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SMANTUB (anti tuberculosis smartwatch) integrated with spy-TBC: Early strategy for Tuberculosis eradication based on smartwatch and Aiot-Posbindu-PM-TBC (artificial intelligence of things post for infectious Tuberculosis)

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ABSTRACT

Background: The prevalence of tuberculosis which is expected to decrease (rather than increase or rise) by the government and all groups or elements of society (especially the community that takes a role in the health sector and is directly involved in every movement of efforts to minimize tuberculosis and its prevalence) has actually become a "note or task in itself" for the government and the general public. Progress in efforts to eradicate TB or Indonesia free from TB 2030 should be continued and appreciated in order to move towards a more advanced and visionary future. There is still no special application to overcome TB cases in Indonesia based on AIoT or the internet). The aim of this research is to provide an idea to eradicated TB throught health also social care with advanced technology also innovation. **Methods**: The method of this article is literature review. The author realizes that this article is a development of an essay and is also an idea. The author proposes an innovative idea that may be useful in the future in efforts to eradicate tuberculosis cases through a plan approach. **Findings:** From the complexity of the problems in the introduction above, the author was inspired to present an innovative idea called "SMANTUB" based on a Spy-TBC integrated Smartwatch which is an innovative and latest idea based on AIoT and has never existed before. **Conclusion**:. Smartwatch "Smantub" integrated Spy-TBC based on AIoT technology in the form of Big-Data and WebApp and location tracking (tracker) also AIoT-Posbindu-PM-TBC in the jejamoe café can be used as a cutting-edge tool or technology in early and mature prevention efforts to reduce the prevalence of TB which is currently still high in Indonesia**. Novelty/Originality of this article:** SMANTUB helps overcome the problem of TB, especially in controlling the location of sufferers and controlling the prevention of transmission.

KEYWORDS: smartwatch; tuberculosis; Spy-TBC.

1. Introduction

The prevalence of tuberculosis which is expected to decrease (rather than increase or rise) by the government and all groups or elements of society (especially the community that takes a role in the health sector and is directly involved in every movement of efforts to minimize tuberculosis and its prevalence) has actually become a "note or task in itself" for the government and the general public. A note of tasks that must be completed or a gap is sought, titled a solution or way out, which has actually been carried out by both the

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government and all elements of the people through various steps and efforts en masse (together) since several years to decades ago. Although in reality also practice there are still shortcomings, weaknesses and obstacles. An effort has indeed been made maximally by mobilizing all minds and energy. Although in reality and practice it is not as perfect as expectation, at least an effort will produce progress or progress even though it is very small or little and slow. No exception in the efforts to eradicate tuberculosis initiated by the government through its national program, namely "Indonesia is free from tuberculosis 2030" involving all elements of Indonesian society regardless of their social status and especially in young generation. Progress in efforts to eradicate TB or Indonesia free from TB 2030 should be continued and appreciated in order to move towards a more advanced and visionary future. Therefore, there needs to be a continuous, compact evaluation from the government and the community for the success of the Indonesia free from TB 2030 program by deeply assessing all types of weaknesses, deficiencies and obstacles accompanied by various threats, challenges and obstacles and disturbances in efforts to practice or realize it. The national program set by the government that Indonesia is free from TB by 2030 can be maximized by improving quality health services and promkes (health promotion) is one way (Mardianto, 2023).

Humans are God's perfect creatures with the gift from God in the form of sense besides lust in the human body itself. An essence of the test for humans to live and continue to work in this world is to wisely choose and sort out useful things based on reason or even rely on their lust to produce a level of aesthetic value in themselves (in the human being) created by God. With values based on clear and positive reason or by only prioritizing lust alone, it then describes the level of human nobility. Is it appropriate to get a degree of nobility by prioritizing reason in front of lust? Or on the contrary, become despicable only by relying on lust. Therefore, the importance of clear and positive reason based on strong faith will certainly produce a welfare or solution in dealing with certain problems (in this case, efforts to eradicate tuberculosis or TBC). Humans are certainly created to have weaknesses. However, these weaknesses essentially describe perfection as human beings created by God. With weaknesses, we are not always discouraged by always being motivated to look ahead (visionary) to find solutions to a problem that is identical to the term "way out". Especially in the world of health itself (besides the world of education which is also very important in forming a generation with golden character by prioritizing morals and ethics) as the foundation of public welfare in a country with efforts to eradicate TB including those that have been planned and planned by the government through the Indonesia TB-free 2030 program. As in efforts to handle tuberculosis or TB cannot be ignored in order to form public welfare in facing and overcoming the threat of infectious diseases to the downstream flow that has great potential to lead to death. The threat of death is time to be eliminated and prevented as early as possible. The existence of weaknesses or deficiencies accompanied by obstacles in efforts to handle TB in order to realize "Indonesia TB-free 2030" accompanied by threats, challenges and obstacles and disturbances (especially the threat of death) it is time to be evaluated by each other between the government and the people (who lead the government in the course of government) without any discriminatory elements, coercion to blaming each other. One of the challenges in efforts to control TB in Indonesia is the level of compliance with long-term treatment, characterized by several families reporting difficulties in following the required treatment regimen, in addition to the lack of public understanding of the sources and transmission of TB disease even though there have been socialization efforts by health workers or in other words, there is still a gap in knowledge about TB (including how it is transmitted to the spectrum of symptoms) (Musyafa, 2017; Setyandari & Setiyadi, 2023).

