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FACTORS AFFECTING THE SUSTAINABILITY OF TELECENTRES IN DEVELOPING COUNTRIES

Abstract:

Due to rapid technological changes, governments in developing countries have paid special attention to sustainability. However, understanding insights into the sustainability of telecentres remains an open question. This paper aims to fill this gap. We conducted a case study in Vietnam by using both qualitative and quantitative data. We used the Kumar and Best's (2006) model as our theoretical lens to analyse the sustainability of telecentres in Vietnam. The paper finds that telecentres have shifted their concept to provide a wide range of services, both online and offline. The paper indicates that technological, political, and social sustainability are important for the sustainability of telecentres. The paper recommends that we should take the role of state-owned enterprises and the digital transformation into consideration to sustain telecentres. Furthermore, the paper indicates the mutual relation between political and technical sustainability with social sustainability that has not been yet unveiled in the prior literature.

Key words: telecentres, cultural-post offices (CPOs), sustainability, digital transformation, Vietnam.

1. Introduction

Telecentres were established first in Scandinavia in the 1980s and later in Western Europe. The purpose was to provide rural/isolated areas with telecommunications service and information technology facilities in the 1990s (Oestmann and Dymond, 2001; Whyte, 2000). Nowadays, telecentres are used mostly in developing countries. Although no precise concept of telecentres is universally accepted (Whyte, 2000), a majority of scholars agree that telecentres are described as a physical place to provide public access to ICT services. Telecentres play a critical role in bridging the “digital divide” in rural/isolated areas (Oestmann and Dymond, 2001; Whyte, 2000; Roman and Colle, 2002). Telecentres are useful in helping rural/isolated areas in developing countries to enjoy online-education, government services, healthcare and other services, take advantage of the information/digital economy, and to develop socially and economically (Oestmann and Dymond, 2001; Best and Kumar, 2008; Falch and Anyimadu, 2003; Islam and Tsuji, 2011). Due to the importance of telecentres, a significant number of initiatives have been introduced by various governments and international development agencies around the world (Avgerou, 2008; Madon, 2005). According to Bailur (2006) research has focused on sustainability, impact, and best practices. Sustainability is the most important of these (Faroqi et al., 2019; Hoq, 2015; Whyte, 2000).

Vietnam is an emerging economy with a unique political system. Since the 1990's the Vietnamese telecommunication sector has been through radical reforms. Telecentres or Cultural Post Offices (CPOs) were established in 1998 by the national telecom operator - Vietnam Post and Telecommunications Corporation - VNPT (Tuan, 2011; Thu, 2014). The main objectives of the CPOs were to provide rural and remote areas with basic posts and telecommunications services and to promote a reading culture by lending out books for free. The CPOs were also a channel for introducing information and regulations of the ruling political party and the Government (Thu, 2014). Up to 2018, there were 8,135 CPOs serving around 90% of the rural population. 2,001 CPOs were in extreme poverty communes. The CPOs have played a crucial role in closing the digital divide in Vietnam. In 2010 they connected 97% of the communes with telephones and 55% with Internet (Thai et al., 2018). However, after ten years of operation, the CPOs' equipment was degraded. The services and contents were outdated. Also facing with the popularity of mobile phones in Vietnam, the revenue on telecommunications services at the CPOs gradually went down and the total revenue did not cover operation cost (Tuan, 2011).

Under the current circumstances, a lot of telecentres in developing countries have been closed down or existed for a short time, and many others have found out ways to survive (Best and Kumar, 2008; Bailur, 2006). This paper looks at the CPOs in Vietnam. How is the level of sustainability of the CPOs and what are the major factors for achieving sustainability?

The paper is to provide a better understanding of how telecentres can become sustainable in Vietnam as well as in other developing countries. The paper applies the Sustainability Failure Model presented by Kumar and Best (2006) to analyse factors affecting sustainability of the CPOs in Vietnam. This model was designed to provide an analytic framework to study factors influencing sustainability of ongoing or long-term ICT projects. A survey and interviews have been conducted with CPO staff and customers and local government officials in Dak Lak and Kon Tum provinces. Moreover, the paper uses document analysis to analyse secondary documents gathered from the Vietnam Ministry of Information and Communications (MIC), Vietnam Post Office Corporation (VNPost) and the Vietnam Public Utility Telecommunication Service Fund (VTF).

The paper is structured as follows: section 2 briefly reviews literature on telecentre sustainability, section 3 presents research methods and data, section 4 provides an overview of telecentres in Vietnam, section 5 presents the results and analysis. Discussion and conclusions are included in sections 6 and 7.

2. Literature review

Sustainability of telecentres in developing countries has been discussed intensively in literature. Five factors are identified, as being the most important for sustainability of telecentres. They include financial and economic factors, cultural and social factors, technological factors, political and institutional factors, and environmental factors. Table 1 illustrates these main factors and their references.

Table 1: Common sustainability factors of telecentres

Sustainability factors	Main findings	Selected references
Financial sustainability	Finance is considered as the most important, but also the most challenging factor to achieve sustainability of telecentres.	Bailur (2006); Faroqi et al (2019); Kumar and Kim (2017); Madon (2005); Tschang et al (2002); Whyte (2000)
Cultural sustainability	Culture and society indicate the importance of the contributions and support to telecentres from local inhabitants and vice versa.	Faroqi et al (2019); Bailur (2006); Madon (2005); Heeks (2002)
Technological sustainability	Technology is at the core of a telecentre. Sustainability cannot be achieved if telecentres cannot master a suitable technology.	Best and Kumar, (2008); Faroqi et al (2019); Heeks (2002)' Jensen and Walker (2001)
Political sustainability	Political support is crucial for telecentres, especially in remote areas where telecentres are unable to survive on market conditions.	Faroqi et al (2019); Madon (2005); Madon et al (2009); Whyte (2000); Bailur (2006)
Environmental sustainability	Environmental sustainability refers to reuse of an environmentally friendly disposal of electronic equipment.	Kumar and Best, (2006)

Among the literature, the research of Kumar and Best (2006) covers all the five factors. They argue that an ICT project could be sustainable for a long run if it includes five factors:

- Financial or economic sustainability failure indicating the loss of funding granted by sponsors after some fixed period of operation and the project could not keep operation and has to shut down;
- Cultural or social sustainability failure referring to a benefit provided to the community however could not be maintained overtime;
- Technological sustainability failure relating to the degradation of equipment and network due to lack of tracking upgrades;
- Political or institutional sustainability failure mentioning the loss of relevant local institutional leaders' care and support;
- Environmental sustainability failure depicting a project that sources a large number of PC's without plans for their eventual disposal or reuse when they reach the end of their effective life.

This paper recruits Kumar and Best (2006)'s model as a theoretical lens because this model shows the most important factors for sustainability of telecentres. A number of researchers apply this model to study sustainability. Among them are typically the research of Liu (2016) and Best and Kumar (2008). Although Kumar and Best (2006)'s model has been used in the literature, one of the weaknesses of this model is a lack of describing the relation between sustainability factors (Faroqi et al., 2019; Liu, 2016). This paper thus also focuses on the relation among sustainability factors.

