities and increase the export earnings from IT/BPM sector.

This study will focus on the immediate and intermediate outcomes of the project implemented during the period 2016-2020. During this period ICTA has supported 58 startups and provided grant funds to 47 startups, while the balance was provided with ecosystem development support.

4.1.1 Selection of the Study Sample

An appropriate and representative sample was selected for the study to include startups supported in different years and ones who had received seed funds and those who had only followed the ecosystem development support training session. Table 1 provides the saline features of the sample selection process.

Survey Characteristic	Description
1. Basic unit of survey	Tech-start-up company supported by ICTA during 2016 to 2020
2. Sample frame	58 tech-start-ups supported by ICTA during 2016-2020
3.Sampling design	Stratified random sampling with proportionate allocation
4. Level of stratification	Year of joining the program.
5. Level of precision	90%
6. Sample size	32 tech startups
7.Sample fraction	55.20%
8. Method of data collection	One-on-one interviews with the founder of the startup
9. Type of data collected	Quantitative and qualitative
10. Method of data analysis	Exploratory data analysis

Table 1. Sample selection and data collection procedures

4.1.2 Major findings

1. Number of Tech startups supported annually by IDP

Spiralation is the only government-sponsored startup support program in the country and during the 2016-2020 period, it has supported 58 startups and provided seed funds for 47 companies. The amount of seed funding provided had varied from year-to-year, from Rs 750,000 in 2016 to Rs 1.5 million in 2019. Main criteria for selection included the following:

1. Tech companies had to be already registered or to be registered with the Registrar of Companies before the program
2. Number of directors had to be minimum of two.
3. The applicants had to be registered with the Startup SL national platform.

Selected companies had to undergo intensive training on capacity building and face three-stage selection process, namely, 1. Application short listing, 2. Business pitching and 3. Technical pitching before signing the final agreement. It is observed from Figure 1 that number of startups supported by ICTA has increased over the period and had included some only the training component of the program.

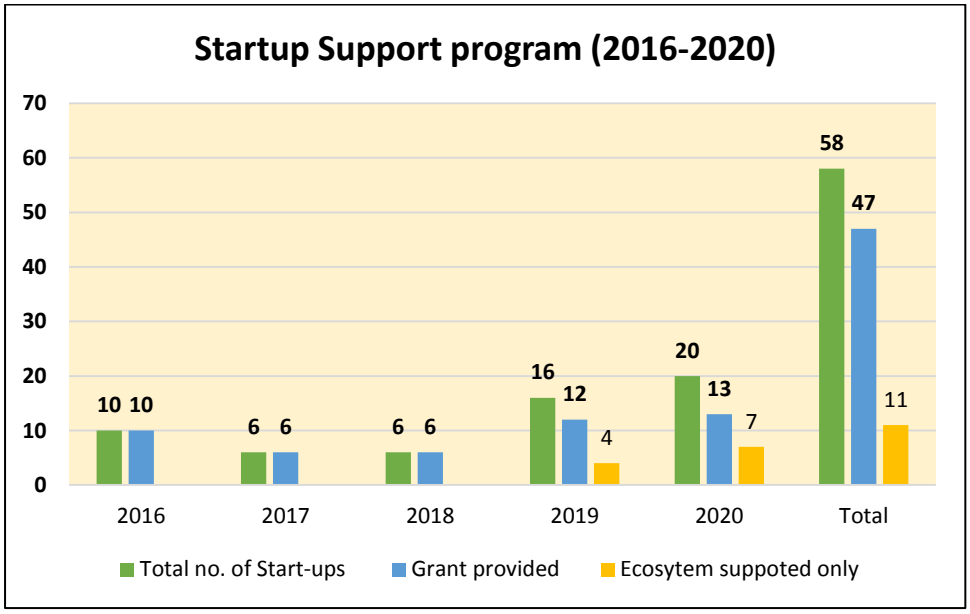
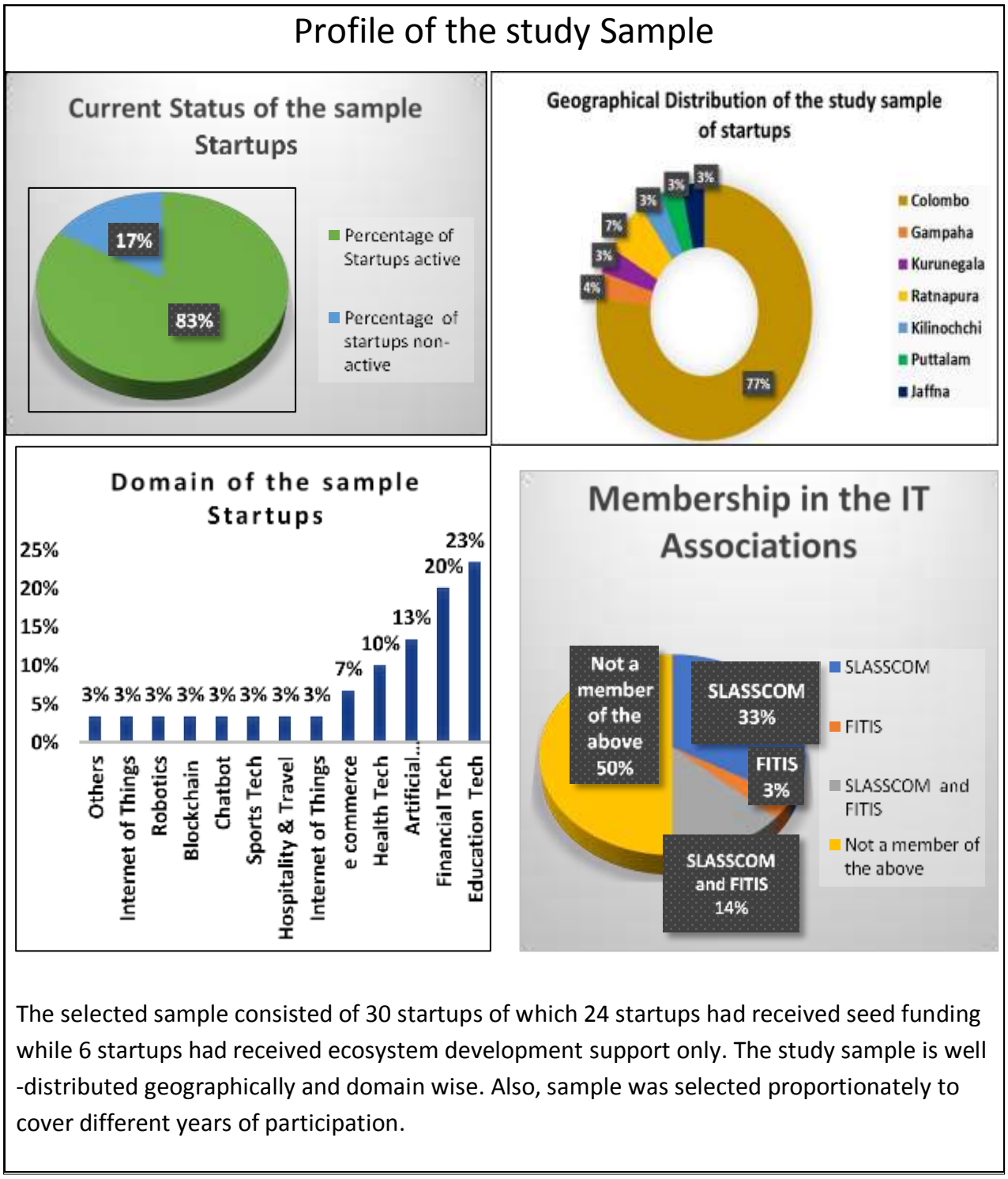


Figure 1. Number of Startups supported annually by IDP during the period

2. Profile of the Study Sample

The selected sample consisted of 30 startups of which 24 had received seed funding while the balance 6 had received only the ecosystem development support. The study sample selected was well-distributed geographically and domain wise. Also, sample was selected proportionately to cover different years of participation. It is observed that majority of Startups (77%) were from Colombo district and most of the startups fell into Education tech category (23%), followed by financial tech companies (20%). Also, as illustrated in Figure 2, around 17% of the Startups are not in operation at present due to various reasons. For example, one startup providing services to tourist travel sector, had lost its business due to Easter Sunday attack followed by Covid -19 pandemic, while some others who had developed unique solutions to the state sector were not able to market their product due to strict procurement procedures followed by the government organizations.

It was observed that some companies had developed unique products combining hardware and software solutions to solve problems and some have already patented their products.



The selected sample consisted of 30 startups of which 24 startups had received seed funding while 6 startups had received ecosystem development support only. The study sample is well -distributed geographically and domain wise. Also, sample was selected proportionately to cover different years of participation.

Figure 2. Profile of the Sample Startups

3. Profile of the Startup Founder

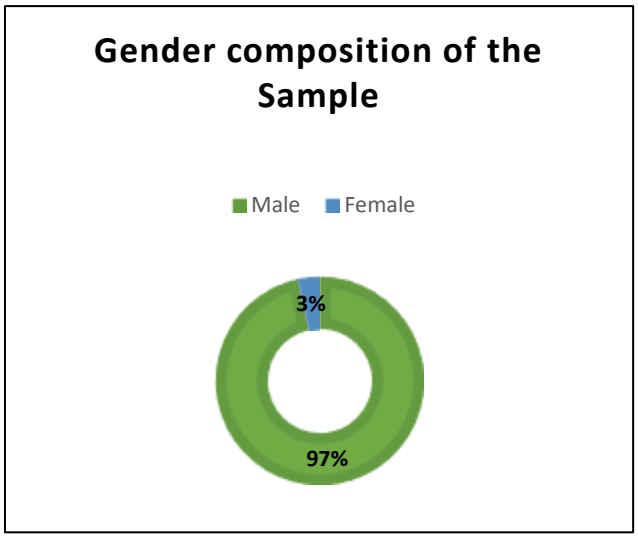
As observed from Figure 3, except for one, all the other founders were men and most of them (74%) were young and fell into the age category of 26-35 years. Further, the majority 68% had the IT/Computer science as the core area of specialization. Academically, majority 66% and another 14% had bachelor's degrees and Master's level qualifications respectively. It is also, pertinent to note that some founders are still continuing their postgraduate studies, sometimes in business administration.

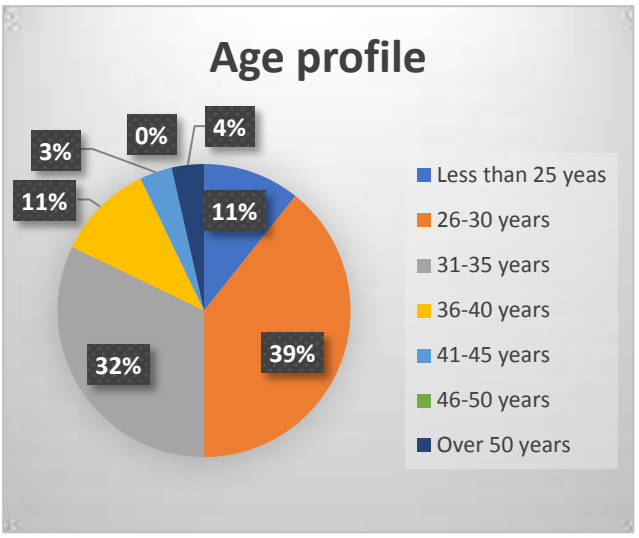
As the Figure 4 illustrates, majority 66% had stated that the prime motivational factor behind the entrepreneurial spirit was their in-born passion to create an innovative product/service. Some have founders had tried to further advance their undergraduate research projects to next level and develop a viable business venture.

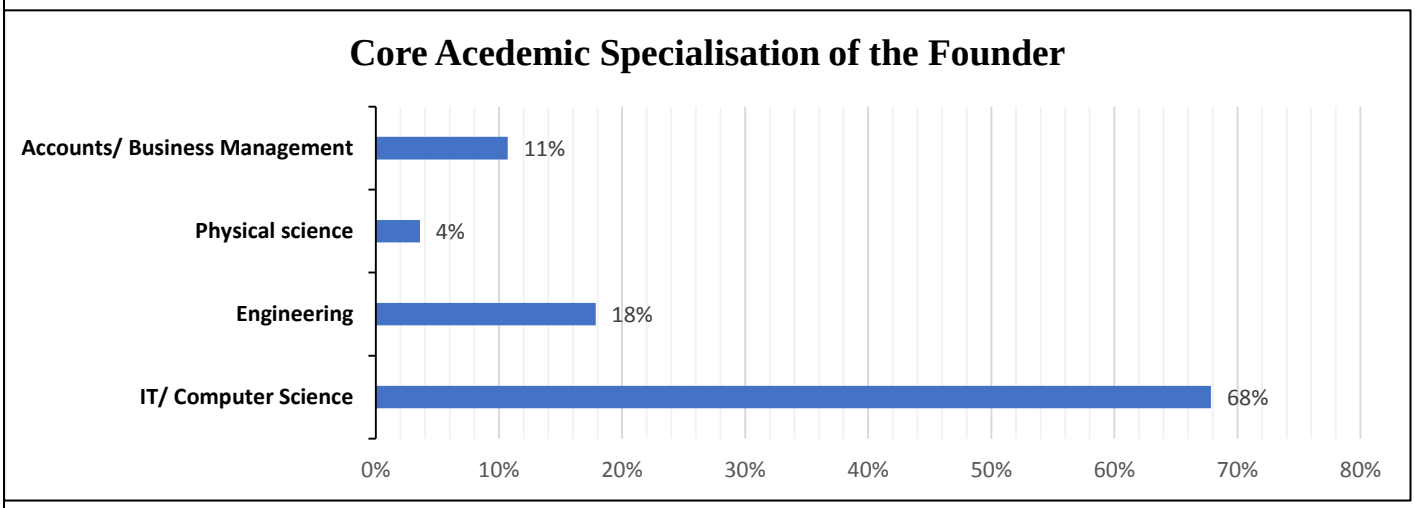
When number of founders are analyzed, majority 53% of the startups had two co-founders while 17% had only a single founder and one startup had six co-founders. It was observed that when co-founders are from different academic disciplines, the combination provided the synergic effect to come up with successful business solutions. On the other hand, combination of university friends had also provided viable combinations to create successful products. Some Startup founders had previous work experience in the IT field and were able to make use of their past experience effectively in their current business ventures.