The problems with TB control efforts that have been described above (Setyandari & Setiyadi, 2023) should have been the subject of evaluation or self-reflection between health workers under the auspices of the government (especially the Ministry of Health which should be able to coordinate with the Ministry of Social Affairs or similar Directorates) along with civil society regardless of their title or social status to work together in synergy to continue moving forward and innovating further in order to maximize the termination of

transmission and sources of TB disease without blaming each other. As in efforts to eradicate the basic factors causing TB, namely poor home sanitation to low education accompanied by increasing unemployment (Asemahagn et al., 2020). Health workers under the auspices of the Ministry of Health who are tasked with eradicating TB to its root causes should be able to coordinate with the Ministry of Social Affairs (in this case poverty and unemployment which also concern environmental or home sanitation). The allocation of social assistance should also be able to overcome poverty which is the root cause of the lack of a decrease in TB prevalence by not being corrupted within the central or regional scope. The allocation of social assistance funds will be more beneficial if used for real action directly in an effort to combat the increasing prevalence of TB, especially in terms of handling poor home sanitation accompanied by poverty, unemployment and low education. Openness or transparency based on honesty between the government (Ministry of Social Affairs and Ministry of Health) to the community is important and cannot be ignored, especially in terms of the use of fund allocations for certain purposes (in this case funds for TB prevention and control). Social Support funds that are corrupted by the elite can lead to a decline in public trust in state officials (Yusrina, et. al., 2023).

It is undeniable that we currently live in an era of advanced and rapid digital-based technology that is unlimited in terms of area and distance. Problems related to TB control which are still riddled with obstacles, deficiencies or weaknesses that lead to TCOD (threats, challenges, obstacles and disturbances), especially the threat of death due to TB, should be able to be overcome with advanced digital-based technology. The existence of advanced digital technology should have made various forms of problems regarding TB control efforts and its TCOD can be resolved and be easier, not the other way around, even though in reality it is still accompanied by weaknesses in it. It is time for us to utilize digital-based technology for the prevention and elimination of TB along with the impacts and threats it brings, including death in it. Various efforts based on internet technology (including AIoT) have actually been implemented by several parties (especially health promoters and researchers) to resolve obstacles in ending TB in Indonesia from the socialization stage to the practice of treating TB patients. However, until now there has been no official AIoT-based application or technology under the auspices of the government in efforts to eradicate the prevalence of TB in Indonesia (or in other words, there is still no special application to overcome TB cases in Indonesia based on AIoT or the internet). Thus, special attention and innovative products are needed to facilitate efforts to eradicate TB in Indonesia based on AIoT with maximum application functions and minimal weaknesses, deficiencies and obstacles to its TCOD. Several factors causing the increasing TB problem are unhealthy housing criteria such as too many occupants, house ventilation that does not match the size of the room (increasing the humidity level of the house), poor sanitation, lack of personal hygiene, high unemployment rates, low levels of community education, non-compliance with TB patient treatment and most importantly there is still no system that can integrate elements of patient therapy, elements of patient rehabilitation/social, economic elements, counseling elements and preventive elements (Kenedyanti & Sulistyorini, 2017).

2. Methods

The method of this article is literature review. The author realizes that this article is a development of an essay and is also an idea. The author proposes an innovative idea that may be useful in the future in efforts to eradicate tuberculosis cases through a plan approach. The concept of the plan in PDCA cycle is guidelines for the team when working on a system improvement project., while the plan is focused on establishing goals for all areas of progress and creating strategies to reach the goals (Tanwir et. al., 2024). This goals of this research is to decreased TB through new idea of inovation also technology namely SMANTUB.

This approach emphasizes proactive planning to anticipate potential challenges in TB eradication. SMANTUB is designed to enhance early detection and efficient management of

TB cases. Furthermore, this innovation integrates digital technology to improve patient monitoring and support healthcare providers.

3. Results and Discussion

From the complexity of the problems in the introduction above, the author was inspired to present an innovative idea called "SMANTUB" based on a Spy-TBC integrated Smartwatch which is an innovative and latest idea based on AIoT and has never existed before. The application of SMANTUB based on this smartwatch aims to be a tool to control the prevalence of TB by utilizing the location tracking feature or GPS tracker. Like a sophisticated smartwatch with oxygen saturation features, blood pressure and so on, this smartwatch called "SMANTUB" is equipped with a location tracking feature with the aim of tracking between positive TB sufferers and those who are not so that there is no continuous transmission in the field.

SMANTUB users will later be able to keep their distance from TB sufferers around them. This SMANTUB will later also be integrated into an AIoT web called "Spy-TBC" after performing a barcode scan or scanning using a personal smartphone on the barcode under the SMANTUB screen. The application of this barcode is a form of AIoT implementation. AIoT is a combination of Artificial Intelligence and the Internet of Things to overcome various problems in the process of controlling the prevalence of TB and its prevention efforts.

