Digital Empowerment and Opportunity Mapping for Khyber Pakhtunkhwa – by Aman Nasir

Part 1

Introduction

The world today is increasingly mobile and connected with technology being ubiquitous and inexpensive, allowing people to work at flexible times and locations and creating new innovative business models. Pakistan's digital ecosystem holds significant potential, given its increasingly digitally savvy young population, large number of IT graduates and cost arbitrage vs. other countries. It is currently the 4th largest free-lancing market in the world. Technology has the potential to transform Pakistan's economy, result in inclusive growth and uplift its youth, if the right skills development programs, infrastructure and policy framework are put in place.

Whilst there have been positive developments over the years, including IT exports touching $3bn (incl. $500m generated by over 3m free-lancers) and over $1bn of VC capital being invested, Pakistan's technology ecosystem remains nascent due to disjointed, inconsistent policies, lack of availability of risk capital, limited globally competitive human capital and digital adoption. Within Pakistan, KP lags behind when it comes to digital connectivity and influx of capital into tech ventures, with less than a handful of KP start-ups attracting VC funding. Its large 30m+ population (50% of which is <30) represents an opportunity to address this untapped potential, leveraging the learnings from other ecosystems at a similar stage.

The KPITB which was set up in 2012 and became operational in 2016/17 launched an ambitious 5 year Digital Policy (2018-23) highlighting a number of recommendations across digital infrastructure improvements, skills up-lift, establishment of digital cities and policy framework for digital adoption. Whilst this was commendable as a start, in many cases the recommendations were not followed through. Of the 24 recommendations, many were basic and had limited quantifiable impact or outcome measures – these include "cloud adoption", "maximizing use of technology in education" and "data-driven decision making".

Pakistan's rankings on international indexes for digital skills, innovation and ICT development remain abysmally low, with KP lagging even further behind within the country – Pakistan ranks in the fourth quartile across most measures, despite being the 5th most populous country in the world e.g. ranked 147/190 in Ease of Doing Business, 151 in digital skills and 110/139 in Network Readiness. This stark reality should serve as a cause for action, particularly in KPK, as it is essential to equip its population with the right skillset in a fast-changing world that offers greater connectedness and opportunities.

Whilst there have been some good initiatives over the years, such as Durshal by KPITB, NIC Peshawar and Business Incubation Centres by HEC, these have not driven meaningful change and the impact has proven short-lived. There are no scaled IT services companies or start-ups based out of KPK with most enterprises engaged in small-scale IT free-lancing / services exports or engaged in localized business models.

1. The state of the digital infrastructure in KP

A reliable, well developed digital infrastructure plays an instrumental role in the development of the tech ecosystem – it acts as an ignition for the industry, enabling entrepreneurs to serve local and international clients, and expand their services. This includes uninterrupted access to the internet (including fibre broadband) and mobile network coverage, functioning working spaces, technology parks and data centres.

Despite rapid growth in the number of cellular subscribers and broadband internet users in Pakistan to 195m and 130m respectively in 2022, there are wide variations in coverage across districts / provinces. Internet penetration in Pakistan remains at a low c30% (vs. South Asian average of 40%+). A shockingly low <10% of users residing in KPK have access to fibre optic broadband internet with wide areas being unserved. Pakistan's speed also remains low – it ranked 118/141 in terms of mobile internet speed and 150/178 for broadband internet speed. The only area Pakistan scores well is being among the countries with the cheapest mobile data plans. KPK scores below the national metrics across all areas, albeit Peshawar has recently seen wide outlay of fibre-broadband network with

multiple providers and internet connectivity has improved in recent months but is still less reliable vs. other major cities in Pakistan.

Whilst mobile network coverage has been enhanced through a spectrum auction in 2021, coverage remains low and unreliable. Upcoming areas in digital ecosystem such as Swat still suffer from patchy 3G/4G coverage. Plans for a 5G spectrum auction which could significantly improve coverage in marginalized areas has seen slow progress as the local mobile operators are yet not ready to invest in it given currency devaluation and high investment required. Even where 4G towers exist in more remote areas, these services are often not offered due to security concerns. At the same time, India has already rolled out 5G and Bangladesh is planning the same this year.

Further, frequent power outages as well as intermittent blocking of internet access become major hurdles in the development of the digital economy. In more remote areas such as Bajaur, internet services have often been suspended due to security reasons and it can be difficult to provide electricity or broadband across such mountainous areas.

The weak digital infrastructure in KPK holds the province back – till 2018, there was only 1 telco operator in the province. High speed internet remains an issue and 3G/4G connectivity is worse than other provinces as it is considered a low ARPU (average revenue per user) market. PTA outages have been a recurrent theme which seriously affect internet dependent businesses. These serve as major impediments in being able to scale service offerings especially when one has to compete with other regional players that benefit from a more developed infrastructure.

The recent announcement by MoIT and PTA to grant satellite communication service licenses to interested parties is a welcome development with Starlink poised to become the inaugural provider. Greater competition in the provision of broadband/telco services can be encouraged – reliance on a single provider (e.g. SCO in parts of KPK) makes the digital economy prone to disruptions and lower quality of service.

The 2018 Digital Policy also called for the establishment of a Digital City in Haripur and a Technology City in Rashakai Special Economic Zone (SEZ), along with the establishment of SEZs in other places. These, along with STZ Mardan and Ghandara Digital Complex have been approved by the recently formed SIFC and would be tax free zones. These projects are focused on creating roads and plots and have not been able to attract blue-chip IT companies thus far. The Chinese had also previously explored setting up a semi-conductor industry in an STZ in KPK but withdrew plans due to the non-availability of skilled workforce – the need is thus for better human capital, digital infrastructure and an enabling policy framework first rather than more real estate projects for the digital economy.

There have been some good developments with regards to setting up dedicated spaces for BPOs (Workaround), led by the World Bank together with KPITB. This offers subsidized, plug and play ready spaces for companies such as Affiniti, provided locals are employed. Similar spaces have been set up for start-ups through the Durshal program. Co-working spaces such as COLABS and Daftarkhwan, in other parts of Pakistan, have been able to create thriving centres for start-ups, holding regular speaker sessions and providing a range of support services – some of these practices can be emulated by the centres in KP.

A cloud first policy had been initiated by the government and KPITB – however, there has been limited progress. Various government departments have been setting up their own data centres resulting in inefficiencies as it results in duplication and high charges. Engaging the private sector for this would be a better approach. Prioritizing cloud storage, including platforms such as AWS and Microsoft Azure for non-sensitive data, can help streamline data centre capacities.

For the KPK digital economy to move forward, the government must focus on enhancing coverage of fiber broadband, 4G/5G cellular connectivity and commit to minimal outages. Coverage of fibre optic based broadband must be extended to bring services at par and incentives must be given for providing connectivity in underserved areas, including to disruptive players such as Starlink. Poor connectivity particularly places those in remote, rural areas at a particular disadvantage, further widening the gap vs. the rest of the country.

2. Skills and Workforce – the current digital skills landscape and strategies for skills development and capacity building

KP has 6.5m school-going kids and 6k ICT graduates each year, of which it is estimated <10% are employable. A disconnect between the skills required by the private sector and that being produced by the education system is stark in KPK, resulting in an 'over supply and over-demand' issue at the same time. There are 40,000+ vacancies in the IT companies across Pakistan which have not been filled due to the lack of suitable candidates.

The finesse, polish and presentability is often lacking in graduates. A multi-pronged approach is needed, across the lifecycle, in both technical and soft skills which can help unlock earnings potential.

The 2018 Digital Policy referenced the need to up-skill the digital skills of the populace and a number of programs were subsequently launched. These programs included one-off training on freelancing (on Fiverr/Upwork), AWS training to upskill government personnel on cloud technology, early age programming (rolled out in over 900 schools) and essential IT skills and generic e-commerce training to the youth. Whilst a good start, in many cases, the skills imparted through these programs have been basic or one-off with a lack of measurable outcomes. With the fast-moving nature of technology (Moore's law), many programs have become outdated. For instance, developments in generative AI mean basic skills such as in web-design and graphic designing are quickly becoming less relevant with the availability of programs like Dall-E-3 (image generation generative AI) built on ChatGPT. Newer roles are opening up e.g. a prompt engineer (i.e. writing a two-sentence prompt on an AI tool) is replacing the traditional graphic designer as tech is becoming commoditized.

What is thus required is a holistic approach, partnering with the private sector (e.g. AWS, IT companies, VCs) to address gaps and focusing on capacity building and soft-skills. These need to be long-term term, rather than one-off trainings.

Schools: In today's increasingly competitive age, it is important to hit the ground running on key skills. There are parts of the school curriculum on computing that still teach about CDs, binary options and MS word in Pakistan, focusing on basic computer literacy rather than a structured program for coding, critical thinking and entrepreneurial skills development. A culture of learning coding / programming languages from an early age must be developed – these can include Javascript, PHP and Python, and be augmented over time. Courses can be conducted in partnership with the private sector with companies such as Start-up Early, Atomcamp, Epiphany and Code for Pakistan whilst the curriculum is updated. Charging a nominal fee rather than offering such courses completely free is expected to increase how invested people are in such programs / see value.

From an early age, children must be encouraged to think critically, develop a problem-solving mindset, familiarized with coding and programming skills and given opportunities to apply these through internship opportunities/hackathons. Globally, children are learning coding languages in their early years, providing a head start.