3. Research Methods and Data

This paper applies the Sustainability Failure Model of Kumar and Best (2006) to analyse factors affecting sustainability of the CPOs in Vietnam. In order to fit with our study, we change the order of the five factors: 1) Technological sustainability, 2) Political/institutional sustainability, 3) Environmental sustainability, 4) Financial/economic sustainability, and 5) Cultural/social sustainability.

The study collects data from both primary and secondary sources. The primary sources include a survey and interviews. The survey was conducted in May 2020 in Dak Lak and Kon Tum provinces. The survey included two different groups: staff working at 107 CPOs and consumers using services at the same CPOs. The total number of

respondents were 720, including 112 respondents from CPO staff (44 in Dak Lak and 68 in Kon Tum) and 608 respondents from customers (254 in Dak Lak and 354 in Kon Tum). In the questionnaire, we used both closed and open-ended questions with simple, direct and unbiased wording. Meanwhile, the interviews were carried out by the first author with 21 officials, staff, and customers at VNPost, the CPOs, and at local government offices. A semi-structured interview with open ended questions was applied. The interviews were not recorded, but extensive notes were made during the interviews and took around 30 minutes. The interviews were conducted to triangulate data collected from the survey as well as to get more knowledge about sustainability factors that might not be unveiled in the survey. Most of the interviewees were from the two provinces Dak Lak and Kon Tum. The list of interviewees is shown in Appendix A.

All secondary data was gathered from the Vietnam Ministry of Information and Communications (MIC), the Vietnam Utility Telecommunications Service Fund (VTF), VNPost, and magazines/webs (like <https://english.mic.gov.vn/Pages/home.aspx> and <http://www.vnpost.vn>). The secondary documents were used to complement the primary data. Using both sources of data increases the overall credibility of the data, reduces systematic bias in data, contributes to validity of findings, and eliminates overlapping areas (Creswell and Miller, 2000; Yin, 2003).

In this research, the concept of telecentres is understood as a physical place to provide public access to ICTs services.

4. An overview of the CPOs in Vietnam

VNPost is a state-owned company having managed the CPOs since 2008. The organization structure of VNPost is divided into 3 levels similar to the administrative-territorial-levels of the Vietnamese government: provincial, district, and commune level. In other words, the VNPost's headquarter is situated in Hanoi managing all post-related activities in its organization. It has provincial level subsidiaries at all 63 provinces, district level sub-subsidiaries at all districts, and the CPOs throughout the country. Figure 1 depicts the organizational structure of VNPost.

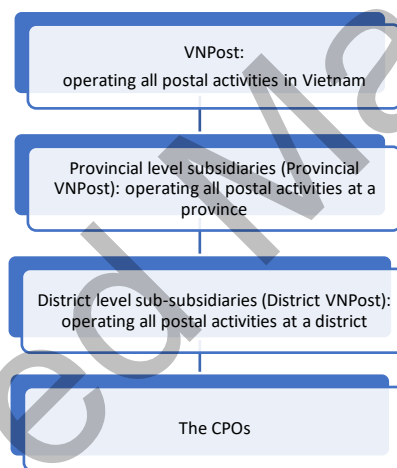


Fig 1. The Organizational Structure of VNPost

The majority of the CPOs have the same image and provide similar services. The CPOs are located at the rural and remote areas and usually close to the People's Committee of Communes or the centre of communes. Provincial level subsidiaries of VNPost are in charge of all activities and business performance of the CPOs in their province. The CPOs usually provide international and domestic post services, logistics, public administration services, and commercial services. Due to the prevalence of mobile phones in Vietnam, a majority of the CPOs have now terminated the provision of telephone and Internet connection services for rural dwellers (except a few CPOs subsidized by the Government). Each CPO is usually operated by one staff (just 152 CPOs have two staff or more). Almost all of the CPOs are equipped with a desktop computer connected to the Internet, a printer, a counter, a scale, a barcode, a table, chairs, and a cabinet. CPO staff's income depends on their performance.

5. Results

In this section, we present results from the survey and interviews conducted in Dak Lak and Kon Tum provinces as well as data collected from the secondary sources.

5.1 Technological sustainability

According to Kumar and Best (2006), technological sustainability failure refers to the degradation of equipment and network due to lack of tracking upgrades. In other words, technological sustainability can fail if technology is not put in place to meet users' needs and fit to the local system and culture (Jensen and Walker, 2001; Liyanage,

2009, p.56). Technology lies in the core of the telecentre concept and can undoubtedly bring enormous benefits to communities (Jensen and Walker, 2001). Hence, in order to analyse technological issues, we present three components consisting of services, equipment, and profiles of CPOs' staff and customers.

5.1.1 Services

The services provided by the CPOs can be classified into three main categories:

- Postal services including international and domestic mails/parcels delivery and public newspaper delivery.
- Public services including government services (like delivering documents for citizen identifications, driving certificates, birth/death registrations, passports, judicial history cards, etc), social insurance benefits (including old age pensions) and social assistance transfers (social assistance for the disability, the poor, the elders, people with meritorious services to the country), public/local newspapers, and reading books.
- Commercial services including consumer goods (like detergent, soften, milk), telecommunications services (like SIM/top up cards, game cards, Internet access, broadcasting), financial services (like banking savings, money transfer, power bill pay, collecting presumptive taxation and fine, and selling non-life insurance and life insurance).

In the survey, the data shows that the postal services, social assistance transfers, reading books, and consumer goods are of the most common services provided by the CPOs. Meanwhile, Internet access is the least common service. Table 2 shows the percentage of services provided by the CPOs in Dak Lak and Kon Tum provinces.

Table 2: Percentage of services in Dak Lak and Kon Tum provinces

Services	Dak Lak	Kon Tum
Postal services	94	95
Government services	64	58
Social assistance transfers	97	92
Public newspapers	76	82
Reading books	82	85
Consumer goods	87	83
SIM/top up cards/ Game cards/broadcasting	92	58
Internet access	10	20
Financial services	100	57

VNPost has recently increased their focus on e-commerce. In 2016 they launched an e-market (badasa.com.vn and later renamed postmart.vn) where end users could find local products all over the country. In 2019 they opened a new feature on this platform (<https://postmart.vn/san-pham-ocop-c497>; <https://ocop.postmart.vn>) to promote local specialities. This feature was developed in cooperation between the Central Office of New Rural Development and VNPost¹ to help rural farmers to sell their agricultural products on the e-market. The e-market is operated by VNPost using B2B, B2C, and C2C models. Accordingly, VNPost has the responsibility of enhancing promotion and sales of these products in the CPOs, guiding rural dwellers how to process applications for approving local specialities, and delivering these applications. Although this is just a first step to bring local specialities into the e-market, it indicates the involvement of VNPost and the CPOs into the local economy in helping rural farmers not lag far behind with the change of the digital age.