As shown in Figure 5, initial funding for the startup had come from many sources and majority 69% had self-funded the initial expenses while 21% had been supported by the family and friends. Another salient feature of the founders is that only 27% stated that they are fully committed to the startup business. Balance 73% are involved in other businesses, professions or in higher studies.

Profile of the Startup Founder







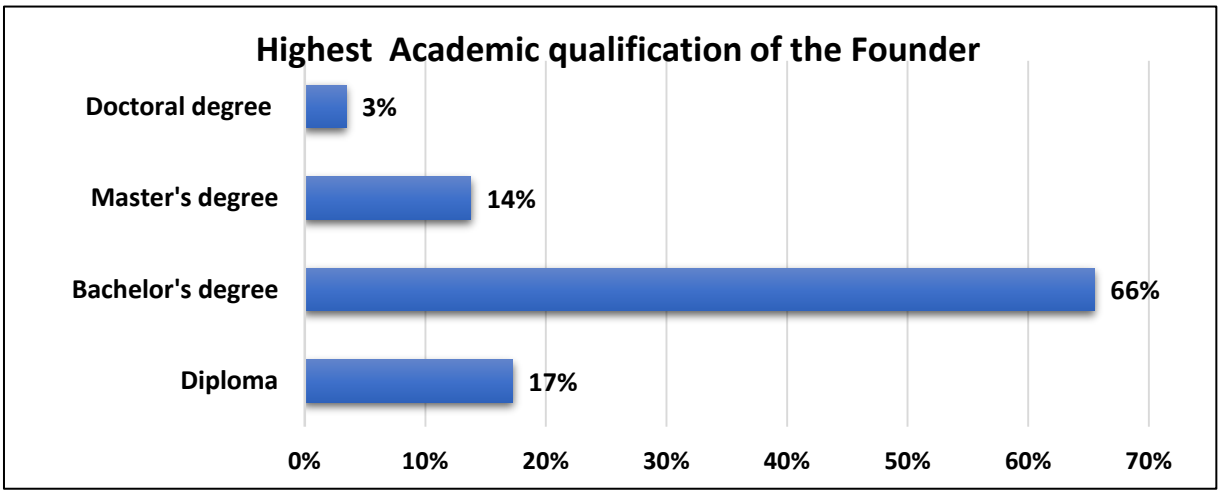


Figure 3. Profile of the Founder

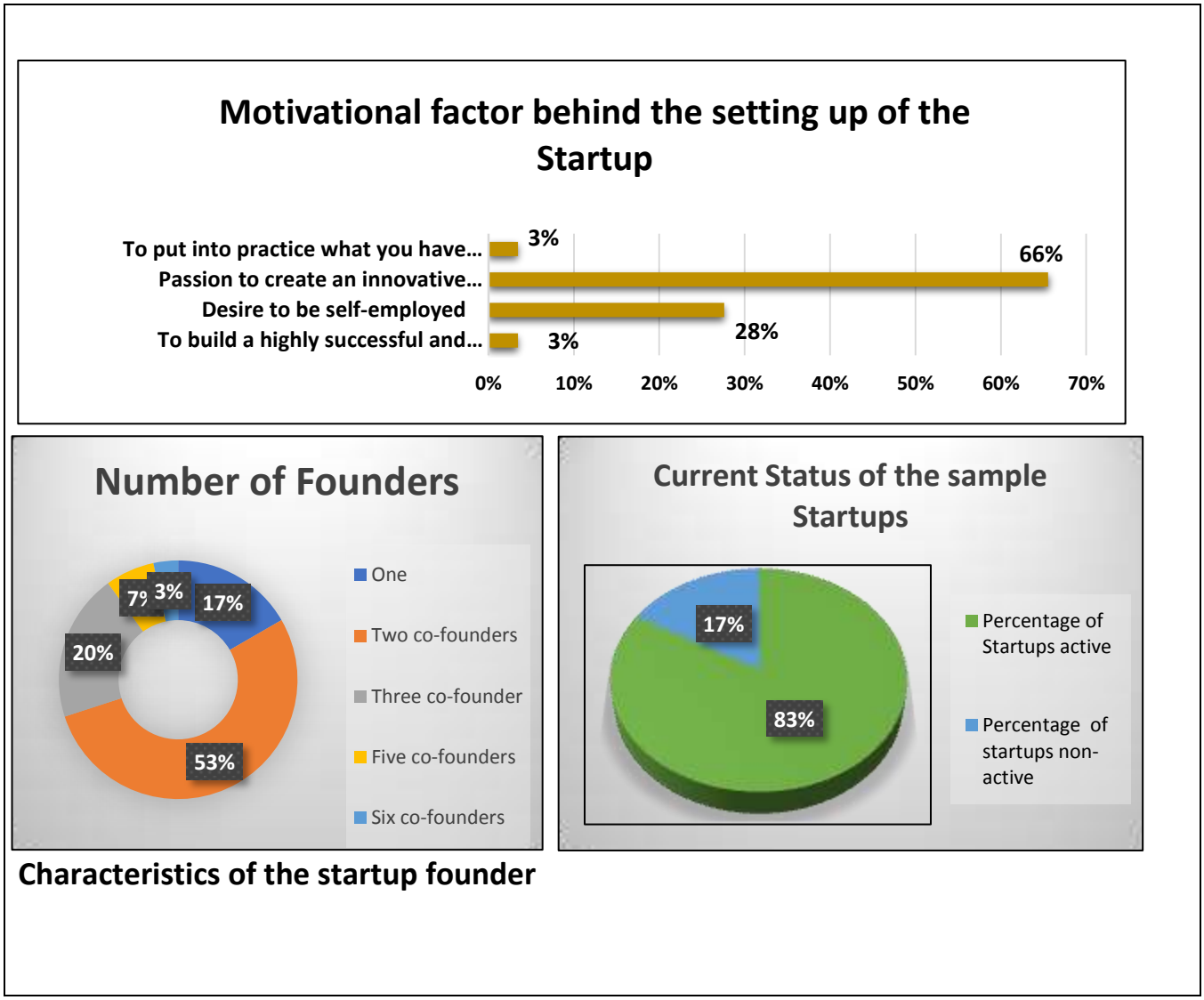


Figure 4. Characteristics of the Founder

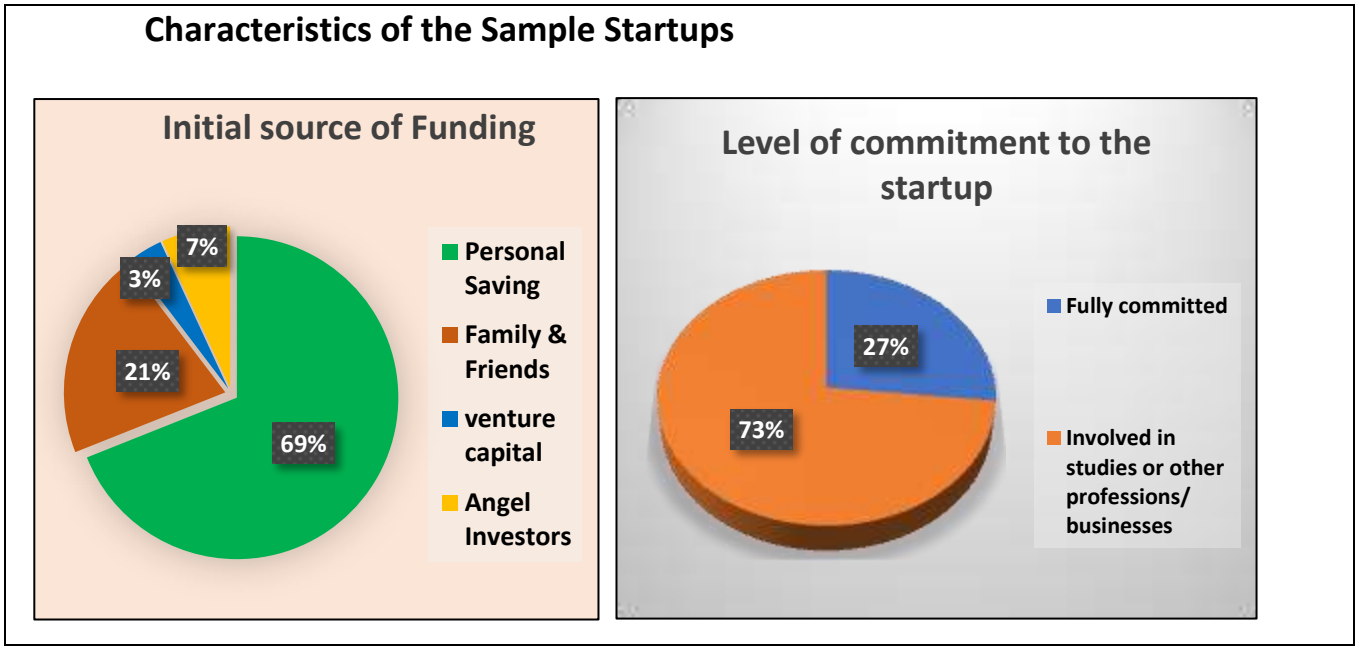


Figure 5. Important characteristic of the Startups

4. Perception of the Founder: Spiralation Selection Process

ICTA has followed a very stringent and transparent procedure to select the ultimate batch of startups to be supported and funded. The three-tier selection process consists of (i) Application short listing, (ii) Business pitching and (iii) Technical pitching before signing the final agreement. The study inquired the respondent's level of satisfaction with various components of the selection process and the results are given in Figure 6. The results indicate that the respondents were satisfied with the minimum requirements to apply, selection criteria, and the interviewing process. Some of the respondents (23%) were not satisfied with the number of milestones set by the project to get the funds. They were of the opinion the timelines set were too rigid and sometimes needed more time to complete certain components.

5. Assessment of Training activities

It was observed that ICTA has provided an intense training program for several weeks on various topics ranging from idea generation, business model development and legal essentials etc. to provide essential knowledge and skills using quality resource persons and industry experts. Since some founders were fresh to the business field, they needed proper guidance and technical advice to start a business correctly. The survey queried from the respondents their level of satisfaction with few selected sessions of the training program. The results are summarized In Figure 7.