Universities: Universities play a vital role in not only imparting the relevant skills and knowledge but also the soft skills and values to groom students into being well-rounded leaders. Pakistan has faced a gradual degradation in human capital, given outdated curriculums, stifling of critical thinking and inadequate soft skills, resulting in the vast majority of graduates not being employable, let alone being globally competitive. A majority of the graduates lack the technical and soft skills required to be hired by the leading technology businesses in the country.

Where a graduate has the technical know-how, a lack of soft skills including marketing, presentation, the ability to network/connect with and sell to the rest of the world handicaps them. Some institutions in KP have a relatively more open environment where students are encouraged to speak their mind and be vocal, including IM Sciences Peshawar and University of Chitral but these are exceptions. Public universities in particular, continue to have a bureaucratic, stifling environment that impacts confidence.

IT universities across Pakistan need to revisit their curriculum and ensure it is up to date with the demands of the private sector – for example, iOS programming is not part of the curriculum and has to be self-taught/learnt at the workplace by a graduate. Though some attempts have been made e.g. Comsats has partnered with Cisco in KPK, the course implementation leaves much to be desired. A

rigid culture of conformity acts as an anemia to innovation, free-thinking and disruption. Instead of being inundated with course work, a project-based learning approach can help instill critical thinking and problem-solving skills. An enabling environment that promotes STEM (Science, Technology, Engineering and Mathematics) must be encouraged – research conducted by Endeavor's indicates over 60% of unicorn founders came from a science or engineering background.

KPK has some good universities whose graduates are rated well, including IM Sciences and FAST in Peshawar and Comsats in Abbottabad. Start-ups in KPK have thus mostly come from these two cities though more recently, Swat is seeing an increasing representation. IM Sciences, in particular, encourages an open, inclusive culture, including open access to senior faculty by the students as well as teaching courses on entrepreneurship – this has led to an outsized representation of IM Sciences graduates in the start-up eco-system (c.50). IM Sciences has also partnered with a number of other institutions in other parts of KPK to help design their courses.

Real estate infrastructure now less of a binding constraint – the focus of the government has hitherto often been on real estate projects for the IT sector – creating technology parks (e.g. Digital City Haripur, Gandhara Digital Complex), incubation centres, dedicated ready space for the BPO industry (Workaround). The basic real estate infrastructure now exists and is less of a requirement – what is required is a shift in focus towards investing in human capital to make it globally competitive. This requires a cultural shift in the way education is imparted – encouraging a questioning, global mindset. A recent announcement by MoIT on rolling out 10,000 E-rozgar centres to provide suitable work spaces for freelancers, whilst well-intentioned, continues the policy of focusing on creating real estate spaces for the IT sector. Bridging programs between academia and industry can help facilitate recruitment of the right kind of talent e.g. through creating potential fellowships.

Skills development – Any skills development initiative has to cover both i) technical and ii) soft skills. Developing technical skills can be addressed through a programme of targeted recognized certifications in coding and other areas (Sales Force, Power BI etc.) as well as a broader program of bringing the university curriculum in line with the requirements at the workplace through potential partnerships with the private sector and other established universities both within and outside Pakistan (e.g. LUMS etc.).

Feedback from established KPK based start-ups indicates that coding skills are generally weak (e.g. in C Sharp) and the students often do not have hands-on experience. The founder of Horizon Games, an NIC Peshawar gaming start-up that has exhibited at GTZ in the US and got 40m+ downloads, finds that graduates do not know what to learn that would be relevant at the workplace – Horizon typically starts getting university students involved 6 months before they graduate to provide hands-on experience and career counselling. Talent for gaming that is skilled in 3D modelling (e.g. in Blender), animation, coding, UI/UX is hard to find as often these are not taught at universities – in one instance, Horizon had to hire a developer from Lahore to build a gaming character. KPITB has recently launched a gaming program, training 40 students in game development, designed together with EPIC Games, which is a welcome start.

Soft skills include the ability to network, market, build trust and relationships with others. It is a continuous process honed over time, through investing in personal development, coaching and mentorship and is critical for scaling up globally. Feedback from IT companies indicates that graduates, whilst hungry, eager and possessing subject based knowledge, lack a strategic mindset, knowledge and experience with corporate governance, self-confidence in presentation and global exposure, making them not investible from a VC's perspective.

A networking mindset is lacking – Whilst driving a cultural mindset shift is a long-term goal, regular networking events and partnerships can help improve connectivity with universities and the private sector in other provinces. A good example of a collaboration is of LUMS with University of Baltistan (UoB). Whilst the NICs and technology parks have made a start with providing space and mentorship, greater efforts are required to build bridges, share learnings and be better plugged in to the broader Pakistan technology ecosystem. Outreach programs to better connect graduates with employers through careers fairs, counselling and networking events can be conducted.

KPK also suffers from a perception/reality gap which inhibits existing Pakistani start-ups based in Karachi, Lahore and Islamabad (KLI) to expand to the province, hire talent from it and for KPK based

companies to raise capital and have access to networks. In some cases, the most successful founders have had to end up moving out of KPK e.g. to Islamabad or Karachi to be able to scale up and raise capital. Shamoon Tariq, the founder and CEO of Mahaana (the first digital asset management company in Pakistan), originally from Peshawar, is now based in Karachi and has raised $2.1m from a blue-chip investor base including VEF, Y-combinator and IGI Holdings.

Alongside the programs outlined above, it is important to continue existing programs aimed at digitization of government departments, digital literacy of the masses and ensure that the government becomes a facilitator for the growth of the digital economy.

Existing skills programmes require an update – A number of skills training programs have been launched by the government in the past, in partnership with development agencies such as the UNDP. This includes:

- The E-Rozgar program that trained 3,000 people in freelancing skills, including basic web development, HTML, content marketing, e-commerce (Amazon, Shopify, drop-shipping etc.)
- The Digiskills program trained 3m people nationwide across ten courses, including graphic designing, digital marketing, e-commerce, and basic web-designing.
- KP Youth Employment program launched in 2016 to help equip the youth with digital skills (IoT, content writing, data security). 13.7k youth were given basic to intermediate skills through this.
- Digital Connect – for basic skills in the merged districts and creating digital libraries.
- National Freelance training program, which has established 20 centres, of which 3 are in KPK (IM Sciences Peshawar, University of Malakand and UET Mardan) to teach basic e-commerce and content marketing skills.

These programs have made a good start in building up basic digital literacy in KP and in many cases, are being continued/expanded e.g. Digiskills. There is now a need for a well-designed next version of many of the skills training programs (including E-rozgar) that are focused on more relevant skills that enable the participants to be able to sell their services globally and meet the demands of technology companies – e.g. courses in Javascript, Solidity, Rust, PHP, Python and Dall-E-3, together with training in areas such as generative AI, cyber-security, gaming (Blender, UI/UX, 3D Modelling) and blockchain. These courses can be conducted in partnership with institutions such as IM Sciences, Aptech or with the help of online tutorials, helping to up-skill and capacity build in the province. These could help address the skills gap that currently exists between the demands of local and global tech players and the supply of university graduates as well as boost the free-lancing economy.

There are already ambitious plans by KPITB to train 84k youth in basic skills and 32k in advanced skills. The advanced skills would include UI/UX, Python, mobile development (Flutter) with training provided for by Corvet institute, AWS and Aptech and focused on graduates in their final semester. These would also be provided with training in areas such as Linkedin profile, CV development.

Creating centres of excellence / clusters in areas such as e-commerce, freelancing and fintech can help create network effects. This has already been done in the BPO space (Workaround). Affiniti, a leading BPO player present at Workaround has mostly employed technical staff in KP and has struggled to hire customer facing staff and data scientists.

A SEED programs (Women and Youth Ecommerce and Digital Skills Learning Programme (Decode) is in train which is teaching 200 graduates advanced skills in cloud computing, data analytics (Power BI), e-commerce and app development (Flutter), in partnership with LMKT. The program includes 75 women and is free of cost. Whilst there have been some no-shows, those attending have provided good feedback and following completion, are offered a 3-month assignment with a tech company where they have the chance to be offered a full-time role. Another program with Atomcamp (Upskill Khyber Pukhtunkhwa) has been proposed covering soft skills (communication, CV etc.), digital marketing, web development and free-lancing. The success of such programs depends on how it matches with the demands of the private sector. Power BI, cloud computing, Salesforce and similar single workflow courses provide easy entry into the market and are low-hanging fruit; however, they

are focused on specific tools / roles and can have a low earnings ceiling. There may be limited full-time roles for such courses and thus in addition, more holistic programming courses should also be considered together with courses that can deliver globally recognized certifications.

A recent initiative by the MoiTT has been launched, in partnership with HEC and the Pakistan Software Export Board (amongst others) to conduct standardized quality tests across universities with those successful to be provided Industry Placement Programs. This is a positive step, to help address the low employability issue of ICT graduates. However, it is important that any such program focuses on the curriculum and targeted courses (such as in certain programming languages, AI) and soft skills rather than adding an additional layer of tests for students to navigate through, with limited benefits.

Increasing number of employees are self-taught – Speaking to employees at start-ups, many were self-taught in digital marketing, graphic designing (through platforms like Udemy and Youtube) and had to move to Peshawar to avail of opportunities as the infrastructure there was much better than the areas they came from (e.g. Khyber Agency). A passion for coding and self-learning from an early age often is the critical factor given the easy availability of Youtube tutorials available in Urdu/Hindi. Tools such as ChatGPT and Stack Overflow (Q&A website for programming) now make it easier to be self-taught and write code.

