ICT and ITES for Pakistan

National ICT Policy Framework & Draft Recommendations for discussion

Version 1.3, 29th August 2011

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Preamble

There are many ways to approach and develop a national ICT policy framework. Over the last eleven years a number of initiatives have been undertaken in this area by individuals and groups sponsored by our technology industry association (P@SHA), Ministry of IT (MOIT), by the state (the Planning Commission), local and expatriate Pakistanis. Within the list of above initiative policy documents have been developed keeping in view long term national goals, vision and outlook; by initiating and documenting stakeholders conversations; by surveying industry groups and their customers; by comparing our efforts with regional initiatives and finally by reviewing where we are and where we need to be in the future.

While at a broad policy level we have information as well as recommendations on using ICT for growth, development and employment creation it was felt that an updated national policy document with actionable milestones and fundable projects, reflecting the point of views of primary stake holders and the technology industry association was required. We needed a document that would reflect our assessment of gaps in the state of national ICT and the role we can play in plugging those gaps. A document that was specific enough to build a case for recommendation to ICT Taskforces yet deep enough to stand on its own in the policy conversations and debates we initiate.

As part of our efforts to prepare this document we reviewed the work done by a number of our predecessors, engaged members of civil society, the technology industry, the telecommunication community, the services sector, media and socio-political activists. The document was then selectively presented for initial feedback and reactions and the feedback was incorporated after discussion. As a final step the document will be presented at three forums in Karachi, Lahore and Islamabad to key stakeholders for a final round of discussion before its release to the policy community in Pakistan.

Prior work

In a national ICT policy workshop arranged in October 2008 a list of over arching principals were agreed upon by all ICT policy stakeholders. These principals included

Promote Accessibility
Preserve National Security, Confidentiality & Integrity
Promote Innovation
Proportionality
Conformity with international best practice
Transparency
Openness
Inclusive Policy Making
Promote market forces
Holistic stakeholder participation
Light regulation where necessary and possible

Gender Positive
Promote Youth
Multilingualism

In addition to this the P@SHA CIPE Business Agenda for Pakistan IT & ITES Sector recommendations for 2009 identified a number a gaps in the areas of:

a) Human Resources
b) Finance
c) Infrastructure and
d) Legislation

Internationally we can also look at the Diplo Foundation's analysis of the Internet Governance Forum's themes:

1. Data protection and privacy
2. Capacity Building
3. Awareness building on Open Standards
4. Internet Access and Connectivity
5. Human Rights
6. Multilingualism
7. Access to Knowledge
8. Freedom of Expression
9. Gender Issues in Access and Representation
10. Access Improvement for Persons with Disabilities
11. Legislative (Regulatory) Framework for Internet Access and Use
12. Child Online Safety
13. Awareness Building on Climate Change
14. Content Diversity on the Internet
15. Critical Internet Resources
16. Cyber Crime
17. Internet Governance

As well as the EU Digital Agenda it directly links economic policy with social policy[1]

Pillar 1: A vibrant digital single market
Pillar 2: Interoperability and standards
Pillar 3: Trust and security
Pillar 4: Fast and ultra-fast Internet access
Pillar 5: Research and innovation
Pillar 6: Enhancing digital literacy, skills and inclusion

[1] http://ec.europa.eu/information_society/digital-agenda/scoreboard/pillars/index_en.htm

Finally numerous P@SHA AGM, CEC and stakeholders meetings have highlighted challenges faced by local companies and partners.

The original national ICT policy paper presented and implemented between 2000 and 2011 was prepared with a yearlong coordinated national effort. From a structure, action plan and focus point of view did a great job of building consensus as well as setting national direction for technology industry and initiatives in Pakistan. At the end of the policy document was a list of 20 projects that together were expected to change the technological landscape of the country. While work was done on some of these initiatives, others couldn't receive funding or failed in the execution and implementation stages.

At a high level the 2000 national ICT policy effort focused on the following intervention areas:

1. Human Resource Development
2. Infrastructure Development
3. Software Industry Development
4. Hardware Industry Development
5. Internet
6. Incentives
7. IT Promotion and Awareness
8. IT usage
9. Legislation
10. Regulation

The biggest contribution of the National ICT Policy initiative was the generation of a decade of policy implementation experience. While in certain areas clear policy initiatives were taken (skill based training, access to new markets via participation in international industry exhibitions and events, establishment of the national ICT R&D fund, capacity building initiatives, national internship schemes, national scholarship scheme) in other areas policy level discussions continued for a number of years without any measurable or visible impact.

State versus Private sector role

The less than perfect implementation of the national ICT policy of 2000 despite the best of intentions, a very strong team and the allocation of resources raised an interesting debate during our stake holder sessions.

The State certainly has an enormous advantage over others in raising resources, allocating revenues and awareness. It also had an edge in the area of enforcement and legislation and there are certain gaps that only the State can fill.

However where the State fails and stumbles is execution and implementation. And this is not unique to us as a nation but is a widely recognized governance problem. The common implementation issues were:

a) Change in momentum with each initiative as faces changed at higher levels

b) Speed of implementation and execution once the case was made
c) The selection of the appropriate execution model for an initiative
d) The effectiveness of the execution effort
e) Absence of an effective feedback loop and proactive ownership from the industry

It wasn't that the industry abstained from contributing; it was more that it wasn't able to create an effective and sustainable channel of communication, direction or influence within the government at Federal and provincial level. Rather than creating a sustained thrust focused on crucial implementation issues, we reacted on a selective basis when a crisis unfolded (VOIP disconnects, submarine cable, import duties, sales tax, cyber crimes ordinance, etc).

After the experience with the previous ICT policy exercise and its implementation an interesting choice is now available.

While we will and can carry on making our recommendation for the State and even assist in the implementation of the same initiatives, it is necessary for the industry to take the initiative around directional and core intervention projects. Projects that include proof of concepts, model execution, setting direction and pilots need to be owned and initiated by the Industry. In other words the Industry needs to step in and drive the process rather than abdicate all responsibility to the State. It can play an active directional role by funding, managing and implementing critical pilot projects as a private sector participant and use that role to effectively harness the resource generation, enforcement and legislative capabilities of the State.

A note on Private sector and industry: The word private sector and industry is used very broadly here. It is assumed that it includes all non-state actors (for profit, not for profit, NGO, foundations, trusts, ect) interested in participating and contributing to the cause of using ICT for development in Pakistan. While P@SHA doesn't expect to be the only body using ICT for development in Pakistan, it does plan on taking a leading and defining role in ensuring that at an industry level, keeping national interests in mind the right frameworks, controls and mechanism are suggested and proposed. P@SHA hopes that by taking the first steps it can encourage others to join in its effort for using ICT for development in Pakistan.

National ICT Policy recommendations

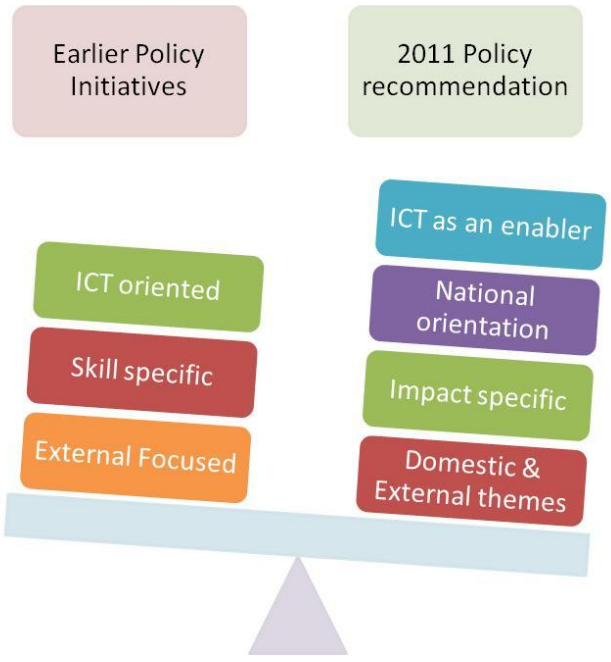
A different orientation

Earlier policy initiatives were primarily industry centric. In its early stage the ICT and ITES industry was external focused with a large number of companies targeting the software export market. Given the industry focus and the government initiative to increase the pace of exports, the primary intervention theme was to do the needful required grow software exports. From building a pool of skilled and trained human resources to providing internet connectivity, from reviewing curriculum to exhibiting internationally, almost all core policy initiatives focused on the external market.

