

# Model To Improve HIV/AIDS Care: Consultation And Monitoring Real Time

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**Running Title :** E-HC3, HIV/AIDS, Counsellor, VCT, TTF

**Significance Statement:** The model developed resulted in an Electronic HIV Control and Counselling Care (E-HC3) application that can help counsellors dealing with large numbers of clients and are private. Applications built have three levels, in which the first level is as a super admin (government), the second level is an admin (counsellor) and level three is the client. The total value of the percentage of the five variables is 80.10% with a very good level of acceptance from the E-HC3 Applicationusers.

**Abstract:** Background: Many cases of HIV/AIDS have not been reached by the program (unreached population) such as clients who visit independent practice health services, clients who seek treatment themselves with alternative medicine or buy drugs at pharmacies that are not in accordance with standard HIV drug. Many government programs deals with HIV/AIDS, however there are many obstacles in the field associated with the persistence of negative stigma, discrimination and lack of data privacy of HIV clients. Objective: This study aims to design a model that can help the government in HIV case through counsellors aiming to reduce the spread of the infectious diseases. Method: The type of research conducted is applied research. This research designed and built a model to help counsellors and clients during the treatment period. The study was conducted in Palu City with a number of samples scattered in 8 Voluntary Counselling and Testing (VCT) clinics. Results: The model developed resulted in an Electronic HIV Control and Counselling Care (E-HC3) application that can help counsellors dealing with large numbers of clients and are private. Applications built have three levels, in which the first level is as a super admin (government), the second level is an admin (counsellor) and level three is the client. Conclusion: Based on testing conducted using the adoption of the Task Technology Fit (TTF) evaluation model, it is known that the majority of counsellors' assessment of task characteristics of E-HC3 answered strongly agree with the percentage of 83%. Furthermore, regarding E-HC3 technology characteristics found that the majority of counsellors answered strongly agree with a percentage of 85%. The task-technology fit assessment on E-HC3 was 78% and the Usefulness construct was 77%, which means the majority of counsellors agreed. Likewise with the assessment of the 77.5% user satisfaction variable the majority of counselors answered agree. The total value of the percentage of the five variables is 80.10% with a very good level of acceptance from the E-HC3 Applicationusers.

**Index Terms:** Model, E-HC3, HIV/AIDS Care, Consultation, Monitoring, VCT, TTF.

## 1 INTRODUCTION

The application of good governance principle is equality in public services, one of which is in the health sector[1], [2]. A good government certainly must pay attention to health services. One of them is the eradication of infectious diseases in an effort to reduce morbidity and mortality due to infectious diseases[3]. However, many problems were found in the field such as the lack of medical personnel dealing with infectious diseases[4]. Thus, many clients die because they do not get the health services they should. The application of good governance principle is equality in public services, one of which is in the health sector[1],[2]. A good government certainly must pay attention to health services. One of them is the eradication of infectious diseases in an effort to reduce morbidity and mortality due to infectious diseases[3]. However, many problems were found in the field such as the lack of medical personnel dealing with infectious diseases[4].

Thus, many clients die because they do not get the health services they should. Based on data from the Joint United Nations Program on HIV and AIDS (UNAIDS) in 2018, there were 36.9 million people in various countries living with HIV and AIDS in 2017. Among the total sufferers, 1.8 million of them are children under 15 years old. The rest are adults, which was by 35.1 million sufferers. Indonesia becomes one of the countries included in the Asia Pacific Region. This region is ranked third as the region with the most HIV/AIDS sufferers worldwide with a total of 5.2 million people. Indonesia accounts for 620,000 out of a total of 5.2 million people in Asia Pacific who have contracted HIV/AIDS[5]. Many cases of HIV/AIDS that have not been reached by the program (unreached population) such as clients visiting independent practice health services, clients who seek treatment themselves with alternatives or buy drugs at pharmacies that do not meet client standards [6]. This is a challenge in the HIV/AIDS control program before it is resistant and the treated HIV/AIDS client can complete treatment to completion. Therefore, direct assistance is provided to clients who suffer from HIV transmitted diseases that will be done by health workers and non-health workers [7]. Many programs carried out by the government, one of them is the Voluntary Counseling and Testing (VCT) program, which is one of the effective public health strategies for prevention as well as an

