

A MODEL STUDY OF PUBLIC INTERNET ACCESS POINTS FOR TURKEY

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Abstract

Recently, studies for Public Internet Access Points (PIAPs), which provides citizens with access to digital technologies to support economic, educational, and social development, have gained importance in Turkey. In this paper, a model for achieving better implementation of PIAPs in Turkey has been described. The methodology used to develop that model is essentially based on comprehensive analysis of best PIAPs practices in the world. After defining questions critical to development of the model, 17 PIAPs-related projects have been investigated based on a template. Using a template helped to extract similar information from each investigated PIAPs project and eased the process of analysis. With a comprehensive analysis, valuable results have been obtained and questions addressing the characteristics of managerial and operational structure, management of financial resources, the services offered in PIAPs and their priorities, preferred setup locations of PIAPs, common problems faced and their preferred solutions have been answered. Considering trends in the world PIAPs cases and the current situation in Turkey, general structure of the PIAPs model has been outlined. It has been detailed with the help of series of meetings and a workshop with the participation of experienced public and private authorities. Final version of the model comprises a roadmap for 5-years period (explaining human resources need, potential costs, and services to be provided in each year), management structure of PIAPs project, detailed definition of managerial roles of public and private bodies, operational structure, detailed definition of roles in operation of PIAPs, critical success factors for better implementation and to do list for the next stage.

Keywords: Information Society, Public Internet Access Points, Digital Divide, Telecenter

1. INTRODUCTION

Thanks to its capability of providing ubiquities access to information and communication technologies (ICTs), public internet access points (PIAPs), aka telecenters, have been proposed as an effective solution to social and economical development problems around the world [1]. PIAPs also have considerable potential to diminish the gap between people with effective access to ICT and those with very limited or no access. They can play critical role in helping developing countries to take advantage of information economy. As a consequences, huge number of such kind of centers have been implemented by many governmental and development agencies in various methods so far [2]. Some of successful PIAPs projects in literature and included in this study are given in Table 1:

Case	Country
1. American Community Technology Centers (CTC)	America
2. Australia Telecentre Network	Australia
3. Kitimat Community Skills Centre	Canada
4. UK Online Centers	England
5. Hungary Telecottages	Hungary
6. UNESCO Community Multimedia Centers (CMC)	Latin America, Africa and South Asia
7. Paraguay AMIC@s	Paraguay
8. People First Network (PFnet)	Solomon Islands
9. Gaseleka Telecenters	South Africa

Table 1 Sample PIAP Projects

Investigations on PIAP literature shows us that each project has its own characteristics, such as management and operation structure, types of PIAPs utilized, services offered, etc even though some common points exists. No detailed statistical analysis on a sample of PIAPs project has been performed yet to learn common trends or differences in PIAPs project implementations. Such an analysis could be used as guideline for countries that are planning to implement PIAPs project (e.g. Turkey) and for countries that have poor PIAPs implementation.

The purpose of this study is to analyze best practices of PIAPs in the world and then to propose a country-wide model for better implementation of PIAPs project in Turkey. Analysis results helped to answer questions given in Table 2:

The services offered: ✓ What are the popular services provided in PIAPs? ✓ What are the services preferred less? ✓ Which basic and advance services can be provided in PIAPs?
Project Owner (Executer): ✓ What kinds of institution(s) can own the project? ✓ Is there cooperation in project management, or does only one institution has own the whole project? What is the general behavior?
PIAPs Operator: ✓ What kinds of institution(s) can operate PIAPs? ✓ Does only one institution has the responsibility of all PIAPs' operation, or can different institutions operate different PIAPs' in the same PIAPs project? What is the general behavior?
Financing of PIAPs Projects: ✓ What kinds of financial sources can be made use of? ✓ What are the choices for alternative financial sources?
Set-up Location: ✓ What can be the critical factors for the determination of PIAPs location, ✓ Is rural or urban area preferred more for PIAPs location,

Table 2 Questions and Indefinite Points about PIAPs

This study will make a significant contribution to domain by identifying statistically common trends and differences in PIAPs projects and by offering a sample country-level model for PIAPs implementation in Turkey. This model can be utilized by other countries for their PIAPs-related projects.