However one of the lessons that we have learnt from the last decade of policy implementation experience is that a national ICT policy has to be national in its focus and emphasis. While software exports have grown at an impressive rate over the last decade the domestic technology consumption figure is now just as significant and almost half as large, if not more, than our total international contribution. More importantly both contribution figures (exports, domestic consumption) ignore the enabler impact of technology on other related sectors such as banking, insurance, government, manufacturing, media, education, defence and agriculture.

But beyond technology, ICT and ITES play a significant role in national development and GDP growth. Two projects that support this point of view are the Tameer Bank/Telenor easy paisa project and the NADRA national identification card database. Besides documenting the economy, both projects have created the potential to add another 2% – 3% to the national GDP and will consistently do so over the next many decades.

Imagine the impact similar projects could create in the area of education, literacy, agriculture, trade, market development manufacturing and media.

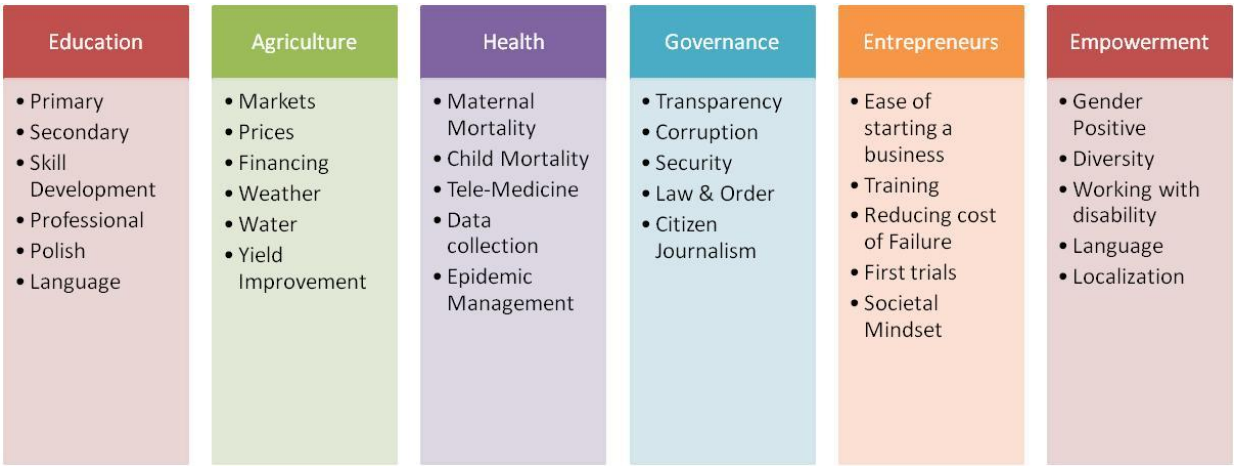


Hence the need to create a national orientation within the ICT Policy making process. The objective is to not drive the process by a sense of patriotism or philanthropy but recognition of the economic opportunity unsolved problems represent in the domestic market.

The opportunity comes in two dimensions. The first is solving a problem through technology and getting paid for it. The second is the reference sites and domain expertise the solution creates for the collection of firms solving that problem which can then be used to pitch for work globally.

For example, we have recently seen freelance cell phone developers morph into specialized mobile application developers morph into mobile animation shops, morph into mobile gaming companies within a span of 3 to 4 years. With the right set of incentives and mentoring a similar roadmap could be repeated for companies working with financial services, health, telecommunications industry, manufacturing and agricultural technology.

One way of achieving this objective is to create two themes in the policy initiative. The first is a national macro level theme that addresses the above objectives.



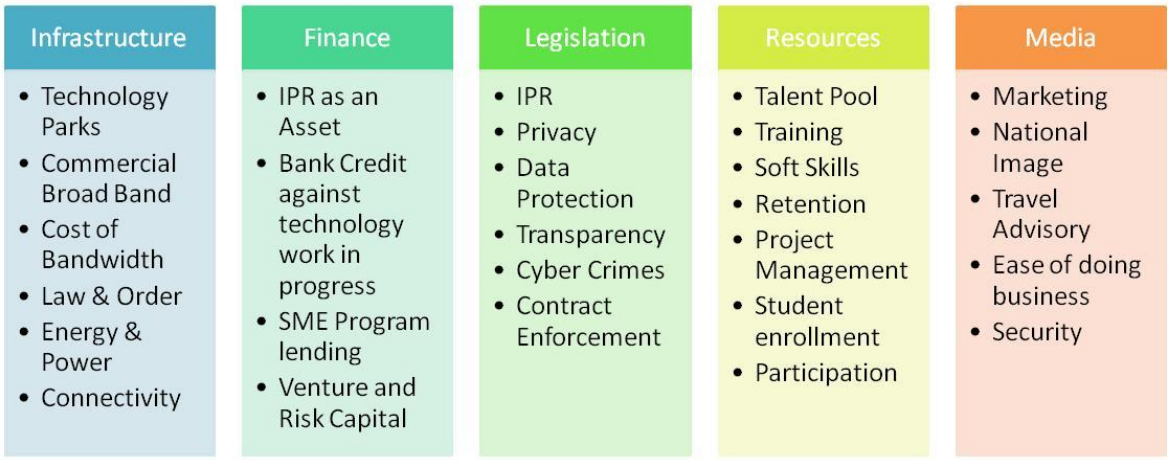
The national theme answers one simple question for each area of focus. What can technology, technology enabled services and telecommunication do to solve a big problem in an area of focus within the next five years. The question is asked for the following macro level sectors:

a) Education
b) Agriculture
c) Health
d) Governance
e) Entrepreneurship
f) Empowerment

The thinking behind this list is that solving a large problem in any of these areas creates a new domestic market for our companies and in case of success allows us to create real growth and prosperity using ICT and ITES as an enabling tool which in the long run will address related industry level micro issues.

The second is an industry specific theme that side by side with national elements focuses on issues critical to the long term development of the ICT and ITES enabled industry in Pakistan.

Of the list that follows only one deals with the hardware (Infrastructure) of development while the rest deal with software (resources, skills, environment) of development.



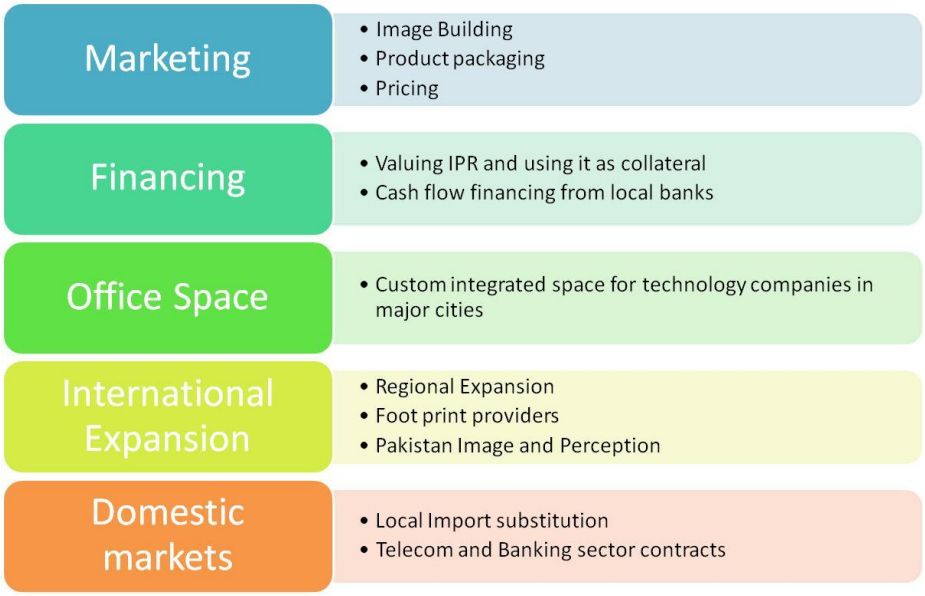
There is nothing new in the above list. At a broad level like all other industries of our nation we need affordable, functional space, competitively priced electricity and power, always on connectivity (without interruptions and disruptions), access to finance, a client, investor and business friendly legislative framework, a growing pool of talented professionals and a positive media image.

While some of these elements are not possible without government intervention (legislation and finance), direction for other can at least be set by pilot projects funded by private sector initiatives that can then become role models for later government intervention.