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entry point for case management services and care, support, and treatment for people with HIV/AIDS (PLWHA) [8]. However, there are still many obstacles for its use in the field. The study results from several studies found some of the same problems in VCT services, namely logistical problems which include insufficient counsellors, poor counselling quality and communication between counselor and client which only goes one way, the queue is too long, counselor knowledge and counselor quality, clients are ashamed to meet, inadequate clinical facilities and lack of privacy. This has become a number of reasons why people are reluctant to come to VCT Clinic [9], [10]. Related to the negative stigma and discrimination against VCT clients, in the principle of VCT services, services must be professional, respecting the rights and dignity of all clients. WHO in 2011 has announced that there is no new HIV transmission, no deaths from HIV/AIDS and no discrimination (exclusion, exclusion, injustice) towards people living with HIV/AIDS (PLWHA). However, apparently, the negative stigma and discrimination still exist in Indonesia. The study results in Eastern Cape, South Africa said that one of the factors that influenced the low utilization of VCT Clinic was due to stigma and discrimination. This is in line with research conducted by Odimegwu et. al, Apanga, and Fido. [11]–[13] Recognizing this research needs to be done to design a model that can help the government in this case HIV counselors to reduce the spread of infectious diseases. Although many previous researchers have conducted studies on HIV/AIDS prevention, the focus of research by designing models to reduce the spread of HIV/AIDS is still limited. This research is expected to help to realize the Three Zero target by 2030, namely: 1) No more new HIV infections, 2) No more AIDS deaths, and 3) No more negative stigma and discrimination in people with HIV/AIDS (PLWHA).

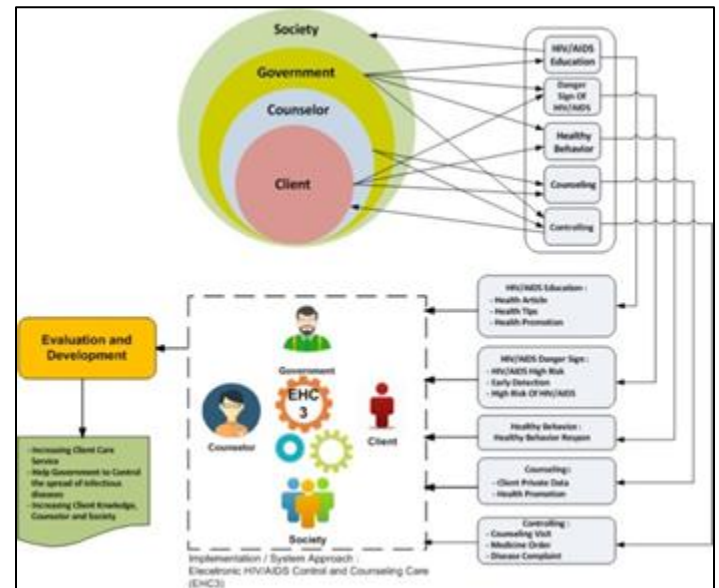
## 2 RESEARCH METHODS

The type of research conducted was applied research. This research designed and built a model to help counselors and clients during the treatment period. The study was conducted in Palu city with samples spread across 8 VCT clinics located in Palu City Health Office, Birobuli Health Center, Kamonji Health Center, Pantoloan Health Center, Singgani Health Center, Talise Health Center, Anutapura Public Hospital, and Undata Hospital. The type of data needed in this study is divided into 2 (two) categories, which are primary data in the forms of client data, VCT counsellor data, VCT program process flow, and problems faced in the field by VCT counsellors and clients. Secondary data in this study are theoretical literature from various books and internet sources as well as articles and journals related to research. Researchers conducted observations by interviewing 8 VCT counsellors.

## 3 RESULT

### 3.1 Proposed Model

The developed model produced an application that can help counselors dealing with HIV clients in large numbers and are private. The application built has several features. The main page of the application contains health tips for clients, then there are also articles that can be accessed by users without having to log in to the application. The main page also has a login menu. There are three levels of login built, the first level is the super admin (government), the second level is the admin (counselor), and the third level is the client.



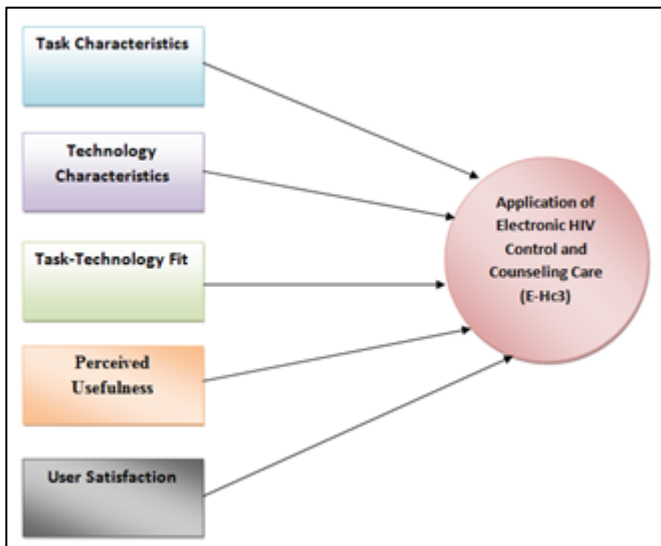
**Fig.1 Model to Improve HIV/AIDS Care**