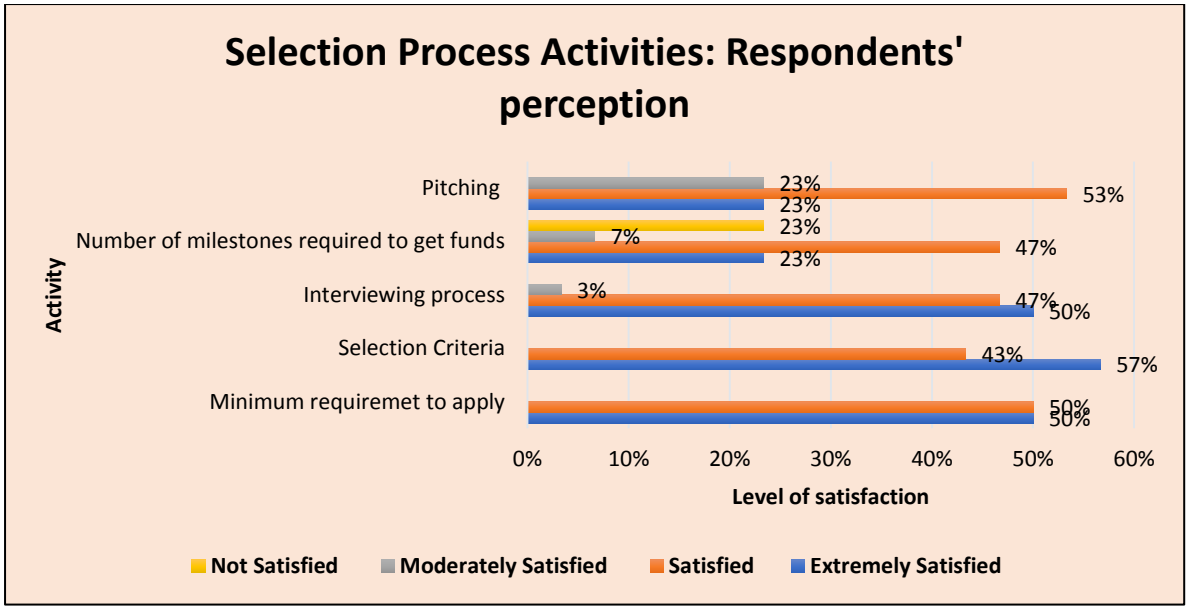


Figure 6. Perception of the Founder: Selection Process

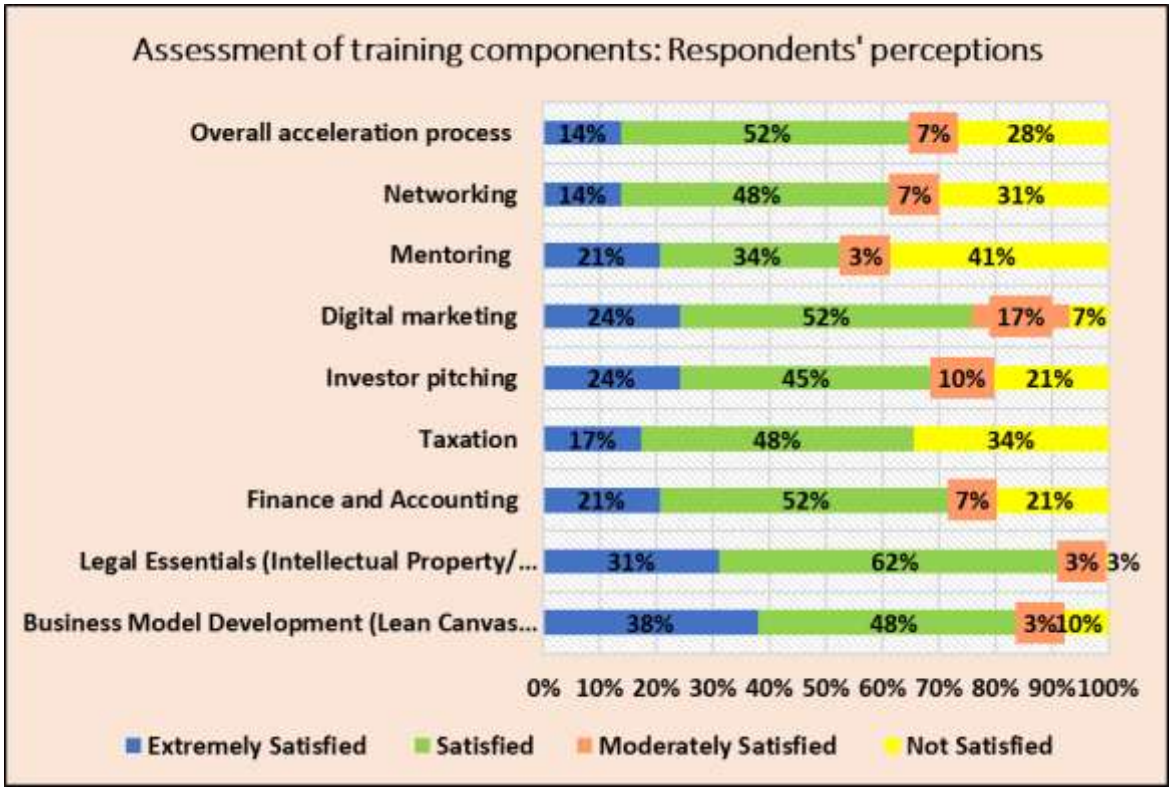


Figure 7. Assessment of Training activities

6. Seed Funding

Seed funding has proved to be very important for emerging and early-stage entrepreneurs to commence their businesses and meet the initial working capital and other day-to-day expenses. Of the total startups surveyed, 80% had received seed funding while balance had only participated in ecosystem development initiatives. Except for some, majority agreed that funds were received on time. The fairly long delays had been experienced in one particular year and has caused difficulties for some of them.

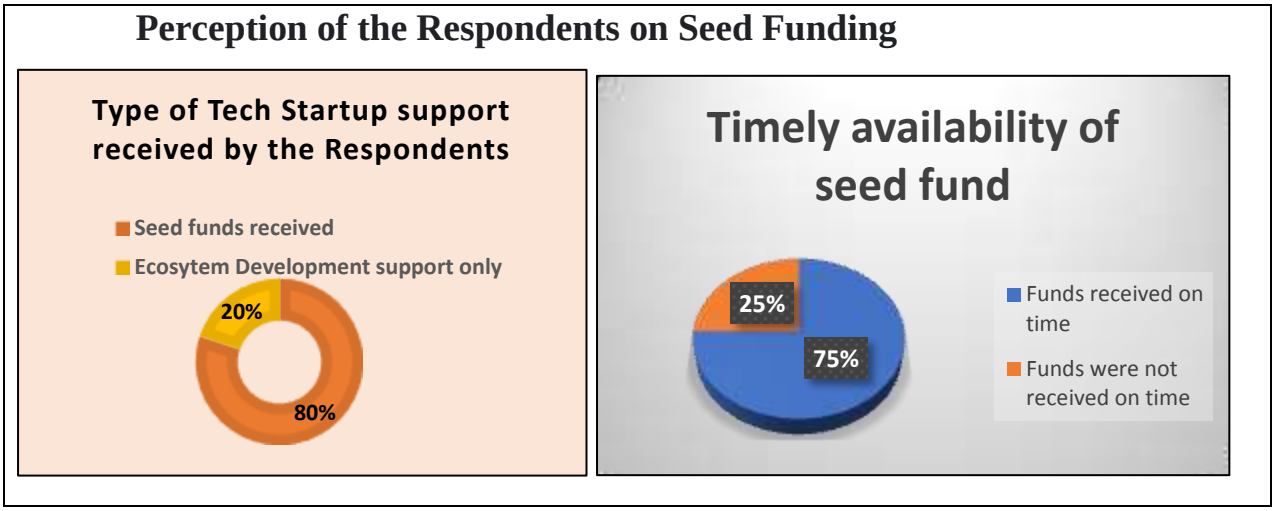


Figure 8. Seed Funding

4.2. Disrupt Asia- International Startup Conference and Innovation festival.

Disrupt Asia is the prime startup conference and exhibition in Sri Lanka organised by ICTA for the benefit of local startups to support their business growth and expansion. Started in 2016, it has been held annually in Colombo up to 2019. Local startups a were provided opportunity to showcase their products, meet other exhibitors, build strategic partnerships, receive investment and mentoring support from leading international personalities.

Main components of the event:

Startup Conference

The Startup Conference is the main component of Disrupt Asia. The conference has two keynotes by eminent startup personalities from Sri Lanka or abroad as well as presentations and panel discussions throughout the day. Technology enabled theatrical performances had been planned between the panel discussions to entertain the audience bringing the innovation festival components to the stage.

Startup Showcase

The startup showcase of Disrupt Asia is a place where selected startups get an opportunity to showcase their startups/products to the attendees of the event.

Innovation Festival

The Innovation Festival is a place where innovations in technology, arts, music, inclusion, creative industries etc. are showcased. With the positive feedback received in year 2018 (this was the year it was introduced to Disrupt Asia), it has now become a core segment of Disrupt Asia.

In 2018, the innovation festival was opened to the public and it consisted of art installations, digital activations, several innovation pavilions to showcase innovations on inclusion & diversity, gaming & creative industries.

1. Major outputs of Disrupt Asia event

Major outputs of Disrupt Asia past event are summarized in Table 2. As observed the number of participants had been increasing year-by-yea and also the international speakers. This event has been a useful experience for young entrepreneurs, especially those who had not been to such events before to understand the bench marks of startup ecosystem. They were also provided with networking opportunities and listen to international speakers as well. A core value of Disrupt Asia is to be a platform to go global, as hub in South Asia which connects global markets.

Disrupt Asia: Major outputs	**Year**			
Outputs	**2016**	**2017**	**2018**	**2019**
1. Number of local speakers	37		41	10
2. Number of international speakers	5	52	12	15
3. Number of startups showcased	35	28	40	30
4. Number of attendees	200+	400+	1000+	1000+

Table 2. Major outputs of disrupt Asia event

Evaluation was carried out using the same sample of startups to assess the outcomes especially their perceptions about the event participants. As shown in Figure 9, around 70% of the surveyed startups had participated in the event, some more than once and many exhibiting their products at the exhibition.

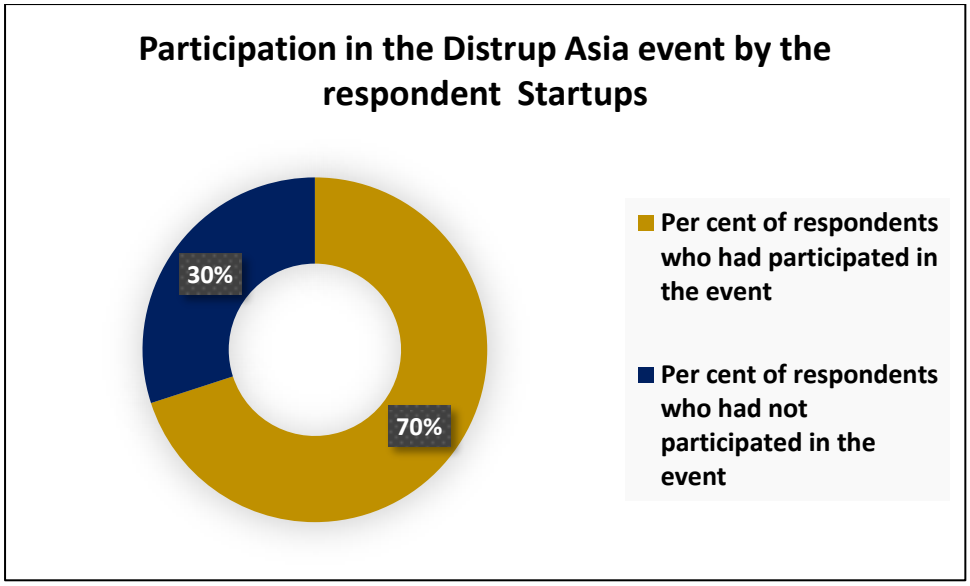


Figure 9. Proportion of respondents who had participated in Disrupt Asia event.

2. Perception of the participants about the events at Disrupt Asia exhibition

As seen from Figure 10, almost 90% of the respondents had found the opportunity they got to showcase their product at an even of this nature useful or extremely useful. Similarly, 96% had found the startup conference useful/extremely useful.

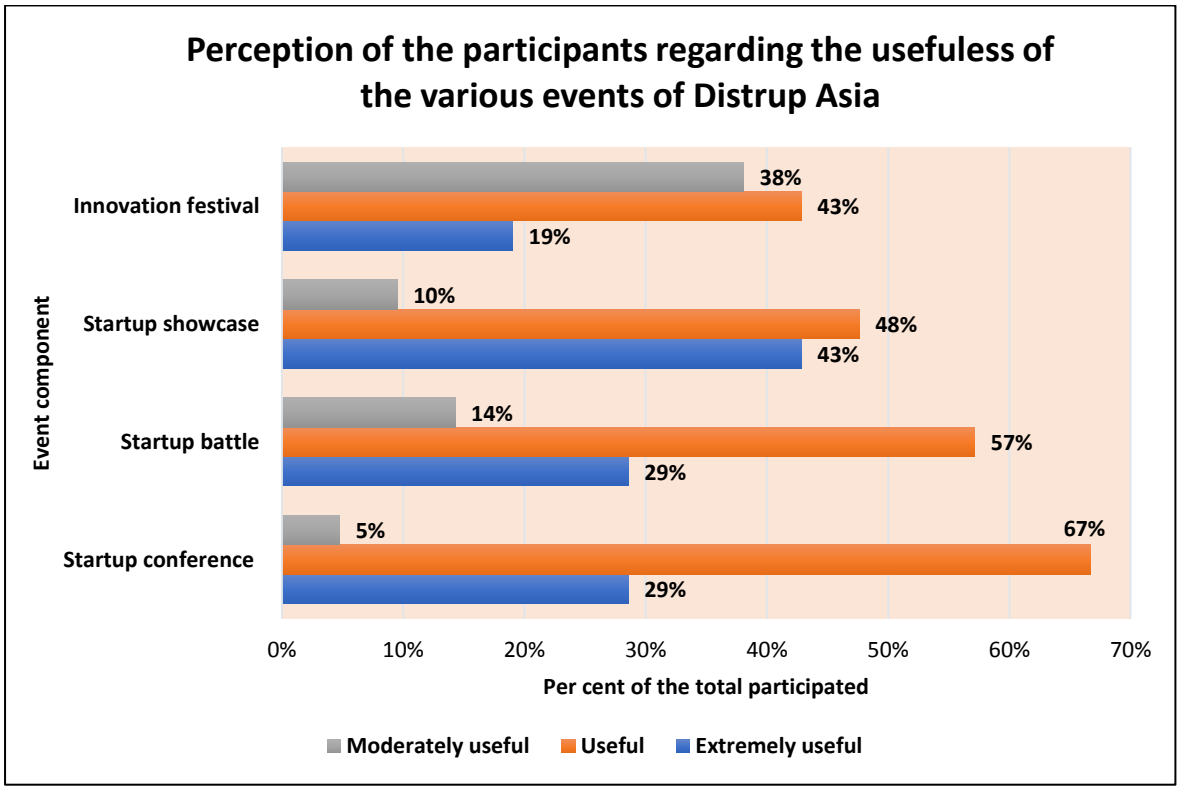


Figure 10. Respondents' perception about the usefulness of various events

4.3. Startup SL

Startup SL is the single national online platform operated by ICTA for startups and ecosystem partners to register in order to get a proper recognition and access to accreditation, financial assistance, partnerships and market access. Already 400+ startups and 20 ecosystem partners have registered with the website. It is like the national startup directory which is expected to get government concessions, loans, grants and in future tax holidays as well.

Some expected benefits include:

- **Preference**

When calling for bids for the procurement of application software, where the estimated cost is less than Rs. 2 million, such bids shall be called exclusively from startups, registered in StartupSL.

- **Financing**

Special finance schemes for startups, government concessions, loans, grants and any future tax holidays as well as other tax benefits will be available for startups.

- **Partnerships**

Startup Sri Lanka will have partnerships among different professional bodies within Sri Lanka and overseas, where Sri Lankan startup ecosystem could benefit out of the links in terms of expanding their business within the country and outside the country.

- **Market Access**

Startups will be given information and subsidized rates for expanding outside Sri Lanka. Registered startups will be given priority when taking part in global access market programs led by government initiatives.