The rest of the paper is organized as follows. Following the introduction, Section 2 provides a brief definition of PIAP and explains the potential types of PIAPs. Section 3 is devoted to major analysis results of the PIAP cases. The quantitative analysis presented in this section reveals the trends

encountered in the cases. In Section 4, PIAP model is provided. Section 5, as the last part, mentions some concluding remarks.

2. PIAP DEFINITION AND TYPES

2.1 PIAP Definition

PIAPs can be defined as public places where people are able to access ICT-based services and applications and where operators intend to benefit the community in the context of social development [3]. In the literature, it is observed that PIAPs are entitled with various terms such as telecentre, telecottage, community technology center, digital community center, community multipurpose center and digital center. Serving the major purposes as to diminish digital divide observed in national and international levels and to provide socio-economical development opportunities for countries, PIAPs intend to accomplish following specific outcomes:

- To provide technology infrastructure for citizens living both in rural and urban regions,
- To increase the rates of use of information and communication technologies (ICT),
- To offer variety of services considering the needs and interests of individuals,
- To provide information sharing and to support economic development,
- To train public especially with professional courses,
- To support initiatives through infrastructure and technology,
- To increase the use of e-government services

2.2 Types of PIAP

In order to serve all segments of society, various types of PIAP should be considered. PIAPs are mainly categorized according to population density they address, technological infrastructure and geographical characteristics of regions in which PIAPs are installed. In literature there are different categorizations of PIAPs. For example, according to The Community Telecentre Cookbook for Africa, PIAPs is grouped into four types which are Micro Telecentre, Mini Telecentre, Basic Telecentre and Full Service Telecentre. This categorization is solely based on services provided in telecentres. Considering regional characteristics of Turkey and PIAPs types in investigated word cases, four types of PIAPs are proposed in this study. The summary of four potential PIAP types (i.e. Multi-purpose PIAPs, Mini PIAPs, Kiosks, and Mobile PIAPs) is released in the Table 3.

PIAP Type	Multi-purpose PIAPs	Mini PIAPs	Kiosk	Mobile PIAPs
User Capacity	5-20 users	1-5 users	1 user	5-10 users
Region Addressed	Urban	Rural	Urban	Rural
Purpose	Intends to provide wide-range of services in highly populated areas.	It is a minimized version of Multi-purpose PIAPs that provide services applicable for rural areas having low population density.	It provides mainly Internet access in places such as terminals, hospitals, etc.	It mainly supports awareness of public by performing advertorial activities

Table 3 Types of PIAPs

2.2.1 Multi-purpose PIAPs

Multi-purpose PIAPs are intended to be located in highly populated areas to serve the country citizens living in urban regions. Operational units of Multi-purpose PIAPs are similar to computer laboratory classes in which 5 to 20 personal computers are made available for use. The potential places or buildings to set up computer classes are schools, barracks, libraries, dormitories and public training centers. In this model, the range of services is extensive compared to other PIAP models. Basically, telecommunication services, trainings, e-government services, office services, library services are offered within model. Multi-purpose PIAPs can be operated by a single institution as well as by multiple institutions in a cooperative way. The possible institutions that can take responsibility to operate this type of PIAPs are public organizations, non-governmental organizations and local administrations.

2.2.2 Mini PIAPs

Mini PIAPs, which are designed as the minimized version of Multi-purpose PIAPs, are planned to be established in rural areas. This version aims to serve few people so that its class capacity is decreased to 1 to 5 personal computers. The potential Mini PIAP setup locations can be schools or appropriate community buildings. Considering the needs of local community, Mini PIAPs aim to provide citizens with basic level services such as fundamental ICT courses, communication services and online information services.