Super administrator can only add active counsellor data and can move previous counsellor client data when there is a client transition because it is caused by the counsellor moving assignments or stop being a counsellor. The counsellor master menu is used by the government concerned to find out the number of active counsellors and the number of clients. Data counsellor such as username, NIP, name, certificate number, place of service, address, cellphone number, email. Then in the super admin page there is a master menu that consists of danger signs HIV/AIDS, high risk signs of HIV AIDS, healthy behaviors of HIV AIDS, and early detection of HIV AIDS risk. The super admin is responsible for the content of health tips information and health articles that are on the main page of the application. At the second level acting as admin is the counsellor who has been registered by the super admin in the system. Counsellors can add client data to the system. The application is used to store all client records so that if the counsellor wants to see client data there is no need to open the counsellor's book or records. Client data entered by the client when he first becomes a client is confidential and only clients and counselors know the contents. The data that is filled in is the client's biographical data such as Identity Card Number, client's name, place of birth date, age, address, religion, photo and cellphone number and the data of the person closest to the client that can be contacted by the counsellor if something happens to the client. On the counsellor page, there is VCT examination menus such as counselling frequency data, risk groups (Sex Workers, indirect sex workers, sex clients, transsexuals, high risk partners, Gay, etc), length of time (sex workers, customers, Drug Users), visit status (coming in person or referred), referral status, special population, client partner data, partner risk status, pre-test counseling, risk assessment (such as perna having risky vaginal and anal sex, ever changing syringes, blood transfusion, etc), providing information, HIV antibody testing,

and post-test counseling. Then, in the application, a forum feature is provided for the counselor's discussion room such as exchanging information on handling HIV/AIDS without leaking client secrets. Furthermore, on the client page, there are detailed results of client data that have been inputted, then the data of the counselor responsible, then the results of client checks and there is a live chat that can be used by clients to communicate quickly if they want to contact the counselor. In addition, there are features that require drugs that must be filled by the client if the client wants to add drugs, to get additional drugs the client first contacted the counselor to get a referral letter to the hospital.

**3.2 Model Test using Task Technology Fit (TTF) Model**

At this stage, the E-HC3 application was tested using the Task Technology Fit (TTF) Method which has been modified according to the research needs. The TTF method is a formal construct known as TTF, which is the suitability of technological capabilities for the needs of the task at work, namely the ability of information technology to provide support for work. The TTF model has five key constructs namely task characteristics, technology characteristics, task technology fit constructs, performance impacts and utilization[14]–[16]. This study adopted several constructs and added constructs of user satisfaction and perceived usefulness. Figure 2. Test Model Using TTF Method (adopted)



**Fig. 2 Test Model Using TTF Method (Adopted)**

**TABLE 1**  
**COUNSELLOR PROFILE**

Indicator	Mean	n	%
Total Counselor		8	100
Age (years)			
(35-40)	40.88	4	50
(>40)		4	50
Gender			
Male		2	25
Female		6	75
Status			
Married		8	100
Education			
Diploma		2	25
Bachelor		5	62.5

Master		1	12.5
Income (IDR)			
3,000,000-5,000,000		6	75
> 5,000,000		2	25
Length of Work as a Counselor(years)	6		
1-3		1	12.5
4-10		6	75
>10		1	12.5
Number Of Clients (people)	207.50		
50		1	12.5
80		1	12.5
100		2	25
120		1	12.5
160		1	12.5
300		1	12.5
750		1	12.5

Source: Data processed 2019

Based on Table 2, it is known that all counsellors already married with majority education are undergraduate. The ages of the counsellors are all in the adult category with long working as counsellors 4-10 years with a percentage of 75%. The majority sex is female by 75% with a varied number of clients and the highest number of clients is 750 and the number of clients is at least 80. Average counselor income is 3,000,000-5,000,000 million per person.