Another area where Pakistan lags is the provision of remote assistance. Pakistani call centre workers currently charge c$5 per hour vs. $8-10 by India and $15-20 in the US. The key requirement here for remote assistance is communication skills and literacy. Such workers can act as part-time remote assistants, managing calendars, handling sales, or making bookings (e.g. for restaurants). For high performing engineering talent, platforms such as Remotebase help connect them with Silicon Valley based start-ups helping to provide exposure to the world's most innovative companies.

There is a wide disconnect currently between the understanding of the digital economy of the private sector and the government. Bureaucrats often lack knowledge of what is required and often focus on showing numbers / basic skills rather than creating a multiplier impact. Any skills development program should thus engage with a cross-section of the private sector, universities and DFIs to ensure it is fit for purpose and has transformational impact.

3. An assessment of the KPK Digital Ecosystem

Pakistan's technology ecosystem holds significant promise, given it can leverage the learnings from other ecosystems and benefit from a leapfrog effect. There has been close to $1bn in VC funding that has flowed into the country since 2018 into 200+ start-ups, mainly operating in e-commerce, logistics and fintech. The end of ZIRP (zero interest rate policy) and accentuated political and economic turbulence in Pakistan, however, has meant a drying up of capital recently, impacting investor confidence early in the ecosystem lifecycle. Even during the peak era of free money in 2020/2021, investment mostly flowed into start-ups in KLI (Karachi, Lahore, Islamabad), with KP-based start-ups unable to attract the same interest due to a variety of reasons.

The KP province has an economy of over $40bn (same as Jordan) with a population of 40m. Peshawar is a city of 2.5m people, more than Islamabad, with widespread smartphone adoption and basic digital literacy. Customers in the city have significant spending power, evident in the large retail businesses present in the city. KP has about 500k+ freelancers, working primarily on platforms such as Fiverr and Upwork, who have been helped by programs such as the E-Rozgar scheme that educated the youth in freelancing and digital skills. Freelancing offers an opportunity especially for women in KPK to avail of employment opportunities from their homes and without the mobility and cultural barriers that prevents office-based work.

There are, however, a number of challenges the digital ecosystem in KPK faces. These primarily relate to a lack of access to investors and capital, lack of mentoring opportunities, under-developed technical and soft skills (pitching, art of story-telling, developing financial projections, market research, corporate governance), no targeted acceleration programs, infrastructure issues and the unconscious bias investors may have in backing founders that do not fit into the stereotypical foreign-educated, English speaking start-up founder. The recent political uncertainty has also paused several initiatives due to uncertainty around continuity of programs and future government priorities.

From an investor perspective, many KPK based tech companies are small-scale, lacking big ambition/vision and focused on localised e-commerce and marketplace models. Where the product quality is up to par, start-ups often lack the branding – packaging, marketing and labelling – thus not being able to effectively market themselves and scale globally. Venture capital firms look to invest in companies that can deliver a 10x return over a 5-year timeframe and thus expect a certain degree of investment readiness, scalability and corporate governance structures to be in place.

Research indicates that 71% of founders had the idea for their start-up from understanding the pain points they came across in their previous jobs. In a number of instances in Pakistan, founders have come from large corporates such as Nestle and Unilever or other start-ups such as Foodpanda and Daraz. The limited presence of large multi-nationals and existing start-ups thus acts as a further inhibitor to fostering a growing entrepreneurial ecosystem. An Endeavor study found that a majority of unicorn founders had 10+ years of experience, had worked previously at start-ups or were serial founders.

Evaluating recent initiatives

A number of good initiatives have been launched in recent years, including on the policy side, that have kickstarted the ecosystem – these include Durshal, NIC Peshawar, BICs by HEC and a number of skills development programs that have helped promote entrepreneurship as a career. Given KPK's youth bulge, large market, a strong work ethic and cost arbitrage, there is tremendous potential for the KPK populace, including women and those from remote areas, to be able to up-skill and benefit from the digital age – what they require is the next phase of policy reform, enabling environment, guidance and skills development programs that can make them competitive, create better market linkages and encourage risk capital.

Durshal ("gateway" in Pashto) is an initiative by the KPITB launched in 2018 that established a network of 7 incubators across KPK offering incubation, mentorship, networking, co-working space, and monthly stipend to founders. It offers a community space across the locations to each start up member for 3 months and a 6-month incubation cycle, as well as potential seed money up to 14M PKR per cohort (previously a 30K per person stipend was offered). 173 start-ups have graduated from Durshal, creating 1,600 jobs. Durshal aims to provide a link between the local governments, tech industry, IT entrepreneurs and investors to anchor KP's digital transformation. In some cases, Durshal has seen KPITB partner with universities such as IM Sciences, Peshawar to set up incubation centres at the universities to promote entrepreneurship. There have been some success stories emerging from the Durshal program – Chkar.com, a marketplace for travelers and hosts, raised 50M PKR in seed money; Darewro, a popular on-demand delivery service, was incubated at Durshal IM Sciences Peshawar. However, these successes are far in between.

For the founders that manage to progress past the initial stages, they have tended to then migrate to the National Incubation Centre (NIC) Peshawar which was launched in 2017 and is funded by Ignite/MoITT. This was set up to serve as the key incubation platform for bringing start-ups and investors together. It provides greater mentorship and networking opportunities with people from across Pakistan, helping to provide more exposure and support. Whilst admirable, there is a need to develop more bespoke training programs for the NIC Peshawar cohorts – this can be done in combination with universities, venture capital firms and private sector companies. For example, NIC Karachi recently had a 3-month XSeed training program launched in partnership with INSEAD, which included a number of VC firms also participating. Partnerships with key global incubators / accelerators and conferences can be harnessed to facilitate greater exposure to international investors and conferences for KPK start-ups.

Observations from a presentation delivered at NIC Peshawar to start-ups

As part of this exercise, a presentation on fund-raising was delivered to NIC based start-ups by Aman Nasir. It was notable that the start-ups present were more comfortable in Urdu, were not familiar with terms such as liquidation preference/preference shares and on average, lacked a global perspective. Some seemed reluctant to network. The female participation was also low at 2 out of 15-20 that attended.

Entrepreneur Support Organizations (ESOs) such as NIC Peshawar, Digital Hub of Gilgit, Durshal, Accelerate Prosperity, Epiphany and Tech Valley Abbotabad play a key role in harnessing entrepreneur talent, providing mentorship and networking opportunities and a safe space to exchange learnings with others. The National expansion plan (NEP) of the MoITT and PITB expanded the network of incubation centres, providing a monthly stipend, free workspace and mentorship.

The start-ups in the NIC Peshawar cohort can often be very early stage and require greater handholding rather than the current generalist training program that is delivered that in some cases may not be relevant to certain start-ups. Many lack global exposure and are focused on localized marketplace / e-commerce solutions (e.g. selling honey, artisan works, laundry, feminine hygiene products online) with thin margins vs. building globally scalable products e.g. in SaaS, fintech or gaming. This requires competence in two key areas – a product building skills and the ability to sell.

There are however certain exceptions – some start-ups in KPK have build solid products, across gaming, ERP (school/HR management systems) and health-tech – e.g. Pharmadepia is a Peshawar based start-up in health-tech offering comprehensive information on generic drugs and medicines including pricing/alternate brands has crossed 1M+ downloads.

Feedback from start-up founders who have been through the Durshal and NIC process as well as other stakeholders indicates the absence of accelerators, limited presence of VCs/local risk capital and lack of mentorship/networking opportunities with angel/VC investors and later stage start-up founders acts as a hindrance to scaling up, resulting in KP lagging behind other provinces. Often founders have to end up moving to Islamabad or other cities to be able to build these relationships and raise capital – whilst the attraction to move to ISB/Karachi will remain, more can be done to retain promising start-ups in KP.

The existing programs such as Durshal and BIC have made a good start promoting entrepreneurship at an early stage – placing them within educational institutions (e.g. Durshal IM Sciences) has helped create synergies and more such centres should be housed within universities. To take things further, there is a need for a more bespoke incubation program as well as an acceleration/pre-acceleration program, combined with targeted efforts at connecting the KPK ecosystem with the rest of the country.

A Durshal 2 pre-acceleration program is required which would enable start-ups, that have gone beyond the initial incubation stage, to get access to more bespoke programs, addressing any gaps and helping to make them investment ready. These need to be tailored (e.g. for fintech, AI, SaaS), providing hands-on guidance on areas such as budgets, forecasts and strategy. Feedback indicates that KPK entrepreneurs are very eager and hardworking – what is lacking is strategic depth, direction and mentoring. Examples of such programs run elsewhere include Y Combinator, Plug N Play and Orbit. Any such program has to combine the training with a rule-based funding program and broader connectivity with local and foreign investors – this can be done in partnership with other such programs such as Flat6Labs from Egypt.

Y Combinator is a good example of an acceleration program that combines targeted training and coaching with a rule-based funding program. It runs a 3 month intensive program that focuses on getting start-ups to improve their product and fundability, as well as offering a strong network of founders, investors and mentors. It invests $500k in each company on standard terms – $125k for 7% and $375k on an uncapped SAFE. This offers one-on-one office hours, connectivity with other founders, a 3-day founder retreat, key note Tuesdays (inviting speakers such as founders of Airbnb and Doordash), demo days, help with public launches, and on-going post graduation support.

