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Social Wellbeing by Design: IT Solution for Children Mental Health Problems in Urban Poverty of Klang Valley

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Abstract

In recent years, Malaysia's urban poverty has been seen as increasingly apparent because of urbanization. Children under the age of 18 are some of the most affected groups in urban poor communities facing a variety of daily problems and challenges. Growing up in this environment ultimately affects their mental health. This study was conducted to investigate children's mental health problems in the urban poverty community of the Klang Valley area. Based on the desk research conducted, we have found children are vulnerable to mental health issues and more susceptible if coming from an urban poverty background. Available intervention systems are insufficient and non-accessible. The main objective of this study is to adapt the soft system methodology for Community IT-Based project. The method involved using action research. Postgraduate students in Information Technology from a public university in Malaysia taking the problem-solving course for information technology had applied the soft system methodology in their group project. Using Soft System Methodology (SSM), the phenomenon is studied to explore the issues systematically, untie hidden relationships of involved stakeholders and suggest an ideal solution. We propose the Public Mental Health Booth with telehealth and online tips services, bridging the gap between children in need of professional help to the professionals themselves. The conceived solution integrates social wellbeing by design, which promotes security and empowerment for a possible positive behavioral change. The main contribution and motivation for this study are

in the form of adaptation of SSM to the local context as a case study in guiding future research and application for Community IT-Based Projects. This research supports Sustainable Development Goals on Quality Education and Good Health and Well-Being.

Keywords: Urban Poverty, Children Mental Health, Wellbeing, Social Wellbeing by Design, Soft System Methodology

Introduction

Since the 1960s, Malaysia has prospered economically. From its humble beginnings in an agricultural-based economy, we now witness Malaysia's ability to provide high-tech services in the knowledge-based economy and compete on a global scale (Yigitcanlar & Sarimin, 2015; Boori et al., 2015). This drives urban expansion as more businesses and industries invest in Malaysia, transforming land use and increasing urban amenities. Naturally, people migrate to the cities for greener pastures (Rashid, 2017).

Klang Valley is a large agglomeration consisting of the Federal Territory of Kuala Lumpur, Gombak, Petaling, Klang, and Hulu Langat (Rashid & Ishak, 2009). It is roughly located in the central part of West Coast Peninsular Malaysia. Klang Valley has been regarded as one of the fastest-growing regions in Malaysia (Rashid, 2017). Rapid urbanization is desirable for a developed country as it can stimulate economic and physical development, offer various job and educational opportunities, as well as better infrastructures among others (Rashid et al., 2014).

Fig. 1 shows the designated Klang Valley area on the map of Peninsular Malaysia.