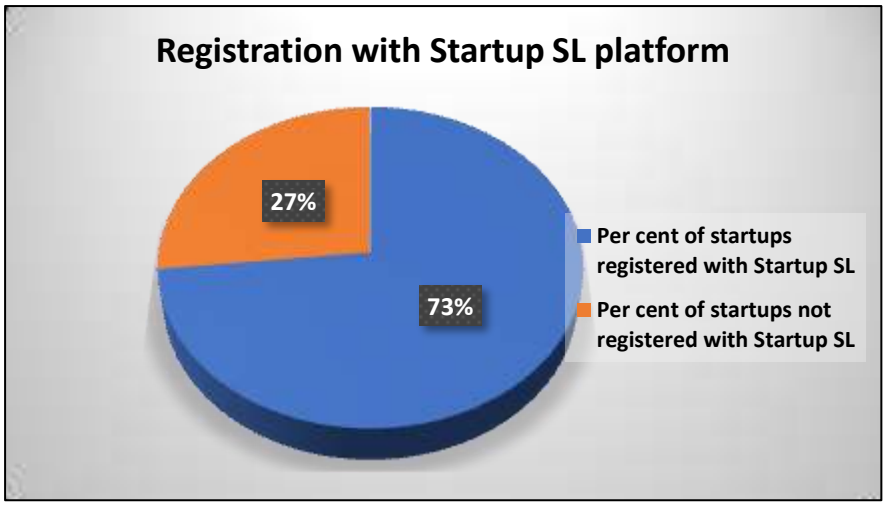


Figure 11. Sample Profile

For this study too same sample used for 'Spiralation' and Disrupt Asia assessment was used. As seen from Figure 11, already 73% has registered their startups with the StartupSL platform while lack of awareness was cited as the main reason for non-registration by others. However, so far the registered startups haven't received any major benefits except some discounted rates for certain services.

4.4 LEAP Sri Lanka: Digital Business Clinics for Regional Tech Companies

"LEAP (Learn Engage Aim Prosper) Sri Lanka" is an initiative implemented by ICTA to scale-up the regional tech companies to break into new global markets. The selected cohort of SMEs had received a 360-degree support ranging from personal development/grooming to business development, remodeling etc. to reach the international markets to upgrade their companies. At present, LEAP is a community consisting of 40 SMEs from around the country (representing all provinces of Sri Lanka). Program had been launched in August 2019, initially focusing on business remodeling and providing a glimpse of the non-technical aspects a business needs to explore the export market. All programs were designed and conducted as non-traditional workshops, promoting the practical application of concepts and methods which resulted in participants' active engagement, peer-to-peer learning, networking and building up a culture of cross selling among each other as direct/indirect outcomes of the LEAP program.

1. Study methodology

Methodology followed was very much similar to the Tech Startup study where interviews were conducted online with the founders of these regional IT SMEs who had participated in the LEAP program. In order to gather reliable and in-depth understanding, conversational type of interviews was conducted online with the founders assuring them the confidentiality of the information provided by them. Required queries were made understand their level of perceptions, opinions, attitudes and benefits accrued to them as a result of participating in various initiatives conducted under LEAP initiative. This method allowed free and frank exchange of views useful for the study. Using the list of 24 IT SME participants provided by ICTA, consultants were able to interview 18 founders. They were extremely enthusiastic and happy to give their feedbacks and suggestion for further improvements. However, it was found that some respondents had joined the program midway through a friend in the program, hence could not comment on some sessions held at the beginning.

2. Major Findings of the survey

1. Profile of the IT SME Businesses

As illustrated in Figure 12, the age of the organisations fell into varied categories ranging from three years to sixteen years. However, around 70% of them were ten years or less in their operations.

Similarly, as shown in Figure 13, these regional IT SMEs were distributed in different geographical locations representing 8 districts of the country with Colombo district having the highest representation (44%) number of companies followed by Kandy (17%) and Puttalam (11%) districts.

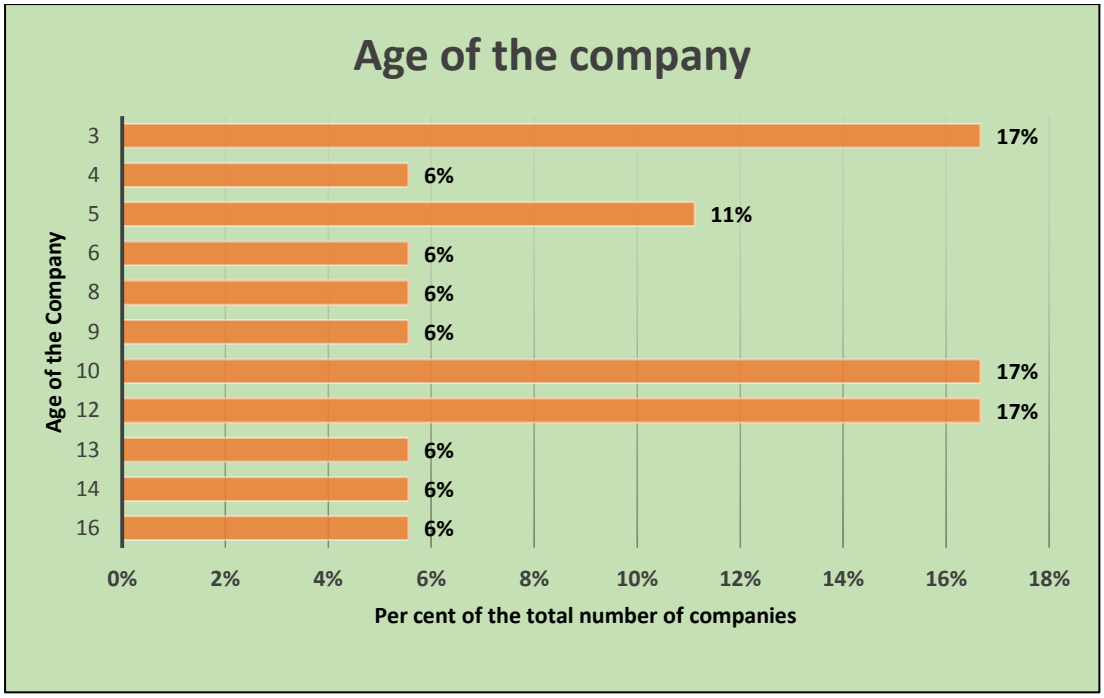


Figure 12. Age of the Business

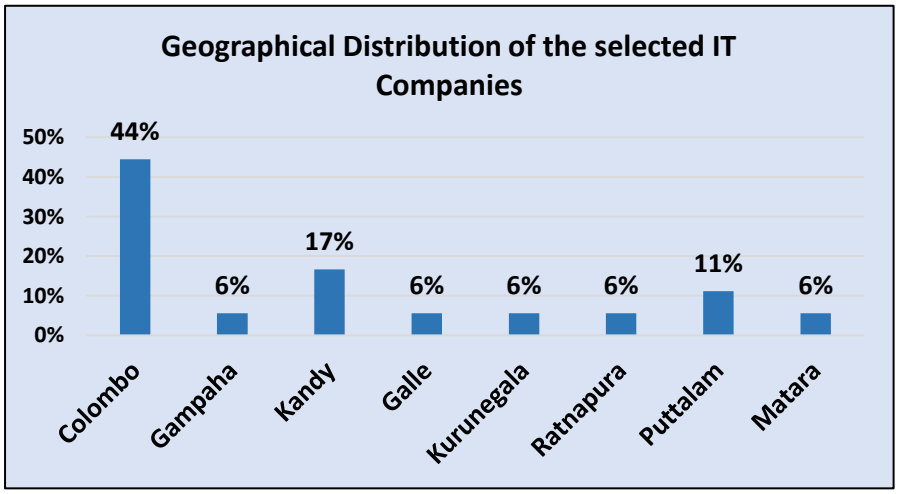


Figure 13. Geographical distribution of the sample

Figure 14 shows their affiliations with major IT associations of the country. It is seen that 33% of these companies are not members of these major IT associations, but some of them are affiliated with regional chambers of commerce.

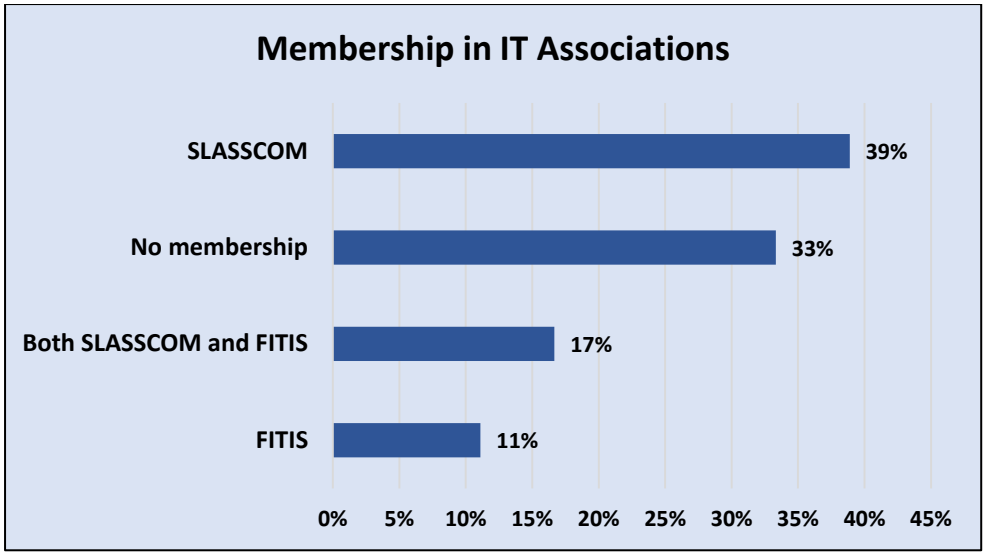


Figure 14 .Membership in major IT Associations

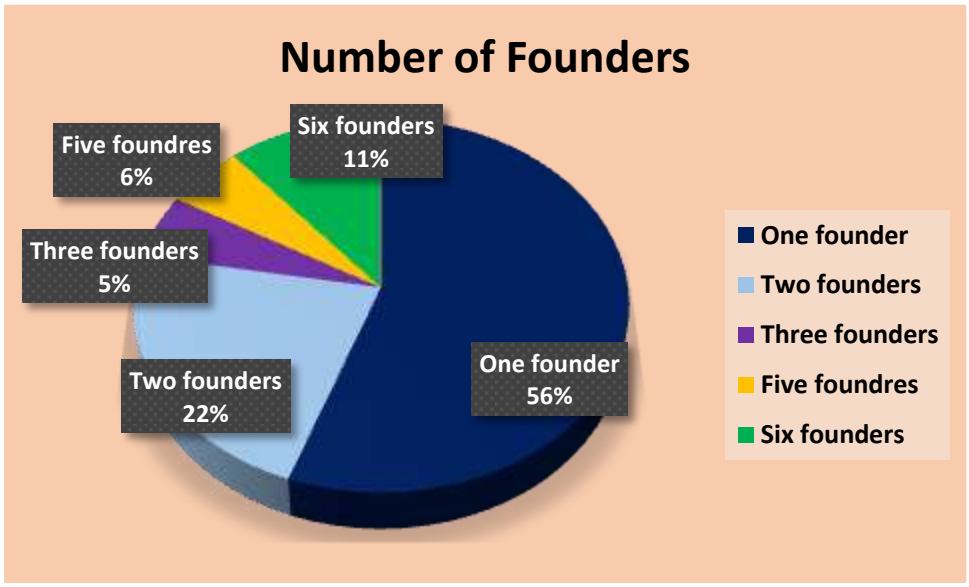


Figure 15. Number of Founders of the company

As depicted in Figure 15, majority of companies (56%) consisted of a single founder while 22% had two founders. Another 17% of these companies had five or six co-founders. Majority of them have started their businesses just after their basic or postgraduate degrees.

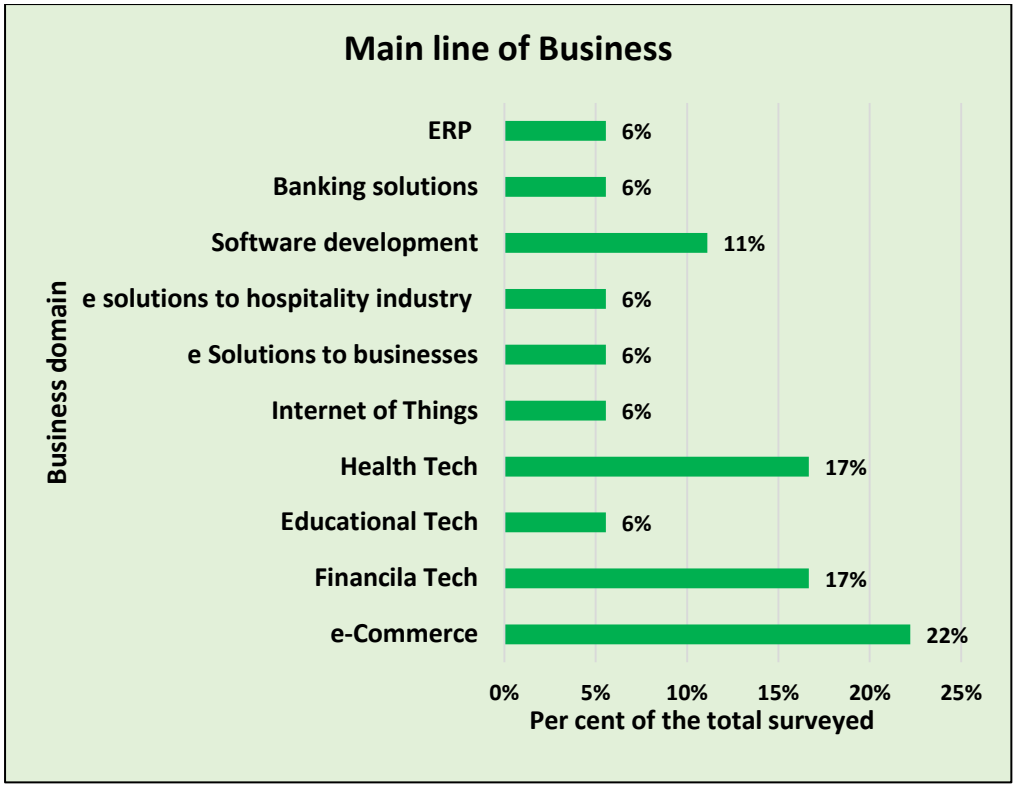


Figure 16 . Main line of Business

Figure 16 provides the distribution of the sample companies according to their main line of business. Most of the companies were providing ecommerce solutions to their customers in the area while health tech, financial tech and software developments were the other businesses these companies were involved in. They were mostly catering to the individual needs of their clients and lacked the knowledge, skills or enthusiasm to scale up their businesses to international level.