2.2.3 Kiosks

Kiosks usually take place in bus terminals, hospitals, airports, hotels and shopping centers of highly populated urban regions. In these places, one or multiple kiosk terminals can be installed to provide users with Internet access in limited time interval. Each kiosk terminal generally provides only Internet access service for one user at a time. The possible institutions that can operate kiosks are public organizations, and private companies.

2.2.4 Mobile PIAPs

Mobile PIAPs essentially intend to enhance the ICT awareness of people living in rural regions, where it is hard to set up Mini PIAPs. As the name implies there is no permanent structure for Mobile PIAPs; they are special vehicles designed to serve citizens through its appropriate technical infrastructure. In parallel to size of vehicles, 5 to 10 users can benefit from Mobile PIAPs at a time. During their visits, users are generally provided with Internet access and basic ICT courses. The possible institutions that can support the operation of Mobile PIAPs are public organizations, private companies, non-governmental organizations and local administrations.

3. ANALYSIS AND RESULTS

3.1 PIAPs Projects in the World

Within this project a comprehensive analysis has been carried out in order to identify the common PIAP trends to be used as a roadmap for PIAP project in Turkey. This analysis involves 17 PIAPs cases. Cases and country names are given in alphabetical order in Table 4 below (*See Appendix A for the references of PIAPs cases*).

Case	Country
1. American Community Technology Centers (CTC)	America
2. Australia Telecentre Network	Australia
3. Kitimat Community Skills Centre	Canada
4. Remote Community Service Telecentres	Canada
5. UK Online Centers	England

6. Hungary Telecottages	Hungary
7. UNESCO Community Multimedia Centers (CMC)	Latin America, Africa and South Asia
8. Distance Learning Support Centre In Maseru	Lesotho
9. Mexico Digital Community Centers (DTC)	Mexico
10. Mozambique Telecenters	Mozambique
11. Paraguay AMIC@s	Paraguay
12. Senegal Telecenters	Senegal
13. e-Sri Lanka Telecenters	Sri Lanka
14. People First Network (PFnet)	Solomon Islands
15. Gaseleka Telecenters	South Africa
16. Taiwan Telecentres	Taiwan
17. Uganda Telecenters	Uganda

Table 4 Full List of PIAP Projects

3.2 Research Findings

3.2.1 Services in PIAPs

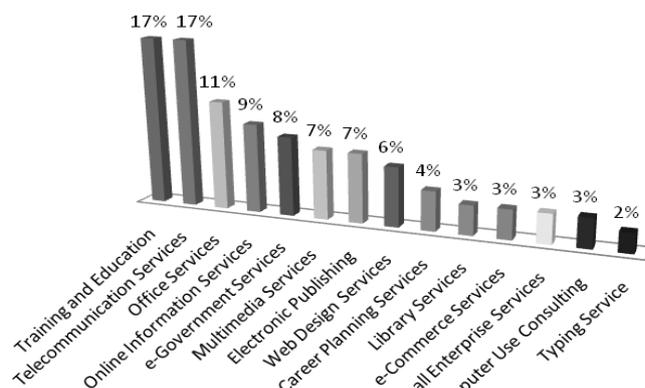


Figure 1 PIAP Services

Analysis has revealed that PIAPs intend to provide citizens with variety of services: totally 14 different types of service are observed in PIAP cases. Figure 1 demonstrates the category of PIAP services with their proportion of availability. As can be seen from the Figure 1, the most widespread PIAP services are Training and Education, and Telecommunication Services with 17% of availability value for each. Existence of these two services reflect the major purposes of PIAPs. Through training and educational services, citizens are enabled to take courses in specific areas. The

most common training course offered is basic ICT course to make citizens learn about basic ICT concepts. As Telecommunication Services Internet access, telephone, e-mail, fax, and chat are typically offered in cases. Remaining services are involved to attract interests of citizens towards use of PIAPs and also to support sustainability of PIAPs. Typing service, which is used to convert hard copy of a document into electronic format, is the least preferred service to be offered in PIAPs.