Lack of proximity and unconscious bias on the part of existing VC investors also plays a role as all of the existing VCs are run by investment professionals that are based in KLI, are mostly foreign educated and have thus preferred to back founders with a similar socio-economic background. The perceived cultural difference and lack of understanding of the size of the market in KPK acts as a hurdle for existing start-ups in Pakistan to expand in the province. For instance, Bykea, whose founder is from Abbottabad, is currently only present in Karachi, Lahore, Islamabad and Faisalabad, despite Peshawar having a higher population than Faisalabad/ISB and facing the same public

transport issues, albeit there are plans to launch in Q2-2024. Better showcasing the province's potential, providing incentives and creating a more enabling framework for existing companies can help attract companies to expand to the province.

NIC Peshawar has had to hold most of its summits in ISB to be able to attract the investor community; however, these often result in many local start-ups not being able to travel and showcase themselves.

Limited Access to finance/Risk capital: Given banks are reluctant to lend to the private sector without collateral, an entrepreneur has to turn to risk capital, including from family/friends, angel investors and VCs. Most VCs in the country currently have limited investible capital as they look to raise further funds and are targeting start-ups that are more progressed. This leaves a funding gap for pre-seed/seed ventures that often require greater hand-holding and risk appetite.

This is where angel investors, incubators/accelerators and government programs that provide grant funding have a critical role to play. There have been attempts at creating a KPK fund to provide grant funding to early-stage start-ups to fill this gap. The KPK Seed Fund was set up by the KPITB which engaged Epiphany for it, to provide grant funding of $500k in total to 17 start-ups. These grants ranged from 1M – 15M PKR and were funded by the World Bank. Whilst such programs are commendable as they help get ideas off the ground, there is a need for a financing continuum to exist. Often these programs do not prove sustainable as after the grant funds are exhausted, the start-ups fail to raise further funding and scale up and it is also not valued the same way as equity capital. The value add that a VC typically provides, including help with strategic decision making, unlocking networks and help with raising follow-on capital is missing from such programs. These would be more impactful and sustainable if they are run as a Venture Accelerator (with a reimbursable grant component) combined with an equity fund that invests in companies that have managed to prove product-market fit and scaled up.

Accelerate Prosperity (AP) is currently the only institutional investor that has been active in KPK/GB and provides concessional debt up to $100k. AP also requires the product and some traction in place to be investible – there is thus a need for an equity-based Seed fund that bridges the gap. There can also be cultural / religious resistance to taking on interest-based debt by start-ups in KP. The Durshal centres provide free space and a stipend to founders, however, not many have been able to graduate from grants to sustainable, equity based funding.

Significant Gender gap: The gender gap in KP remains stark across all metrics and acts as a significant barrier to a gender inclusive digital ecosystem. Cultural barriers combined with a lack of family resources, result in differences in education enrolment and access to networks. Females often suffer from lack of access to mentorship, inadequate transport and imposter syndrome.

Programs such as the She Means Business (in collaboration with Meta) and Women Empowerment program by the KPITB has trained women in social media marketing, blogging and digital tools, to enable them to take advantage of the free-lancing market whilst working remotely. In combination with expanded versions of such programs, KP needs to create more inclusive workspaces and programs designed to pro-actively engage with and coach female founders. Women-only incubation and acceleration centres can be created, which could be housed at women universities to provide a safe space where females feel comfortable working from. To fully tap its digital economy potential, an enabling environment for equitable opportunities for females in KPK must be created, including institutions and programs that focus on capacity building and that help address imposter syndrome and build trust. NIC Peshawar has been a good example of creating a good working environment where women feel comfortable.

Creating role models are critical here – a number of success stories are starting to emerge which could act as a catalyst for female founders. Afshan Khan, CEO Fastmove package, who set up a packaging and cardboard manufacturing factory by selling her gold, stresses the importance of creating women role models, who inspire and act as mentor to other female entrepreneurs. Other women entrepreneurs include Nayab from Nayab's Rogue and Yashfa Zaman from CyberSync Technologies.

Better networking opportunities and market linkages: Need for incubators and start-ups in KPK to build greater connectivity with investors from other provinces, building personal relationships through hosting targeted summits and investor education programs. Bespoke investor summits can help to bridge this – an excellent example of such a summit is the 2-Day WeRaise program run by the World Bank that brought together leading investors and start-up founders at Bhurban focused on gender-lens investing. Such summits can help to showcase promising IT services companies and start-ups. Start-ups can also be showcased at global summits such as LEAP, Paklaunch and GITEX.

Investors from other cities have been reluctant to visit KPK due to pre-conceived notions of the lack of opportunities available there. A Digital Youth Summit, sponsored by the World Bank, was held in 2016-18 but has not been continued. In some instances, KPK based start-ups have been allowed to exhibit at flag-ship events such as Pak Launch due to their lack of connectivity with others in the ecosystem.

Intimate regular gatherings of investors (local and international), KPK-based start-up founders, incubators and other stakeholders can significantly help in building bridges and providing greater exposure to KPK entrepreneurs.

Promoting collaboration between founders and partnerships with universities and NICs across Pakistan: Collaboration, networking and mentorship are critical ingredients for the success of an ecosystem. Estonia, a country of 1.4 million people, has produced 10 unicorns (start-ups valued at over $1 billion) – mainly attributable to the strong founder networks it has and the multiplier effect from success stories such as Skype. Structured mentorship programs, partnerships with other universities including LUMS, IBA and NUST can be harnessed to promote greater knowledge sharing and create a platform through which learnings are shared by founders e.g. on common challenges such as payments.

Catalyzing local capital in KPK through investor education and incentives: Pakistan, particularly KPK, suffers from a lack of domestic risk capital. Traditional Pakistani families are generally risk averse, choosing to park their money in guaranteed government securities or real estate. Further, there is a general lack of understanding and skepticism around how start-ups work. In one instance, an investor in KPK demanded money back from a start-up he had invested in. There is thus a need for organized angel syndicates in KPK that adopt a portfolio approach to investing and are able to unlock local networks.

Such investors would also help unlock greater national and international capital for KPK based start-ups through being the “eyes and ears” on the ground, help with diligence and access to their networks in the province. A robust early stage angel investor network is required which would enable the start-ups to get to the stage where VC money can be unlocked.

In another instance, a start-up that pitched to a local businessman for 12M PKR ($30k) for building a stand-alone game found it to be a cumbersome and draining process. The investor did not know how to evaluate the opportunity and turned this down – the same game ended up getting sold for $400k. Such examples, along with the lack of interest of VCs, have added to skepticism from KPK based start-ups on the need to raise external capital.

Historically, government policies have provided guaranteed returns in sectors such as power, subsidized energy for textile/fertilizer plants and encouraged the diversion of capital towards unproductive areas such as real estate through regular amnesty schemes. Therefore, investors have been averse to investing in riskier ventures including start-ups. There is a need to now re-direct this ‘unproductive, unknown capital’ towards areas that can have a multiplier impact on employment and the economy.

Having KPK based venture capital firms would help address the issue of networking and unconscious bias that currently acts as a significant barrier. Having proximity to investors for founders can act as a key enabler – for this purposes, a well designed fund of funds program or a Venture Accelerator (combined with a rule-based equity investment component) can act as a catalyst.

In 2018, a $5m fund was designed by the KPITB together with the World Bank, which would provide a matching grant to local start-ups that raise funding. However, this could not be executed.

The KPK digital ecosystem holds significant promise as it can benefit from a leapfrog effect; its youth require guidance, the right skills training, mentorship and platform which would allow them the same opportunities as available to other major cities. This requires a multi-pronged approach, through bolstering existing initiatives, introducing targeted support programs, and upskilling the population, particularly in soft skills, including English language proficiency and marketing as well as creating easily accessible resources (digital library) which can include selected Youtube tutorials that are in Urdu/Hindi. The ground work has been laid by programs such as Durshal, E-rozgar, NICs amongst others; there is now a need to take this further through dedicated accelerator programs, incentives for risk capital, an enabling policy framework and greater connectivity with platforms outside KPK.

4. Policy and Regulatory framework assessment

The policy and regulatory framework has a critical role to play in the development and growth of the digital economy. This encompasses a number of areas including skills training, fiscal incentives for investments, regulatory framework for digital payments and intellectual property and data laws.

Pakistan has only belatedly started to focus on the technology sector. During the period, India and other countries built critical mass in IT services exports, trained their human capital at world-class local IT universities and transitioned to deep-tech, AI and a mature start-up ecosystem. However, this presents an opportunity for Pakistan to study their policy roadmap and learn from their lessons from more developed digital ecosystems such as Indonesia and India.

The policy and regulatory framework relating to digital economy has significantly evolved since 2019, with developments such as Holdco mirroring regulations, award of digital banking licences and initiatives such as STZA and RAAST, helping to galvanize VC investment of over $1bn in Pakistan. 2023 has seen a significant decline in VC funding to $75m (vs. $332m in 2022), given the heightened macro-economic turbulence. However, of the 200+ start-ups that got funded, less than a handful were KPK based.

A holistic assessment of the policy framework is required to channel investment into innovation and remove the constraints that currently exist. In addition, there is a greater need for collaboration between the provincial and federal IT ministries / Boards to reduce any duplication of efforts and sharing of best practices – e.g. many of the skills programs are being launched at both federal and provincial levels and duplication in designing e-governance systems is currently commonplace as they don't speak to each other.

KPITB's 5 year Digital Policy 2018 included some policy recommendations in relation to cloud adoption, data protection – however, these have not yet been implemented. Many of the initiatives from the 5 year plan require an update to make them more targeted, with a program in place for continuous evaluation.