**TABLE 2**  
**PERCENTAGE OF VALUES**

Values	Explanation
0% - 19.99%	Very (Disagree, Poor or Very Poor)
20% - 39.99%	Disagree or Not Good
40% - 59.99%	Enough or Neutral
60% - 79.99%	Enough or Neutral
80% - 100%	Very (Agree, Good, Like)

Y = The highest score Likert x number of respondents (1)

Index Formula% =  $\frac{x}{Y} \times 100$  (2)

Notes:  
= Mean total  
Y = Total

**TABLE 3**  
**COUNSELLOR ASSESSMENT RESULTS**

No.	Variable	SD	D	N	A	SA	Total	index
		1	2	3	4	5		
1	Task Characteristics	0	0	0	24	10	34	83%
2		0	0	0	24	10	34	
3		0	0	9	16	5	30	
4		0	0	0	24	10	34	
5		0	0	6	24	5	35	
							33.40	
1	Technology Characteristics	0	0	3	32	5	40	85%
2		0	0	9	12	10	31	
3		0	0	0	24	10	34	
4		0	0	3	20	10	33	
5		0	0	0	24	10	34	
6		0	0	0	28	5	33	
							34.17	
1	Task-Technology Fit	0	2	12	12	5	29	78%
2		0	3		24	10	34	
3		0	0	12	8	10	30	
4		0	3	15	4	10	29	
5					6	16	10	
6				3	20	10	33	
7					24	10	34	



				31.57		
1	Usefulness	12	12	5	29	77%
2		6	20	5	31	
3		9	12	10	31	
4		6	20	5	31	
5		6	16	10	32	
				30.80		
1	User Satisfaction	3	20	10	33	77,5%
2		9	12	10	31	
3		3	20	10	33	
4		12	12	5	29	
5		12	8	10	30	
6		12	8	10	30	
Average Index					80,10%	

Notes: Strongly Disagree (SD); Disagree (D); Neutral (N); Strongly Agree (SA)

Based on Table 3, it can be seen that the majority of counsellors' assessment of E-HC3 task characteristics answered strongly agree with the percentage of 83%. Furthermore E-HC3 technology characteristics explains that the majority of counselors answered strongly agree with a percentage of 85%. The E-HC3 task-technology fit assessment was 78% and the usefulness construct was 77%, which means that the majority of counsellors agreed. Likewise with the assessment of user satisfaction by 77.5%, the majority of counselors answered agree.

## 4 DISSCUSSION

### 4.1 Model Test using Task Technology Fit (TTF) Model

The model that was designed to produce an Electronic HIV/AIDS Control and Counseling Care (E-H3C) Application has many features that can help counselors and clients communicate effectively. The application comes with client data according to the counselor when they first came for consultation. Thus, there is no more client who face or consult with several counsellors. This is to anticipate data redundancy because client data exists in several counsellors. Existing data in the system besides personal data is also a client's health data. The application also features a live chat that can connect between the client and the counsellor so that it can help the counsellor control the client online and the history of client complaints can be well differentiated. This application can accommodate if there is a counselor who changes assignments so that his client can be moved to another counselor easily and quickly. Emergency features are also provided in the application so that if something dangerous happens with the client, the counselor can immediately make a decision to help the client by contacting the next of kin who has recorded data on the system. A forum is also provided to exchange information among counselors so that they can exchange information about VCT services but not to the client's situation because it is confidential. The application also helps clients to take drugs in the hospital, because the client's requirements can take or add drugs to the counselor.

### 4.2 Counsellor Profile

The age to become a counselor should be mature because in adulthood, the ability to assist clients in solving problems becomes more mature[17][18][19]. Counselors in the city of Palu are all in the adult age category. So, the counselors can help clients in solving client problems. This is proven in the field with the maturity of many counselors clients who feel

comfortable to consult with counsellors rather than with doctors, because clients feel cared for by counselors with the condition of those who suffer from infectious diseases. There are more female counselors than men because women have sympathetic, social and friendly abilities, are trustworthy and open, collaborate, and able to sound their feelings[20],[21]. The counsellors in this study are dominated by women because in reality and in the field, many clients feel more comfortable telling stories with female counselors. Government regulations in Indonesia state that the minimum age for a man's marriage is 19 years old, while a woman's marriage age is 16 years old. [22]. In this study, the average age of the counselor was 35 years with married status. This is consistent with what is in the field that in Indonesia, the average marriage is over the age of 20 years. A counselor besides having a good intervention approach with the client must also have extensive knowledge because it is expected that the counselor can recognize the client's problems well so that the solution provided is a good solution[23]. In this case, education is one of the indicators[24]. The average counsellor education in this study has a good level of education at least a diploma. The majority of counselors' income is in the range of 3,000,000 - 5,000,000 because most of the counselors in the city of Palu are civil servants working in hospitals and public health center[25]. The working period of a counselor explains that the majority have served for 4-10 years with the largest number of clients is one counselor serving 750 clients. The number of clients is influenced by location, and the area of a counselor conducts consulting services. In this study, the location of the most people with HIV/AIDS is the coastal area close to the location of prostitution.