Life Cycle Needs

Where this policy document differs is with respect to two additional steps that we take in evaluating the needs of small businesses while identifying suitable intervention steps.

a) We first take a look at life cycle needs of companies based on their growth profile and employee head counts. The needs of our companies change as they grow from a two man startup to a 500 strong multinational trade, services and manufacturing groups. If we better understand what companies need as they mature within their life cycle we can do a better job of communicating these needs to policy makers.
b) Having said that, there are still certain common denominators that are shared by all players in the industry despite their size. We classify these as common industry specific needs that are not dependent on the size of companies but their profile as an externally oriented export focused product and services group.



The final element that is now missing is a credible road map and action plan that allows the industry association to take steps in addressing some of these needs – life cycle as well as industry specific needs. Historically in the areas of office space, international marketing, skill development, resource, talent development and marketing we had relied on a combination of industry efforts and State policy initiatives given the resource base the State controls. We revisit this topic again in our action plan and roadmap section.

Pillars of National ICT Policy

The second lesson that we have learnt from the last decade of implementation experience and the breakdown of law and order at the national level is that we cannot focus on micro industry issues and let national issues fester without any corrective action on our part.

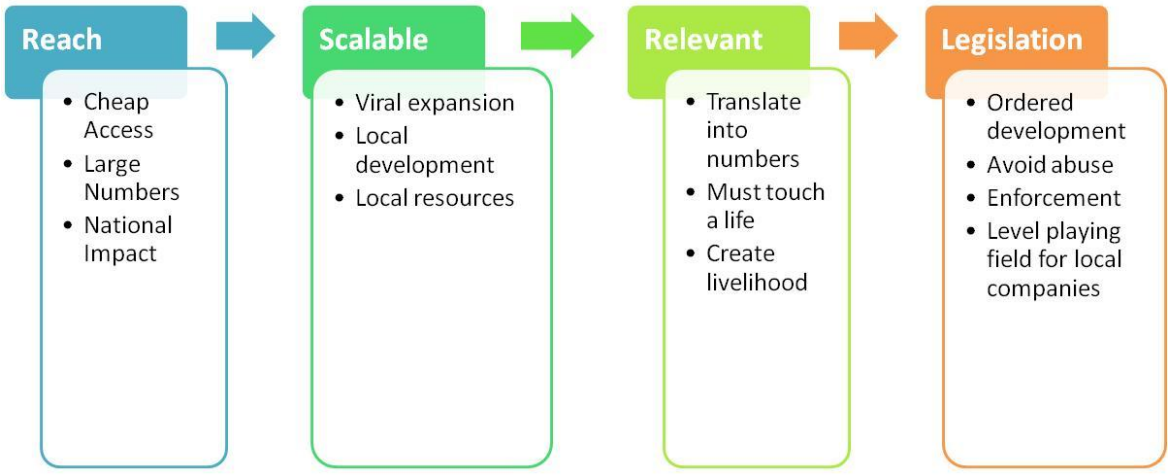
If we were an industry that was helpless and could contribute nothing one would understand our status as an observer. However given the multiplier effect of technology enabled services, a true ICT policy document must focus on moving all of Pakistan to the next century, not just the ICT community.

For example imagine what we can do by combining grass root education initiatives with technology and cell phones. Simple tools that improve the ability to do basic mathematics, reading and writing and problem solving can go a long way in improving the quality of the national education and the resulting workforce pool. Combine this with hands on skill based training that you could view and run on your cell phone as a high school or undergraduate student. Courses and topics that encourage you to look at computer science (for e.g) as a career, polish your skill set, make you aware of real world industry challenges, skill that you must pick so that you hit the ground running before you start your first job.

It's not philanthropy or corporate social responsibility. Education and professional development is a commercial, economically viable domestic market just like any other. Yes there are a number of barriers that need to be lowered before the above becomes feasible which is another theme that we have tried to address later in this document.

Combining the two macro and micro level themes suggest possible pillars for the national ICT and ITES policy document. While the list is significantly shorter than the original list proposed in early 2000 as part of the previous IT Policy drafts its expected impact is much broader and is driven by a combined national theme.

1. Reach
2. Scalability
3. Relevance
4. Legislation



One reason for using this broad brush approach rather than a specific skill oriented focus used in our earlier policy editions was our inability to accurately predict what would be the relevant technologies and platforms over the next 10 – 20 years. While we started off with an initial version of relevant technologies and areas of interests over the next decade we quickly realized after discussion with industry participants that in the current state of transition, any attempt at locking down the future would be futile. Will the device of the future be a handheld, a tablet, a wide screen cell phone, a laptop or an image projected on your drawing room wall? Will the platform used be a derivation of mobile development, browser based applications, distributed computing or something completely different?

Having seen multiple shifts in search, mobile applications, development paradigms, architecture, payment and business models and usability over the last 5 years there are as many views and versions of what the future holds as there are technologists.

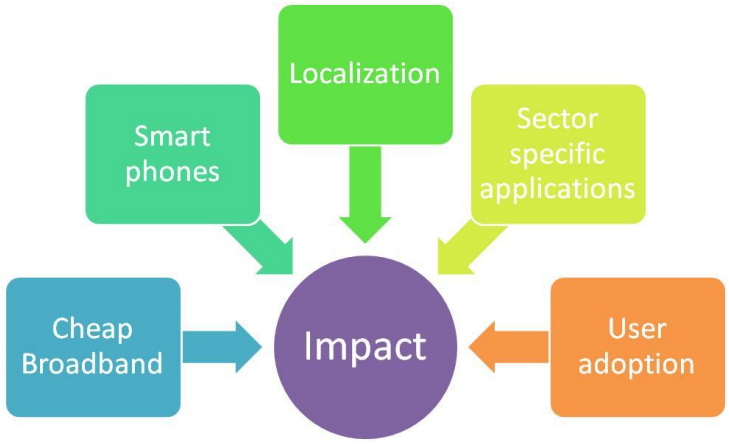
With this specific context in mind we felt that it was better to use an approach agnostic to any specific opinion about what the future would hold in a technological, skill, development platform and market context and focus more on an approach that used technology to upgrade our national GDP, standard of living and quality of life.

At an industry specific level it was felt that in addition to the above, the selected policy initiatives must

a) Make it easier for new ventures to be formed, incubated and launched
b) Improve the quality and depth of our resource and talent pool in one specific area – problem solving abilities
c) Create a industry wide knowledge dissemination resource for sharing minimum standards, benchmarks and best practices for developing products, enterprise applications, contracts, pricing, packaging and marketing.

Let's review each of these pillars.

Reach

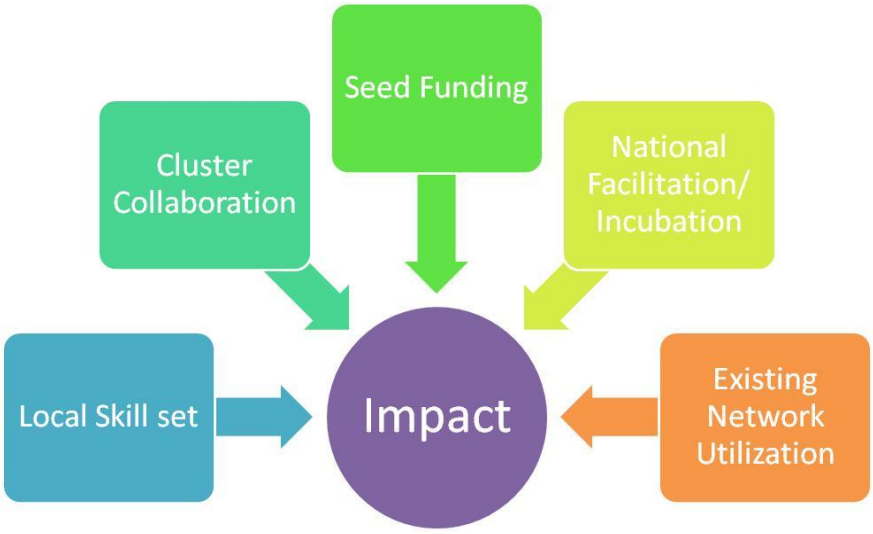


At a policy level we define reach as the combined effect of 5 elements working together to create impact.