3.1.2 Management Structure

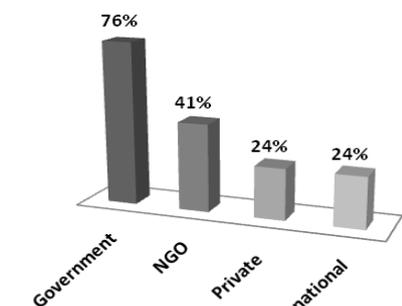


Figure 2 PIAPs Project Managers

According to analysis of the PIAP cases, it is found out that cases are managed by one initiative or multiple initiatives collaboratively. Types of organizations that engage in management of PIAPs cases are public (i.e. government), NGOs, private companies and international organizations. Of 21 PIAPs cases, generally one organization conducts the whole project management, however there are cases where organizations can cooperate to manage and implement the PIAPs project. The distribution of organization types having the role of project manager of PIAPs is given in Figure 2.

As can be seen in the figure, 76% of PIAP projects are owned by governments; governments have managed 16 out of 21 samples alone or in cooperation with other potential organizations. NGOs follow the government with 41%. The least encountered type of organizations that manage the PIAPs are private companies and international organizations with equal rate of existence.

3.2.3 Operational Structure

In parallel to management structure, types of organizations in charged with operation of PIAPs are different among cases. The organizations that take role in operation of PIAPs are composed of government, NGOs and private sector companies. As it is observed in 21 PIAPs cases, these organizations can have stand-alone operational responsibility of PIAPs in the same project. That means operators can be supported by external organizations, such as NGOs or local administrators, however there is no complete and structured cooperation among operators. In addition, existence of only one organization as a PIAPs operator in the whole project is very rare. The overall percentage of these organizations as a PIAP operator is given in *Figure 3*.

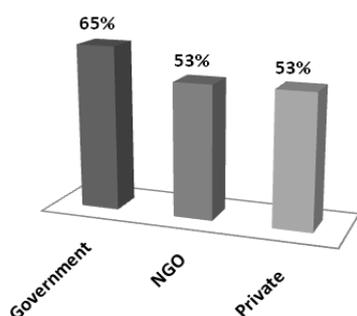


Figure 3 PIAPs Operators

Government is the major organization that takes the responsibility to operate PIAPs, with 65%; governments have partial or full operational responsibility over PIAPs in 14 cases. NGOs and private sector companies have wider involvement in PIAPs operations than management of PIAPs project. They have equal share as operational roles in PIAPs with the 53 %.

3.2.4 Financial Support

In order to achieve the financial sustainability of PIAPs, 6 different types of financial resources can be applied. These are incomes from fee-paying services, Government support, international funding, private companies, donations and local administration support. The percentage of these resources over 21 PIAPs cases are demonstrated in *Figure 4*.

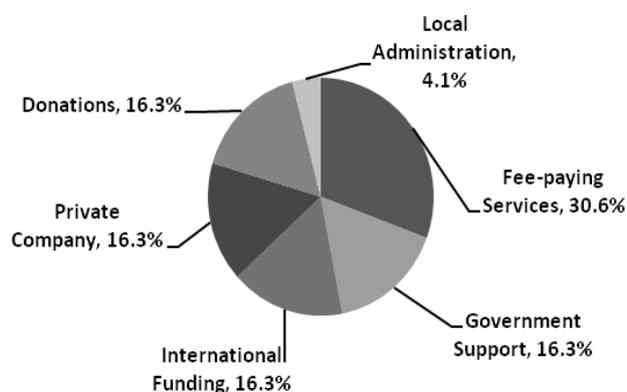


Figure 4 Percentages of Financial Resources

As it is observed in *Figure 4*, the main financial resource preferred in PIAPs projects is the income obtained from fee-paying services; it has 30.6 % in overall. On the other hand, local administration support is the least-observed financial resource with the 4.1 %.