2. Profile of the Founder

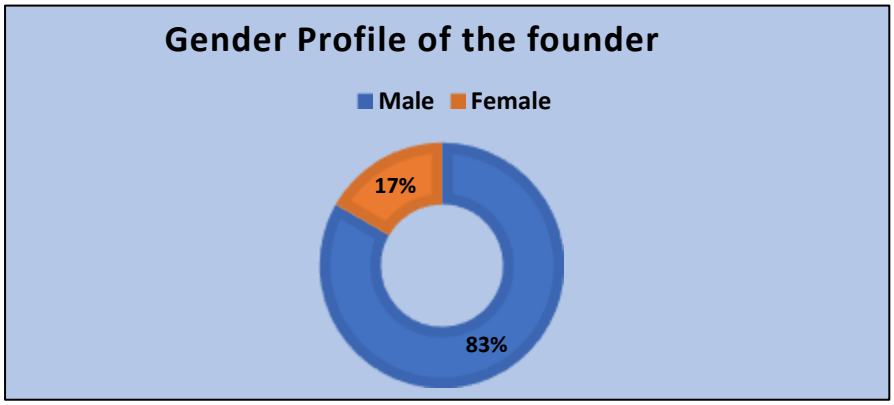


Figure 17. Gender Profile of the Founder

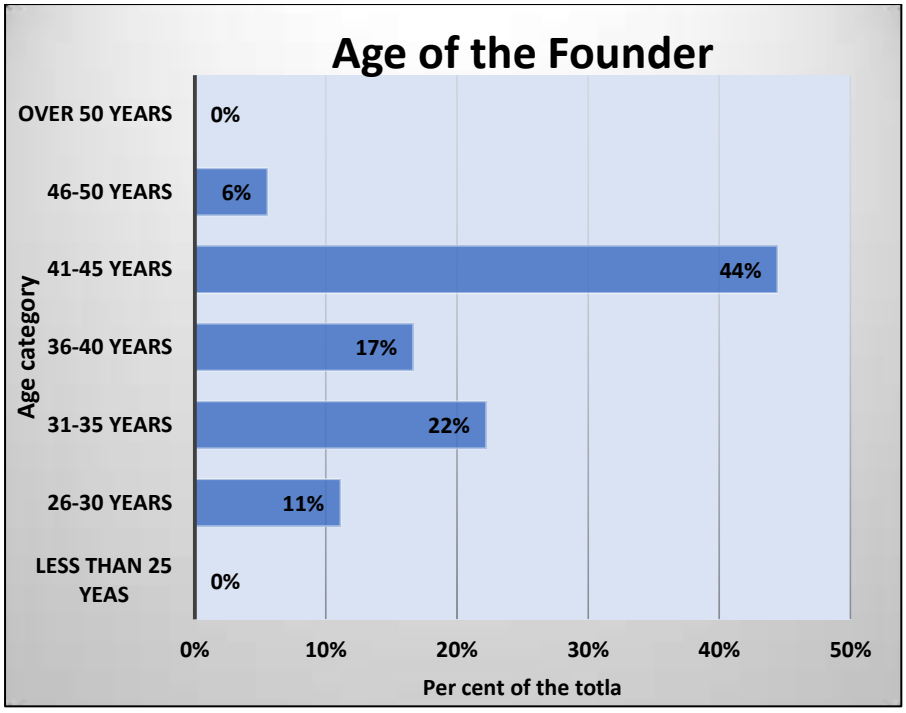


Figure 18 .Age Profile of the Founder

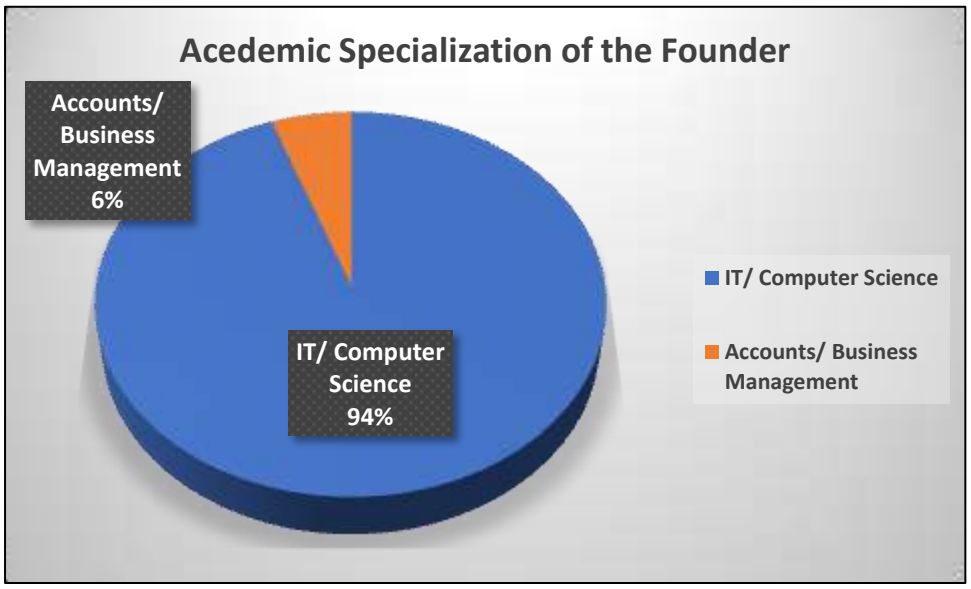


Figure 19. Core Academic specialization of the founder

As observed from Figure 17 majority 83% of founders were males while Figure 18 provides the age profile of the founders and as seen 94% of them were below 46 years of age. In a similar note, 94% of them had the core academic specialization of as IT/Computer science (Figure 19).

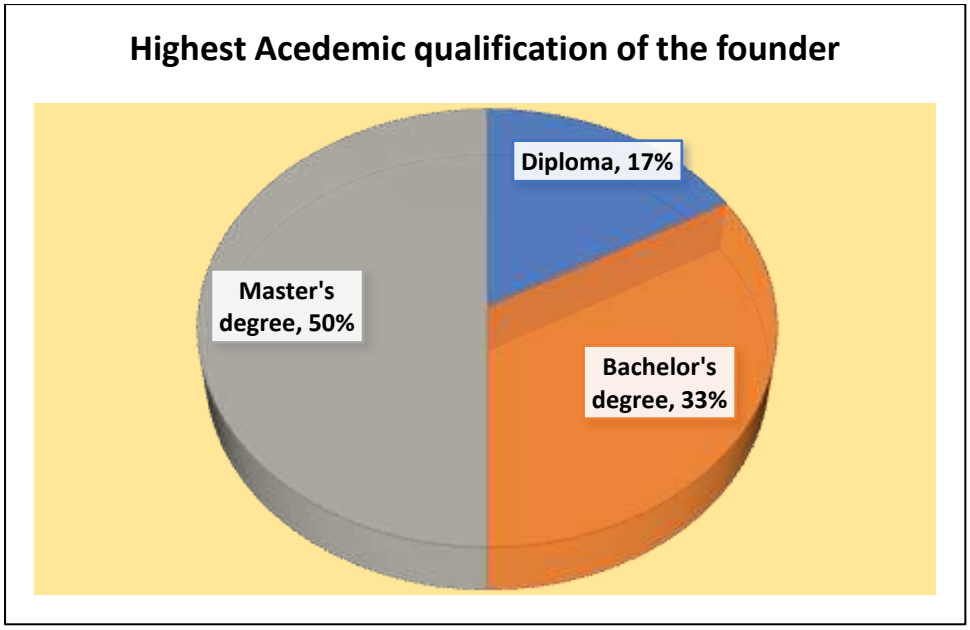


Figure 20. Highest Academic qualification of the founder

It is seen from Figure 20; the founders were highly educated with almost half of them having Master's level qualification while another 33% had bachelor's degrees.

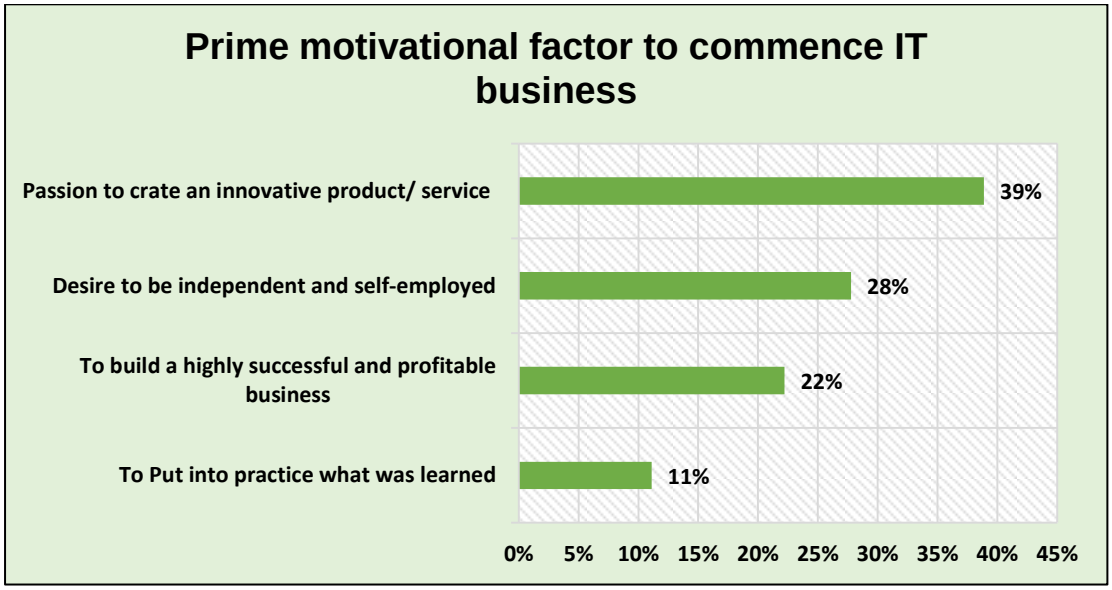


Figure 21. Prime motivational factor to commence an IT business

The prime motivational factors that have driven the founders to commence their business, as shown in Figure 21, were: a) their passion to create an innovative product/service (40%), b) to be independent and self-employed (28%) c) to build a highly successful and profitable business (22%). As such all are keen to take their businesses to next level and LEAP has given the required impetus to achieve this.

3. Perception of the respondents towards LEAP program

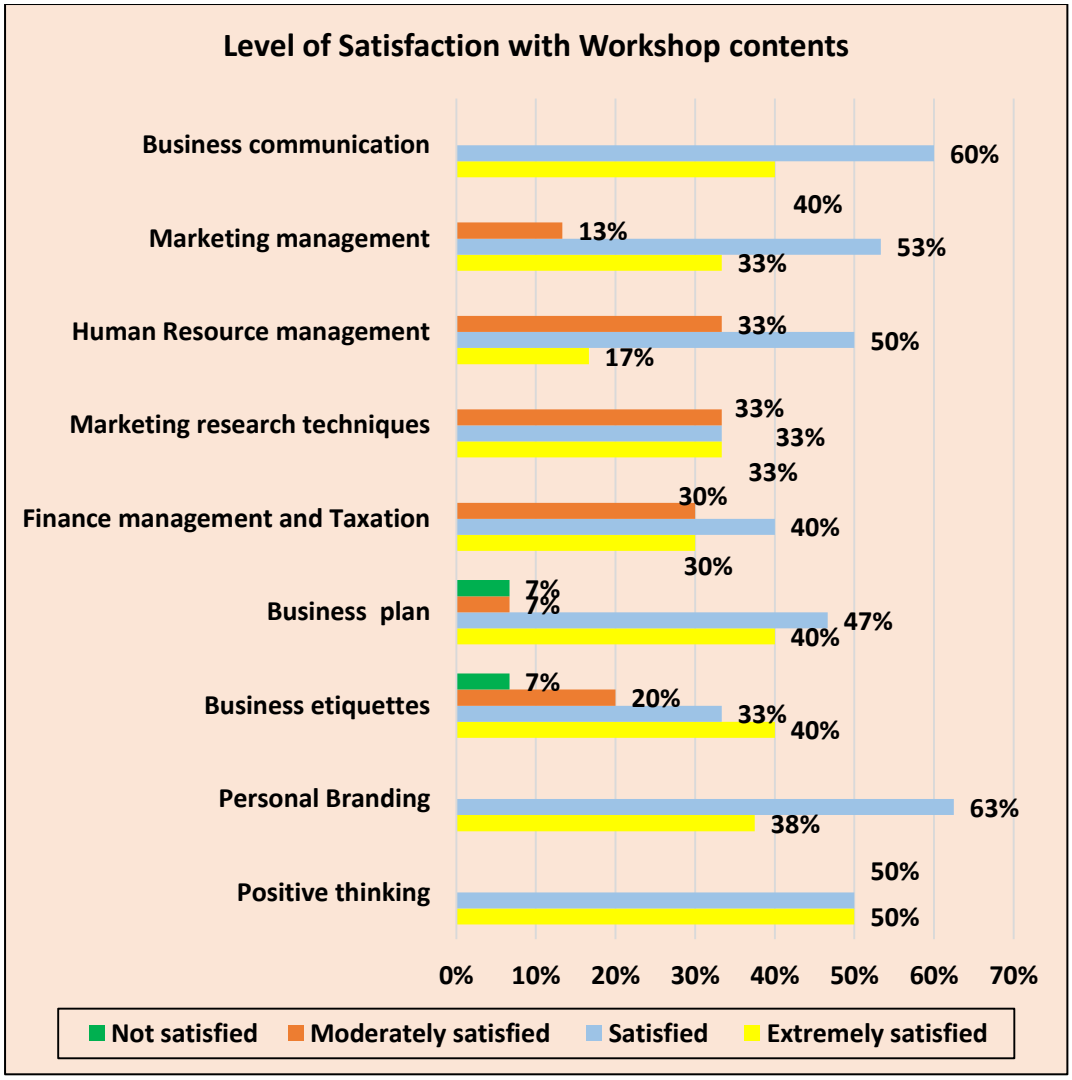


Figure 22. Respondents' perception: Level of satisfaction with workshop contents

As depicted in Figure 22, most of the respondents were extremely satisfied/satisfied with the training workshops conducted by LEAP program. Only few respondents had indicated moderate level satisfaction or dissatisfaction with business plan, business etiquettes, market research techniques, and finance management and taxation sessions. Further, some respondents had joined the LEAP midway and were unable to provide their responses to some training components that they have not participated.