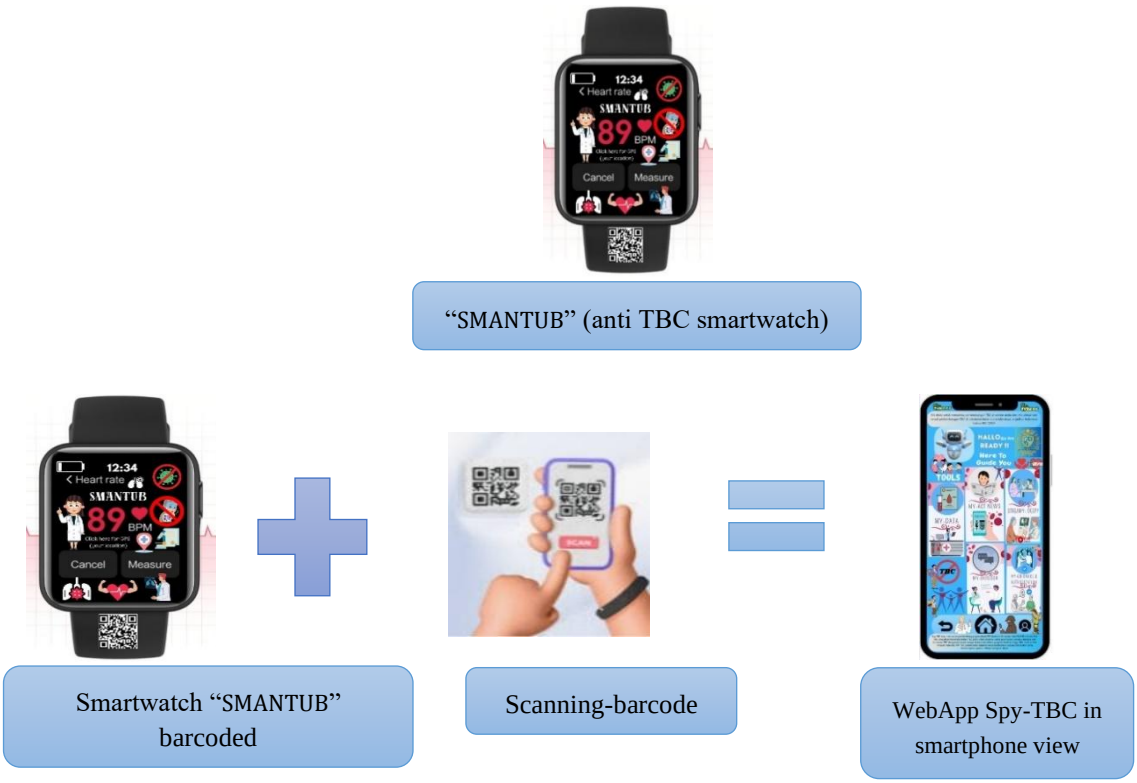

Fig. 1. Illustration of SMANTUB along with the application of "SMANTUB" (anti-tuberculosis smartwatch) integrated with the Spy-TBC web

The practice of the SMANTUB integrated Spy-TBC platform in implementing TB eradication efforts is carried out as a form of effort to minimize the prevalence of TB which of course endangers the nation's generation, in addition to being based on digital technology, it will also be based on AIoT-Posbindu-PM-TBC in its real actions and structured under one umbrella with the jejamoe café. Posbindu activities which have so far only been applied in community life specifically handle non-

communicable diseases or PTM. There have been no posbindu activities to handle infectious diseases. Posbindu-PTM has a very crucial role in social life in society. For example, the small impact that is clearly visible is that people become concerned about health and aware of non-communicable diseases. Integrated monitoring and early detection of PTM risk activities are core activities in posbindu-PTM activities. Heart disease, diabetes, lung disease, asthma and cancer are examples. Disorders due to accidents and acts of domestic violence are also objects of detection and monitoring in this posbindu-PTM activity. So far, there has been no posbindu used for monitoring and early detection of infectious diseases. The idea of a combination of posbindu with infectious diseases (for example tuberculosis) has a great influence on the condition of society. The impact is that people maintain better sanitation or cleanliness both in themselves and the biotic and abiotic environments around them.

Moreover, infectious diseases are carried by microorganisms. The community becomes aware and increases their knowledge and technology. Posbindu infectious diseases or posbindu-PM is a form of combination and innovation (development) of posbindu-PTM where the object of monitoring and detection is infectious diseases. Posbindu-PM-TBC is a more specific form of combination, namely in handling infectious diseases specifically tuberculosis as the object of monitoring and early detection integrated with Spy-TBC with AIoT. The strategy for strengthening the Posbindu program is the support of posbindu cadres from health center officers and the Health Service (under the auspices of its parent, the Ministry of Health) to develop programs that are promotive and preventive in nature, early detection or disease examinations to attract public interest so that they can consistently attend posbindu (Lubis, 2021). AIoT-Posbindu-PM-TBC, which is a development of the original Posbindu in the community, in practice also runs side by side with the greeny-nature Jejamoe cafe as an effort for mental and physical therapy for TB sufferers, as illustrated as follows Figure 2.