3.1.5 Setup Location

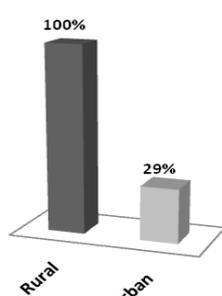


Figure 5 PIAPs Setup Locations

Setup location of PIAPs are categorized into 2 groups, which are urban and rural areas. In 21 PIAPs cases, all projects are implemented in rural areas where there are some cases when both areas are considered. In the *Figure 5*, the percentage of PIAPs distribution in each area is given.

It can be inferred from the figure that all 21 PIAPs cases, with 100% percentage, have been implemented in rural areas. On the other hand, 29% of those have been implemented in urban areas as well. This is an expected result because PIAPs are established to diminish digital divide by providing services mostly in remote areas.

4. PIAP MODEL FOR TURKEY

In its 2006-2010 Information Society Action Plan, Turkey has established a goal to establish the network of PIAPs in whole country in order to accelerate of e-society formation of Turkish citizens. Although some PIAP implementation (i.e. BBBÖP Project, Belnet Internet Houses in Istanbul, Internet Cafés and MoE PIAPs) exists in Turkey, it is observed that there is not any common management and operation structure that involves cases of Turkey. That is, each case applies its own structure and there is not any coordination among cases. To serve the major purposes as to guide the PIAP structuring through Turkey, and to ensure overall coordination and sustainability of PIAPs country wide, a comprehensive model has been offered. General structure of the model is given in Figure 6.

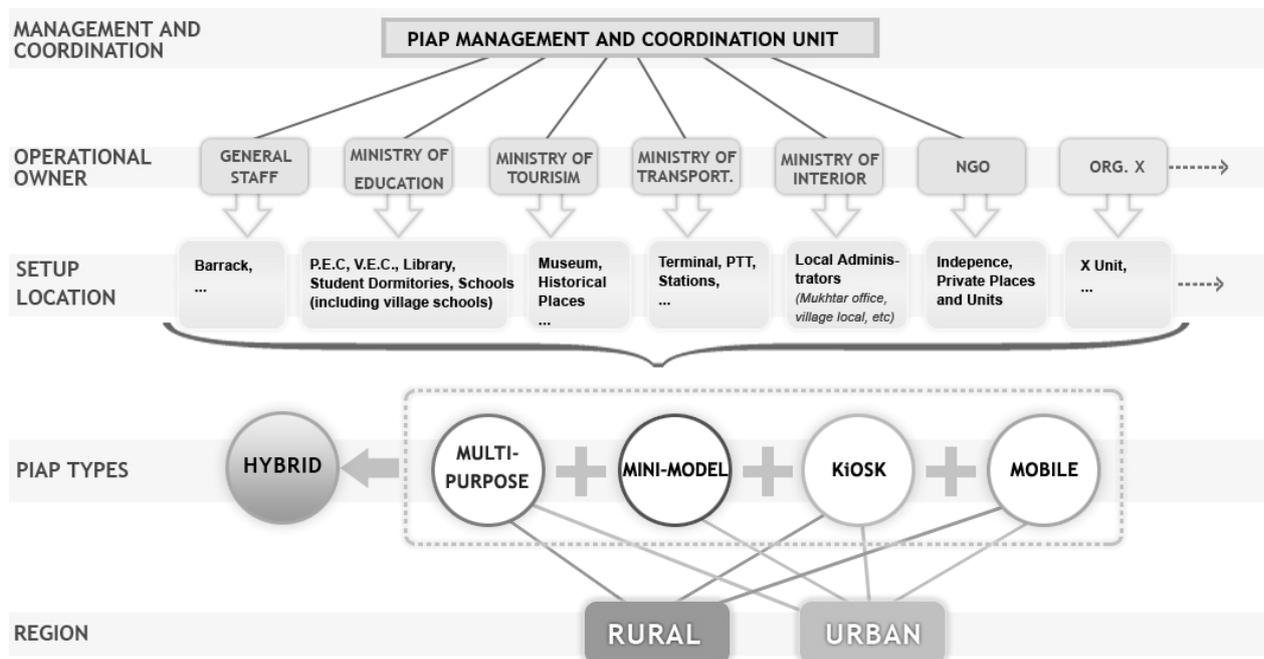


Figure 6 General Structure of PIAP Model Proposed for Turkey

Model is explained in the following sub-sections.