1. The first is cheap broad band that makes it viable to use the internet as a delivery medium for content and technology. We expect broad band rates to decline at a wholesale level and hopefully at a retail level within the next 2 years. These rates can be further reduced by benchmarking data rates quoted by PTCL and Transworld to international and regional rates for similar products and services.
2. We need to also evaluate Direct to Home (DTH) services, open access policies for cable networks and any other initiatives that can reduce the cost of distributing information to any part of civil society in Pakistan through any information medium. That medium can be a cell phone, a set top box, a TV, a computer or a tele-services center. Since without access there cannot be any empowerment.
3. The second is affordable smart phones. Cost of smart phones like broad band rates has been dropping and will continue to drop to a point where they will be the only available handset within the next few years.
4. The third is localization of content both with respect to languages, context and national themes.
5. The fourth is sector specific applications for agriculture, education, security and media.
6. The fifth is adoption of sector specific applications by their intended users.

While the first two elements are driven by market forces, competition and over capacity, the last three (localization, sector specific applications, user adoption) require a policy response. When all 5 are in perfect alignment it is possible for **anyone with a handset** to learn a skill, educate himself, participate in a geographic location specific market (mandi), benefit from relevant price impacting information, look up weather and water distribution trends, access citizen services and more; basically use technology and the communication network to improve his or her overall quality of life and standard of living.

Scalability



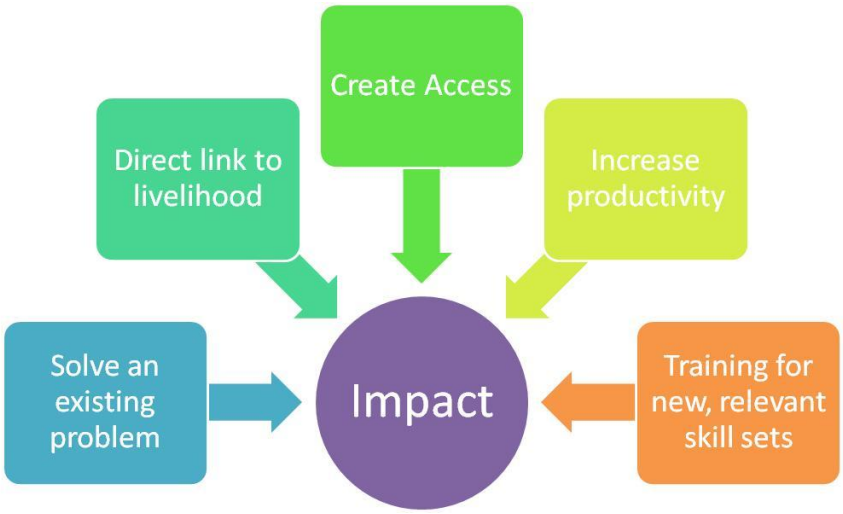
To craft a policy response to the policy pillar of reach we use 5 elements of scalability

a) Using local skill set or retraining existing pool on new required relevant skills

b) Creating clusters of collaboration in required areas to share best practices, knowledge as well as reduce distribution and publishing costs
c) Provide seed funding to pilot proof of concept projects to encourage localization, content creation and user adoption. Basically provide small amount of risk capital that fills in the gap experienced entrepreneurs face when it comes to initial funding
d) Use the technology industry network and goodwill to promote exposure and provide access to decision makers at large local customers
e) Use existing established communication and financial services distribution networks to reach out to new customers

Our hope is that centered around **Reach,** an appropriately designed outreach campaign for powerful products focused on solving large problems around macro and micro themes identified above can kick start a domestic ICT and ITES product and services market in Pakistan. Such a market would allow local companies to use their home ground as a test bed and launch platform for more significant regional and international contracts.

Relevance



How do we select the relevant product and services that benefit from the intervention process described above in reach and scalability? We define relevance as the criteria that allow us to make that decision. An idea selected and promoted by intervention must:

a) Solve a large existing problem at the national level
b) Link the solution to improving the livelihood of the person being impacted
c) Provide or create access to markets that was not possible before
d) Increase productivity
e) Create opportunities for acquiring a new relevant skill set that address (a), (b), (c) or (d) above

Legislation

Legislation is one of the many missing links that investors and clients point to when declining to work with our member companies. With the legal framework in Pakistan there is room for significant improvement in the areas of:

a) Registration and protection of Intellectual Property Rights,

b) Data protection and transportation of sensitive and confidential information across international borders,

c) Privacy, transparency and security of customer data sets,

d) A framework for classifying, documenting, penalizing and punishing cyber crimes and

e) A framework for managing the environmental impact of obsolete IT products by legislating the need for recycling centers for PCB's, plastics, monitors and used cables.

f) Enforcement of local and cross border contracts similar to the progress made by the banking industry by establishing banking courts.

g) Access to information and the rights of an ordinary Pakistani citizen under freedom of speech, and freedom of expression

In addition to the above frameworks there is also a constitutional issue at stake here, because of the tension between Pakistan's secular constitution and the way in which that is being challenged for non-secular reasons (primarily) to do with freedom of expression, censorship, internet blocking and anti-Islamic behaviour). ICT has massive potential as an enabler of social growth and development, but it cannot flourish when there is such fundamental confusion over the proper legal controls and the way they are applied.

ICTs can also be a powerful force for economic development and regeneration in a nation which needs it so badly. However, it cannot grow where rules and restrictions are applied arbitrarily and without due process or accountability.

While over the past 3 years a number of efforts have been made to create and submit draft legislation in some of these areas, the Industry association in collaboration with public and private sources of funding must complete and bridge these gaps within the next 24 – 36 months.

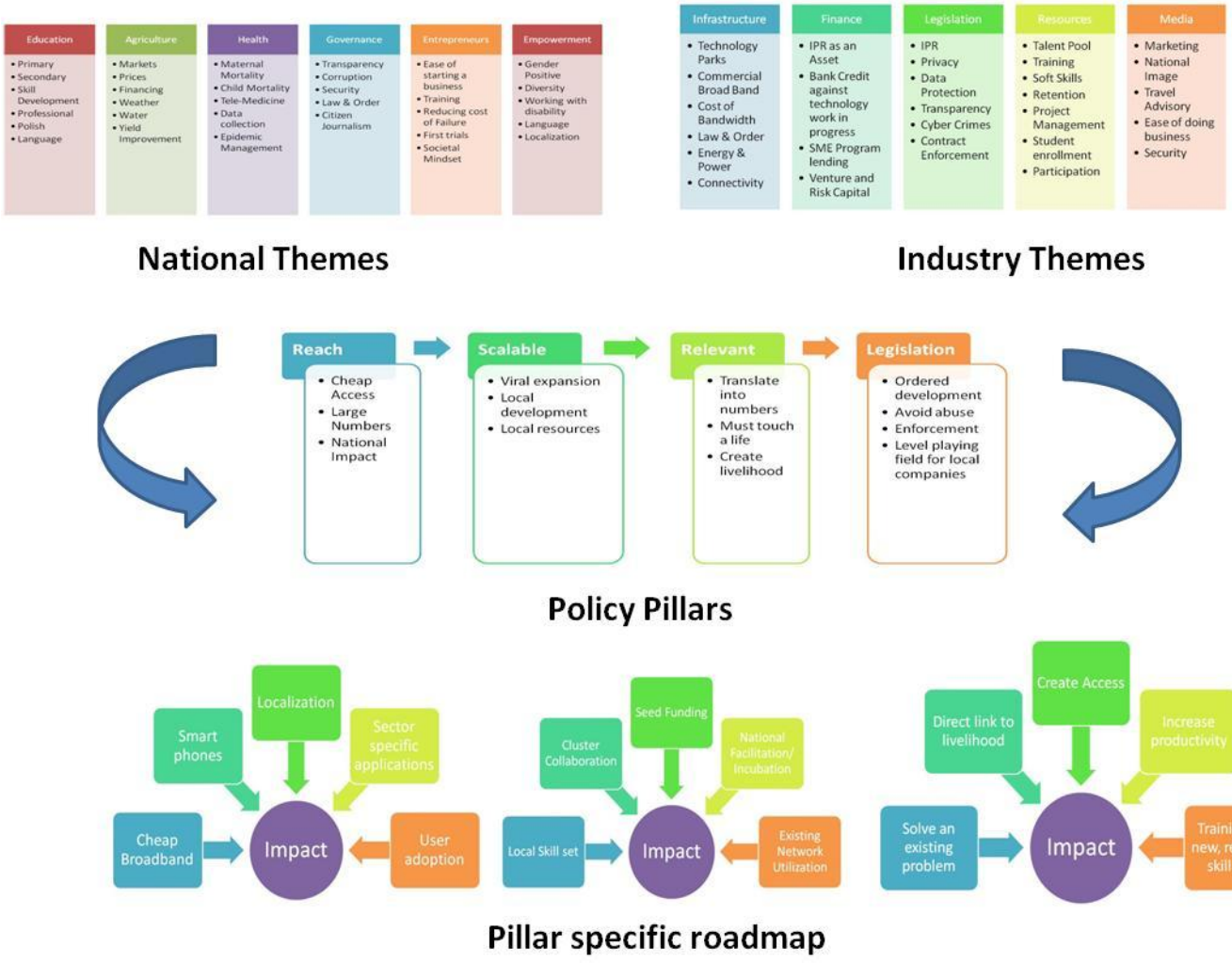
As part of its work on the technology industry sector agenda, P@SHA has already identified and prepared a roadmap and a list of laws where legislative intervention is immediately needed for the promotion and development of the ICT sector at a national level. These laws include:

a) Individual Privacy and Data Protection
b) Cyber Crimes
c) Review of registration process for Intellectual Property Rights
d) Review of the Copyright Ordinance 1962
e) Cross Border data transmission
f) Access to financial and banking records

g) Voice over IP
h) Internet censorship and restrictions

Bringing it all together – National Themes

To tie this all together we look at the national and industry specific themes, apply the policy pillars and build a roadmap for projects, intervention and action plans for each theme. The next section presents an initial draft for an intervention road map using the described process.