### 4.3 Application Model Testing Using Task-Technology Fit Method

Task Characteristics are defined as activities carried out by individuals in turning input into output. In this study, the majority of respondents answered strongly agree with the E-HC3 Application in which counsellors can perform services anywhere and anytime, can access client data easily, get reports easily and quickly, as well as easy and integrated communication with clients. Previous studies using task characteristics to test a system were conducted by Oliveira et al, and Lu June[26], [27]. Technology Characteristics are tools (hardware, software, and data) used by individuals to help complete tasks [28]. Assessment of counselors on the E-HC3 Application the majority of counselors answered strongly agree with the E-HC3 Application because it can provide services without place and time restrictions, provide reliable services, increase facilitation resources (data can be stored properly, there is a history of conversations with clients), services that can be measured (add or subtract features needed), are able to provide accurate data, and provide complete features to support the work. Based on interviews with counselors in general if they want to find out client data they have to open their books and look for records about clients. With the E-HC3 application, counselors can quickly and easily search for client data. The next problem faced in the field such as the technology used to communicate cannot store history of counsellor and client conversations so that if the counselor wants to know the state of the client before, the data is not available. The E-HC3 application can help counsellors to document the history of conversations between clients and counselors.

Task-Technology Fit rational perspective on whether the technology used, can optimize the work or task of the user[26]. This further confirms the suitability of the technology for the task is influenced by the characteristics of the task and practicality of the technology used in helping the work or tasks of everyday users. Several previous studies that discussed the characteristics of task technology fit were carried out by D'Ambra et al, Yadegaridehkordi et al and Huang and Chuang[16], [28], [29]. In the case of this study, the majority of counsellors answered that they agreed with the E-HC3 Application to provide/store data that was useful for the counselor, the work of the counselor becomes more effective because of the availability of fast, complete and accurate data. Application according to the work needs of the counselor, simplify the work, provide access to data comfortably and easily used. According to one counselor when dealing with leaders and attending seminars, the counselor usually needs complete data to make a performance report but always has problems with incomplete and not integrated data. So with the E-HC3 application, the counselor can easily access client data and can make work reports quickly. Usefulness is a belief from someone that by using a certain information technology system, it will improve its performance. Suitability of technology to the task is a determinant of beliefs about the usefulness, importance of use, and the benefits derived from using information technology[28]. In this study, the majority of counselors agreed that the E-HC3 application improved performance, productivity, effectiveness in assignments, and made it easier for their duties as counselors. The counselor agreed with this because with the E-H3C application, the work of the counselor is easier, more effective and efficient, such as time in searching for short data and making reports faster. This is supported by several studies that also used usefulness as one of the variables in the evaluation by Usuro et al, and Yadegaridehkordi et al.[29], [30]. Furthermore, the construct of user satisfaction is the feeling of pleasure or disappointment (dissatisfaction) of the user after comparing the performance of the product with what is expected (expectation)[31]. In this study, the majority of counsellors as a whole were satisfied using the E-HC3 Application because overall the E-H3C application could facilitate the work of the counselor. This is supported by several studies that also used user satisfaction as one of the variables in the evaluation conducted by Bukie [32]. The total value of the percentage of the five variables including Task Characteristics, Technology Characteristics, Task Technology Fit, Perceived Usefulness and user satisfaction was found to be 80.10% with a very good acceptance rate from users of the E-HC3 Application.

## 5 CONCLUSION

Based on tests conducted using the adoption of the Task Technology Fit (TTF) evaluation method, it is known that the majority of counsellors' assessment of task characteristics of E-HC3 answered strongly agree with the percentage of 83%. Furthermore, E-HC3 technology characteristics found that the majority of counselors answered strongly agree with a percentage of 85%. The E-HC3 task-technology fit assessment was 78% and the Usefulness construct was 77%, which means the majority of counselors agreed. Likewise with the assessment of the variable user satisfaction by 77.5% the majority of counselors answered agree. The total value of the percentage of the five variables including Task Characteristics, Technology Characteristics, Task Technology Fit, Perceived

Usefulness and user satisfaction by 80.10% with a very good level of acceptance from users of Electronic HIV Control and Counseling Care (E-HC3) Applications.

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