5.1.2 Equipment

The CPOs have been usually supplied various kinds of equipment such as desktop computers, printers, Internet connectivity, counters, tables, chairs, scales, barcodes, cabinets and bookshelves. According to VNPost, they are now running 6,500 CPOs equipped with these kinds of equipment. Almost all of the computers have been installed with specialised software to manage their business like BCCP for managing parcels, the PayPost for financial services, and the PTCOM for consumer goods.

Table 3. The working condition of equipment in Dak Lak and Kon Tum provinces (N=107)

Equipment	Good working condition (%)	Moderate working condition (%)	Not working (%)	Not present (%)
Desktop computer*	42	42	1	19

¹ The Program No 116/CTPH-VPDP-VNPost dated July 17, 2019 and the Action Plan No 2181/KH-VPDP-VNPost dated May 21, 2020. This cooperation aims at implementing the Program of One Commune One Product-OCOP issued by the Prime Minister at the Decision No 490/QD-TTg on May 7, 2018.

Laptop	0	0	0	100
Internet connectivity	56	20	1	23**
Internet modem	30	19	0	51
Camera*	8	4	0	89
Scanner	4	0	1	95
Printer*	47	30	0	23
Uninterrupted power supply (UPS)*	19	8	3	72
Telephone	29	14	16	41
Photocopier	5	0	1	94

Note: * Some CPOs have more than 1 equipment unit, so the percentages of these equipment are bigger than 100%
 **: It also includes 10% CPOs that data is not available.

The survey indicates that 84% of the CPOs have desktop computers working good or moderate. 86% of the CPOs have a broadband connection² (FTTx is now the dominating technology with a market share of 94% of fixed broadband subscribers³). 13% of the CPOs do not have any connection at all. 96% of the CPOs have bookcases and books/magazines, however just 83% of the CPOs serve the local dwellers with reading books. Less than 5% of the CPOs have photocopy machines which were bought by the local CPOs staff and not by VNPost.

In the interviews with CPO staff in Dak Lak and Kon Tum provinces, ten out of twelve did not have any complaints about ICT facilities, they said that ‘power is stable, the desktop computer is fine, the internet connection is sometimes quite slow. If having any technical issues about ICT equipment, a technician⁴ from the district VNPost will come to fix it. With regard to software, a staff from the provincial VNPost will support’. Two out of twelve mentioned the degradation of housing and lack of water supply. One out of twelve mentioned the lack of power. In terms of training CPOs staff, all of the staff said that before starting work or launching new services they had been trained on those services/software. The training courses are usually held on Saturdays and Sundays at the provincial VNPost.

5.1.3 Profiles of CPO staff and customers:

According to the survey, 92% of the CPO staff in Dak Lak and Kon Tum provinces are women, and 8% are men. 91.3% of them are local dwellers. The data also reveals that 70% of the customers are women, and 30% are men. 15,6% come from poor households.

Regarding occupations of customers, 50% of them are farmers, 22.5% are running their own business, 20% are staff working for enterprises or organizations, the remaining 7.5% are pupils, students, housewives, or freelancers. Figure 2 presents education levels of the CPO staff and customers in Dak Lak and Kon Tum provinces.

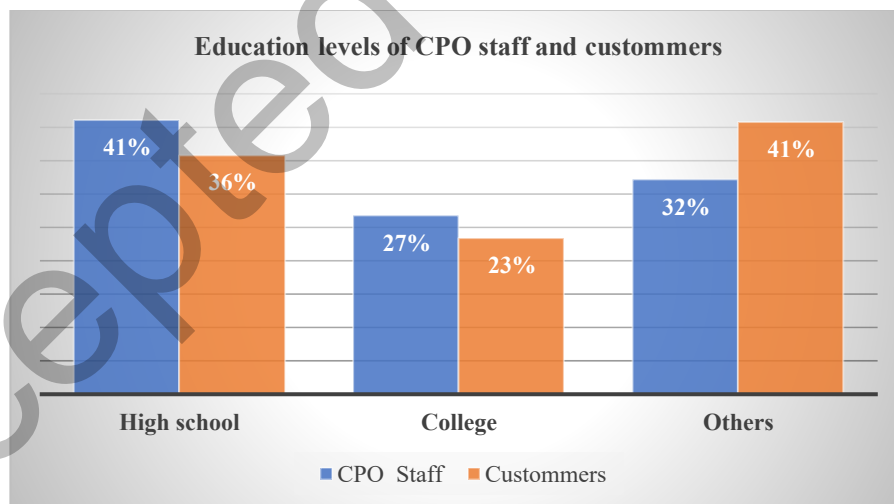


Fig 2. Education levels of CPO staff and customers

² This data differs from the data on Internet connectivity in Table 3, because there are two questions relating to the Internet in our questionnaire survey.

³ <http://english.vnta.gov.vn/thongke/Trang/dulieuthongkeeng.aspx?#>. Accessed on Sep 30, 2020.

⁴ A technician usually takes many roles as a driver, a supporter (in selling goods), and a supervisor

To predict the number of customers in relation to the number of services, the Internet access status, the number of devices, and the number of employees in the CPOs, we perform a simple regression with logarithm of daily_customers (e.g., the number of customers per day) as a dependent variable, the explanatory variables are the logarithm of No_service (e.g., the number of services provided by each CPO), Internet_Acc (e.g., the Internet access status of each CPO), No_device (e.g., the number of devices i.e. PC, scanners, laptops, etc., in each CPO), and logarithm of No_staff (e.g., the number of employees in each CPO). The regression results can be seen in Table 4. The procedure of the regression model can be found in the Appendix B.

Table 4. Parameter Estimates of the regression

Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	Intercept	1	0.12064	0.54182	0.22	0.8243
Inservices	Log (No Service)	1	0.46245	0.21217	2.18	0.0316
Internet Acc	Internet Acc	1	0.97802	0.31327	3.12	0.0023
No device	No device	1	0.05809	0.03856	1.51	0.1350
Inemployees	Log (No staff)	1	0.75784	0.60681	1.25	0.2146

F-value in this case is 9.41 and $Pr > F$ is < 0.001 , which is smaller than 0.005. Also, R-square is 27.0%. The closer R-Square is to 1, the better the model fits. Moreover, the t Value helps to see which variables have the biggest effect on the dependent variable, daily_customers. Internet_Acc has the biggest value meaning that it has the biggest impact, while the number of services is followed. This means that one CPO has more the number of services with the Internet access, it has more daily customers. It is noted that No_device, and No_staff are not statistically significant because its p-values are greater than the usual significance level of 0.05.

5.2 Political/institutional sustainability

Political factors relate to continuing support from the policy-making and regulatory environment (Kumar and Best, 2006; Bailur, 2006). There are many regulations relating to the CPOs, however four out of them demonstrate clearly the support from the Central Government.

In order to spread out the CPOs nationwide, the Central Government issued in 2001 the Document No 478/CP-NN permitting provincial governments to provide VNPT ground without paying any fee and land tax to build CPO premises. A majority of the CPOs have been located at the centre of communes or close to the office of Commune People's Committees. In an interview with the Vice Chairman of the People's Committee at Cu Sa commune, M'Drak district, Dak Lak province he appreciated the benefits of postal and government services that the Cu Sa CPO was serving and said 'the People's Committee usually facilitates this CPO's activities by removing barriers as well as responding fast to their requests. In our Infrastructure Development Plan, we have planned to provide 600 square meters to set up a CPO since 2012. However, VNPost has not constructed premises yet. I hope VNPost will build soon a building here to assist the Cu Sa CPO⁵ running effectively'.