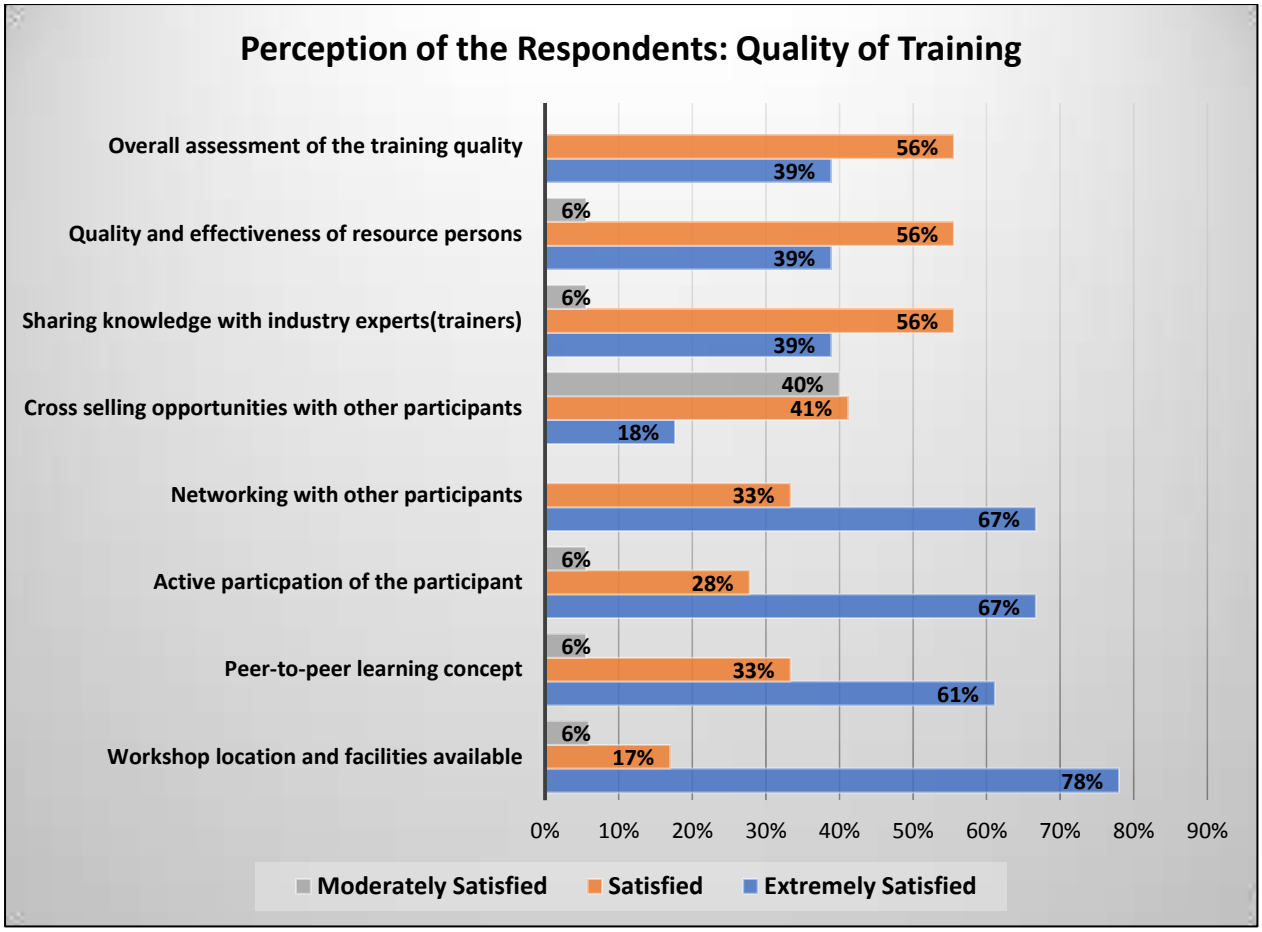


Figure 23. Respondents' Perception: Level of satisfaction with quality of workshop

The survey also verified the respondent's level of satisfaction with other aspects of the workshops conducted by LEAP program and results are shown in Figure 23. As observed, 78% had indicated the workshop venues and facilities available at these locations were extremely satisfied. Over 60% of the respondents had found peer-to-peer learning concept, active participation of the participants and networking with other participants extremely satisfactory. Cross selling opportunities were not always possible with other participants and hence, 40% of the respondents had assess it as 'moderately satisfactory'.

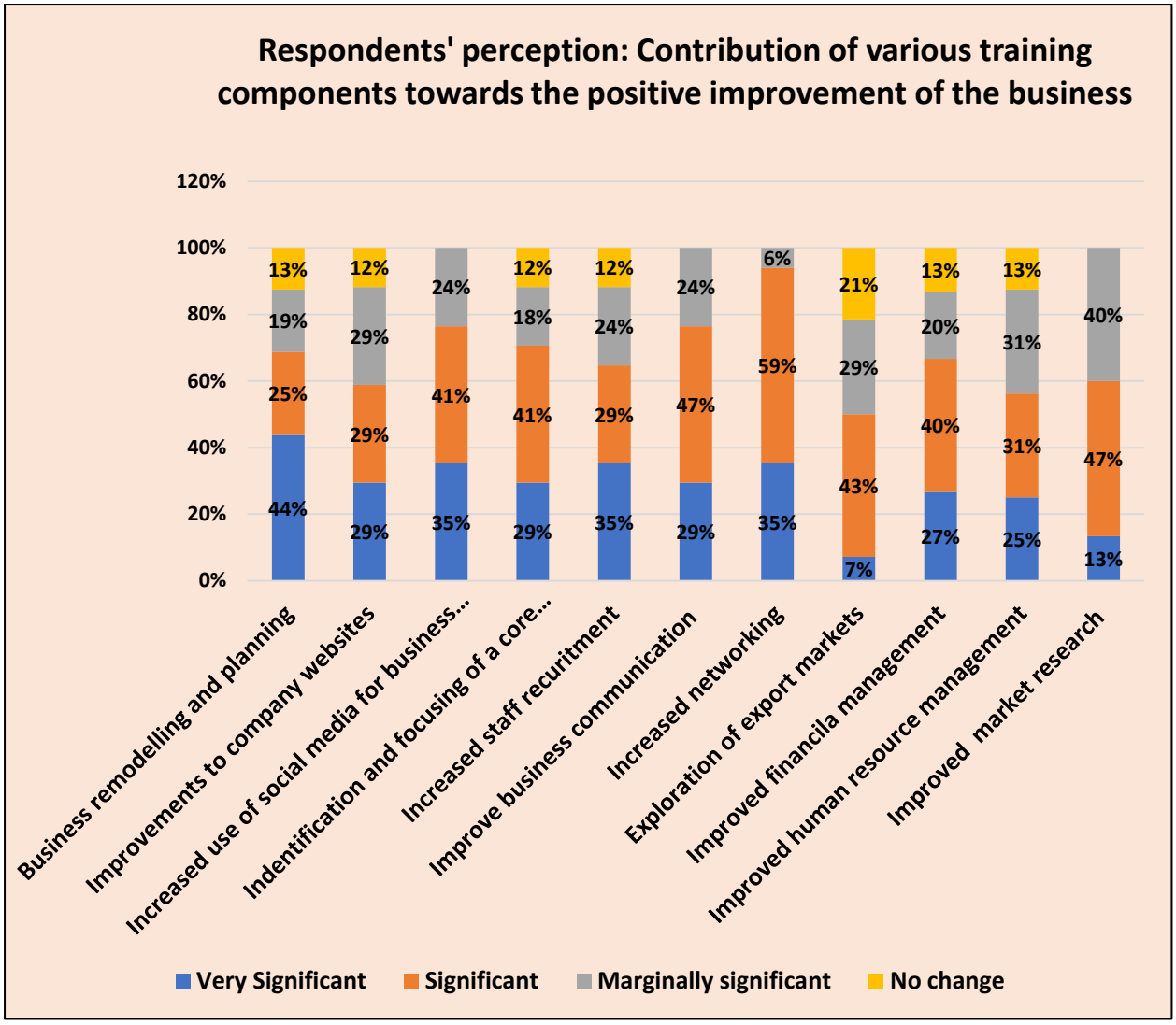


Figure 24 Respondents' Perception: Level of significance of LEAP for business improvement

During the training secessions participants acquire new knowledge and skills that can be applied to make positive changes within their businesses. These behavioural changes are considered as immediate outcomes of these training sessions. As illustrated in Figure 24, respondents had acknowledged the positive contribution these trainings had made towards improving their businesses. Increased use of social media for business promotion, identification of core business for promotion, improve business communications and business remodelling after the LEAP training had significant impacts on their business. Market research, human resource management, and exploration of export markets and web site improvement had less significant impact on their businesses. It was observed that some participants were focusing on local market and had less interest in scaling up their businesses to reach global markets partly because of the nature of their products.

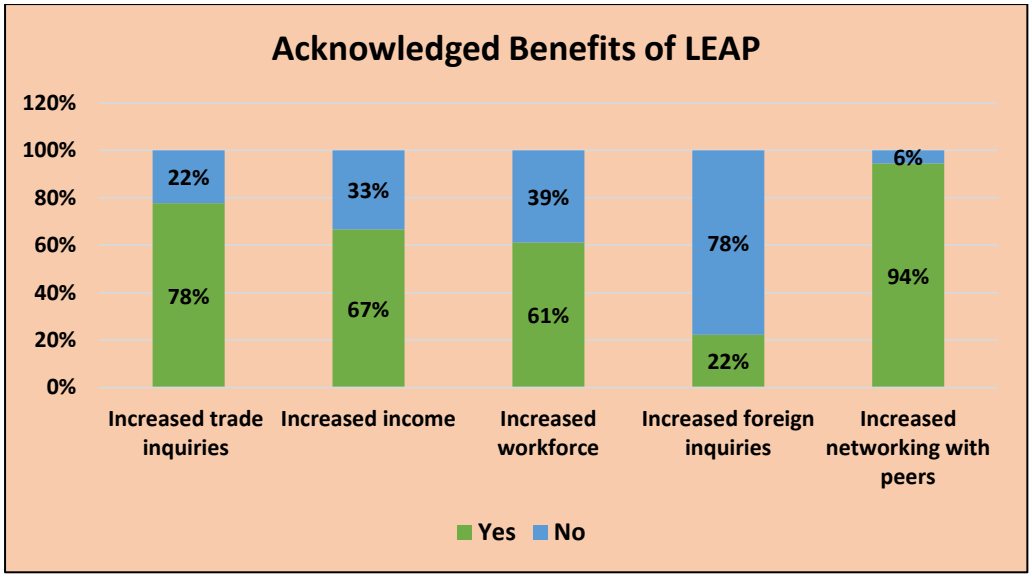


Figure 25 . Acknowledged benefits of LEAP

The survey inquired from the respondents the real tangible benefits their businesses experienced after making relevant changes based on what were learned during LEAP training. Accordingly, they have acknowledged increased networking (94%), increased trade inquires (78%) and increased income (67%) as significant benefits they have experienced as a result of implementing LEAP recommendations.

4.5. 'Imagine IF' : Entrepreneurship Development initiative for Undergraduates

The program had been initiated in 2018 with the objective of building future entrepreneurs who can transform viable business ideas to globally scalable startups. Contents delivered at these workshops were designed to plant the seeds of entrepreneurship among the young undergraduates by laying the foundation for them to develop thinking and developing skills on problem solving and researching for them to be successful in the long-run to create globally scalable start-ups. This initiative is relevant and aligned with the overall objectives of the IDP.

Target group: Students from state universities and non-state universities/higher education institutes.

Main objectives of the program;

- To create awareness of the startup eco-system in Sri Lanka and the supporting structure for the aspiring entrepreneurs.
- To transfer the necessary basic knowledge to start their first business with a more feasible business plan supported by industry experts.

Activities and workshop structure

Program consists of a three-day workshop/boot camp held in the hosting university. The boot camp consisted of three sessions (days), as described below.

Day 1.

The workshop introduces and brings to light the basic concepts of entrepreneurship and educates the participants on how to generate an idea, the design thinking process to identify better ideas, how to validate those, how to do the initial market research, how to test the product and identify the better product-market mix, how to draft the first business plan, growth hacking techniques and get the teams to come up with own ideas and business plans facilitated by the speakers and ICTA officials.

Day 2.

The workshop is filled with fun and enthusiasm as the students are asked to form groups and fabricate viable business concepts. Parallelly, mentoring sessions take place facilitated by a group of industry experts and entrepreneurs who volunteer and educate the participants with much needed knowledge on developing their business plans upon the business idea.

Day 3.

This day activities are very interactive, supported by mentoring and facilitation, followed by a pitching competition which allows the participants to present their business models in front of a panel of judges who eventually awards the participants with industry validated certificates.

Output: Total of 1564 undergraduates from 14 campuses empowered.