Fig. 2. Jejamoe café or kedai Jejamoe integrated with AIoT-Posbindu-PM-TBC and Greeny-Nature or natural green nature

In addition to being able to scan-barcoding or scanning using the user's smartphone on the barcode under SMANTUB, clients who are members of the community with or without TB complaints can also scan the flyer or poster for counseling before consulting at the five AIoT-Posbindu-PM-TBC tables. This is the application of AIoT to posbindu and is the author's latest discovery. An illustration of the application of AIoT-Posbindu-PM-TBC through a counseling flyer as an alternative means of counseling besides using SMANTUB itself is described as follows

Fig. 3. Implementation of AIoT on the Posbindu integrated extension flyer by scanning the barcode which is then directed to the Spy-TBC web

The committee as a function of an organization is very crucial. The management or committee of the integrated posbindu-PM-TBC Spy-TBC with AIoT basically consists of 1 coordinator and 4 cadres. Cadres are divided into several types. The composition of the management or committee assigned to each table can be made with the following details

Table 1. Composition of the management of the integrated posbindu-PM-TBC Spy-TBC and Spy-TBC planning parties

Posbindu-PM-TBC administrators or committee	Role
Coordinator	The head of the association and person in charge of activities and coordinating with the health centers and related supervisors in their area (can be from the Ministry of Social Affairs or the Ministry of Health).
Mobilizing Cadres	Active, influential and communicative members of the association are tasked with mobilizing the community, while also conducting interviews in gathering information at table 2 (officers from the Ministry of Social Affairs or Ministry of Health).
Monitoring Cadres	Active and communicative association members are tasked with taking measurements at table 3 (from the Ministry of Health).
Counselor/Educator Cadres	Active, communicative association members who have become role models in implementing a healthy lifestyle are tasked with providing counseling, education, motivation and following up on referrals to health centers or hospitals. Assigned at table 5 (from the Ministry of Social Affairs and the Ministry of Health who coordinate with each other).
Recording Cadres	Active and communicative association members are tasked with recording the results of posbindu-PM-TBC activities and reporting to the posbindu-PM-TBC coordinator (from the Ministry of Social Affairs).
Parties	Role
Software Development Team	Consisting of developers and programmers who are responsible for developing features and system architecture for both Spy-TBC and Smartwatch "SMANTUB" with AIoT.
Database Expert	Designing a database plan to maximize data retrieval and storage.
Information Security Specialist	Ensuring strong security measures to protect sensitive information including the identities of officers and the public.
Front-end Developer	Creating an easy-to-use interface for cadres from the Ministry of Social Affairs and health workers in a clear and secure manner.
Back-end Developer	Responsible for running application logic and managing server-database interactions to ensure optimal performance between the three parties (Kemensos cadres, health workers and the public).

In the enforcement of posbindu-PM-TBC on the day of implementation, a 5-table system or modification is carried out according to the needs and mutual agreement and patients undergo the examination stages one by one in turns. The importance of contact examinations and wider TB screening in the community to identify hidden cases and break the chain of transmission (Zawedde-Muyanja et al., 2022; Sommerland et al, 2017). The intra-personal counseling process integrated with Spy-TBC using AIoT is carried out at table 5 with guidance from administrators from the Ministry of Health and the Ministry of Social Affairs.

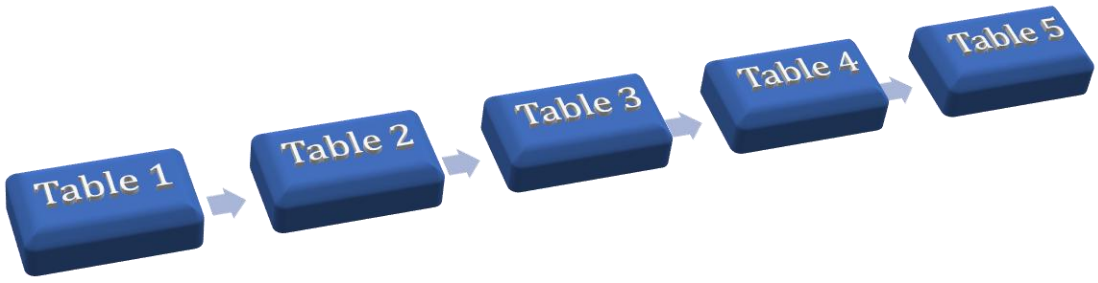

Fig. 4. Table; table 3 measurement of weight, height, BMI waist circumference, body fat analysis. Sputum sampling assisted by nurses.