In order to reduce the digital divide, the Prime Minister introduced a Program on Providing Public Telecommunications Service till 2010 (the Program 74) in 2006 and a Program on Providing Public Telecommunications Service till 2020 (the Program 1168) in 2016. The two Programs subsidised carriers to roll out broadband infrastructure in unprofitable areas and rural dwellers to use telecommunication services. The CPOs were also financed to provide telephone services and internet access. The Program 74 subsidised VNPost to maintain around 3,211 CPOs from 2006 to 2010 (Thai and Falch, 2018). Since 2016, the Program 1168 subsidised VNPost to maintain around 450 CPOs.

Additionally, in order to reduce administrative procedures in 2016 the Prime Minister issued Decision No 45/2016/QD-TTg permitting governmental entities to receive and return administrative applications via public postal services. This Decision paved the way for VNPost to provide public postal services⁶. As an interview with the Chairman of the Ea Tan Commune People Committee, Krong Nang district, Dak Lak province he appreciated the Ea Tan CPO in providing government services. He said 'the facilities (like tables, chairs, and digital cameras) at this CPO are in better condition than mine. So they will serve citizens better. Since the government services have been served by this CPO, I have more time to deal with other tasks. However, the provincial VNPost should form another 40 meters-square-area to serve the government services and recruit one more staff. Because this CPO runs both its own business and provides government services in the same place. It may possibly affect the quality of the provision

⁵ At the interview time, the basement of this CPO is still placed at the CPO staff's house.

⁶ VNPost has been assigned to manage public postal networks and to provide public postal services since 2011 (Decision No 41/2011/QD-TTg issued by the Prime Minister on August 3rd, 2011).

of government services'. According to VNPost, the number of the administrative applications delivered by the CPOs throughout the country was around 9 million sets in 2017, 12 million sets in 2018, and 15 million sets in 2019⁷.

5.3 Environmental sustainability

Environmental sustainability refers to reuse or responsible disposal of devices (e.g., computers, photocopies, network devices) or other environmental-related issues (Kumar and Best, 2006; Larsson and Grönlund, 2014). It seems that the environmental issue is overlooked by the CPOs. This can be explained by the fact that the number of devices in each CPO is low and that those devices can be sold to repair-shops easily regardless of their conditions. Moreover, almost all of the CPOs are in rural areas, where the environmental issue normally comes from outside its villages.

5.4 Financial sustainability

The total annual revenue of the CPOs is considerably increasing but it cannot cover the expenses. The data in Table 5 shows that the revenue from the postal services is increasing and accounts for a larger proportion of the total revenue, however the revenue is still smaller than the expenses. It is likely that delivering e-government services leads to boosting the need for shipment and makes the revenue from these postal services increased. Financial and commercial services are two categories of services making profit for VNPost, in which the profit from the financial services makes the biggest proportion.

Table 5: Profit of the CPOs from 2017-2019

	2017	2018	2019
	Unit: million VND		
1. Revenues	1,992,948	3,026,101	3,762,179
Postal services	127,486	348,596	596,315
Financial services*	386,690	522,203	647,677
Commercial services	1,478,772	2,155,302	2,518,187
2. Expenses	2,169,375	3,115,694	3,828,597
Postal services**	475,531	667,000	929,962
Financial services	238,780	317,863	396,708
Commercial services	1,455,064	2,130,831	2,501,927
3. Profits	-173,911.2	-85,922.2	-62,705.2
Postal services	-348,045	-318,404	-333,647
Financial services	147,910	204,340	250,969
Commercial services	23,708	24,439	16,260
Subsidy from the government (Program 74 and Program 1168)	2,515.8	3,670.8	3,712.8

Sources: Report on Business Performance of VNPost.

Note:

* Fees that are paid by Social Insurance Agencies to transfer social insurance benefits and social assistance are aggregated in the revenue of the financial services.

** Some other costs (like telecom, power, water, repairs, equipment, sharing of transportation and others) are calculated at the expenses of the postal services.

5.5 Cultural/social sustainability

As Kumar and Best (2006) explain, cultural/social sustainability refers to benefits provided to the community. More specifically, social factors could be looked at via participation of the community (Larsson and Grönlund, 2016; Madon, 2005; Masiero, 2011) and ability of telecentre operators to provide relevant content to the local (Madon, 2005; Masiero, 2011). The social factors of the CPOs in Vietnam have two dimensions: relations to localities and a channel for collaboration initiatives.

5.5.1 Relating to localities

VNPost has now 7,954 CPO staff working at 7,814 CPOs in the whole country. Their average age is around 30 years old. Almost all of them are local inhabitants. According to the survey, 92% of the CPO staff in Kon Tum province are local inhabitants and 90% of them are women. The figures in Dak Lak province are 90% and 95% respectively. The average age of CPO staff in Dak Lak province is 36 years old and in Kon Tum province is 34 years

⁷ <https://vietnamnet.vn/vn/thong-tin-truyen-thong/dich-vu-buu-chinh-hanh-chinh-cong-can-h-tay-noi-dai-cua-cac-so-nganh-648946.html>. Accessed on Sep 30, 2020.

old. Their monthly average income is 5.5 million VND in Dak Lak province and 3.8 million VND in Kon Tum province. Meanwhile, the monthly average income of a rural inhabitant in 2018 was around 3 million VND.

In 2011 VNPost started transferring social insurance benefits via the CPOs to 12 provinces. In 2013, all the CPOs were permitted to deliver this service⁸. In 2019 this service was provided in all 63 provinces serving approximately 3 million people with the money transferring around 11,200 billion VND per month (taking account of 97% of all recipients in Vietnam⁹). Whilst the social assistance transferring was started in 2012 in 6 provinces. It was spread out over 59 provinces in 2019 serving around 3 million people with the money of 1,200 billion VND. As the survey shows that 97% of the CPOs in Dak Lak province and 92% of the CPOs in Kon Tum province have transferred social assistance to citizens. In the interviews, we identified that the number of citizens receiving the social assistance and social insurance was from 26 to 500 people per one CPO.

The daily average number of customers served by the CPOs in Dak Lak and Kon Tum provinces are 22.25 and 14.47 people respectively. A majority of the CPOs in Dak Lak and Kon Tum provinces have bookcases already, however the number of readers is very modest. The weekly average number of readers per CPO are 3.5 and 4.5 persons respectively. The number of books and magazines in the CPOs is between 50 and 500 items and mostly provided by VNPost. 83% customers in Dak Lak province and 88% customers in Kon Tum province usually use at least one service at the CPOs. The number of monthly visits to the CPOs by one customer is around 9 times in Dak Lak province and 5 times in Kon Tum province. Postal services and power bill pay are the most used services. Percentages of these customers using these two services are 58% and 46% in Dak Lak province, and 48% and 62% in Kon Tum province respectively.