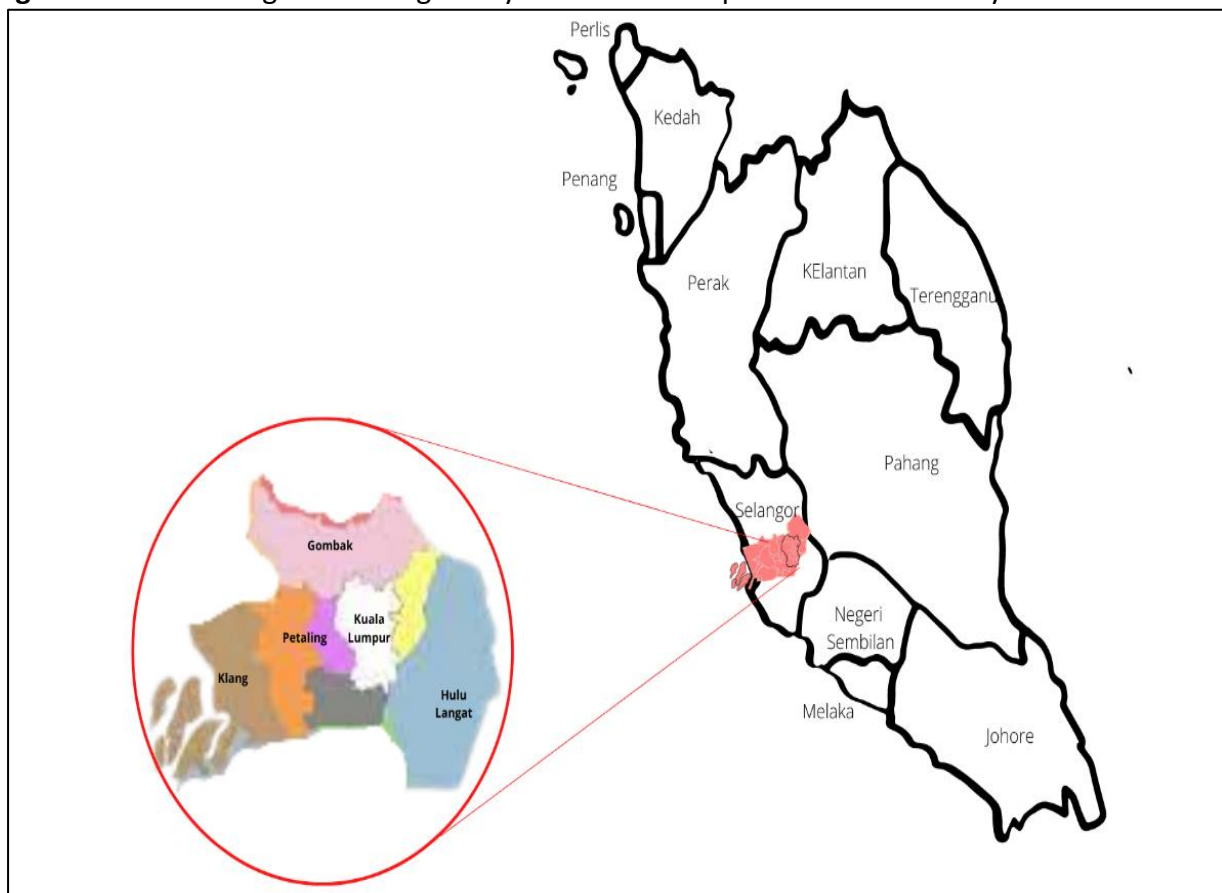


Fig. 1. The location map of the klang valley area

However, with the good comes the ugly – urbanization also means increased cost of living and unfortunately, this increment does not correspond to the earned income. The spiraling cost of living in recent years has seen an economic implication, particularly for the urban poor. They are vulnerable to poverty threat as they are susceptible to lack of income and job opportunities, unable to access public, health, and social facilities and services, as well as lack of social security (Mayan & Nor, 2020).

Excessive urban growth has social and economic consequences which include a lack of health awareness, nutritious food, inaccessibility to land, and transportation, inadequate learning environment as well as a high crime rate (Mayan & Nor, 2020; Siwar et al., 2016; Fowler et al., 2009). Research too has shown the correlation between urbanization and children's mental health and behavioral problems (Sidhu, 2005). According to UNICEF (2018), children under the age of 18 are some of the most affected groups in urban poor communities facing a variety of daily problems and challenges. One such problem is adverse mental health issues (Choudhry et al., 2016; Ahmad et al., 2015, Treanor, 2012) with the issue a growing concern within the Klang Valley area (Mayan & Nor, 2020; Rashid, 2017; Yeap & Low, 2009)

A. Mental Health Among Malaysian Urban Poor Children

“Mental health is the state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community”

(World Health Organisation, 2004)

“Mental health is the capacity of the individual, the group and environment to interact with one another to promote subjective well-being and optimal functioning, and the use of cognitive, affective, and relational abilities, towards the achievement of individual and collective goals consistent with justice”

(Malaysia Ministry of Health, 1997)

The definitions stipulated by the World Health Organisation and Malaysia Ministry of Health indicate that mental health concerns with individual's ability to function well cognitively, emotionally, and relationally whilst also being productive to others around them in achieving collective goals. This means poor mental health can affect a person's mood, thinking, and behavior (Leighton & Dogra, 2009). Prolonged and untreated mental health would negatively affect social relationships, making existing problems worse and worst of all, feeling suicidal (Ibrahim et al., 2017).

We found that research on children's mental health within Malaysia's urban poverty community is lacking, let alone within the scope of the Klang Valley area. With reports inferring Klang Valley's urban poverty rate as significantly high (UNICEF & UNFPA, 2020), more densely populated compared to other states, and addition to statistics of reported mental health and behavioral issues among children is rather high in Klang Valley (National Institutes of Health, Ministry of Health Malaysia, 2019), we believe we can present cases that highlight the adversity of mental health issues engulfing children from urban poverty community.