Please note that the shared roadmap is meant to jumpstart discussions around final recommendations and represents the first step for building consensus across all stakeholders.

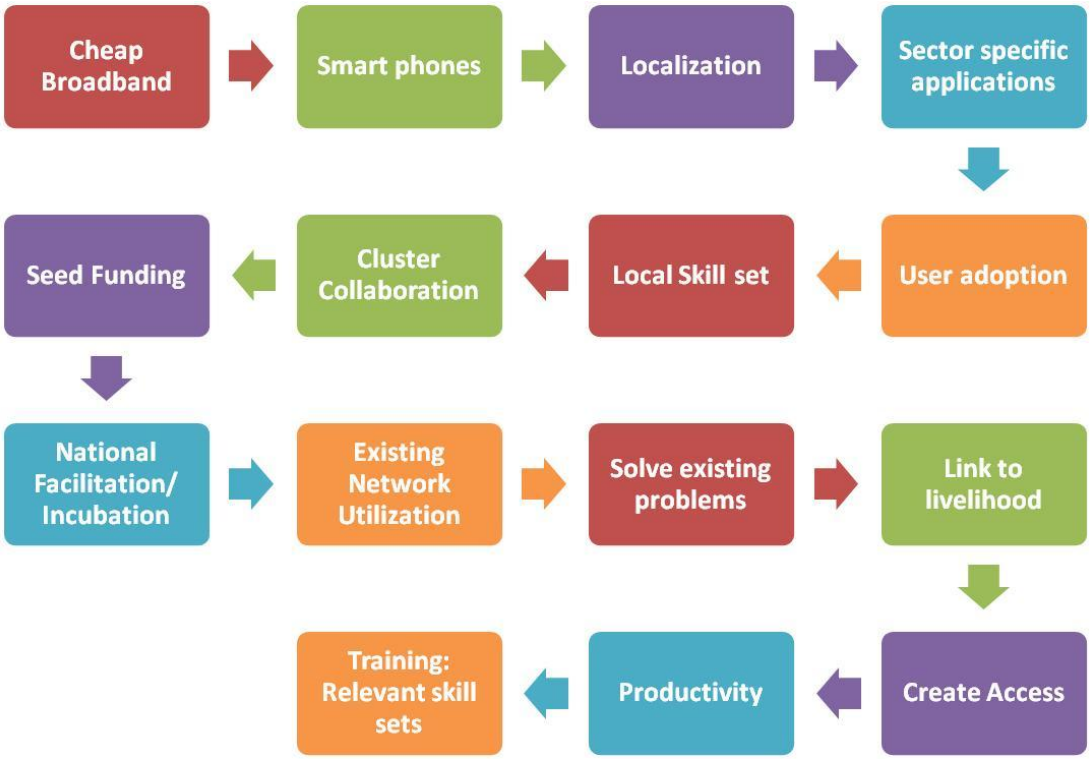
Measuring and tracking progress – ICT Policy Goals

We believe that by using this integrative approach focused around ICT for development together we will be able to achieve the following goals over the next decade of implementation

a) Create 250,000 new jobs across Pakistan (not just in the cities) linked to the ICT and ITES sector.
b) Increase enrollment and quality of graduating students from computer science schools in Pakistan. Measure this increase in quality by improving the percentage of employable computer science candidates from 10% to 50%.
c) Double the % of women participation in the ICT and ITES workforce.
d) Increase the adult literacy rate by another 25% across all demographics and by 50% in rural areas and socially disadvantaged segments.
e) Increase the GDP per capita by 25% by improving agricultural yields using ICT and ITES, leveraging the cellular phone network for education and access to information, localization of content and broad based growth of the ICT and ITES sector.
f) Reduce child and maternal mortality by 25% using ICT, ITES and Tele-medicine services.

Implementation and Intervention models

If we separate the intervention steps from the policy pillars our national ICT policy recommendations would get ultimately categorized under the following heads:



We start at a higher level with the national themes with the aim that our stakeholders' discussions will help us broaden the impact and reach of the final set of recommendations.

Education

- Primary
- Secondary
- Skill Development
- Professional
- Polish
- Language

Education

Initiatives in the area of education focus on improving the quality and reach of primary and secondary education and basic computer science exposure at a national level using technology.

The initiative also focuses on creating curriculum and best practices materials in an easy to download and accessible form for young professionals, undergraduate and graduate students.

While the content is aimed and meant for all professionals, the thrust of this effort is on reaching out to student communities outside primary urban and commercial centers who do not necessarily get exposure to main stream speakers and professional development opportunities.

This requires an additional element of localizing content by translating and dubbing it in national and regional languages.

Intervention model

a) Similar to the P@SHA Social Innovation Fund, P@SHA will raise funding from public and private sector partners to launch a P@SHA Education Fund that will provide seed funding to select pilot projects in the areas of primary, secondary, professional and skill development education that use a combination of audio and video based delivery using hand held devices as the primary delivery medium[2].
b) P@SHA will use its goodwill, network and influence to help promote the products produced by the seed funding initiative at national as well regional forums.
c) P@SHA will work together with technology and content companies to establish a center (forum or portal) for language (linguistic) support and translation that would bring providers of translation and dubbing services together with companies producing content in non-local languages as well as companies with existing inventories of applicable content that can be translated and licensed to distributors of that content.
d) P@SHA will work with a team of legal professionals and a working group of local companies to explore, suggest and promote a boiler plate licensing or revenue sharing model for using existing and future audio and video based content to encourage promotion of local content and localization of relevant content produced by member companies.
e) P@SHA will raise funding to create, support and manage a best practices and standardization program for current and prospective employees of local companies that would help them hit the ground running in their jobs by providing supplementary training resources for technical, personal and professional polish. The program would serve as a knowledge dissemination center that would cross pollinate ideas and support the natural evolution of industry specific standards by routinely bringing together experts and industry leaders with young professionals and managers.

Agriculture

- Markets
- Prices
- Financing
- Weather
- Water
- Yield Improvement

Agriculture

Within the agriculture sector primary areas of intervention deal with productivity, wastage, conservation of water and power, long term storage, access to markets, liquidity and financing.

ICT and ITES can play a role in improving the existing environment in some of these areas.

Intervention model

Help build a collaborative eco system that:

Create opportunities for producing local content in local languages that help improve agricultural yields by distributing and applying research being performed at our agricultural universities.

[2] The objective here is to take a first step via an organization that understands technology, education, content, bandwidth and convergence and then expand the initiative as more multistakeholder organizations join the initiative.

Help move this local content to handsets and media.

On a sustainable and commercial basis collects and distribute price, volume and demand data from agricultural commodity markets across local districts and make it available as a location based service on handsets so that small farmers are able to get better pricing for their crops.

Collect and distribute weather, water, temperature, pest infestation and crop diseases data on a similar basis.

Collect and distribute concepts and product ideas around high value produce and value addition to agricultural communities such as drip irrigation, pipe farming, high value, out of season crop cycles, reducing wastage of dairy products by converting milk into longer shelf life products such as cheese.

Health and Disaster Relief management

There are multiple statistics that measure access to healthcare and related services for general population. Some of these are focused around maternal and child mortality, while other look at basic health care units per 1000, doctors and nurses per 1000, vaccination rates per 1000 in general population. It is also important to include disability, rehabilitation and preventive care statistics in any initiatives.