Both cadres from the Ministry of Health and the Ministry of Social Affairs, both synergize with each other in an effort to eradicate the root causes of TB which are generally based on poverty, low education and unemployment in addition to intensive treatment or vaccination efforts. At table 5, a consultation was also carried out regarding the economic conditions that influenced poor sanitation accompanied by poverty, unemployment and low education by representatives of cadres from the Ministry of Social Affairs in addition to consultations on treatment or other preventive efforts such as vaccination by cadres from the Ministry of Health. Integrated Posbindu-PM-TBC Spy-TBC-based counseling is expected to be able to overcome social problems in addition to physical problems by prioritizing the quality of trust between the government and the community, which has often clashed between the two. The first social assistance program includes long-term consultation and planning services with one concrete example being assistance for individuals suffering from TB (Islami & Pratiwi, 2023). Modifications and arrangements of the 5-table system can be described with the following illustration

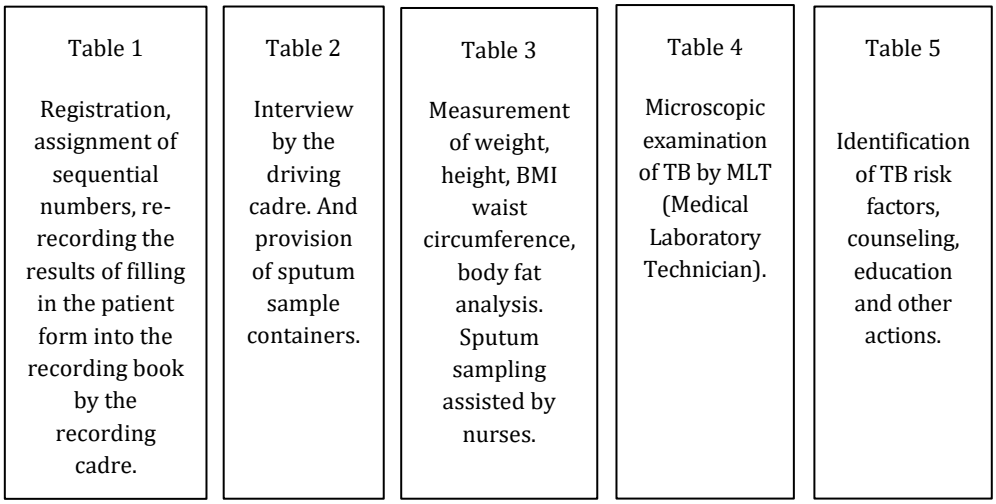

Fig. 5. Illustration of the implementation of AIoT-Posbindu-PM-TBC

For counseling on the causative factors of integrated TB Spy-TBC covering poor sanitation accompanied by poverty, unemployment to low education is carried out at table 5. At table 5, the performance of the Ministry of Health and Ministry of Social Affairs (as the parent of various elements of the workforce below it) can be seen through Spy-TBC which guarantees transparency or openness based on honesty by the government to the community it serves (its features will be explained in detail below). Through Spy-TBC, it is hoped that it will be able to guarantee a quality bureaucracy, high quality and guaranteed free from corruption based on Posbindu-PM-TBC directly by the government in serving its people so as not to harm the country. The harmonious combination of Spy-TBC and Posbindu-PM-TBC is certain to reduce the prevalence of TB along with its basic causative factors, namely poverty accompanied by unemployment and low education in addition to the threat of corruption, collusion and nepotism of social assistance funds for TB eradication efforts by certain individuals (which of course disturbs civil society). Furthermore, patients who in this case are people who are residents of a certain area can request further referrals if they are in the acute TB phase. Referrals can be made to the nearest and easily accessible hospital or health center in terms of distance and location to receive intensive treatment or therapy. The importance of contact screening and wider TB screening in the community to identify hidden cases and break the chain of transmission (Zawedde-Muyanja et al., 2022; Stracker et al., 2019; Asres et al., 2018).

Tuberculosis is very vulnerable and its transmission is not realized. Prevention can be done by vaccination which can only be done by babies under 2 months old. For prevention that is more preventive in nature against the presence of tuberculosis in the midst of community life, monitoring and detection efforts can be carried out in the community and all of that is packaged through the enforcement of integrated posbindu-PM-TBC facilities Spy-TBC with AIoT which is a form of combination and specific innovation of posbindu-PTM or posbindu in general. The existence of posbindu-PM-TBC integrated Spy-TBC is expected to be a useful facility for community life both in rural and urban areas by prioritizing transparency in the allocation of social assistance funds for TB control by the government through full real-time supervision by the people in order to avoid the practice of corruption, collusion and nepotism in the allocation of social assistance funds for TB control by certain individuals. Spy-TBC which is integrated with Posbindu-PM-TBC which has been explained in detail above, is expected to be able to combat corruption practices and improve the quality of TB control itself. In detail, the features in the Spy-TBC platform (or in other words the WebApp of Spy-TBC) are explained in the following image.

Fig. 6. Spy-TBC (original) based on AIoT and its features in the form of WebApp to realize a clean, healthy and high-quality bureaucracy in an effort to eradicate TB by prioritizing the interests and welfare of the people free from corruption, collusion and nepotism by certain individuals who hinder the prosperity of the country

3.1 Features on Spy-TBC

3.1.1 My-data feature and my-act news feature

Through this feature, the platform can collect various types of data on Posbindu-PM-TBC practices along with the allocation of social assistance funds set by the government to address the causes of TB such as economic factors including details of each individual's

treatment history to the use of TB social assistance fund allocations transparently (openly) and clearly. After logging in with a personal email and password, Spy-TBC users will find out the status of the disease which also concerns home sanitation and the economy in this feature (carried out at the second desk by the synergy of Ministry of Social Affairs of the Republic of Indonesia and Ministry of Health of the Republic of Indonesia cadre officers after recording, registering and filling out patient forms at desk 1) until reaching the consultation stage at desk 5 later. accuracy of patient data is critical in the management of infectious diseases such as TB (Gupta et al., 2015; Gupta-Wright, et. al., 2020).