The KPK Paperless project (under a WB program) has been outsourced to Netsol which is a welcome step and could digitize government approvals. Albeit, visits to the government offices still indicated business is paper based and in some cases, being duplicated through scanning files on to the digital portal as the older bureaucrats are not familiar with digital tools.

There continue to exist gaps in the policy framework:

- No robust data privacy or data protection legislation in place, along the lines of GDPR, despite being in draft form for several years. The draft Personal Data Protection Bill 2023 pushed for data localization, transferring ownership of sensitive personal data to the state, received wide criticism from the local VC community, start-ups and international players that it would negatively impact start-ups, given their dependency on cloud-based services such as AWS.
- Despite the existence of a cloud first policy, several government departments have their own physical data centres, with significant duplication and inefficiency. A cloud policy needs to be

enforced uniformly across government departments. There are also conflicting regulations around data centres e.g. between NADRA and NITB law.

- No policy framework for incentivizing capital towards the innovation and digital economy. In many countries, including the UK and India, investors are provided tax incentives for investing in high risk, innovative ventures or in R&D. The UK's EIS/SEIS program provides tax-back (up to 20-40%) of the investment amount through the tax return, with any gains being capital gains free. On the contrary, government policies on sovereign guarantees on power projects, subsidies on gas, provide high returns on low-risk ventures, discouraging investment in innovation.
- There are no credit bureaus that have full access to customer transactional data to be able to credit score. This results in collection of data in silos and imperfect credit underwriting.
- IT is a devolved subject which often results in lack of coordination and duplication between the provincial IT boards. An Interprovincial Coordination Division exists but has not been active in this area. In Australia, a Digital Transformation Agency exists to coordinate actions related to the digital economy across states.

A number of key projects have faced constant delays due to red-tape and long approvals process.

- Centre of Excellence for Gaming (CEGA), a dedicated virtual production studio that was recently announced to be set up at NED Karachi and NASTP Lahore has been in the works for 5 years. An Rfp for this was recently circulated. A similar centre for gaming in KPK can be explored with government funding.
- DEEP (Digital Economy Enhancement Project), a $78m WB funded project, which includes setting up an electronically verifiable digital locker (similar to India's DigiLocker) has been in the making for 4 years. If executed right, this has the potential to be transformational, enabling ID documents (such as drivers licence and academic certificates) to be kept in a Digital Vault. KPK should ensure it remains actively engaged with such federal initiatives.

There are a number of ways the government can play a role in catalyzing capital into KPK's digital economy, through launching a **fund of funds or co-investment program.** Government participation can be structured in a number of ways:

- A $5-10m program that invests in other VC funds provided a multiple of the committed amount is invested in KPK-based start-ups. Fund of funds programme such as Yozma in Israel and SIBDI in India have seen tremendous success in acting as a catalyst for the digital ecosystem.
- An addition to the federal $10m fund of funds program that has recently been launched by the MoIT. This program contributes 30% of a qualified round led by a VC as a grant, up to $300k for a single cheque. However, grants can often result in the wrong behaviors as seen from start-ups that are primarily grant-funded and have engaged in heavy discounting, given lesser pressure to deliver returns to shareholders.
- Alternatively, this could also be designed as a co-investment vehicle where KPK based start-ups that raise above a certain amount from qualified investors, can have a certain % in matched funding as an equity investment from the government.

Other areas where the policy and regulatory framework can help facilitate the start-up ecosystem:

- **Re-invigorate the Special Technology Zones (STZs) and update local funds regime:** Whilst the government has made progress through offering tax incentives to IT companies to set themselves up in the designated STZ zones in KPK, progress has been slow and they have failed to attract national and global IT companies to establish themselves in the province. The tax incentives include 10-year tax holiday on income and sales tax and from gains on fund investments/dividends. However, IT companies have been reluctant due to the risk of a change in policy and time barred nature of the tax incentives. For the same reason, VC firms have not domiciled within Pakistan due to the risk of future taxation on profits and

potential capital controls in repatriating profits. There is a need to bridge this gap through policy consistency and having an outreach program with the private sector. There still exists tax ambiguity/timing delays on the local funds regime which has led to VCs most domiciling outside of Pakistan. Best practices from the European AIFM Smaller Managers Regime can be incorporated to provide confidence to foreign investors when investing in local funds.

- **Removing the provincial services tax:** the KPK government can consider removing the provincial services tax for KPK based IT related services and start-ups. Whilst there is already a reduced rate of 2%, removing it can get rid of red-tape in registrations/filings, provide a significant boost to the sector and encourage capital inflows to it, including from other provinces.
- **Providing preferred access to KPK based start-ups for government projects:** Provided a KPK based start-up meets the criteria, preference should be given for KPK based start-ups for government contracts (or to use them at least as sub-contractors) in areas such as e-governance, health-tech and ed-tech etc.
- **Channeling the "unknown money" into the innovation economy:** In the past, several real estate amnesty schemes have been given, allowing people to whiten their money by investing into plots. Whilst not an ideal solution, given the size of the undocumented economy, a one-time amnesty for "unknown money" to be invested in qualified start-ups/venture funds would allow the same capital to be more productive and have a multiplier impact.
- **Enabling capital flows:** There are currently significant hurdles to making foreign payments including to Google, cloud storage etc. Any dollar remittances were not allowed to be held in USD, albeit this has now changed to 50%. This acts as a hindrance and disincentives start-ups from bringing in their proceeds to Pakistan. Allowing free-lancers / IT companies to retain 100% of their USD earnings in a USD account in Pakistan as well as enabling repatriation of capital can help instil confidence and remove hurdles for start-ups. The real IT exports are likely much higher than $3bn as most of the proceeds are not brought into the country due to fear of capital controls and forced conversion into PKR.
- **Government capacity building:** Several peripheral issues that together act as a significant hurdle including confliction definition of start-ups, outdated practices such as manual attestation of documents and time-consuming security clearances, lack of coordination between different agencies, lack of understanding of the business models by government authorities and ineffective intellectual property laws.
- Seek **due share of KPK government from the Universal Services Fund** and use it to improve the digital infrastructure. Alternatively, the provincial services tax can be waived/reduced for Telco (currently at 19.5% vs. 17% for other provinces) with the same amount earmarked to upgrade infrastructure. This had previously been explored and agreed but never implemented – government circles claim the telcos could not provide solid commitments in this regard.
- **Formulate a uniform right of way policy for telcos.** The sector is currently plagued with an NOC culture which impedes progress. For the fibre broadband investment, 70% is usually right of way ("RoW") and 30% physical infrastructure costs. A uniform RoW policy with defined rules could result in a one-time deployment / access that all providers could avail in a uniform manner rather than ad hoc.

Many of these policies will require close engagement with the private sector to remove red-tape, ensure speedy execution and facilitate investment into the digital economy. The pace of implementation and consistency is critical as Pakistan, particularly KPK, is already playing catch up with the rest of the world.

Part 2 – Opportunity Map

1. **Skills development – expansion of current digital skills learning programmes and driving longer-term change agenda**

Any skills development programs has to be based on a gap analysis, conducted in partnership with the private sector. Such a program needs to have a short-term strategy for the low-hanging fruit when it comes to skills development and capacity building, to help plug the existing vacancies within the country in the IT sector as well as expand the market for freelancers. Over the longer run, a wholesale shift in how subjects are taught, approach to soft skills development and updating university curriculums is required.

Over the short term, the current SEED programs (Decode and Upskill KP) are a step in the right direction. The Decode program is focused on advanced skills in cloud computing, data analytics (Power BI), e-commerce and app development (Flutter) to 200 graduates, in partnership with LMKT, and provides easy entry into the market. This program can be further expanded, based on the success (employability) of the graduates after the course. Similarly, the Uplift KP program run by Atomcamp has been proposed covering soft skills (communication, CV etc.), digital marketing, web development and free-lancing – whilst these are generic, they can help provide basic knowledge about getting started for graduates. Incorporating global certifications under an expanded version of these programs can be considered to improve the marketability of the graduates.

The courses under the current program are focused on specific tools / roles and can have a low earnings ceiling. Over the longer run, thus, a broader strategy is required to help address the deficiencies in the graduates' critical thinking ability, soft skills and the university curriculum.

SEED can assist with conducting a gap analysis in partnership with the private sector organisations such as PASHA and PSEB to identify weak areas. Whilst courses such as Power BI, Sales force, cloud computing, digital marketing and free-lancing skills provide low-hanging fruit, for wholesale transformation to occur, digital literacy and programming has to be embedded in the DNA of the school/university curriculum and society.

Specific areas that require further skills development include:

- Advanced coding / programming languages – Javascript, PHP, Python etc. These can include courses being introduced in schools as well as universities, providing internationally recognized certifications.
- Games development – 3D modelling (Blender), UI/UX
- Soft skills – presentation, art of story-telling, global exposure

Universities – Given updating the curriculum is a long-drawn process, courses can be conducted in partnership with the private sector with companies such as Start-up Early, Atomcamp, Epiphany and Code for Pakistan. These can include bridging programs between academia and industry which can help facilitate recruitment of the right kind of talent e.g. through creating potential fellowships (KPITB has an existing Government Innovation Fellowship Program which can be further rolled out).

Co-op programs can be created i.e. a 5 or 6 year degree program, that includes 12 or 24 months of private sector work experience, instead of a 4 year standard degree. This can help plug the dearth of practical experience in graduates.