While there isn't a separate section or theme for disaster recovery, ICT and ITES services also play a significant role in resolving health, nutritional and epidemic crisis resulting from natural or manmade disasters.

Intervention Model

Help build a collaborative eco system that:

Publicly share Information around preventive care with prevalent and dominant disease groups across all ages and genders using local languages and handsets

Track and reproduce vaccination schedules of infants to reduce rates of childhood mortality from preventable diseases on account of non-vaccination or awareness.

Makes it easy to collect health, disease and epidemic data and trends in both normal as well as crisis mode

Track long-term effectiveness of a health intervention strategy aimed at geographic locations and disease groups

Rank availability, access and quality of care available based on statistics generated by the above models and share that information publicly to create incentives for improvement as well as intervention

Leverage access to qualified professionals by building networks of Para-medical staff working directly and/or remotely with experienced physicians and specialists using technology

Disaster relief management

There are also elements of social policy which are hindered by a lack of effective ICT policy. For example, the flooding in many areas of Pakistan in 2010 continues to affect and even threaten the lives of millions of people in remote and rural areas. Aid efforts are hampered not just by lack of resources and physical infrastructure, but also critically by the lack of cheap, ubiquitous and effective ways to communicate with, inform and educate those affected. There is therefore a need for:

- An infrastructure set up for any / all form of disaster management including incidence reporting, disease management, location specific relief needs and tracking relief camp population demographics for better coordinated resource allocation
- Emphasis on integration with mobile cell phone companies leveraging the outreach of the cell phone networks
- A national committee that is trained in the disaster management protocol (from earthquake, tsunamis, Floods, Terrorist attack, to war)
- Technologies ready and enabled to be available at the flick of a switch when the national government declares a disaster
- Provincial authorities enabled and ready to help the national disaster and relief management infrastructure
- Autonomy of the national and provincial disaster management cells
- Coordination across all bureaucracies during the times of disaster

Governance

The governance section possibly has the most dimensions that can have the biggest impact on the success or eventual failure of a national ICT policy.

Starting with keeping a dialogue open with the industry to making it possible to upgrade the regulatory infrastructure in line with technological developments in the world; from helping local technology companies putting their best foot forward internationally to providing an environment to them locally that allows them to operate on a sustainable and competitive basis. There is a great deal that the governance dimension can do with technology and for technology; not just for the industry but also for the nation.

Intervention Model

a) Ensure that the both Federal and Provincial cabinet positions for the role of IT minister are filled from the industry and are seconded and reviewed by P@SHA. The ministries must be staffed at all times with access to sanctioned budget. Precedent for this already exists within Finance, Textiles and Exports and can easily be extended to ICT and ITES sectors.

b) Expansion of citizen services and e-government using technology solutions and platform with a focus on **service and governance** rather than **computerization and automation**.

c) Create a continuous dialogue between the industry and the legislative arm of the government to ensure that gaps in the legislative environment are identified and addressed as they arise ensuring that the competitive landscape provides a level playing field for local companies.

d) Other than exports, create incentives and initiatives for import substitution by helping the domestic ICT and ITES industry build upon its success in traditional sectors of strength including banking, insurance, health and telecommunication applications.

At a broader national level the IT policy must help enable future governments to better serve the people in that it must:

a) Create mechanism and tools for tracking performance and score cards of local and provincial governments at District and Tehsil levels.
b) Highlight technologies to empower the parliamentarians from the Senate to National Assembly to the Provincial Assemblies
c) Help good governance policy implementation in a transparent manner
d) Help local bureaucracies with the use of efficient open source technologies to serve the people of Pakistan.

Entrepreneurship

Entrepreneurship is not limited to starting up one or two man new ventures from a room but also applies to a framework that can be used by smaller companies to expand and scale up into larger, more profitable, productive versions of themselves.

As discussed within our policy outlook above since we can't predict the future we want to increase the number of shots we can take on as many version of the future as possible. In addition the entrepreneurial process and spirit also performs the necessary function of creative self destruction by which existing players move from dying markets and niches to richer and strategic opportunities more suitable to their growth curve.

This cannot happen unless we make it easier for new ventures to form and existing ventures to grow.

In addition the other big hurdle is the perceived cost of failure – which can be addressed by education as well as building national platforms for marketing, sales and distributions. These shared platforms reduce the cost of accessing new markets, launching new products and ultimately failure by reducing the time and cost to market for a small business by directly shortening the time to first customer trials (sales and exposure).

Intervention Model

a) Help reduce the pain of starting and scaling up by creating materials that fast track the build, launch, release, scale cycle for any idea.
b) This can be achieved by combining training, mentoring, incubation initiatives with fast track road maps that help young companies avoid the mistakes made by their predecessors in launching ideas, recruiting, marketing, contracting, pricing, pitching and expanding internationally.
c) In addition to live training make as many remote and online resources as possible available for students, practitioners and managers. Incorporate entrepreneurial, product development and sales training as a mandatory subject in all undergraduate and graduate curriculum.
d) Create an accessible mentoring network with generalist and specialist members that can be reached directly or remotely by all member companies.
e) Create mechanisms for local companies to compete and benchmark themselves against international and regional players and competitors.
f) Build a platform of events that new ideas, products and services can use to launch, expose and market themselves effectively to their target segments, investors and potential acquirers in Pakistan as well as in the region.
g) Build a platform of international distribution and exposure that allows new companies and idea to quickly tap and test their product potential in international markets.
h) Provide support through legislation, the banking and judicial systems for a clearly defined road map to failure for failing businesses that reduces the cost of catastrophic failure.

Empowerment

While inclusion, access and empowerment and their impact on socially disadvantaged groups drives the debate, empowerment is meaningless without creating social leverage through the ability to earn a living in alignment with one's competence. Once a group is positioned for economic independence and growth and has the financial resources to address inequality, it can find its way out of the social injustice met out to it.

Combine that by giving the group a voice, a support group and a platform to connect and rebuild and you are well on the way to productive integration within society. **Arm them with a useful skill, provide them an opportunity to contribute, give access to a market to sell their products.**

While a national ICT policy should also address access and inclusion it **must link** empowerment to livelihood that allows one to rise out of social disadvantage. One's ability to earn a living, the quality and meaning of work and the economic opportunity must not be linked to gender, disability, deformity, ethnicity or religious belief.

Intervention model

a) Starting from the top the biggest reason disadvantaged groups are kept out of the work force is on account of the flexibility required to accommodate them. Working mothers need flexible timing, disabled professionals require special assistance, minority groups require a chance to prove their abilities. Organizations create flexibility on account of either enlightenment, prior personal or professional experience or require incentives to do the same.
b) The best incentive is a financial one. The ICT policy should explore the viability of a tax credit made available to a company incorporated in Pakistan that employs full time and part time professionals from a socially disadvantaged group.
c) The incentives work at two levels. They make visible a group of resources that has always been available but ignored and at the same time create new employment opportunities for the said group.
d) The other big reason why disadvantaged group stay disadvantaged is the denial of education, awareness and knowledge. On the inclusion front access and language are two big issues that promote denial of education to the disadvantaged.
e) The education intervention model discussed above touches some of these issues but also highlights the importance of making content available in local languages. By making the necessary content and applications available on a smart phone, the first step that we take is get the right handset in the hands of the disadvantaged group and show them how to use it. If we can get them through that door, their own will and determination to rise will do the rest.
f) Preferential access to the national distribution, collaboration and support networks that we have touched upon in the policy pillar of scalability complete the intervention circle.

Gender Perspective

Gender perspective is often missing in our policies. We need to observe gender in more wider and broader perspective in ICT policy as we have witnessed the inherited prevalence of patriarchal structures has commonly led to a gender digital divide that disadvantages many girls and women in comparison with boys and men within the same societies. If ICTs are to exert a balancing function between genders, therefore, it is clear that particular public policies will be required to achieve this.

1. Equal opportunities for women and girls to study and work in the ICT sector and to develop their own ICT businesses.
2. Need to examine that how jobs have been created as a result of the growth in ICTs, or within ICT industry and how the opportunities can be engendered.
3. Need to examine the gender stereotyping in respect of ICT education, training and work, resulting in limited work benefits and career opportunities for women. Measures and recommendations around these issues needs to be addressed as these issues have relevance across the educational and employment fields, and the ICT sector therefore needs to be considered in that wider perspective.
4. Attention also needs to be paid to the gender impact of access strategies if we are to ensure that access becomes available in ways that are inclusive of women and girls. For

example e services like e health, e education and e government should be in the reach of women and girls of the rural and undeserved areas where the gender digital divide puts women at a disadvantage.