Children under 18 years of age and coming from urban poverty, often find themselves living in poor environmental conditions. This leads to not only poor health but increased risks of mental health that could last a lifetime (Hodgkinson et al., 2017). Yoshikawa, Aber &

Beardslee (2012) alarmingly attested that urban poverty is correlated to physiological responses to stress, where the longer one is exposed to poverty, the more problematic blood pressure and cortisol levels will be. This in turn causes the child to be more vulnerable and emotional as they are unable to control their stressors. Worst, children with mental health issues find it an extremely alienating experience (Kok & Lai, 2017).

Mental health problems among Malaysian children (5 to 15 years old) show an upward trend (Ahmad et al., 2015). Izuan et al (2018) further found that children from low socioeconomic status have a higher prevalence of mental health issues compared to their peers from higher socioeconomic status. A more recent report from the National Institutes of Health, Ministry of Health Malaysia (2019) provides more detailed findings on the prevalence of mental health and behavioral problems among children. Mayan & Nor (2020) found that the majority of urban poverty communities have family members with medical conditions. They are unable to get formal medical attention due to medical and transportation costs. Hence, they resort to self-care/self-treatment to prioritize expenditure on necessities. This may mean, that children with mental health issues will not get the much-needed care as their families are inundated with various other internal and external constraints.

UNICEF and UNDP (2020) report highlighted that parents from urban poverty communities strongly believe their children's mental state has been affected by the Covid-19 pandemic, which may be worse than the pre-pandemic. This is because, during the lockdown, children are stuck in confined spaces crowded with other home occupants, exasperated with school online lessons where often they miss out due to limited gadgets and internet access, and unable to escape from the hectic home activities brought forth by other house members. They were unable to socialize, mingle and play outside - to behave like children should, resulting in them into a lonely child filled with anguish and desperation.

Based on the aforementioned arguments, it would appear that mental health problems have not shown much improvement since 2010, based on findings by (Teoh, 2010). Even in 2010, Teoh found that children with mental health problems would be aggressive, have social impairments, and can be unruly, which such behaviors were reported by the parents and the children themselves. There are several initiatives in place by relevant ministries such as the placement of counsellors in schools; *Healthy Mind Programme* which promotes behavioral change through motivational talk, and *PROSTAR*, which encourages a healthy lifestyle (Idris, 2017). However, recent reports have highlighted that many urban poverty children are school dropouts meaning, the aforementioned initiatives will not reach them (UNICEF & UNDP, 2020).

The literature showcases strong evidence of poverty's detrimental effects on children's mental wellbeing. For example, Peters (2010) has estimated that children in Malaysia with mental health issues did not receive adequate medical attention. If not addressed, these children will have low self-esteem, poor behavior and social competency, inadequate school performance, and dwindling quality of health (Ahmad et al., 2015). Unfortunately, little attention has been given to facilitating accessible and affordable mental health services to the urban poverty community, more so to the children (Idris, 2017). However, this may also be attributed to the urban poor being reluctant to seek help due to low health literacy, low self-esteem, cost and logistics constraints, social stigma, and even self-blame and self-loathing (Mayan & Nor, 2020; Shahar et al., 2019; Zainuddin & How, 2016; Smith et al, 2013). This also means a different approach to providing help must be ventured that considers privacy, affordability (free), and in-situ.

B. Social Wellbeing by Design

There is a need for more innovative and transformative approaches to addressing mental health problems among children experiencing poverty. Solutions that are children-centric and contextual combined with a comprehensive treatment approach may promote better therapeutic changes and increased engagement. It must also be acknowledged that post-Covid-19 pandemic, the socioeconomic conditions of the urban poverty community has deteriorated where Dr. Rashed Mustafa Sarwar, a representative for UNICEF Malaysia has called for a *“reimagination of social protection for the most vulnerable in Malaysia”* (Malay Mail, 2021)

Technologies are seen as one medium to improve mental health and wellbeing. This possibility is due to well-being being an inherent value that can be adhered to and promoted (Brey, 2015). Sterling et al (2022) have outlined that a good well-being technology should consider (i) the function it serves, (ii) the emotions of the stakeholders, and (iii) promote engaging and sustainable use. Poor balance of utility and emotive experience may lead to user frustration (Shneiderman et al., 2016) and system rejection (Sherkat et al., 2022).