2. **Creating a freely accessible digital library**

The current skills programmes and resources are fragmented with significant overlap between the federal and provincial programs. A single repository can be constructed, with SEED's assistance, to store the most relevant courses across key areas, including providing access to educational platforms such as Udemy, and the most highly rated Youtube tutorials on specific topics.

This can be done in partnership with the private sector and universities. The library can include a guide on how to navigate the job market / career counselling and a messaging platform where answers can be crowdsourced from other participants (incl. in the local languages).

3. **Provide support for opening a gaming studio in KP**

   A Centre of Excellence for Gaming (CEGA) dedicated virtual production studio is being opened at NED Karachi and NASTP Lahore. SEED can lobby the KP government to provide funding for a similar centre in KP which hosts a number of promising gaming start-ups. Such a centre can serve as a hub for showcasing talent, including building linkages with gaming studios and conferences globally.

4. **A mentorship and coaching program**

   An area where KP lags behind other provinces is access to networks and mentors. Whilst NIC Peshawar has tried to bridge this to some extent, there is a need for creating a single platform where mentors from across Pakistan and abroad can be matched to aspiring and established entrepreneurs. It is critical to create a platform through which learnings are shared by founders e.g. on common challenges such as payments.

   A separate program can be tailored for female founders, providing them ready, relevant access to mentors and experienced entrepreneurs – this is a key bottleneck as female founders are culturally reluctant to seek out male mentors and thus unable to benefit from an exchange of knowledge. Founders can benefit from the mentorshop of more established female founders (e.g. Halima from Oraan, Naureen Hyat from Zoodpay and Iman Jamall from Creditbook) as well as industry leaders such as Musharraf Hai (ex-CEO Unilever), Hafsa Shamsie (CEO, Rosche) and Maheen Rehman (CEO, Infrazamin).

   Such a program can have a separate soft-skills coaching program where founders go through extensive soft skills training – presentation, negotiation, networking, dressing, communications. SEED's involvement can lend credence to such a platform.

5. **Start-up summits and exchange programs**

   KP-based start-ups would greatly benefit from bespoke investor summits held in KP by reputable partners – an excellent example of such a summit is the 2-Day WeRaise program run by the World Bank that brought together leading investors and start-up founders at Bhurban focused on gender-lens investing. Such summits can help to showcase promising IT services companies and start-ups.

   SEED can play a role in galvanizing DFIs and agencies such as FCDO to host dedicated investor summits, potentially at scenic destinations such as Skardu, where start-ups can build the connectivity with the rest of the eco-system.

   It is also important to get KP start-ups to exhibit more prominently at flagship technology conferences both within Pakistan (+92 Disrupt, Slush'd etc.) but also internationally (LEAP, Paklaunch and GITEX) to provide global exposure.

6. **University partnerships**

   Partnerships can be an efficient way to benefit from the learnings and knowledge of other institutions. SEED can act as the conduit between KP universities, especially the public ones, to develop linkages with universities in the other provinces (e.g. LUMS, NUST etc.) as well as in the UK. This can be through one year exchange programs and potential UK degrees awarded after studying the same curriculum in Pakistan.

There can also be partnerships with the private sector for specific courses e.g. in hardware / IoT, services, venture capital, software engineering to ensure relevance. SEED can help facilitate these partnerships, resulting in courses being designed and taught by the private sector e.g. the way LVMH has partnered with Central Saint Martins (London College of Fashion) and Dell for hardware courses at US universities. 12-month gap year internship opportunities can be introduced at universities to ensure students get critical practical experience in the private sector rather than just subject-based knowledge. Such courses can be taught using a problem-based learning method.

IM Sciences has already partnered with a number of other institutions in other parts of KPK to help design their courses – SEED can help scale this up through creating a dedicated window and funding for such partnerships, including with global universities.

Over the longer term, SEED can help push for speedy changes to the university curriculum, through creating an advisory board to the HEC for IT that includes start-up founders, private sector IT companies and local and international universities' representatives.

7. **Bespoke Pre-accelerator/Accelerator program**

SEED can help structure, mobilise funding for and help with technical assistance in setting up a bespoke pre-accelerator/accelerator program which is currently missing in KP. This can be tailored by sectors (e.g. for fintech, AI, SaaS), including a separate one for female founders, providing hands-on guidance on areas such as budgets, forecasts and strategy. Any such program has to combine the training with a rule-based equity funding program and broader connectivity with local and foreign investors – this can also be done in partnership with other such programs such as Flat6Labs from Egypt, Plug n Play or 500 Global.

Bespoke training seminars can be conducted with the NIC and such accelerators on topics such as fundraising, exits and corporate governance.

8. Fund of funds program / Seed Fund

A $5-10m program KP-government led program can be designed that invests in other Pakistan focused VC funds. An RfP process can be conducted to select suitable VCs, together with SEED's input.

The program can require each VC to invest 1-2x of the committed amount in KPK based start-ups, thus helping to create greater connectivity, investor education and a dedicated pool of capital for local start-ups, helping to act as a catalyst.

KP currently lacks an equity-based seed-stage fund. The KPK Seed Fund was set up by the KPITB which engaged Epiphany for it, to provide grant funding of $500k in total to 17 start-ups. These grants ranged from 1M – 15M PKR and were funded by the World Bank. Whilst such programs are commendable as they help get ideas off the ground, there is a need for a financing continuum to exist, and for start-ups to graduate to sustainable, equity-based funding. SEED can help mobilise an angel investor network through creating greater awareness, or set up a small seed-stage fund in partnership with DFIs for investing in KP start-ups.

9. Red-tape – incorporation, tax registrations and filings, and security clearances

Often this acts as a distraction for start-ups, consuming time and energy that could have been spent on the business. Obtaining approvals for tax registrations, security clearances from the Ministry of Interior and the regulators can become an arduous task, often impacting growth and ability to raise capital.

One of the leading VC backed start-up founders commented: "We did a sales tax registration in KPK but it was so painful to go through the process and do 3 different registrations that we gave up. With such red-tape, start-ups are so troubled navigating Punjab and Sind that they do not get the chance to expand into KPK". Many of the government digital initiatives also fall prey to red tape. The long approval processes and delays have led to non-utilization of available funds from grant programs that have then expired – e.g. the MDTF (Multilateral Donor Trust Fund) for KPK and Balochistan rehabilitation.

SEED can consider a program along the lines of 'Start up Bangladesh" which provides a one-stop shop for start-ups to navigate government departments, facilitate approvals, register OpCo/HoldCo structures, provide connectivity and financing (equity and convertible debt). Estonia allows e-registrations of companies to be completed within 15 minutes vs. Pakistan where such processes can involve antiquated steps such as notarized documents and multiple security clearances.

There have been cases where foreign shareholders in a local start-up have faced irrational scrutiny and in selected cases, their clearances have been revoked. In other instances, founders have had to present their credentials / CVs in person multiple times to relevant government departments for approvals.

For entities regulated by the SECP, an NOC clearance from the Ministry of Interior is required for any foreign shareholder (individual or company), a big obstacle. This NOC can be withdrawn at any time, without explanation, with 14 days' notice to transfer or dispose of the shareholding, effectively revoking the foreign shareholder's ownership. Such draconian measures can act as a deterrent for foreign investors to invest in locally incorporated companies.

The process for acquiring the approval is un-coordinated, questions asked unnecessary and intrusive and no specific timeline for approval exists or dedicated officer the company can follow up with. The process is repeated each time the same investor makes an investment and there is no centralized record or system not to ask the same questions again.

A central, streamlined process can be devised with the SECP taking the lead with a dedicated team and for MOI to coordinate with the SECP. This can ensure unnecessary delays and duplication does not take place, providing confidence to foreign investors.

10. Research and Development (R&D) tax credits

To encourage SMEs to invest in technological innovation. This can allow a cash rebate or a reduction in tax for projects that meet a rigorous assessment, devised and scrutinised by a body comprising the FBR and representatives from development organisations with input from SEED. A similar program in the UK has had a 2x impact in R&D spend for every £1 in foregone tax.

11. Create an IT park for freelancers / start-ups

To attract both local and international freelancers to work remotely there. Such a park would require strong internet connectivity, a safe, inclusive space, and ancillary activities – a location such as Gilgit, Swat or Skardu could be considered for this. This can be along the lines of Workaround, a dedicated BPO space, which houses companies like Affiniti and subsidises the office space if locals are hired. This would create a hub for networking, idea-sharing and innovation.

12. **Offering concessional financing**

A gap currently exists for ventures seeking low-interest debt funding who do not want to dilute their equity. A program for concessional financing for start-ups that are making an impact (gender empowerment, financial inclusion, job creation, climate change) in the province can be devised, similar to the SEDF (Sindh Enterprise Development Fund) program in Sindh which covers the KIBOR cost of loans. This could help early-stage start-ups scale and bridge their financing needs whilst raising equity financing. The qualifying start-ups would require careful vetting with an independent body in place, which SEED can help form.

13. Enacting a data protection and privacy law

For several years, a draft data protection bill has been under discussion. A disconnect exists between the state that wants to enforce its security measures, including access to sensitive personal customer data and local physical hosting of data, vs. the flexibility that start-ups want that are mostly reliant on cloud platforms such as AWS and MS Azure.

SEED can play a role in addressing the concerns of the stakeholders, through providing case studies of global best practices e.g. Indian law requires payments data and insurance data within India. The cloud storage providers (e.g. AWS) are currently reluctant to set up bases in Pakistan due to uncertainty around capital flows. A data protection bill can be drafted that addresses the reasonable

concerns of the state, whilst affording protection to the customer and not adding to the burden of the start-ups.