4.1 Region Addressed

Turkey’s potential regions to establish PIAPs have been considered and classified into “Rural” and “Urban” regions. In this context, rural area means a residential area in which population is less than 20,000 while urban area means a residential area with population higher than 20,000. Rural areas are generally involving villages, towns and small cities, while urban areas consist of cities, and metropolitans.

4.2 PIAP Types

Potential PIAP types have been identified for Turkey case by concentrating on types of PIAPs utilized in the world and Turkey so far. Potential PIAP types are kiosk, mini-model, mobile PIAP, multi-purpose PIAP and finally integrated model which is hybrid of more than one PIAP type. In order to serve various needs of citizens in different regions integrated model seems to be most appropriate one for Turkey.

4.3 PIAP Setup Locations

The steps towards model formation are followed with identification of possible PIAP setup locations. As target locations, there are various potential units such as barrack, public education center (PEC), vocational education center (VEC), library, dormitory, terminal, school, hospital, hotel, post office or an autonomous unit in Turkey. This list can be extended with the addition of possible units. Each PIAP type intends to be installed in different set of units. For instance, multi-purpose PIAPs can be established in barrack, PEC, VEC, school, dormitory or library.

4.4 Operational Structure

The proposed model has a distributed management and operational structure. Organization that is responsible for the operational management of PIAPs depends on the unit which PIAPs are set up within. For instance, if PIAP is located within a hotel, then organization which is responsible for that PIAP will be T.R. Ministry of Tourism.

4.5 PIAP Coordination Unit (PIAP-CU)

At the top of the model, as significant component, PIAP Coordination Unit (PIAP-CU) is proposed to be responsible for overall management and coordination of the PIAPs through Turkey. As it is emphasized before, distributed management and operational structure is adopted for the proposed PIAP model. That is why a coordination unit, which is PIAP Coordination Unit (PIAP-CU), becomes a critical component of the proposed model. The mission of PIAP-CU is to plan and coordinate the process of building network of PIAPs by establishing coordination, adaptation and regularity among organizations/institutions that are in charge with PIAP management and operation.

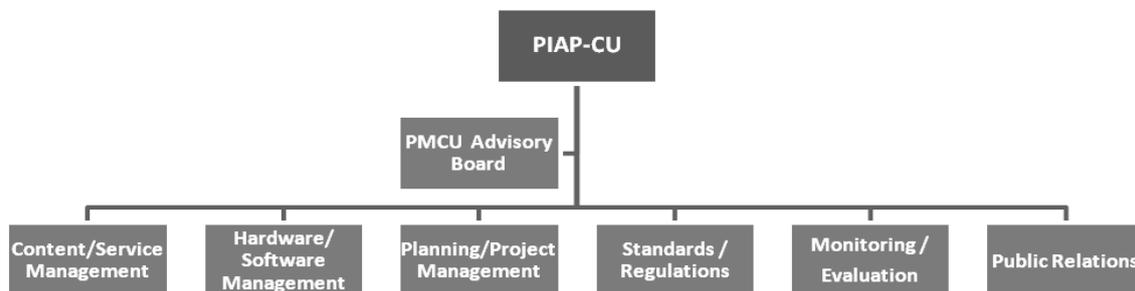


Figure 7 Internal Structure of PIAP-CU

As it is depicted in Figure 7, PIAP-CU shall have 6 sub-units to carry out its studies in an organized way. Responsibilities of subunits are summarized as follows:

- **Content/ Service Management:** This unit is mainly responsible for provision of services and required content in PIAPs.
- **Hardware/ Software Management:** Mission of this unit is managing software/hardware procurements and performing regular maintenance.
- **Planning and Process Management:** Major responsibility of this unit is planning the overall PIAPs project, and especially human resource management.
- **Standards / Arrangements:** It is mainly responsible for defining general standards that PIAP operators and users should obey.
- **Monitoring / Controlling:** It has responsibility in monitoring and controlling activities of PIAPs.
- **Public Relations:** It deals with the user demands, complaints and performs advertorial activities.