Big-Data analysis technology is used by Spy-TBC to analyze the collected data comprehensively. This analysis helps to find actual and factual news trends regarding Posbindu-PM-TBC practices in various places in Indonesia to the possibility of violations of practices such as Collusion, Corruption, and Nepotism certain individuals (especially government cadres from the Ministry of Health and Ministry of Social Affairs) which must be investigated and then made viral, then information about a healthy lifestyle free of TB with strong guidance and assistance by competent health workers (under the auspices of the Ministry of Health) and the possibility of other problems or violations (such as violations committed especially by dark individuals corrupting TB social assistance funds which must be investigated, monitored and made viral by the people so as not to harm the people and the country). Consultations conducted at table 2 will also be conducted in depth through this feature. This feature also presents the causative factors of TB which are based on low home sanitation due to poor economic conditions accompanied by poverty, unemployment and low education through intra-personal interviews and highly maintains privacy. However, regarding the allocation of social assistance funds, openness or transparency is maintained.

3.1.2 Streamy-deepy feature and my-outlook feature

This platform has a real-time monitoring feature that allows continuous monitoring by the general public based on Posbindu-PM-TBC directly on the performance of the government and Posbindu-PM-TBC officers or cadres in handling efforts to reduce the prevalence of TB, so that problems or violations can be detected immediately. This feature also has a live broadcast of the Posbindu-PM-TBC program that is being carried out in the community, including the distribution of TB social assistance funds that are right on target and openly by all components of society (the people also openly monitor the allocation of funds with live broadcasts on the Streamy-Deepy feature to avoid the provision of TB social assistance funds that are not right on target). The allocation of funds that are set openly is clearly visible and is intended for poor people who are truly unable or less able to overcome TB in themselves. In addition, the location feature in SMANTUB is also integrated through this feature. The integrated live-streaming map feature can track between TB sufferers and non-TB sufferers so that transmission and spread can be suppressed directly or in other words, SMANTUB is able to break the chain of TB transmission with the help of features in Spy-TBC. Posbindu-PM-TBC activities starting from the first table can be monitored directly through this feature including measuring body weight and BMI to taking sputum samples at table 3.

Posbindu-PM-TBC cadres under the auspices of the Ministry of Social Affairs and health workers under the auspices of the Ministry of Health can use Spy-TBC to get in-depth feedback on their performance and practices directly supervised by the general public. The public can comment directly through this feature under the latest viral headline news. This feedback helps government officials to continue to improve the quality of their services in serving the country and society by always introspecting themselves and through certain training qualifications. The general public can also consult about a healthy lifestyle free of TB in the chat column by consulting a doctor or health worker assigned directly by the Ministry of Health. In the comments column, you can also exchange ideas with fellow Spy-TBC users regarding healthy anti-TB lifestyles accompanied by mental or economic conditions leading to inadequate or inadequate sanitation based on Posbindu-PM-TBC

directly under the guidance of health workers and Ministry of Social Affairs officers. While waiting for their turn to be called by patients starting at the first desk, patients who are clients of Posbindu-PM-TBC based on Spy-TBC integrated with AIoT can fill in feedback or comments on viral TB news to the use of TB eradication fund allocations in an actual and factual manner in this feature.

3.1.3 My-guidance and authorization feature

With this feature, Spy-TBC can monitor the level of compliance of cadres from the Ministry of Social Affairs and also health workers with the competency standards and professional ethics set by the government that assigned them. This helps ensure that their practices are also in accordance with applicable regulations. The quality of anti-corruption by the government in serving its people can also be assessed in this feature. Consultation at table 5 at Posbindu-PM-TBC will also be implemented in this feature to ensure preventive efforts that have been carried out since the first time AIoT-Posbindu-PM-TBC was implemented (including monitoring the treatment process optimally by health worker cadres and monitoring from a social perspective by official cadres from the Ministry of Social Affairs).

3.2 An innovative of Spy-TBC

Spy-TBC is an innovative and latest idea based on AIoT which is a combination of Artificial Intelligence and Internet of Things to overcome various problems in the process of controlling TB prevalence and its prevention efforts (along with KKN practices in the government or Ministry) by ensuring high transparency between the Ministry (Ministry of Health and Ministry of Social Affairs) to civil society as recipients of TB control fund allocations (or social assistance). Spy-TBC is also an application that aims to control the prevalence of TB in Indonesia with the hope of decreasing rather than increasing starting from the root causes (Kenedyanti, 2017). Spy-TBC is the latest innovation based on WebApp or automatic internet devices that integrate elements of patient therapy, elements of patient rehabilitation and socialization to elements of counseling and prevention including poverty and unemployment as the root causes of TB. Spy-TBC also emphasizes the basic factors that have been the root causes of the increasing prevalence of TB such as poor sanitation, unhealthy or less healthy household criteria (including air ventilation which causes increased humidity) and lack of education accompanied by increasing unemployment by paying special attention to therapy efforts, rehabilitation and social patients and counseling elements along with AIoT-based prevention in the form of WebApp in addition to AIoT (Tandel & Jamadar, 2018). WebApp is an application that can be accessed via a web browser on a network, such as the internet or intranet (Haryanto & Saputra, 2021; Mualim & Putra, 2017).