5. Access points (Women Tele-centres): Affordable and easily accessible access points should be there for example this need to be located in areas where women can go without physical risk, where they are socially welcome and comfortable. Even though access to Internet via smart phones will diminish the need of such centres but still useful for the women who are with limited skill set or literacy level.
6. ICT training should be provided at access points, as at other centres of education, should offer diverse opportunities for appropriation and acculturation, so that women can make use of ICTs in ways that are most meaningful and useful for them.
7. Gender-sensitive statistics are important when planning technology policy and deployment. Statistics can help dispel some of the myths and assumptions that have accumulated around technology deployment.
8. Physical access to infrastructure: If the technology isn't there, you can't use it. Infrastructure is a gender issue as well. We need to address this huge gender gap which exists in access to communications in rural areas.

Elsewhere, disadvantaged and persecuted social groups such as victims of domestic abuse, or those who suffer ethnic or sexual discrimination, forfeit their right to participate in Pakistan's society because their voices cannot be heard. Again, ICT can provide the means to give these people a voice and a role in society- but only if there is an effective ICT policy and an effective ICT development strategy for the country as a whole.

Multilingualism and Localization of content

If effectively leveraged, ICTs have promise to reform all sectors of development, including agriculture, health, education, rural development, governance, women empowerment and youth affairs. It is essential for achieving the millennium development goals, and to promote innovation in our society.

However, to promote the essential social and commercial use of ICTs within Pakistan, it must address existing barriers to access to this technology. Currently less than 10% of Pakistanis can communicate in English. To allow the other 90% of the Pakistanis to access the ICTs, the technology must be enabled in local languages these communities speak. In addition to language barrier, more that 45% Pakistanis are currently illiterate. Thus, development of speech enabled dialogue bases systems must also be actively pursued to allow these people to benefit from the ICTs. Computers and internet have very limited penetration in Pakistan, with access limited only to 10% of the population. Compared to this, 60% people in Pakistanis have access to mobile phones. Thus to fully leverage the potential, mobile based local language computing solutions must be developed and deployed. This must be done across all sectors.

There are multifaceted challenges to achieving this, which include the following objectives:

(i) Develop human resource capacity to undertake R&D in language computing
    a. Commercial solutions
    b. High end academic R&D
(ii) Develop language computing technology
    a. Basic localization for other languages (fonts, KB, locales, interface, collation; for computing and mobile platforms)
    b. Advanced localization, through coordinated frameworks (MT within Pakistani languages; MT between Pakistani languages and English; Text to speech and speech recognition; dialogue based systems with integration with mobile platform, etc.)
(iii) Enable language computing use
    a. Develop training material in local languages
    b. Develop sustainable mechanism to train various user groups
(iv) Enable local language content development
    a. Require top down content development
    b. Facilitate bottom up participatory content development

This may be achieved through developing policy to achieve the following detailed objectives:

(i) Develop Speech and language computing R&D programs in collaboration with HEC at least two universities in each province
(ii) Hold training programs for faculty development in this area, with collaboration with foreign organizations to address short term needs
(iii) Create specific national and international scholarships for MS and PhD work in speech and language processing. National scholarships through the R&D centers for local language computing
(iv) Enable basic localization for all languages with more than one million speakers on open source and proprietary platforms
(v) Enable advanced applications in all languages with more than 10 million speakers, including ASR, TTS, Lexicon, OCR and MT
(vi) Promote government as a supplier of open and free content for language computing research in Pakistani languages, including text and speech corpora. Encourage industry, especially media and publishing industry to support the development of open linguistic resources for R&D in speech, script and language processing
(vii) Develop a MT system which translates among Pakistani languages to facilitate free flow of information within Pakistan for better provincial harmony
(viii) Enable basic localization for at least 25% of less-spoken languages, with open licenses for commercial and non-commercial use
(ix) Have at least one R&D center supported by a graduate program in each province for speech and language processing, with capacity to do mobile localization and local language application development
(x) Develop a vibrant open source localization community to support current and further localization needs

(xi) Require local language computing training in NEPA(?) and other government training courses

(xii) Require language computing literacy in at least one local language for government service recruitment exams at national and provincial levels

(xiii) Develop training courses in local language computing for vocational training institutes

(xiv) Work with other ministries to develop ICT training courses in local languages for other cadres in the field e.g. health (community mid-wives, lady health workers, nurses, doctors), educations (teachers, officers), agriculture and livestock (extension workers and officers)

(xv) Develop certification programs in local language computing for general public, including women and youth

(xvi) Require government ministries and departments to maintain website in Urdu and one regional language, at provincial and national levels. Require hiring of web developers at these departments for this purpose. Give central space for hosting web pages inside Pakistan for this purpose

(xvii) Give incentives to businesses to develop local language content online; work with chambers of commerce for this purpose, e.g. allow tax break to support one webmaster per business for this purpose, if the business actively maintains a local language website

(xviii) Hold website development competitions to encourage public participation on themes in all domains, promoting local culture and information on various topics related to health, agriculture, livestock, women, youth and rural development.

(xix) Work with SMEDA to develop small business feasibility around local language computing training and content development

(xx) Work with other ministries to integrate local language based services using computers and mobile for citizens in health, agriculture, livestock, women, youth, rural development, etc.

(xxi) Develop a Center for Excellence for Development and Promotion of Computing and Content in Pakistani Languages

(xxii) Work with language authorities and academies to finalize computing standards

(xxiii) Work with Computer Society of Pakistan and other vendors to make relevant hardware available for use, including keyboards in local languages, keypads in local languages on mobile phones, key pads on ATM machines, etc.

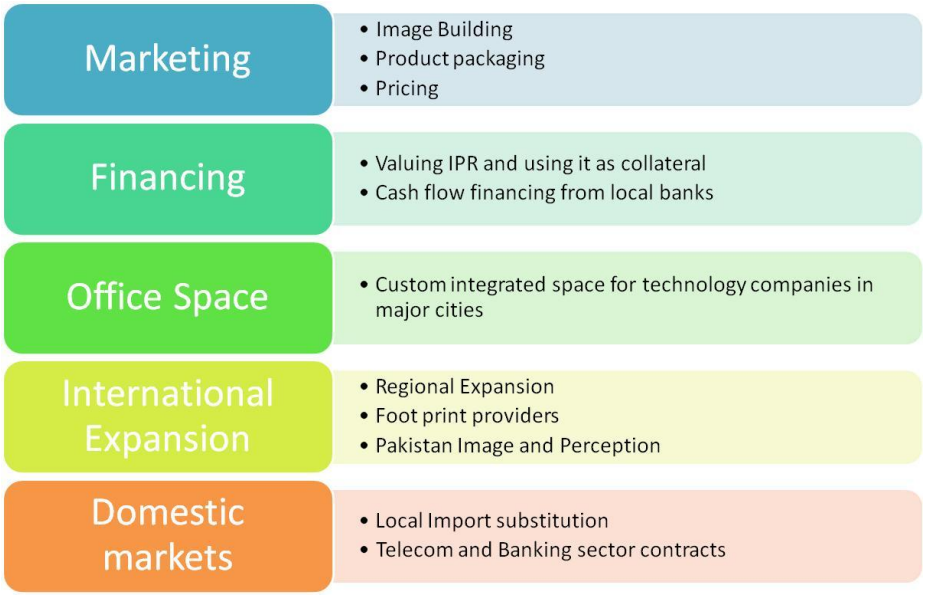
(xxiv) Develop IDN program and registry and subsidize domain registration in local languages for at least five years for at least first 30,000 domains to encourage local content

(xxv) Subsidize domain registration for less spoken languages and for rural areas

(xxvi) Define indicators to set baseline and measure use and impact of local language computing; initiate studies to measure them

Industry specific themes and related recommendations

After developing the above framework we looked around the region to see the work done at the policy level by other nations to address industry specific themes



We found a number of cohesive efforts at the national level that helped the technology industry ramp up by addressing common problems and hurdles. A very useful document for this comparison was the unpublished PSEB study on regional policy initiatives authored by Dr. Athar Osama at Technomics.

Using the work done as part of the PSEB study we were able to identify a number of national successes for each of the above areas which further supported the rationale for national policy intervention.