14. Credit bureaus

There are no credit bureaus in Pakistan that have full access to customer transactional data to be able to credit score (vs. 4+ in India), albeit there are four regulated by the SBP that have access to lending data/CIBs (e.g. Tasdeeq). This results in severe under penetration of credit as borrowers have no deterrence to defaulting and lenders find it cumbersome to be able to develop a full financial profile of the borrower.

SEED can help with mobilizing global players such as Experian to engage with the Pakistan government and provide a roadmap for better data sharing (exploring Open Banking) and functional credit bureaus.

15. Digital Payments Acceptance – Points of sale (PoS) terminals

The Physical PoS market is severely underpenetrated in Pakistan with only 120k machines deployed (vs. 5 million + in India), which are mostly outdated with limited value add functionality (e.g. tap to pay, reconciliations, PoS lending) and dominated by the banks.

The high cost of the terminals ($150+), resistance to documentation / rampant tax evasion and limited presence of disruptive, lower cost players has led to low digital acceptance at retailers. Whilst there have been recent initiatives such as RAAST merchant payments, penetration remains abysmally low. The KPK government has recently launched “Pameer”, a payment gateway integrated with 1Link that will allow 18 government services (e.g. licence fees) to be availed and paid for online.

SEED can provide technical assistance to the KP government in coming up with a framework for making digital acceptance mandatory for larger outlets and providing incentives to existing and new PoS players (such as Keenu, Hello Group, Stripe) based on benchmarks, including introduction of newer technologies such as mPoS. The KP government can incentivize digital acceptance through lower tax charged on card vs. cash payments (similar to Punjab).

A wide roll out of the RAAST Pay-to-Merchant rails can be facilitated by the government, which would help businesses increase their sales and reach, and reduce the use of cash. With SEED’s technical assistance, a number of further innovations can be introduced to RAAST e.g. tap and pay using smartphones, RAAST lite (no OTP required), and facilitate knowledge sharing with similar programs in other geographies such as UPI in India.

16. Payment gateways

The absence of payment gateways such as Paypal or Stripe means freelancers have to pay higher charges on other platforms like Payoneer. In some cases, e.g. a freelancer on the platform Squarespace could not sell her services as it only accepted Paypal or Stripe. Recently, Elevate, an Egyptian start-up, has entered Pakistan that allows free-lancers to open FDIC insured US bank accounts, free-to-use vs. 1% charged by Payoneer, and low FX fees.

SEED can work with the government to devise a pathway to getting Paypal and other gateways into the country. Currently, the exchange control regime, lack of data privacy and concerns around money laundering have been the major obstacles to their presence in Pakistan.

Part 3 – Recommendations

1. Skills development

Objective: To help bridge the gap in skills between the private sector requirements and the talent pool

Expected Outcomes: Provide a platform to guide, up-skill and improve the employability prospects of the KP youth, across the school and university levels

There are a number of on-going, often overlapping, skills development initiatives being undertaken at the federal and provincial level as well as the private sector. The existing SEED programs are being conducted in partnership with LMKT (for Decode) and Atomcamp (for Upskill KP).

The Decode program is focused on advanced skills in cloud computing, data analytics (Power BI), e-commerce and app development (Flutter) to 200 fresh graduates (incl 75 women) remotely, in partnership with LMKT, and offers a 3-month internship at the end in the private sector to enhance employability.

Whilst certainty a step in the right direction, there are a number of areas where these programs can be further enhanced:

- The class includes fresh graduates with mixed levels of knowledge in the taught areas – some are beginners whilst others have intermediate knowledge (e.g. of Flutter). A program should be designed to test the existing know-how to pair up candidates to the appropriate level, and not preclude those without a university degree.
- The trainers, whilst competent, do not come with significant private sector experience. Having trainers who are established private sector experts, rather than just knowing theory, could have a significant positive impact.
- Limited places for graduates to undertake internships at the KP based software houses. There are only 4-5 credible software companies that can provide value-add internships; others may be focused on specific areas such as PoS systems (in PHP coding language). It is important to match graduates in areas that they are most suited to in the private sector.
- A lot of course material is taught in a short-period remotely, across a range of areas including cloud computing, Power BI, web development etc. This results in the baseline not developing and is often too broad to be relevant in the private sector. A more tailored pairing of students with relevant courses and relevant experience would significantly enhance employability.
- Ensuring that the classes are conducted in person and include practical experience in addition to theory.
- The Atomcamp curriculum, from perusal, does not include full stack development and is more focused on front end frameworks.
- Ensuring that all students at completion go through internationally recognized certifications is important for credibility and employability.

Any skills development program needs to be focused on the target audience. E.g. for Power BI (where a number of companies need resources), an extensive program just focused on it, including certifications and practical experience can go a long way.

There are examples of free-lancers in Peshawar, operating as deep learning engineers, making close to $10k+ per month – these have mostly been self-taught (through platforms such as Coursera) and benefited from on the job experience.

Proposal 1A – advanced technical skills program: A skills development program can be designed, in partnership with private sector firms such as Aptech, that focuses on going deep in certain areas such as programming languages (Python, Javascript, PHP etc.), data analytics and app development, with the course work designed to suit specific private sector roles, leveraging available online courses e.g. on Coursera that also provide certifications from partners such as IBM, Google and Meta.

Such courses should be targeted rather than a wide-ranging curriculum and can be combined with a 2-3 month internship period, after completion, which should include on the job learning in that specific area, career counselling and mentorship. At the federal level, IGNITE is also currently exploring launching a program that would focus on five programming languages (including Javascript, PHP etc.) and teach 3000 students over 3 years.

The program does not need to be limited to university graduates but be open to all those who pass a certain minimum test threshold in those areas. Given certain language barriers with platforms such as Coursera, it is important to also, over time, develop local content.

Partnerships can be formed with players such as Systems, Affinity and software houses across the country, for internship opportunities rather than be limited to those based in KP.

Funding: A Pilot program for 200-300 students can be launched, that can be later expanded upon. Funding can be provided by SEED, KPITB (as part of their existing advanced skills program), DFIs (incl. USAID, World Bank, UNDP etc.) and the students through a token fee charged. Private sector partners can contribute in-kind through providing internship opportunities for students, helping to act as a hiring funnel.

For 100 students, it is expected a 3-month program should cost around $40-50k, leveraging available online courses as well, including international certifications. This can be scaled up to 1000+ students over time, creating a critical talent pool of high caliber, employment ready candidates.

Proposal 1B: Early-age school intervention

In today's increasingly competitive age, it is important to hit the ground running on key skills, teaching students coding languages in their early years as well developing an innovative, free-thinking mindset. By the time students reach university, their mindsets are often already developed. The decline in take-up of subjects such as philosophy at universities reflects the limiting mindsets the schooling system has inculcated.

A partnership can be designed between established school networks in KP and private sector firms to supplement their existing computer literacy lessons, with coding languages and certifications, including Javascript, PHP, Python and use of Chatgpt (prompt engineering) as well as courses in entrepreneurship, creative thinking and problem-solving. These can be part of the graded school coursework as well as extra courses for those that would like to go the extra mile (with the incentive of getting paid part-time work).

Firms such as Start-up Early, Code for Pakistan, Epiphany and Aptech be engaged, along with providing subscriptions to platforms such as Udemy and Coursera. This can be targeted at the secondary school level.

A 1,500 student program, through partnering with 4-5 schools, can be designed with $250k in grant funding. Schools and the students can be charged a nominal fee for the pilot, till the results become clearer and then transition to a fully funded model. The major investment required would be in trainers who should ideally be private sector practitioners.

2. A bespoke accelerator program

Objective: to help scale start-ups beyond the incubation stage and make them investment ready for venture capital funds

Expected outcomes:

- More polished start-ups, better versed in story-telling, corporate governance and pitching
- Attract equity capital, build soft-skills and linkages with investors
- Create success stories and role models of a select number of start-ups to create a multiplier impact, promoting wealth creation and entrepreneurship

A bespoke pre-accelerator/accelerator program is a significant gap currently to help start-ups scale beyond the incubation stage. Such a program needs to have a specialist focus, ensuring start-ups get one-on-one sessions and help.

A 3-4 month intensive program can be designed for up to 5 start-ups per cohort based in KP that require more tailored help in becoming VC investment ready, including:

- Relevant workshops: Understanding the funding landscape, pitch preparation and investor relations, fund-raising, corporate governance, accounting and valuations.
- Mentorship and coaching: Pairing each founder with a relevant mentor (within and outside Pakistan) that can add value.
- Investor connectivity – both local and international, with summits designed to bring investors to KP to showcase these more progressed / polished opportunities
- Partnership with an international accelerator such as Orbit or Flat6labs, that can include access to their network, coursework, as well as potential for start-ups interested in expanding outside Pakistan to be a part of their international programs.
- A separate sub-program catered for female founders to improve product and fundability.
- For each of the start-ups, a rule-based equity funding program can be designed (rather than grants), similar to Y Combinator. This can be a $20k investment for 10% equity, in addition to the value add that the program provides. Start-ups would have the incentive to use this capital to get product market fit and attract further financing from venture investors.
- One-on-one office hours, guest speaker sessions and post-graduation support.

SEED can help kickstart this with a total cost of c.$400k including the $200k equity investment. As the program develops, funding can also be arranged from sources such as USAID (which is running a She Leads Pakistan Rises program) and other DFIs. Any successes from the equity invested can help recycle capital back into the program.