The operation of the Spy-TBC platform relies on Big Data. A lot of data on the performance and practices of health workers (under the auspices of the Ministry of Health) and officers under the auspices of the Ministry of Social Affairs as a form of coordination in TB eradication efforts are collected, stored, and analyzed through the Big-Data platform. Records of fund allocations set by the center, history of fund allocation activities for TB control by prioritizing clean and proper sanitation and poverty alleviation efforts accompanied by unemployment as a cause of TB and other relevant information (such as social assistance funds for TB eradication) are also included in this data. Spy-TBC can provide a broad picture of TB eradication efforts practices thanks to this extensive and diverse data. In addition, with the help of Big-Data analysis, Spy-TBC can find the latest news trends regarding TB eradication efforts covering the fields of home sanitation to unemployment and poverty as causes of TB every day along with effective consultation practices (preventive efforts) per individual through access to their respective smartphones under health workers (under the auspices of the Ministry of Health). Spy-TBC can also address potential problems or violations such as corruption, collusion and nepotism of

social assistance or budget funds set by the central government (such as the President) to address the increasing prevalence of TB by allowing it to be handled by the KPK (Corruption Eradication Commission) through the assistance of the FeedBack feature, namely by going viral first with direct community assistance (real-time). Therefore, Spy-TBC is able to guarantee clear openness or transparency regarding the use of social assistance funds to their allocation with the aim of reducing the prevalence of TB. In addition, Big-Data helps make better decisions in the process of handling TB by providing the public with accurate and detailed information about the importance of addressing the factors causing the increase in TB, especially in the areas of poor sanitation and poverty accompanied by unemployment in Indonesia. Spy-TBC has great potential to become a milestone in eradicating poverty accompanied by unemployment and poor home sanitation as the root causes of TB through the use of Big-Data under the supervision and certification of the Ministry of Health and the Ministry of Social Affairs and the community directly. The Ministry of Health has provided free treatment for TB sufferers, so the task of the Ministry of Social Affairs is to ensure that families do not fall into poverty due to suffering from TB (Sari, et. al., 2018).

Fig. 7. SMANTUB (anti tuberculosis smartwatch) details

Similar to smartwatches in general, equipped with blood pressure features, oxygen saturation and so on., SMANTUB as an early preventive measure for TB and its invisible transmission is also equipped with a GPS feature in it so that it can track the location of TB sufferers and non-TB sufferers as an early anticipation aid for TB prevention to its transmission wherever it is (especially outside the home or traveling) and based on the Jejamoe shop area and AIoT-Posbindu-PM-TBC as an emergency aid post or area. SMANTUB is equipped with a scannable barcode integrated with Spy-TBC with more complete and effective detailed features to help clients or users. Looking at the case of tin mining corruption by top artists and actors in the country, which also included several officials in early April 2024, it should be a special concern for the government as the leader of the people (especially the Ministry of Social Affairs).

Moreover, the funds disbursed for corruption are fantastic, amounting to 271 trillion Rupiah, not to mention the losses in the form of natural impacts caused by it. The cost of 271 trillion is actually very useful if used in efforts to prevent TB in the country and the problems therein. This fantastic cost is very useful if used to improve the criteria for unhealthy homes along with other root causes that are the root causes of the increasing prevalence of TB, including high unemployment and lack of education (Kenedyati, 2017). The government should pay more attention to tuberculosis cases in Indonesia by increasing innovation and digital-based products that are more useful for the welfare of its people, especially in the fields of health and education. As in the innovation that the author proposed, namely Spy-TBC, which not only integrates the treatment process with efforts to prevent TB through socialization alone. But also to other causal factors as Kenedyanti (2017) stated above in efforts to eradicate TB, namely the problem of healthy homes that

should have proper sanitation to high unemployment and low education in Indonesia along with preventive efforts for patients. Spy-TBC uses AIoT technology with its AI application in the form of Big-Data. For IoT, it uses the chat-GPT feature accompanied by headline news or actual and factual news about TB in the country to the allocation of funds that have been set by the government (whether the allocation of funds has been used properly in efforts to eradicate TB and its prevention or vice versa, or in other words, minimize the possibility of corruption events such as tin corruption in April 2024). The application of AIoT facilitates the provision of actual and factual information with direct monitoring or supervision (real time) by the people regarding the allocation of funds to reduce the prevalence of TB in Indonesia along with its root causes and TCOD. Prevention is wiser than cure. In order to prevent corrupt practices by the government which have been a scourge for the community (such as the 271 T corruption case), Spy-TBC with SMANTUB integrated presents AI in the form of Big-Data in its implementation practices. Spy-TBC is a WebApp designed to realize the synergy and quality of the TB eradication program along with its employee components to the general public with the function of preventing unwanted fund allocation violation practices such as corruption, collusion and nepotism in the allocation of TB prevention funds in the government. In Spy-TBC, Big-Data is an important key for the supervision and certification of health workers who are government employees. Data regarding TB prevention efforts including root causes such as sanitation or unhealthy homes to other patient preventive efforts are also collected in detail by this platform from various central sources, namely the Ministry of Health and the Ministry of Social Affairs to ensure transparency of fund allocation in TB eradication efforts to the entire general public.