All systems use is geared towards goal achievement. In the context of mental health, part of the goals would be emotional-related goals. Miller et al (2015), highlighted that emotional goals facilitate the sense of worth for which social applications such as public health software systems should have sufficient support (Sherkat et al., 2022). Additionally, Scarpa et al (2021) have suggested *Fun for Wellness* as an approach when using the online-based platform to promote well-being. This is highly relevant to ensure intervention can still be mediated despite physical distances (Wright & Caudill, 2020), as well as more cost-effective and contextual to the user's environment (Lewis et al., 2017).

As people with mental health issues, particularly children are considered a vulnerable group, the technological intervention design must ensure safe usage (Oosterlaken, 2012) and user autonomy, competency, and relatedness (Peters, Calvo & Ryan, 2018). This is because emotional vulnerability comes in layers of affective, social, situational, political, economic, and environmental (Mackenzie et al., 2014). Hence, careful consideration should be in place to ensure that the technology design would not cause further vulnerability to the user when engaging with it (Jacobs, 2020).

Robeyns (2005) listed three conversion factors that should be considered in the content design of a well-being technology: (i) personal conversion factors - internal motivation as well as biological and cognitive abilities of an individual, (ii) social conversion factors – societal norms, cultures, and governance in which one lives, and (iii) environmental conversion factors – environmental conditions of which a person lives in.

This paper has so far presented the issues hurting children from urban poverty and how the emotional, social, and environmental conditions give an effect on their mental wellbeing. We have also presented that technological intervention for mental wellbeing is a promising platform provided proper considerations are in place. Henceforth, this paper moves forward to propose an IT solution to address children's mental health problems in urban poverty of the Klang Valley area.

Methods

The main objective of this study is to adapt the soft system methodology (SSM) for Community IT-Based project. There are growing studies on adapting SSM for community IT-based projects in Malaysia (Isa et al., 2020; Isa et al., 2020). The main objective of this study is to adapt the soft system methodology for Community IT-Based project. The method

involved using action research. Postgraduate students in Information Technology from a public university in Malaysia taking the problem-solving course for information technology had applied the soft system methodology in their group project. This study applies the Soft System Methodology (SSM), an action research method that provides a mediating platform to argue on objectives, needs, purpose, interests, and values of a real-world problem. Using a systemic approach, a complex phenomenon is viewed as a whole and has unique emergent properties (Mehregan et al., 2012). Generally comprising seven steps (Burge, 2015), it allows problem-solving through learning and proposes a solution considered ideal. The seven steps and how it was employed in the study are described in the following sections.

Step 1) Enter the Situation Considered Problematic: The problem phenomenon exploration begins with information gathering. Desk research was conducted to search and gather all the necessary information on mental-health issues in the Klang Valley area with a strong focus on children from the urban poverty community. This work included a summary and compilation of existing research. This approach uses important research resources related to the topic of this study as a source for data analysis. The information collected is used to make informed decisions and discussions. From the desk research, evidence strongly indicates that urban poor children from Klang Valley are vulnerable to mental health problems. It was also found that current solutions are generally inaccessible and costly for the affected community.

Step 2) Express the Problem Situation: As real-world phenomenon is complex, Peter Checkland developed Rich Picture modelling to capture multiple view of the problem situation (Checkland & Poulter, 2020). Using visuals has been proven to be highly effective in representing structural and behavioral properties, whereas written language often comes shortly due to its limitation in facilitating inferences (Bobek & Tversky, 2016). Additionally, Rich Picture serves as a source of inspiration as to what relevant systems could be modeled through the assimilation of relationships and issues. **Fig. 2** illustrates our Rich Picture of the Mental Health issues engulfing the urban poverty children community. It shows children with mental health issues often have emotional and behavioral problems such as anxiety, aggressiveness, and delinquency among others. It also shows that their mental health issues are not addressed well due to poor access to mental healthcare services. The Rich Picture also outlines the relevant system we can undertake to address the problem phenomena which is a new system that is children-centric, affordable, and logistically accessible.