Year	Number of Participants	No of Campus
2018	765	7
2019	593	5
2020	206	2
Total	1564	14

Expected outcomes of the program:

- Created a start-up ecosystem for the students who are eager to move to the next step with their colleagues to develop their business plans and implement them in the future.
- Created new networks and connected them to a platform to share knowledge and produce novel business ideas.
- Improved the knowledge and skills of the participants and created enthusiasm in the subject of entrepreneurship.

This was to be a novel experience for majority of them especially for those who were not from IT and Business-related backgrounds.

Outcome evaluation method:

A questionnaire was emailed to a sample of 27 participants whose contact email addresses were provided by ICTA. However, despite many reminders only six had responded. It was not possible to contact them over the phone due to non-availability of the same.

Hence, it is not possible to make an assessment of the initiative's outcomes.

4.6. 'Educate to Innovate' program for teachers

This program had commenced in 2018 to motivate and inspire the teachers on the integrated approach of teaching STEAM subjects in schools. The one-day program consisted of four inter-related initiatives designed in a workshop style to motivate and inspire teachers on the integrated approach of STEAM subjects in teaching.

Objectives of the program:

- To create awareness among the teachers of the new pedagogical approaches coming up which the country should be ready for
- To get the teachers to replicate same topics in schools (for students) as and when possible.

Workshop structure

Topic 1:
Integrating STEAM Education – STEAM is planned to be an integral part of the curriculum based on the idea of educating students in four specific disciplines- science, technology, engineering, arts and mathematics — in an interconnected and applied approach. In comparison to teaching the five disciplines as distinct subjects, STEAM integrates them into a cohesive learning paradigm based on real-world applications.

Topic 2:
Why and how kids can learn to Code– Computational thinking teaches how to tackle large problems by breaking them down into a sequence of smaller and manageable problems. It allows you to tackle complex problems in efficient ways and involves creating models of the real world with a suitable level of abstraction and focus on the most pertinent aspects. The applications of this approach stretch beyond writing software where it indirectly improves logical thinking, problem solving, collaboration, and communication skills of children. An external speaker was invited to do this session and conducted practical sessions as well, based on the availability of the required logistics and equipment.

Topic 3:

Creative Education and Makerspaces – Creative education lays the foundation for maker movements which leads to create better engineering designers who thrive for innovations. A makerspace is a collaborative work space inside a school, university, technical college, library or separate public/private facility for making, learning, exploring and sharing that uses high tech to non-tech tools. The core of a makerspace is more on the creation of "the maker mindset" which creates something out of nothing and explores children's own interests. These spaces also help to offer baseline for the 21st century skills in the fields of science, technology, engineering, arts and mathematics (STEAM). An external speaker or an ICTA official conducted this session with maker-kits being provided to the teachers and for them to come up with innovative and creative designs to solve a given problem.

Topic 4:

Entrepreneurship & Entrepreneurial Thinking – The need of entrepreneurial thinking of a school kid is a vital part to be incorporated to a students' career. We live in a world in which the future is uncertain, so students need skills that will allow them to make their own way. Inculcating entrepreneurial thinking to students' mind will enhance the problem-solving skills, empathize with others, think creatively, take risks, accept failure as part of the growth process, and appreciate the correlation between hard work and success. This session stressed on the need of entrepreneurship education in the education system. This is not only to encourage, but also get the students to be creative, to innovate, and to collaborate with others.

Target Group: School Teachers who teach Science, Technology, Engineering, Arts, Mathematics subjects and final year trainee teachers from national college of education across the island.

Expected outcomes

- To create awareness among the teachers of the new pedagogical approaches coming up which the country should be ready for
- To get the teachers to replicate same topics in schools (for students) as and when possible.

Output: 17 workshops completed with 265 school teachers and 2878 trainee teachers

Year	Number of Participants	Workshops
2018	2007	9
2019	1136	8
Total	**3143**	**17**

Outcome Assessment:

Since, all these workshops had been organized by the Ministry of Education, participants' contact details were not available with the ICTA. Therefore, it was not possible to get a feedback from them to measure the outcomes and impacts of these events. However, considering the need for increased the ICT workforce in the country, the program is relevant and timely to enhanced enrolment of students to STEM fields.

5.0 Discussion of the Findings

5.1 Tech Startup Support Program

Sri Lanka has a growing and vibrant Startup sector in the IT industry and various programs have conducted and are in place to support its growth and expansion. ICTA too has already doubled its intake for 'Spiralation' program to support tech startups in the country. Based on the sample study carried out with 30 startups supported during the period (2016-2020), only 17% were found to be non-functioning at present. Some have temporarily suspended their services due to the current downturn in the tourist sector.

a. Startup sectors (domains) of the supported companies

Of the sample startups studied, most of the domains appeared to be based on shallow technologies while only few were deep tech startups using advanced technologies such as AI, IoT, blockchain, drone technology ect. In our opinion, only such deep tech startups have a better chance of breaking into global market. In one instance, a startup which funded by ICTA in 2016 and had commence with only two IT persons (co-founders) has now grown into a big company employing 36 IT staff because of the adoption of deep techs to provide cutting edge solutions.

b. Founder's Profile

When analyzing the profiles of the startup founders, it was observed that almost 82% of them are young -below 36 years of age and highly qualified in IT and Engineering (80%) with bachelor's or higher level of academic qualification. Further, 63% had stated that they commenced the business because of their passion to create an innovative product/service. Further, some founders had opted to further their undergraduate research projects to next level to develop a viable and marketable solutions to identified problems. Also, some have combined deep tech hardware and software solutions to develop truly innovative and disruptive products to the market. It appears that ICTA has supported correct types of startups which are of global standard.

c. Selection Process

ICTA has followed a very stringent and transparent procedure to select the ultimate batch of startups to be supported. The selected startup founders were satisfied with the procedures and requirements adopted by ICTA to select the final batch. However, this finding is somewhat bias since we were not able to get the opinions of those who applied but were not selected for the program. It is also pertinent to mention that 23% had indicated their dissatisfaction with the number of milestones and the timeframe given for them to achieve in order to get the grant. Though, these time frames were fixed jointly, while implementing the startups would have encountered some difficulties to keep to the fixed timelines. At the same time some appreciated the strict timelines enforced by ICTA which gave them a valuable experienced of 'working to a given schedule'.

d. Training program provided to Startups

Though the startups were started by young, educated and enthusiastic entrepreneurs, many of them lacked business knowledge and required acumen to develop their innovative ideas into successful and marketable product and businesses. In this regard, the intensive training provided by ICTA to the selected startups were highly useful and appreciated by most of them as indicated in Figure 7. The outcomes of the training components are indicated in terms of the new knowledge gained and the application of such knowledge to build up the businesses. It was noted that all the respondents had not attended all the sessions. Also, some who had participated few years back had forgotten to comments on these queries. Them. However, ICTA has carryout post training evaluations immediately after the sessions to assess the quality of training and had rectified the identified deficiencies in their subsequent events.

Training on legal essentials, covering Intellectual property laws, business registration procedures, shareholder management had been rated as 'Extremely satisfied /Satisfied' by 93% of the respondents while 86% had similar levels of satisfaction with business model development module. Mentoring process had received only 55% 'Extremely satisfied /Satisfied' rating from the participants. Mentoring process is essential for them to develop their skills, competencies and maximize their potentials. As indicated by some interviewees, they preferred individual mentoring or smaller group sessions for them to have one-on-one interaction with the mentor. Also, they preferred a single industry expert with experience in the field to guide them throughout the program.

e. Seed funding

As depicted in Figure 5, almost 70% of founders had started the companies with their limited personal savings, and hence the grant funds had been of great assistance to get their businesses off the ground. It was observed that 'Spiralation' has followed a unique model of providing seed funds as grants and additionally provided them with essential training and capacity building to ensure they succeed in their projects. This was appreciated by the all the recipients. As understandable, timely receipt of funds was critical at early stages, especially when they are operating with limited resources.

However, it was observed that in 2016, some startups had experienced long delays in getting their grant money but no delays were reported in other years. One startup founder who had previously failed in his business, mentioned that ICTA funding not only helped them to restart their business but also the limited amount of funds received as a grant, taught them lessons on how to manage the business with limited funds by avoiding wasteful expenses. Some have suggested to increase the limit of the grant up Rs. 2.5 million, considering the today's costs.

f. Sustainability and Growth of the ICTA supported Startups

It was observed that almost 80% of the ICTA supported startups are doing well and some have grown into big global players. For instance, one startup supported by ICTA in 2016 to restart its operations with three co-founders, has grown into big company with a staff 42 of which 36 are IT staff. Similarly, most companies have increased their workforce and created new job opportunities as an important outcome of the initiative. Those who were not operating fully at present, were providing services to hospitality and tourist industry sectors which suffered serious setbacks initially due Easter Sunday attack and subsequently due to COVID pandemic. Hence, we can safely assume that 'Spiralation' initiative has realized the following outcomes; increased the number startups in the country, increased number of job opportunities and increased export earnings.

g. Unrealized expectations of the startup companies.

Several startups investigated had developed products and services targeting government (both central and local) government organizations offering unique solutions to identified problems. As one founder says, "One of the reasons for join the Spiralation program was to get the government projects, but that linkage is not yet established, and it is recommended to make that link with the state organizations to support start-ups." Though most of these startups have received high-profile national awards for their innovative products, they were unable to offer these solutions to state sector organisations and some even complained that they were not even given an opportunity to meet the heads to explain about their solutions. Also, often they had been unable to offer their bids because startups as emerging business could not meet some of the basic conditions stipulated for submitting the offers. Number of years in business, audited accounts for past three years, past experience in similar projects of over several millions of rupees etc. were cited as examples, which the new startups cannot comply with.

h. Brain Drain

The consultant was able to interview a founder who had gone through 'Spiralation' for with his deep tech startup has left the country and working in an overseas accelerator for the last two years. He too mentioned how difficult it was to offer even a superior product and/or a service to a government institution because of the government red tape which motivated him to leave the country.

Although this may be an isolated case, it emphases the importance of creating an conducive operating and surviving environment for our innovative entrepreneurs to remain in the country.

i Quotes from the founders

"We think ICTA did a great job and from the process of selection to the end of the program it was well planned and the executed in timely manner. The ICTA team was very friendly and supportive throughout the program."

Sanjeewa Pathirana
Nanosoft Global (Pvt) Limited

"SenzMate almost restart the operations with the ICTA funding. The small investment taught us efficient financial management practices and still, we are working in similar financial management practices without any wastages of funds"

Miller Alexander Rajendran
SenzMate (PVT) Ltd

"Spiralation program supported us to accelerate the progress of our project from the inception to commercialization in a rapid phase. The knowledge and financial support received was instrumental in generating initial traction to operate as a business. The work ICTA doing to develop a startup ecosystem in the country must be greatly appreciated. We have never experienced such support from any other government related body in the country with such an interactive and responsive manner."

Migara Amithodhana
Magicbits (Pvt) Ltd

j. Proposed suggestions to improve the 'Spiralation' initiative.

The following suggestions were made by the responding startup heads to improve the program implementation and its effectiveness.

a. Appoint a dedicated industry expert as a mentor who is available throughout the program to provide critical guidance to emerging startups.
b. Provide some individual sessions after the main presentation to discuss individual and specific issues of the participants.
c. Arrange a second level program to provide continued support for those who have completed the 'Spiralation' program successfully.

d. Involve a banker in the program from the beginning for banks to understand the economic value of startups to the economy.
e. At the end of the acceleration, organize a 'Demo-Day' for the cohort startups to reach the right audience and potential investors.
f. Arrange special concessions to import hardware components without any Customs duty for Startups involved in providing solutions involving hardware and software.

5.2 Disrupt Asia- International Startup Conference and Innovation festival

Disrupt Asia is considered as the prime startup conference and exhibition in Sri Lanka organised by ICTA for the benefit of local startups to support their growth and expansion. Started in 2016, this had been held annually up to 2019. As pointed out by one participant, who had participated in the event throughout, claimed that this event is an eye-opener to new startup businesses, without any previous foreign exposure. It provides a clear understanding about the ecosystem and experience in networking and knowledge sharing with other participants. This also has provided an opportunity to international community to get to know about our startup ecosystem and startups in Sri Lanka. Apart from increased market access opportunities, local startups also had got networking opportunities with international speakers and attendees.

5.3 Startup SL

This is the national and largest online platform for startups in Sri Lanka. Already 400+ startups, and 20+ ecosystems partners have registered with the platform. Of the survey participants, 73% had already registered and many others who had not registered yet since they were not aware of this platform. As explained by one interviewee, this is like the national startup directory which has given lot of recognition for local startups. It is expected that future government concessions, loans, grants and in future tax holidays as well as other tax benefits will be available for these registered startups. Further, they will have partnerships with different professional bodies within Sri Lanka and overseas and they will be given priority when taking part in global market access programs led by the government. However, no one has yet received any tangible benefits except some discounted rates for some services.

5.4. Learn Engage Aim Prosper (LEAP) Sri Lanka program; 'Digital Business Clinics for Regional Tech Companies-

Program was launched in August 2019 in order to scale-up the regional IT SMEs to break into new global markets. The selected SMEs have received comprehensive support, ranging from personal development/ grooming to business development to remodeling etc. to upgrade their companies. All training programs had been designed and conducted as non-traditional workshops, promoting the practical application of concepts and methods which resulted in participant's active engagement, peer-to-peer learning, networking and building up a culture of cross selling among each other.

Methodology followed for the evaluation was very much similar to the Tech Startup study where interviews were conducted online with the founders of these regional IT SMEs.

a. Profile of these IT SMEs

Geographically located in eight districts, the selected study sample of 18 regional IT SMEs had the highest proportion of 44% from Colombo, followed by Kandy (17%), Puttalam (11%) and 6% each from Gampaha, Galle, Matara and Kurunegala. These SMEs has been in operation for varying numbers of years, ranging from 3 years (17%) to 16 years (6%). Regarding their main line of business, the highest number of companies were providing e-commerce and business solutions to their customers in the regions (34%) while health tech, financial tech and software development were the other businesses these companies were involved in. There weren't any export-focused deep tech companies that could penetrate the global market. Majority of them were providing IT services to required customers at the regional level.