The program would require office space, a small project team and a network of mentors to get started.

3. **KP Fund of Funds Program**

Objective: To help catalyse capital into KP-based start-ups.

Expected Outcomes:

- Over $20m of venture capital investments into KP start-ups, through leveraging the established investment expertise, network and fund management experience of Pakistan focused VC investors
- Unlock co-financing of $50m+ over 5 years
- Channeling capital into specific areas such as climate tech and female founders

A $20m fund-of-funds program, invested across 3-4 venture capital firms active in Pakistan, with the condition that the committed amount is invested in start-ups with the majority of their employees, revenues, or founders based in KP.

Such a program can help act as catalytic capital for the VCs to start investing in the KP start-up ecosystem. This has been the most impactful way for the government and DFIs to catalyse investments into start-ups, including climate tech ventures. Success stories include Israel's Yozma program and India's SIBDI (>$1bn), that has anchored dozens of local funds. This provides diversified exposure to a number of start-ups, that are selected after a rigorous, structured diligence process by investment professionals, and leverages the existing understanding, connectivity and portfolio management experience of the established funds.

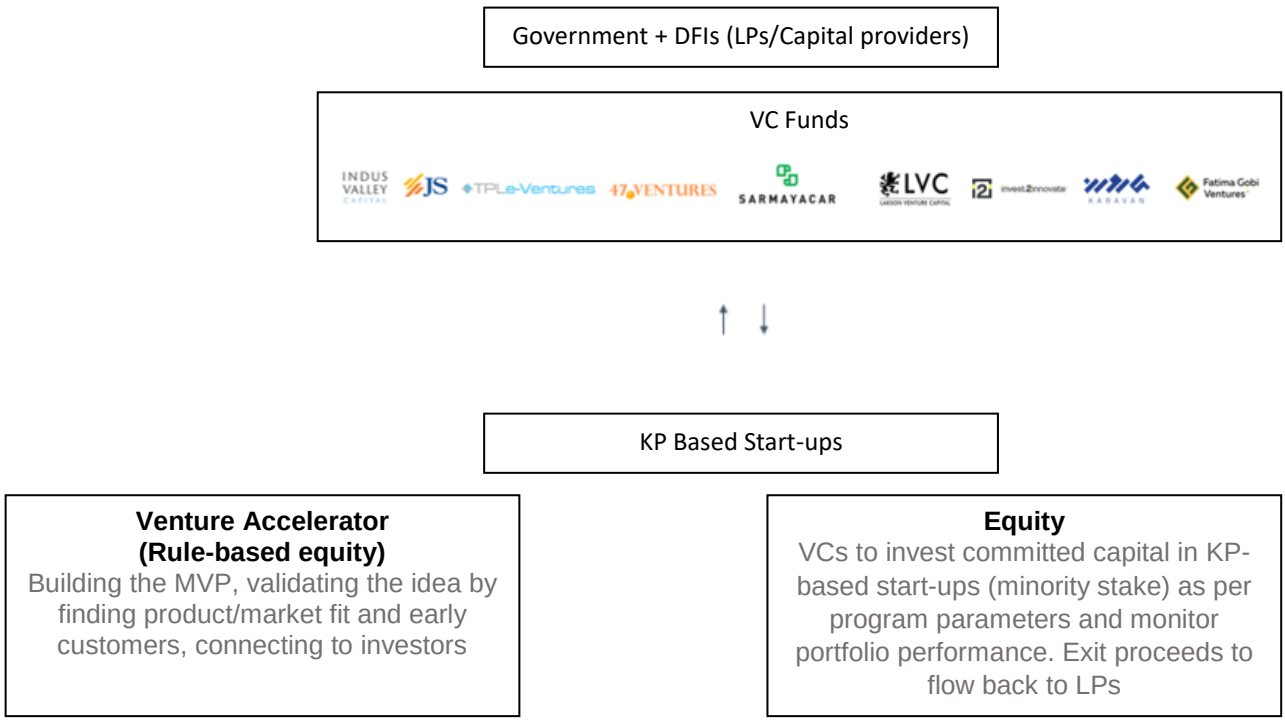
The fund of funds program can be funded through a combination of government, DFI (e.g. GCF, ADB etc.) and other institutional funding, with a transparent RfP process conducted for selecting the individual VCs, based on criteria such as past investments, ethos and investment strategy. This approach ensures lower execution risk and catalyses greater investment through enabling a number of funds to participate in the development of the ecosystem vs. creating a separate government backed fund.

A fund of funds program has proven to be the most effective way to catalyse capital into specific areas. In comparison, a grant funded program, whilst creating positive impact, can often result in the wrong behaviors (e.g. large discounting rather than being commercial focused) as seen from start-ups that are primarily grant-funded.

The individual funds would take an equity stake in the underlying start-ups, as well as provide mentorship, help with strategic decision making (through Board seats), talent acquisition and follow-on funding, thus helping to further bridge the gap between demand and supply for KP-based start-ups funding. Such a program can have a multiplier impact, investing in scalable businesses that inspire others to venture into entrepreneurship. It will require a small central team for portfolio monitoring purposes.

The fund of funds program can be funded through a combination of government, DFI (e.g. IFC, ADB etc.) and other institutional funding, with a transparent RfP process conducted for selecting the individual VCs, based on criteria such as past investments, ethos and investment strategy. Instead of creating a separate government managed fund or setting up a single fund, this ensures lower execution risk and catalyses greater investment through enabling a number of funds to participate in the development of the climate tech ecosystem.

Flow of funds



Key Terms:

- $20m fund of funds program for KP-based start-ups, invested across 3-4 Pakistan focused VC funds in Pakistan
- Target returns of 4x+ over a 10-year period
- Funds would charge 2% p.a. management fee and 20% carried interest (after return of capital)
- Any returns can be recycled back into a larger fund of funds program
- The fund of funds program can attract capital from the government's own funds, DFIs (such as ADB, IFC etc) and other institutions.

4. Red-tape and e-governance

Objective: To improve the ease of doing business for start-ups in KP

Expected Outcomes: Greater focus on business growth, with time spent on incorporation, filings and tax registrations reduced by at least 50%

From registrations to tax filings, manual processes and security clearances, red-tape currently acts as a significant hurdle for start-ups. There are multiple authorities for tax such as KPRA, others for company registrations, often far from each other, resulting in a cumbersome process.

In one example, a start-up was imposed a 700k PKR fine by the tax authorities for not submitting the sales tax return on time after having registered itself despite having no liability resulting in significant time and money wasted in engaging lawyers to challenge the penalty.

A streamlined process for e-business registration, as exists in UAE and Estonia amongst other countries, can be replicated. The KP-BOIT tried to create a one window operation for businesses but failed to operationalise this. More recently, a Pakistan Business Portal is being proposed by the federal Board of Investment (BoI) to create a single window for business facilitation. However, these are not tailored for start-ups which often face more nuanced issues.

SEED can consider a program along the lines of 'Start up Bangladesh" which provides a one-stop shop for start-ups to navigate government departments, facilitate approvals, register OpCo/HoldCo structures, provide connectivity, financial and operational guidance and remove the need for antiquated steps such as notarized documents (that are required by regulation). This would require the set up of an entity that serves as the central point of contact for start-ups and other ecosystem builders, as well as regulatory changes that remove the conflicting definition of start-ups (between the SECP, FBR and SBP) and make a special amendment to the law removing the need for physical notarization.

This can be launched as a pilot program with an up to $100k budget with the intention to remove roadblocks that hinder the development of the ecosystem and enacting necessary regulatory changes by the end of 2024.

APPENDIX: LIST OF STAKEHOLDERS CONSULTED

#	Name	Designation
1	Asim Ishaq Khan	Project Director, NIC Peshawar
2	Mubariz Siddiqui	Founding Partner, Carbon Law
3	Samar Hasan	Founder, Epiphany
4	Muneeb Mayr	CEO, Bykea
5	Jawad Ahmed	Founder, Encoder Bites
6	Sheryar Bawany	Founder, Trukkr
7	Aalishan Akhtar	Manager, Business Planning and Strategy, Ignite
8 9	Akif Khan Shoaib Khan	Director Technical, KPITB Director Finance, Skills Development, KPITB
10	Aleem Bawany	CEO, Compunode Pvt Ltd. (ex-Microsoft)
11	Wagma Farid	Communication & Coordination Specialist, KPITB
12 13	Usman Ghani Dr Qazi	Chancellor, IM Sciences and head of BIC Professor, IM Sciences
14	Dr. Shakeel	University of Peshawar
15	Habibullah Arif	Addn. Secretary, Science and Technology & Information Technology (STIT)
16	Umer Khan	Founder, Horizon Games
17	Sufyan Khan	Founder, Brayt
18	Omar Anzur	CEO, Workreel

19	Afshan Khan	Founder, Fastmove Packages
20	Muhammad Ayaz	Manager, Accelerate Prosperity
21	Shah Aun	Founder, Swich
22	Bismillah, Maryam, Mohd. Umair	Employees (Graphic Design, Marketing, AI Engineer), Work-reel
23	Pir Amad	Project Coordinator, Durshal KPITB
24	Bilal Farooq Khan	Head of Marketing, NIC Peshawar
25	Hammad Sabir	CEO, String Technologies
26	Amjad Arbab	Advisor, World Bank and NIC Peshawar
27	Shamoon Tariq	Founder and CEO, Mahaana