The results can be used in making regulations, finding patterns, and the latest news regarding TB handling. Supported by good WebApp features, Spy-TBC guarantees and helps synergy of cooperation and better decision-making between government components (in this case the Ministry, especially the Ministry of Health) and the community to improve the quality and transparency of TB case handling practices to avoid corrupt practices that harm the country. Big data raises the potential for using machine learning to find out where corruption lies in government (Petheram & Mcmahon, 2019; Gautama et al., 2023). SWOT analysis is useful for analyzing the weaknesses and strengths of Spy-TBC based on Posbindu-PM-TBC. Explained in the following table

Table 2. Spy-TBC swot analysis

Strengths	Weaknesses
The use of a sophisticated Smartwatch to detect the spread and transmission of TB called SMANTUB is very helpful in suppressing the prevalence of TB and its spread in the community. By prioritizing the interests of the general public as a whole, Spy-TBC is able to overcome suspicions between the central government and the community that often occur. Through the Streamy-Deepy feature with real-time monitoring, the guarantee of a bureaucracy free from corruption will be guaranteed so that the TB control process (especially the use of social assistance funds for handling TB) runs smoothly without corruption and benefits the country and the people as a whole in it. The features in Spy-TBC also help the community directly in overcoming TB problems (including treatment efforts to enter the realm of poor sanitation causing TB which is based on poverty or low economy) to the threat of death due to TB. By being handled directly by health workers under the auspices of the Ministry of Health and officially certified Ministry of Social Affairs	Problems with technology access may arise in some places (such as remote areas and poor signal), which can hinder the full use of Spy-TBC. In addition, there is the possibility of digital limitations among the community and Kemensos or health cadres, allowing not all practitioners to have access or the ability to use the platform effectively. Therefore, there is a need for adequate technology-based training that allows for maximum support for the sustainability of Spy-TBC in dealing with the problems and health of the people against the threat of TB directly. The creation of the SMANTUB Smartwatch also requires a lot of money for both the product and the services for the SMANTUB design party. Finding sponsors and collaborating with the government (especially in the fields of the Ministry of Health and Kemensos) allows for a solution or way out in the field of costs or fund allocation.

cadres to serve the community without discrimination based on the basic principle of prioritizing the interests of the people and the state through viral actions based on Posbindu-PM-TBC available in the "My-Outlook" feature, Spy-TBC is expected to prevent the practice of corruption, collusion and nepotism that often occurs on the part of the central government and becomes a scourge for civil society. Clear transparency based on Big-Data in Spy-TBC guarantees the maximum development of the country.	
Opportunities	Threats
Through data-based training provided by the government, Spy-TBC is able to improve the professionalism standards of the Ministry of Social Affairs cadres and their health and also their quality to encourage the development of technology based on real-time data monitoring as a whole. This also enables the latest digital innovation in health practices and poverty alleviation indirectly by providing targeted and beneficial TBC social assistance funds. The opening of employment opportunities for civilians in the field of developing or developing Spy-TBC itself, which of course goes through transparent selection, is also a profitable opportunity for the people and the country. It is progress in eradicating unemployment in the young generation in the country.	Spy-TBC collects and stores personal information about practitioners (Ministry of Social Affairs and Health cadres) and their clients (civilians or the general public). Weak regulation coupled with a lack of maximum attention to personal data can compromise data security. The government must ensure that Spy-TBC complies with strict, legally enforced security standards and appropriate privacy policies. Thus, the threat of data hacking by hackers can be minimized quickly and safely (strict training by information security specialists allows Spy-TBC to be guaranteed from disturbing hacker threats).

4. Conclusions

Smartwatch “SMANTUB” integrated Spy-TBC based on AIoT technology in the form of Big-Data and WebApp and location tracking (tracker). AIoT-Posbindu-PM-TBC in the jejamoe café can be used as a cutting-edge tool or technology in early and mature prevention efforts to reduce the prevalence of TB which is currently still high in Indonesia. Digital technology innovation called Smartwatch specifically for controlling TB “SMANTUB” integrated Spy-TBC.

It is expected to be able to overcome problems in the field of health threats in the form of deaths due to TB and control of the population control of the spread and transmission of TB whose existence cannot be predicted. Through sophisticated technology, the smartwatch called “SMANTUB” integrated Spy-TBC is expected to be able to suppress the prevalence of TB along with its transmission and its existence which has been haunting and side by side invisibly in society. Let's together realize Indonesia free from TB in 2030 successfully through SMANTUB integrated Spy-TBC with AIoT and AIoT-Posbindu-PM-TBC together under the auspices of Kedai Jejamoe or Jejamoe Cafe!

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Author Contribution

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