Particularly, the CPOs are also a channel for transferring assistance to the most vulnerable groups affected by the Covid-19 pandemic¹⁰ (like the poor, people receiving the social assistance, people with meritorious services to the country, and employees lost jobs¹¹). Although, we do not have specific data on the number of the CPOs transferring cash and the number of recipients, we had an opportunity to observe the payment of the Covid-19 assistance at two CPOs, the Ea Kenh CPO and the Ea Ral CPO in Dak Lak province, and conducted an interview with a CPO staff here. Accordingly, in order to pay Covid-19 assistance, two staff at the Krong Pac office (a district VNPost) would be sent there to support. The administrative villages in the Ea Kenh commune would have the responsibility to inform all recipients to know about the place, the date and all necessary documents in order to receive this assistance.

5.5.2 A channel for collaboration initiatives

The CPOs are used as a channel for collaboration with various kinds of NGOs and national projects such as: the BMGF-VN project granted by Bill and Melinda Gates Foundation (BMGF) from 2011-2017¹²; the National Targeted Program on Providing Information to Mountainous, Isolated, Border, Island Areas from 2012-2015 which used the CPOs at 48 provinces to preserve, show and introduce books to rural/mountainous dwellers; and two the national programs on providing universal service as mentioned above.

Besides, in order to boost reading culture in rural/mountainous areas, in 2013 the Ministry of Information and Communications cooperated with the Ministry of Culture, Sports and Tourism to launch a program in the period 2013-2020¹³. This Program aimed to encourage rural inhabitants to read books at the CPOs. Accordingly, books and magazines/newspapers would be moved from public libraries to the CPOs for a temporary time to serve the rural inhabitants. By this program, 1,731 CPOs in 57 provinces in 2018 participated in providing books and served around 11 million participants. The books circulated between the public libraries and the CPOs 9,617 times¹⁴.

6. Discussion

6.1 Technological sustainability

⁸ Document No 3069/VPCP-KTTH issued by the Governmental Office on April 17, 2013

⁹ At the end of 2017 there were 3.1 million people per month receiving old age pension and social insurance benefits in the whole country (<http://tapchitaichinh.vn/bao-hiem/mo-rong-chi-tra-luong-huu-tro-cap-xa-hoi-qua-the-dien-tu-318938.html>). Accessed on Sep 5, 2020.

¹⁰ <http://www.vnpost.vn/vi-vn/bai-viet/chi-tiet/id/92448/key/vietnam-post-tham-gia-chi-tra-goi-ho-tro-cho-cac-doi-tuong-bi-anh-huong-boi-dich-covid-19>; Accessed on Sep 20, 2020.

¹¹ Resolution No 42/NQ-CP issued by the Central Government on April 09, 2020.

¹² This project was deployed at 900 public libraries and 1.000 CPOs in 40 provinces serving around 12 million users with 15,424,374 hours connecting to the internet and 21,222,584 hours using computers (the Final Report of the BMGF-Vietnam project, page 2).

¹³ Program No 430/CTr-BVHTTDL-BTTTT dated February 4th, 2013

¹⁴ <https://mic.gov.vn/Daotaonghe/Pages/TinTuc/138244/Tong-ket-5-nam-trien-khai-thuc-hien-Chuong-trinh-phoi-hop-cong-tac-giua-Bo-TT-TT-va-Bo-VHTTDL.html>. Accessed on Sep 30, 2020.

To identify which types of the CPOs attracting the most visitors, we run the regressions of average number of visitors on the number of services, the internet status, the number of devices, and the number of employees (Table 4 and Appendix B). The results indicate that the number of services and the Internet access have a positive impact on the number of customers per day.

Furthermore, VNPost is transforming its work into a digital environment when they have run an e-market, promoted staff applying social media (like Facebook and Zalo¹⁵) to sell goods, and expanded in delivering e-government services. The data gathered illustrates that the CPOs do not have big problems relating to technology (Kumar and Best, 2006; Jensen and Walker, 2001; Liyanage, 2009, p.56). The only challenge is the degradation of some basic facilities. Three out of twelve CPOs interviewed mentioned the lack of water and toilets or need to repair the ceiling of their buildings.

6.2 Political sustainability

Political support and a regulatory environment are beneficial for the CPOs. This is illustrated by a series of regulations issued by the Central Government. These regulations have not only supported VNPost to build up the CPO system from start but also nurtured them by giving them a priority to implementing governmental initiatives through this channel.

First, in order to enhance reading culture in rural areas and help rural dwellers to access basic telecom and postal services through the CPOs, from the early days (2001) the Central Government permitted provincial governments to exempt the CPOs for land usage taxes. This was an advantage of VNPT compared to other entities¹⁶ who must go through complicated administrative procedures in local governments and pay fees for land usage. This regulation helped VNPost promptly hold favourable business locations which were usually close to the centre of communes.

Since 2009 the availability of telecom and postal services was a parameter for evaluating whether a rural commune was a new rural commune. The target for being a new rural commune has been usually set into Plans of Social and Economic Development by provincial governments. Reaching this target is also a condition to assess whether leaders of communes complete their tasks. In the interview with the chairman of the Ea Tan Commune People Committee, he said 'Every year, we have to consider registering to become a new rural commune and submit it to the Krong Nang District People Committee for approval. If approved, we will be allocated a higher budget to invest in infrastructure. If we reach this target, we will be continuously allocated further. If we fail, we have to find out the reasons and review the responsibilities of the people relating to this failure'. Building new rural countryside has been an important policy promoted by the ruling political party and legalised by the Prime Minister¹⁷. In the Vietnamese context, the ruling political party's resolutions play a critical role. The ruling party controls the country. They appoint officials and administrators in government entities and state-owned-companies at various levels. This is the reason all government entities and state-owned companies have to implement their policies. This regulation seems to confirm the importance of the CPOs in rural communes as well as the leading role of VNPost to continuously maintain and develop the CPOs nationwide.

Secondly, the Central Government has used the CPOs as a channel for implementation of a wide range of initiatives. These initiatives include subsidising the CPOs to provision telecom services (the Program 74 and the Program 1168), implementing National Targeted Programs to disseminate information and to boost reading culture, and delivering services such as transferring social insurance and assistance. Particularly, the Decision 45/2016/QD-TTg paved the way for VNPost to deliver administrative procedure applications via the CPOs. Providing this service played an important role in increasing VNPost's turnover. According to VNPost, they have launched the public administrative services since 2017, the turnover of the postal services rose more than twofold in 2017 and almost eleventh fold in 2019 compared to those in 2016. Meanwhile, the turnover of these services just increased around onefold in 2016 compared to 2015.

E-commerce is developing rapidly in Vietnam (expected to grow 20-22% in 2021) and the Central Government targets on providing 20% of online-based government services in 2021¹⁸ and 50% in 2025¹⁹. Therefore, the need for shipment of goods and documents via the CPOs will increase remarkably and consequently their turnover from these services will grow further.

Apparently, VNPost has gained strong support from the Central and Local Governments. Deploying national/NGO programs brings both reputation and money for VNPost. It is considered as a catalyst to attract more

¹⁵ A Vietnamese social media is very popular.