4.6 Services of PIAPs

In order to specify the services to be provided in PIAPs as well as priorities of services, a simple prioritization approach, which considers both expert view and user demand, has been applied. In this approach, feasibility of services and user demands for services have been investigated and results were integrated to define a reasonable priority-level for each service.

User demand for each service is obtained from the results of survey applied in a group of 2000 users from Belnet PIAP case. To assess the feasibility of services, IT experts have been consulted to grade feasibility-level of each service. Table 5 demonstrates the overall prioritization of services in a 5 year period time for services to be offered in Turkey PIAPs.

Category	Period (Year)	Services			
Services with High Priority	1 st – 5 th	Basic ICT Training	Telecommunication Services	Online Information Services	Printing Service
		Photocopy Service	Scanning Document	Vocational Development Services	Office Software Services
		Instructional Computer Games	e-Government Services	Computer Certification Courses	
Services with Medium Priority	2 nd – 5 th	Web Design Training	Career Planning Service	Language Courses	Typing Service
		Web Design Service	Binding Service	Lamination Service	
Services with Low Priority	3 rd – 5 th	Multimedia Services	Programming Courses	Hardware Training	Small Enterprise Services
		e-Commerce Services	Electronic Publishing	Literacy Courses	Library Services

Table 5 PIAP Services

5. CONCLUSION

Turkey set its information society strategy to diminish the digital divide within country level and in international level with successful achievement of PIAPs project throughout the country. In the light of this strategy, METU EDMER aims to accelerate the process of building network of PIAPs by developing a model for PIAPs to be established in Turkey. The country level PIAP model introduced in this paper has been developed according to general conclusions derived from the analysis of 17 different PIAP cases. In general, the results of analysis provide responses for the questions: What services can PIAPs offer? Which regions and units PIAPs can be established in? What is the management structure of PIAPs? Which types of PIAPs are appropriate for Turkey? The findings direct the research towards creating overall structure of the country level PIAP model.

In order to involve whole country and address needs of different regions, the model covers people living in rural and urban areas through establishment of four different PIAP types such as multi-purpose PIAPs, mini PIAPs, kiosks and mobile PIAPs. In this paper, overall structure of the model is introduced. The concerns of the model are regions in which PIAPs will be installed, types of PIAPs planned for Turkey case, potential units in which PIAPs will serve, organizations responsible for operation of PIAPs and management structure with PIAP Coordination Unit (PIAP-CU).

Main contribution of this study is detailed analysis performed on world's best practices related to PIAPs. This analysis has provided comprehensive information about general trends and differences among PIAPs implementations so that (1) most popular or less popular services provided in PIAPs, (2) characteristic of management structure and organizations that are project owner, (3) preferred operating mechanism and organizations that operate PIAPs, (4) financial resources that are utilized mostly and preferred set-up locations can be identified. This information can be used as guideline for PIAPs related projects. This study also proposes a country-level model for PIAPs project implementation in Turkey. The proposed model comprises details such as regions addressed, piap types, operational structure, management structure, roles of organizations.