Around 39% of respondents were members of SLASSCOM while another 17% were members of both SLASSCOM and FITIS while 33% were not members of either of national-level IT associations but some were affiliated to local chambers of commerce.

b. Profile of the Founders

Majority 56% of the companies had only a single founder while 22% and 11% had two and six founders respectively. Gender-wise majority 83% were males. When age profiles are analyzed, it is seen that almost 50% of the surveyed were over 40 years of age while another 39% fell into the age category of 31 -40 years. The core academic specialization of 94% of the founders were IT/Computer science and almost half of the founders had Master's level qualification while another 33% had bachelor's degrees. Hence, it is clear that majority in the sample are middle-aged and highly qualified in IT/Computer science and with well-established regional businesses.

The prime motivational factor of 40% of the respondents were to commence the business were their passion to create an innovative product/service while another 28% had wanted to be independent and self-employed and another 22% expected to build a highly successful and profitable business.

c. Training quality

It was observed that some SMEs had joined the program subsequently and had not participated in all the sessions and boot camps conducted by LEAP. The survey verified the respondents' levels of satisfaction with quality of the workshops conducted by LEAP program and results are shown in Figure 23. As seen, around 95% of the participants had ranked the overall acceleration process as 'Extremely satisfactory/Satisfactory.' Further, 78% had indicated the workshop venues and facilities available at these locations were 'Extremely Satisfied' and another 17% has found them 'Satisfactory'. This indicates that the participants had a comfortable and conducive environment to learn and gain the maximum from these workshops. Regarding teaching methods and related activities, over 94% of the respondents had found peer-to-peer learning concept, active participation of the participants sharing knowledge with relevant industry experts and networking with other participants 'Extremely satisfactory/Satisfactory'. Cross selling opportunities were found to be 'Extremely satisfactory/Satisfactory' with only 59% of the participants because this aspect depends on the nature and requirements of the each other.

d. Outcomes of the training programs provided to IT SMEs

The assessment of the level of acceptance of the training programs by the participants or their 'reactions' to the knowledge gained from these sessions were measured by gauging their perceptions by checking the participants' level of satisfaction with the training sessions. As observed from Figure 22, all the interviewees (100%) have rated Business Communications, Positive thinking and Personal branding sessions as 'Extremely satisfied/Satisfied'. Also, 87% of participants had rated Business Planning and Marketing management sessions as 'Extremely satisfied/Satisfied'. Between 73%-66% of the participants had found Business etiquettes, Human resource management and Market research techniques sessions 'Extremely satisfied/satisfied'.

From the above, it appears that all the training sessions had been well accepted by the participants and the knowledge gained by the participants were relevant and useful to implement required improves in their businesses. As the Figure 24 illustrates, the participants had used the newly gained knowledge to make positive changes in their business operations to bring about required improvements to the overall performance of the company. The changes effected and how they contributed to the overall performance were measured by assessing the participants' perception in terms of 'level of usefulness', measured in a rating scale of 'Very significant 'to 'Marginally significant' or 'No change.'

Increased networking has produced 'Very significant/Significant' improvement to 94% of the participants while Improved Business Communication and increased use of social media for business promotion have similar improvements to 76% of the respondents. Business remodeling and planning, and focusing on identified core businesses have brought about 'Very significant/Significant' levels of improvements to 70% of the participants. Also 'Very significant/Significant' levels of improvement to businesses had been achieved in case of new staff recruitments (64%) and making changes to their company websites (58%). It was noted that most companies have focused only on local market and not keen on to exploring export markets. For example, one company that has built a near monopoly in developing supplying software solutions to cooperative banks and has already provided banking systems to 139 cooperative banks out of the total of 4424 in the country. His sole aim at the moment is to capture the balance banks.

The survey findings on actual benefits received by implementing those changes are given in Figure 25. As observed, 94% had indicated that they benefited by increased networking with peers and 78% has benefited from increased trade inquires by applying the knowledge they gained from LEAP programs. Similarly, 67% admitted that they increased their income while 61% has increased their workforce as a result of LEAP training. Only 22% has mentioned that they increased export inquires as a result of LEAP training. Therefore, it is seen that one of the expected outcomes of the initiative, 'expanding the business to foreign markets' has not been realized yet.

Another positive outcome of LEAP training is that participants have implemented many changes including expansions to their businesses which had resulted new recruitments resulting creating extra job opportunities and achieving another positive outcome of LEAP. Another participant has completely revamped his business model by better focused core domain, new company name and new website. Further, the new company has also participated in 2020 'ICTA 'spiralation" program as well.

e. Respondents' suggestions for further improvements to future programs

The respondents, while appreciating the LEAP initiative and its contribution towards uplifting the regional IT SMEs to succeed in their business operations locally, had suggested few additions/changes to the existing program.

a. They suggested to include a session on pricing strategies and market competition.
b. Include a session on how to utilize and get required support from government or other already established entities when exploring a new market and/or entering in to a new market. (e.g., Use our embassies to reach out and network with local stake holders in foreign countries etc.)
c. Change the workshop presentations to 'boot camp' style since they consider initial workshops held in Kandy and Negombo were extremely successful because they followed the bootcamp style.

d. To share some preparatory content or task list in advance so that participants can come prepared to get the maximum benefit from the training sessions.
e. Include more practical and hands-on sessions than standard theory sessions.

f. Quotes of the participants on LEAP

"It was a great opportunity for a person like me running a software solution firm in Kandy where there aren't any supporting organization or networking opportunities to go to the next level to understand the industry unless we try and struggle on our own using the digital connections. For SMEs like us, I would say getting that timely mentorship or networking opportunity will get us faster where we need to go. LEAP created that opportunity to network and prepare ourselves as a 'business to see opportunities'. Most of the SMEs will be happy to give their support to make LEAP a strong entity to continue its genuine service."

Ms. Damayanti Ramalingam
iSeeQ Private Limited

"Business Communication skills learned during LEAP training helped the my company to build better relationships with local and overseas clients."

R.W. Chaminda Kumara
Unitec Software Solutions

"We managed to streamline and focus on a core business after LEAP and relaunched the company under a different name."

A.L. Hassan
Zaboora Software Solutions (now Zodium Valley (pvt) Ltd.)

5.5 Imagine IF: Entrepreneurship Development for Undergraduates

The program had been initiated in 2018 with the objective of building future entrepreneurs who can transform viable business ideas to globally scalable startups. Content delivered at workshops were designed to plant the seeds of entrepreneurship among the young undergraduates by laying the foundation for them to develop thinking and reasoning skills, problem solving and researching skills for them to be successful in the long run to create globally scalable start-ups. It appears that the initiative is relevant and is in-line with the overall objective of the program.

However, due to non-response from the participants, consultants were unable to make an assessment on the outcomes of the initiative.

5.6 'Educate to Innovate' program for teachers

The program was commenced in 2018 to motivate and inspire teachers on the integrated approach of STEAM subjects in teaching. ICTA has conducted 17 workshops with 265 teacher and 2878 teacher-trainees.

However, consultants were unable to make an assessment on the outcomes of the initiative, since all these workshops had been organized by the Ministry of Education and their contact details were not available with the ICTA.

However, it is pertinent to discuss the relevance and usefulness of promoting STEM education in Sri Lanka in light of planned expansion of ICT/BPM sector in the country.

As pointed out by Central Bank of Sri Lanka in its Annual Report of 2019, (Page 131), country needs to adopt advanced technologies to remain competitive within global markets and to this end, the country should have a highly skilled workforce, particularly Science, Technology, Engineering and Mathematics (STEM) literate employees. However, the report explains that the level of STEM literacy in the country is not adequate to achieve an innovation led growth. The graduate output of the public university system in Sri Lanka is more biased towards Arts and Humanities subjects and less towards STEM fields. Explaining further, in 2018, the percentage of university students enrolled in STEM fields for undergraduate studies was only 14.8 per cent, which when compared to India (39%), Myanmar (39%), Indonesia (34%) and Malaysia (43%) is very low.

Further, in 2018, the gross tertiary enrolment rate in STEM fields in Sri Lanka was merely 19.6 per cent when the average gross tertiary enrolment rate in upper middle-income countries and lower middle-income countries stood at 53.0 per cent and 24.8 per cent, respectively, suggesting that Sri Lanka lags far behind than an average lower middle-income country in terms of tertiary education enrolment. The report further points out that although overall literacy rates that capture only the reading and writing ability are high in Sri Lanka, the level of STEM literacy in the country is not adequate to achieve an innovation led growth. Quoting the ICT/BPM workforce survey-2019 report of ICTA, the report points out that the demand for IT graduates have increased from 6,246 in 2014 to 21,216 by 2019, while the supply of total IT graduates has increased only to 12,307 in 2018, indicating a widening supply gap in the IT workforce.

Explaining further, report says that the lower levels of student enrolment in STEM fields at the tertiary level is a reflection of the student enrolment patterns at the upper secondary (Advanced Level) stage and poor student performance in mathematics and science at both upper secondary and lower secondary (Ordinary Level) stages.

For example, in 2018, around 32 per cent of the school applicants at the G.C.E O/L examination either failed or conditionally passed the examination as a result of failing mathematics. A majority of such students will drop out from school and will be curtailed from receiving further education since mathematics is a pre-requisite for most higher education programs.

Hence, the report stresses the need of an integrated policy reforms at all levels of education in order to build a strong STEM literate workforce to drive an innovative and knowledge-based economy in the country. Considering increased demand of IT and Computer engineering graduates to expand the ICT/BPM sector, urgent remedial measures are needed to bridge this ever-increasing gap between the demand and supply of IT graduate in the country.

6.0 Conclusions and Recommendations

6.1 Conclusions

The conclusions have been made on expected outcomes and actual results achieved by various initiatives implemented by IDP and assessed during this study. The major conclusions on the findings are presented in Section 5 of this report under 'Discussion of Findings'. The following conclusions have been made based on the findings and knowledge gained during the study.

a. Industry Development Program (IDP) of ICTA has adopted multiple strategies to address the main issues impeding the growth and expansion of IT/BPM sector in the country to emerge as a strategic growth engine for the country.
b. During the study period (2016-2020), IDP's Tech Startup Support program ('Spiralation') has contributed to an increase of 58 new technology-based startups in the country.
c. IDP has doubled the annual number of startups supported by ICTA from 2016 to 2020.
d. Most of these startup founders were young, educated, innovative, and driven by their passions to succeed in new ventures but lacked required experience or business knowledge.
e. The program has provide necessary startup funding and valuable training to 47 entrepreneurs and training only to another 11 companies to take their businesses off the ground.
f. ICTA's various initiatives have helped to create a conducive startup ecosystem in the country.
g. These companies have created new job opportunities to many IT personals and some non-IT persons.
h. Some of these companies have contributed towards the increased the export earnings from IT/BPM
i. Sector during the past five years.

j. ‘Disrupt Asia’ startup exhibition organised by ICTA is the prime startup conference and exhibition in the country that had been held annually for four consecutive years commencing from 2016.The local startups had benefited immensely from the events and had contributed to their business growth and expansion.

k. Startup SL, the single national online platform operated by ICTA for startups and ecosystem partners to register will contribute towards getting a proper recognition and help them to access to get accreditation, financial assistance, partnerships and market access in time to come.

l. IDP has conducted digital business clinics (LEAP) for 40 reginal tech IT SMEs with the objective of expanding their business locally and scale-up to break into global markets. This initiative is relevant and aligned with the overall objective of IDP. These trainings have helped them to expand their business locally, but not sufficient to scale them up to break into global markets.

m. IDP has conducted three-day boot camps –‘Imagine IF’ in 14 state universities involveing1564 undergraduates to develop their entrepreneurial knowledge and skills so that those who are eager to move to the next step with their colleagues to develop their business plans and implement them in the future. Though the content of boot camp sessions were relevant and executions were successful, only six participants responded to the short email survey to gauge their perceptions to assess the outcomes. Hence, it is not possible to make judgements about the outcomes and effectiveness of these initiative.

n. ‘Educate to Innovate’ program for teachers has been conducted under IDP to motivate and inspire teachers on the adoption of an integrated approach of teaching STEAM subjects in schools. Altogether a total of 3143 teachers/teacher-trainee had participated in 17 one-day workshops conducted by ICTA consultants were unable to make any assessment of the realized outcomes, since, all these workshops had been organized by the Ministry of Education, and participants’ contact details were not available with the ICTA. Therefore, it was not possible to get a feedback from the participants to measure the outcomes and impacts of these events.

6.2 Recommendations

On the basis of the study findings, and the conclusion made, the following recommendations are made for further improvement to the IDP programs to ensure the desired achievement of envisaged outcomes.

1. Tech Startup Support program needs to be continued and scaled up to accommodate more deep-tech startups that have the potential to meet the global demand.
2. Considering the initial cost of the startups and involvement of hardware components in the specific projects, quantum of seed fund should be decided.
3. ICTA should explore the possibility of mediation with government organisations to support the startups to get government projects suitable and appropriate for tech startups of the 'Spiralation' program.
4. Disrupt Asia program should continue as an annual event with more foreign participation of speakers, investors and visitors.
5. Startup SL should be expanded to include all the startups in the country and offer government recognition and incentives to registered companies.
6. LEAP program for regional IT SMEs should continue with better focus on selecting companies with domains that can penetrate the global market.
7. Imagine IF program for enhancing entrepreneurial knowledge and skills of the undergraduates should continue focusing mainly on final year IT, Computer Science and Electronic and Electric engineering undergraduates who have the potential of scaling up their research project to a successful business.
8. 'Educate to Innovate' program is an important initiative to increase the STEM literacy in the country and increase the Gross tertiary enrolment rate in STEM fields in Sri Lanka to increase the supply of required workforce for future expansion in IT/BPM.