¹⁶ In Vietnam, the State controls the entire land and provides it to individuals, households and entities for usage. Land users must pay land usage tax, tax on transferring land usage rights, and cadastral fees (Clause 4 of Article 79 at the Law of Land dated July 14, 1993).

¹⁷ Revolution no 26-NQ/TW issued by the Vietnam Communist Party on August 5, 2008 and Decision no 800/QD-TTg issued by the Prime Minister on June 4, 2010.

¹⁸ Revolution no 01/NQ-CP issued by the Central Government on January 01, 2021.

¹⁹ Revolution no 17/NQ-CP issued by the Central Government on March 07, 2019

rural dwellers coming to the CPOs. The higher participation in national rural programs and NGO programs, the more they appeal to customers, the better are the opportunities to sell services and goods. As Whyte (2000) said, political support is a factor which can ensure financial and social sustainability. This political support roots from the institutional structure in Vietnam, where VNPost is a state-owned enterprise under the control of the Ministry of Information and Communications. VNPost has also been assigned to manage the CPOs and deliver public postal services. Furthermore, the CPOs are one of the means used by the Central Government to reduce the digital divide as well as to disseminate regulations and information to rural dwellers. Hence, unsurprisingly the CPOs have received great political support from the central Government and local Governments.

6.3 Social sustainability

The CPOs become social sustainability through provision of a wide range of services to the local community and participation in government initiatives

In terms of serving local needs, VNPost has diversified their services at the CPOs. They focus on logistics/postal, financial, and consumer goods. Their services range from core services (like postal and government services) to commercial services (like financial services and consumer goods). In 2016 they launched an e-commerce platform connecting farmers to business. As a result, the annual revenue from the CPOs has significantly increased. As Naik et al (2012) and Hoq (2015) argue, diversification and provision of government services can be a key factor to enhance the sustainability of telecentres. Hence, transferring social insurance benefits over the country since 2013, providing government services since 2017 and diversifying their services have helped the CPOs to attract further rural dwellers. On the other hand, the importance of provision of Internet access has decreased substantially. This decrease complies with the change of society as a majority of rural dwellers have their own handset²⁰, and the mobile phone subscription has increased remarkably²¹. Nowadays, they could probably connect to the Internet by themselves, they do not need to come to the CPOs. This change fits with the data collected in Dak Lak and Kon Tum provinces indicating that just 0.3% of customers come to the CPOs to get Internet access.

In terms of local communities, the CPOs have been used in various situations by both government agencies and non-government organizations. The CPOs have been used for emergency cases (like transferring assistance to individuals affected by the Covid-19 pandemic), in the short run (like the BMGF project), and in the long run (transferring social insurance benefits, social assistance). In other words, the participation of numerous people is considered as getting symbolic acceptance by the community. Madon et al. (2009) insist that this is one of four key institutional factors necessary for success of digital inclusion projects in developing countries. Furthermore, the data reveals that the CPOs also created a big job source, particularly for the local woman.

6.4 Financial sustainability

Generally speaking, financial sustainability is the biggest challenge the CPOs are facing. Although receiving an annual subsidy from the Central Government and gaining profit from the financial and consumer goods, the total profit has not yet covered the total costs. In reality, VNPost has carried out many promotion programs to enhance the revenue of the CPOs, diversified services to serve rural dwellers, and aligned CPO staffs' income with their monthly sales revenue. In the interviews with the CPO staff five out of twelve said that they usually go out to sell their products on Sunday, four out of twelve use social media to promote their sales. Still, the revenue is still smaller than the expenses.

6.5 Summary of the analysis

In the analysis from aforementioned sections, it is argued that the technological, political, and social factors are key factors affecting the sustainability of telecentres (CPOs) in Vietnam, while the CPOs are just suffering from the financial issue. In particular, political support is a leading factor, technological sustainability is a supportive factor, and social sustainability is the outcome of the two factors. The political support (e.g., governments, ruling parties) also plays an important role for the sustainability of telecentres in other developing countries studied by numerous scholars (Madon, 2005; Faroqi et al., 2019). We complement the study of Faroqi et al (2019) and Whyte (2000) as they indicate that political factors could contribute to the achievement of social sustainability and vice versa.

Given that the political support plays a critical role to the sustainability of telecentres, we provide an in-depth understanding of how Vietnam's CPO received strong political support. These following insights may be useful to other practitioners. First, the CPOs in Vietnam are considered as a tool for the Central Government and the ruling party to reach equity and to develop the economy and the society. As a result, the Central Government and the ruling

²⁰ In 2017, 89% of the rural population were using mobile phones (<https://vietnamnews.vn/economy/418482/smartphone-users-cover-84-of-vn-population.html>. Accessed on Feb 10, 2021)

²¹ The penetration of mobile phones in 2019 was 141% (<https://data.worldbank.org/indicator/IT.CEL.SETS.P2>). Accessed on Feb 10, 2021)

party support the CPOs. On the other hand, the CPOs need state regulations (Viscusi et al., 2005) or political backing from the central Government. In this sense, it is a win-win situation. Second, the CPOs' customers are usually disadvantaged inhabitants in rural or isolated areas. They have received strong support and attention from national or NGO organizations in terms of resources and tools. These factors help the CPOs to attract a great number of rural dwellers using the CPOs' services, which also contributes considerably to the social sustainability of the channel (Larsson and Grönlund, 2016; Madon, 2005; Masiero, 2011). Third, the analysis illustrates that due to a state-owned enterprise VNPost has advantages in terms of secure funding and support from the Central Government in comparison to private enterprises who deal with unprecedented challenges²².

The role of enterprises such as VNPost, who run the telecentres might not be underestimated as a decisive factor. Their role is considered to be operators/entrepreneurs who are able to create services and contents that fit to rural demand (Faroqi et al., 2019; Hoq, 2015; Madon, 2005). VNPost has significantly changed the concept of the CPOs. Today, the CPOs are partly used as a policy tool to bridge the digital divide in rural/isolated areas and to promote reading culture. Instead, VNPost has shifted their CPOs system to become multifunction community points where they can provide a variety of services, not only providing traditional services (such as telecommunications and postal services) but also focusing much on providing public services (such as government services and social security) and commercial services. Particularly, by building up the e-commerce market to connect rural farmers with consumers and traders, encouraging their staff to apply social media to sell the goods, and joining into providing e-government services, it is likely that VNPost has transformed the CPOs into a 'new digital telecentre model' where their services/goods are increasingly being embedded with ICT and the Internet. This transformation is also a wise way to make telecentres sustainable (Naik et al., 2012). The active role of VNPost could be explained by the Vietnam political characteristics, where the success or failure of a state-owned enterprise affects the political career of the manager. It could help them to obtain a higher position or to degrade them to a lower position.