References

- [1] Gómez and Hunt. (1999). “*Telecentre Evaluation*”.
- [2] Latchem, C. and Walker, D. Telecentres (2001). “*Case studies and key issues*”.
- [3] Roman, R. and Colle, R. (2002). “*Themes and Issues in Telecentre Sustainability*”.
- [4] Jensen, M. and Esterhuysen, E. (2001). “*The Community Telecentre Cookbook*”
- [5] American Community Technology Centers’ Network – CTCNet (2003). “*Center Startup Manual*”.
- [6] UNDP, Europe and the CIS (2005). “*Telecottage Handbook: How to Establish and Run a Successful Telecenter*”.
- [7] People First Network (PFnet) Rural Development Volunteers Association. “*The Solomon Islands People First Network (PFnet)*”. [Online] Retrieved: October 17, 2008, from People First Network (PFnet) Rural Development Volunteers Association Web site.
- [8] Anand Chand ... [et al.]. – Suva, Fiji (2005). “*The Impact of ICT on Rural Development in Solomon Islands: the PFnet Case*”. ICT Capacity Building at USP Project, the University of the South Pacific.
- [9] Proenza, Francisco J ve Dewapura, Reshan. (2004) “*E-Sri Lanka’s Telec-EnterDevelopment Program: Strategic Choices and Challenges of a High Impact High Risk Investment.*”
- [10] Michael Yu-Chuan Lin (2005). “*Digital Divide and Telecenter Development in Taiwan*”. Department of Information Management Research, Development, and Evaluation Commission, Taiwan.
- [11] Latchem, C. and Walker, D (2001). “*Telecentres: Case studies and key issues*”. The Commonwealth of Learning, Vancouver.
- [12] Latchem, C. and McGregor, A.L (1991). *Networks for Learning: A Review of Access and Equity in Post-compulsory Education in Rural and Remote Areas of the State of Western Australia*. Report commissioned by the Western Australian Higher Education Council, Western Australian Office of Higher Education, Perth, WA.
- [13] McGregor, A.L. (1992). “*Networks on Trial: An Evaluation of the WA Learning Network Centres Project.*” Report commissioned by the Western Australian Higher Education Council, Western Australian Office of Higher Education, Perth, WA.
- [14] Oliver, R. (1996). *Networks into the 21st Century: An Evaluation of the Western Australian Telecentre Network*. A report commissioned by the Western Australia Department of Training, Perth, WA.
- [15] Short, G., “The socio-economic impact of telecentres in rural and remote Western Australia” www.itu.int/ITU-D-UniversalAccess/seminar/buda/final_papers.htm
- [16] e-Mexico National System.(2008) “*Digital Community Centers*” [Online] Retrieved: October 19, 2008, from e-Mexico National System Portal: http://www.emexico.gob.mx/wb2/eMex/eMex_Digital_community_centers.

- [17] Etta, F. and Parvyn-Wamahiu, S. (2003) “*INFORMATION AND COMMUNICATION TECHNOLOGIES FOR DEVELOPMENT IN AFRICA: VOLUME 2 The Experience with Community Telecentres*” (pp:127-148). IDRC, CODESRIA.
- [18] Etta, F. and Parvyn-Wamahiu, S. (2003) “*INFORMATION AND COMMUNICATION TECHNOLOGIES FOR DEVELOPMENT IN AFRICA: VOLUME 2 The Experience with Community Telecentres*” (pp:72-113). IDRC, CODESRIA.
- [19] Berthe, O., Assubuji, P. A. , Mansingh I., Anjelkovic M. (2006). “*Evaluation of UNESCO’s Community Multimedia Centres – Final Report*”. Heather Creech International Institute for Sustainable Development (IISD).
- [20] UK Online Centres Team at Ufi. “*About UK Online Centres*”. [Online] Retrieved October 20, 2008, from UK Online Centres Web Site: <http://www.ukonlinecentres.com>.
- [21] West, P., Sebatane, L., Setsabi, A.M., Abdo, T. and Howard, L. (2000). “DaimlerChrysler Distance Learning Support Centre, Maseru, Lesotho.”
- [22] The Information Communications Technology (ICT) Centre, The Technology Enhance Learning Initiative of Southern Africa (TELISA Initiative).
- [23] Werner, M., “Empowering socio-economic development in Africa utilizing information technology: Case study of Mozambique” www.bellanet.org/partners/aisi/policy