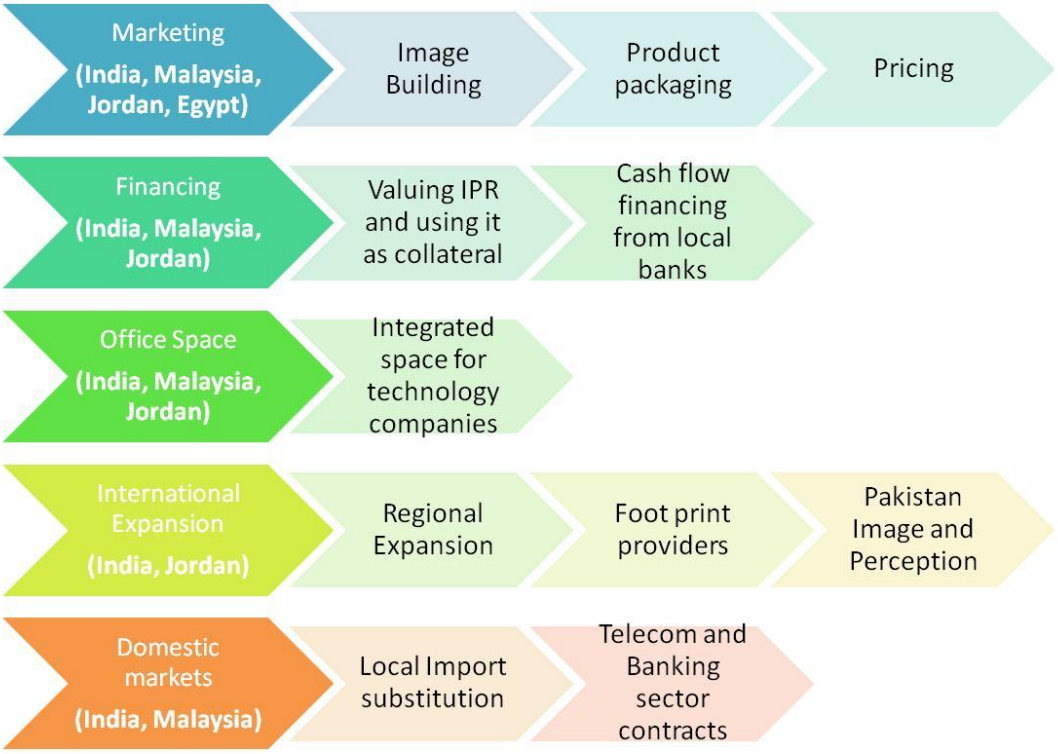
Marketing - India' success in targeting North America and Europe; Malaysia ability to capture the electronics manufacturing niche; Jordan and Egypt success within Middle East and Europe for their technologies companies.

Financing – The successful use of cash flow financing, recognition of technology projects as work in progress and using portions of export proceeds to enhance eligible and available financing by India; Pro active use of venture capital funding and incubation programs by Malaysia and Jordan to provide risk capital to early stage and late stage ventures.

Office Space – Software Technology Parks, Special Economic and Incubation and the Multimedia Super Corridor initiatives by India, Malaysia and Jordan.

International Expansion – The active use of foot print providers by Malaysia and Singapore

Domestic Demand – The work done by India and Malaysia to strengthen domestic demand including the creative use of tax incentives by Malaysia to support the local technology industry.



These successes became the basis for the next set of policy recommendations. These recommendations are in addition to the intervention models discussed as part of policy pillars and national themes

Marketing - recommendations

Allocate and consistently fund a program for highlighting and promoting local successes in the region by making it possible for local companies to compete, present and win in regional ICT and ITES competitions, events, and conferences.

Support a national marketing and branding campaign with funding that produces well thought out quality content for onward distribution in local and international media.

Build national and sector specific online portals that make it easier for regional and international customers to locate, identify and reach vendors and partners in Pakistan.

Financing - recommendations

After engaging the financial services sector for the last 5 years to provide consistent funding for the technology industry and reviewing India's progress in the same arena, it is quite apparent that no progress in this direction can be made without active support and guidance by the State Bank of Pakistan.

Work with State Bank of Pakistan to issue guidelines and framework for the local banks to provide cash flow financing of up to 10 million rupees in the form of two year term loans to local technology companies with documented export proceeds of 5 million rupees and above.

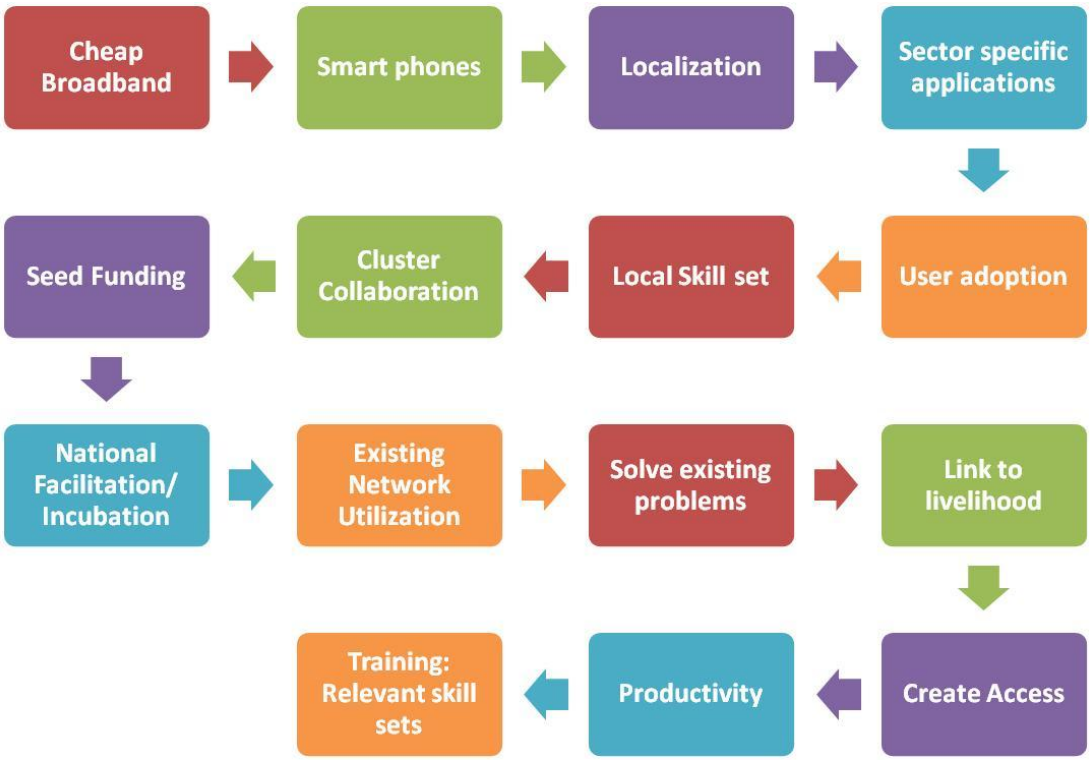
Work with State Bank of Pakistan to issue guidelines and framework for the local banks to provide work in progress financing of up to 50% of the value of a local technology project or contract for a locally incorporated technology company with 2 years or more of operating history.

Work with State Bank of Pakistan to create a seed and incubation fund that provides risk capital to early stage companies in the form of grants, business plan competitions, equity funding and or soft loans.

Work with SECP and FBR to amend the tax treatment of the acquisition of a local company by a local or international buyer.

Fast track initiative that either provides fully built up facilities for local companies, provides land at deeply discounted rates to local technology companies to build software technology parks and provide funding to do one or both.

A final word and next steps



The initial recommendation draft has one primary objective. To introduce a framework for ICT Policy with a set of recommendations that can be used as a starting point for discussion within the industry, with stakeholders, partners and customers. This discussion can then be used to add new recommendations, revamp existing suggestions and tweak the frame work.

Our initial discussions have already identified a number of significant policy elements (please see the image above). More importantly a number of these policy elements are within the reach of private sector with some external funding. Ideally the private sector and P@SHA can start the process and define the roadmap with pilot, directional proof of concepts and the State can join in as and when the case for change gets approved by the relevant authorities. With live, functioning proof of concepts, the probability of approval will be higher.

As per the framework and recommendations presented in this document the final ICT policy recommendations must touch at least one of the critical factors listed above.

Our hope is that over the next two weeks using this document as a starting point we will be able to craft and finalize a richer set of policy recommendations that will help propel Pakistan and the ICT and ITES community together into a new era of prosperity, growth, job creation and recognition.

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