However, it could be argued that besides the role of the Central Government, the private sector also plays an important role. Its involvement could reduce the Government's budget deficit and deliver better services at lower costs (Koppenjan & Enserink, 2009). They also have a stronger incentive than the public sector to reduce costs and improve quality and innovate services (Shleifer, 1998), especially in a competitive environment. The participation of the private sector may customize services and products to fit local users' needs. It is one of the main factors affecting the sustainability of the CPOs (Oestmann and Dymond, 2001; Madon, 2005; Rao, 2008). As a result, it will enhance further social sustainability. Hence, in order to take advantage of its facilities/premises, VNPost should vary their business model. The CPOs in profitable areas should be operated not only by the state (VNPost) but also by the private sector. VNPost just takes care of the CPOs which are in unprofitable areas.

7. Conclusions

Applying the Kumar and Best (2006) model to look at sustainability of the CPOs in Vietnam, the paper found that the CPOs have developed to provide a wide range of services to rural communities. In particular, the CPOs provide government services and social security services. They are also involved in deploying nationwide projects in rural areas and have focused on commercial activities both in offline and online markets.

Figure 3 shows the relations among five sustainable factors. It is shown that technological, political, and social sustainability are the strong points of the CPOs. In which, politics is a leading factor and the role of operators (e.g., VNPost) is a decisive factor, while technological sustainability is a supportive factor, and social sustainability is the outcome of the two factors. In other words, the support from Governments is indispensable to sustain the CPOs, especially in unprofitable areas. The role of state-owned enterprises as operators serving communities and implementing public policies is important as well. Moreover, technology as a supportive factor for telecentres to sustain and not be left out of the digital transformation age as technology helps to establish 'e-tools' to provide services/goods at CPOs. However, in order to keep the CPOs sustainable in the long run the paper recommends that VNPost should vary its business model. The CPOs need to be built upon the principles of multi-stakeholder partnership involving the Government, private organizations, development organizations, as well as citizens (Whyte, 2000; Madon, 2005; Rao, 2008).

²² VNPost is given priority to join ICT projects (Circular No. 17/2013TT-BTTTT issued by MIC on August 2nd, 2013).

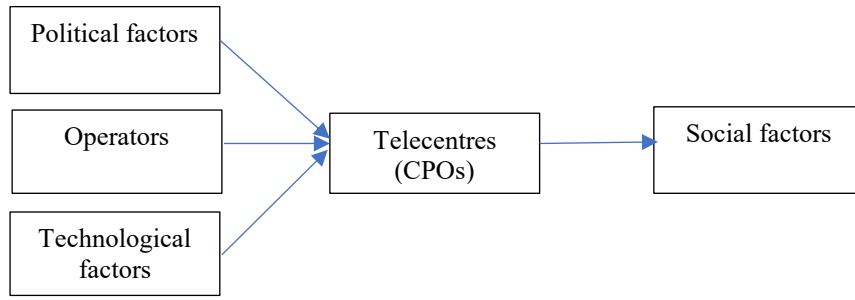


Fig 3. The relations between sustainability factors

This research indicates that the CPOs are suffering from the financial challenge. To overcome this challenge, we found that diversification of services (both governmental and financial services) with the Internet access and involvement in rural projects (Governments and NGOs) are one of the key factors. This helps to attract more customers and consequently achieve social sustainability. Additionally, consumer and financial services help telecentres to sustain financial factors.

The paper contributes both practically and theoretically. Practically, we suggest that state-owned enterprises play a role in operation and in the digital transformation of telecentres fitting users' needs and the change of technology. The case of VNPost in Vietnam might be a useful lesson in which other developing countries can find inspiration in terms of political support from the Government, the participation of state-owned enterprises in delivering services in unprofitable areas, the involvement in national projects relating to rural areas, and the digital transformation into providing services/goods. Theoretically, the paper indicates the significance of the mutual relation between the political and the technical sustainability combined with the social sustainability. This has not been unveiled in the Kumar and Best (2006) model. Furthermore, the paper also identifies operators as another factor affecting the sustainability of telecentres in the model.

The paper has a few limitations. The case study approach may lead to the limitation of generalizability. However, we argue that the research can be applicable in countries with a similar environment. We also acknowledge that we focused on two provinces only in our research. This might lead us to miss some findings given that the country has 63 provinces. Despite this issue, we believe that our results are reliable as other provinces in the country have a similar environment (e.g., administrative structures, political systems, and cultures). There are opportunities for further research based on this study. For example, a study on digital transformation challenges in telecentres could provide an understanding of circumstances under which technology or apps can contribute to achieving sustainable advantages and transform into market performance (Dang and Vartiainen, 2019).

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Appendix A: List of interviewees

Interviewees	Organizations
A chief of CPO Division	VNPost's Department of Communications Planning
A staff of Sales Division	VNPost Dak Lak (a provincial subsidiary of VNPost operating all CPOs at Dak Lak province)
A staff	Krong Nang Branch (a district subsidiary of VNPost Dak Lak operating all CPOs at Krong Nang district)
A staff of Sales Division	VNPost Kon Tum (a provincial subsidiary of VNPost operating all CPOs at Kon Tum province)
A Vice Chairman	Cu Sa Commune People Committee, M'Drak district, Dak Lak province
A Chairman	Ea Tan Commune People Committee, Krong Nang district, Dak Lak province
A Chairman	Ha Mon Commune People's Committee, Dak Ha district, Kon Tum province

2 staffs working at CPOs in Dak Lak province, and
10 staffs working in Kon Tum province

VNPost Dak Lak and VNPost Kon Tum

2 customers using services at the Ea Tan CPO

VNPost Dak Lak

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Appendix B. The procedure of the regression model

Regression of average number of visitors on log (number of services); access to the internet; quality of device; log (number of employees)

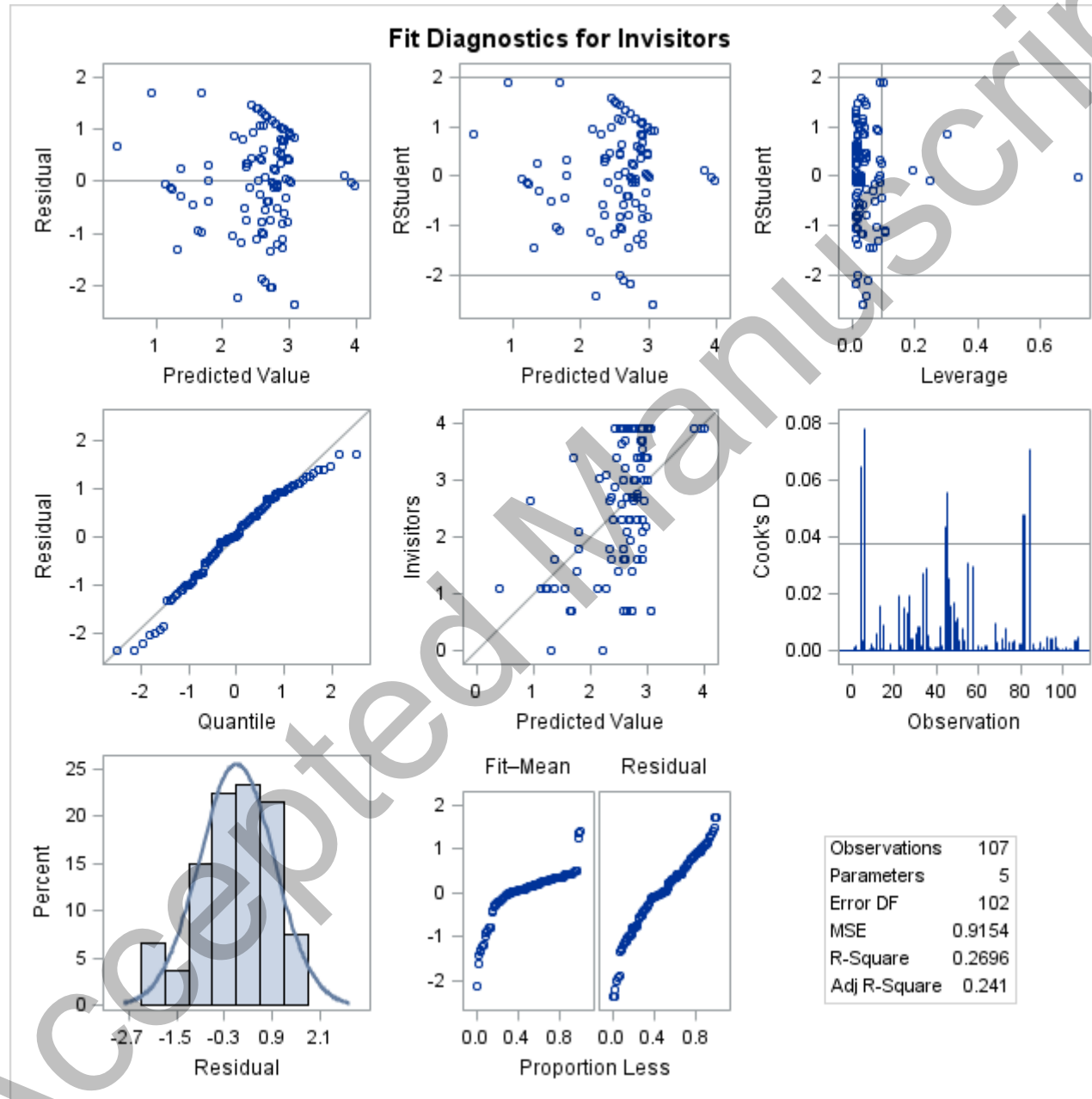
The REG Procedure
 Model: MODEL1
 Dependent Variable: Invisitors

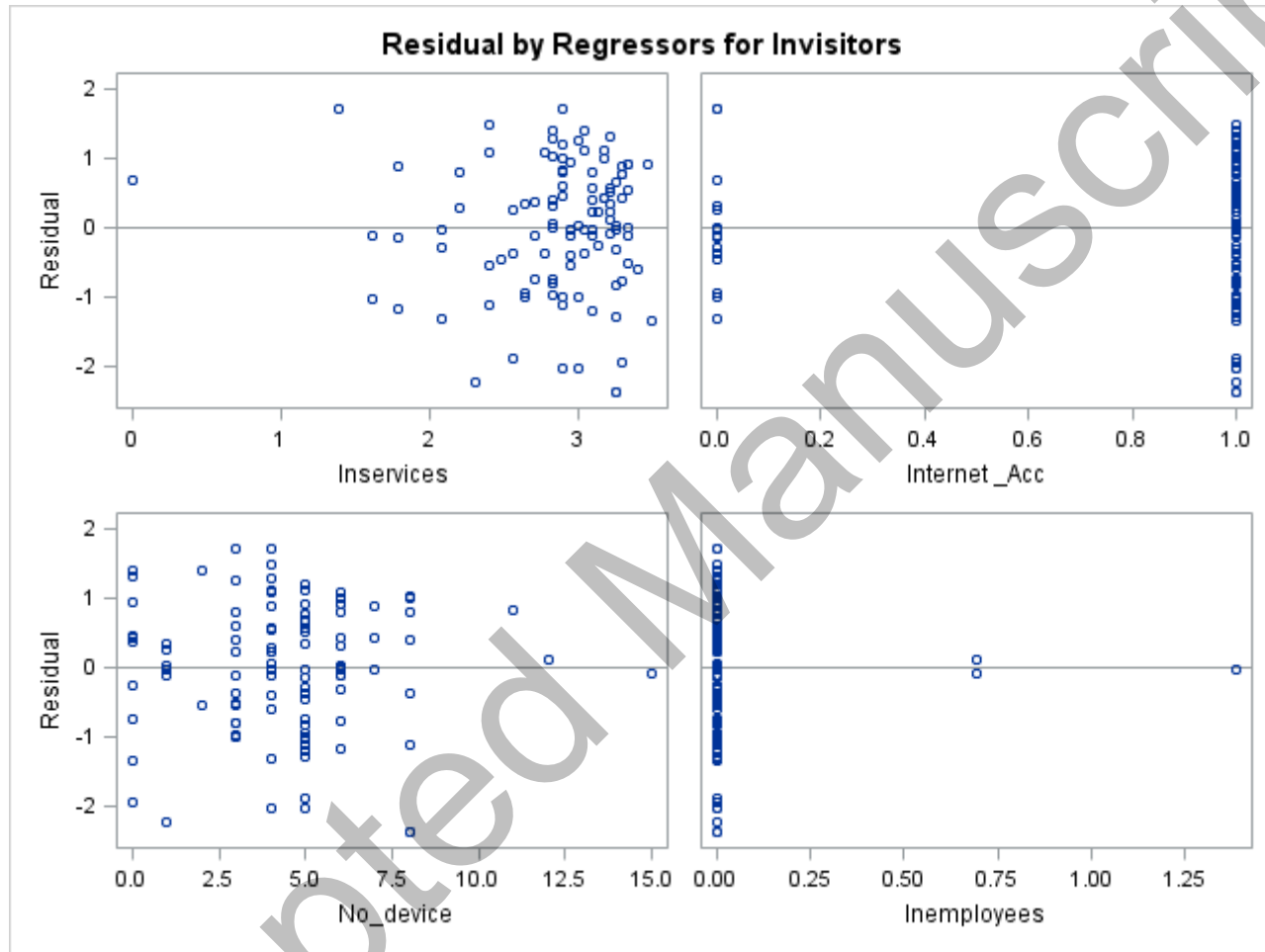
Number of Observations Read 107
Number of Observations Used 107

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	34.46401	8.61600	9.41	<.0001
Error	102	93.37185	0.91541		
Corrected Total	106	127.83586			

Root MSE 0.95677 **R-Square** 0.2696
Dependent Mean 2.56061 **Adj R-Sq** 0.2410
Coeff Var 37.36491

Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	Intercept	1	0.12064	0.54182	0.22	0.8243
lnservices	Log (No_service)	1	0.46245	0.21217	2.18	0.0316
Internet_Acc	Internet_Acc	1	0.97802	0.31327	3.12	0.0023
No_device	No_device	1	0.05809	0.03856	1.51	0.1350
lnemployees	Log (No_staff)	1	0.75784	0.60681	1.25	0.2146





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