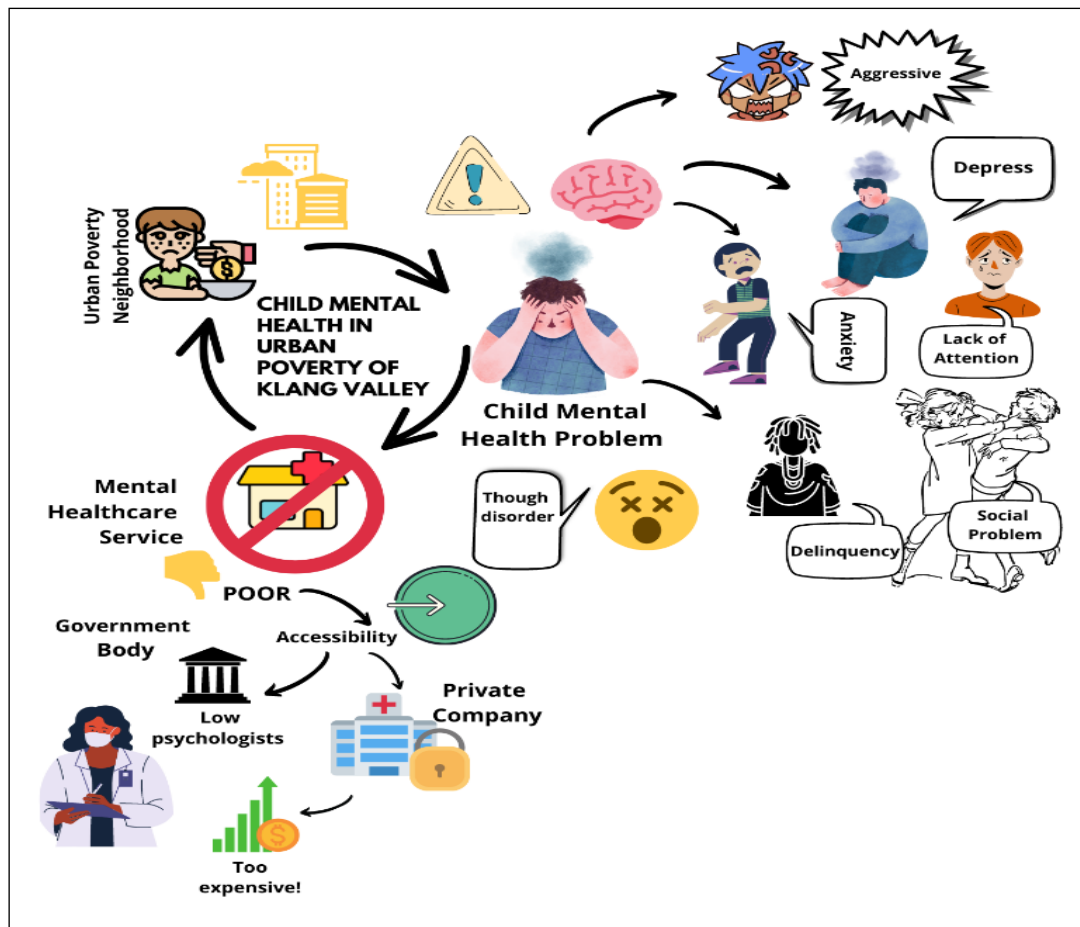


Fig. 2. Rich picture of the problem situation

Step 3) Formulate Root Definitions of Relevant Systems of Purposeful Behaviour: CATWOE mnemonic was used to logically outline the Root Definition of our relevant system identified in the previous step. It concerns the transformation that will be performed by the relevant system.

Proposed General Root Definition for the New Product System for Child Mental Health Problem

This technology needs to be owned by the Malaysia Ministry of Health and need to work together with the psychiatrist/psychologist, computers and software engineers to provide telehealth services for the children of urban poverty in the Klang Valley area. This technology transforms the traditional health treatment into a digital platform which can increase the accessibility and affordability for children to have mental health treatment.

[C] The Customer: Concerns with the transformation recipient. These would be the children from the urban poverty communities of the Klang Valley area

[A] The Actors: The people who would perform the transformative activities should the system be developed. We have identified them to be psychologists or psychiatrists as well as, computers, and software engineers.

[T] The Transformation: The purposeful activity conducted via the system. In the context of our study proposal, this would be the digitalization of mental health treatment

[W] Weltanschauung: German for ‘world view’ symbolizing the values incorporated within the root definition. This would be increased accessibility and affordability of mental health treatment for the children, especially from the urban poverty area of Klang Valley.

[O] The Owner: We stipulate that the Malaysia Ministry of Health would be the wider system decision maker as they would best able to gauge system performance.

[E] Environmental Constraint: The development cost as well as facilitating user empowerment to engage with the system would be the key constraints significant to the proposed system.

Step 4) Build a Conceptual Model of the Proposed Solution: A conceptual model is built to outline the necessary activities to enable the transformation devised in the Root Definition. The representation of the proposed solution is illustrated in **Fig. 3**.

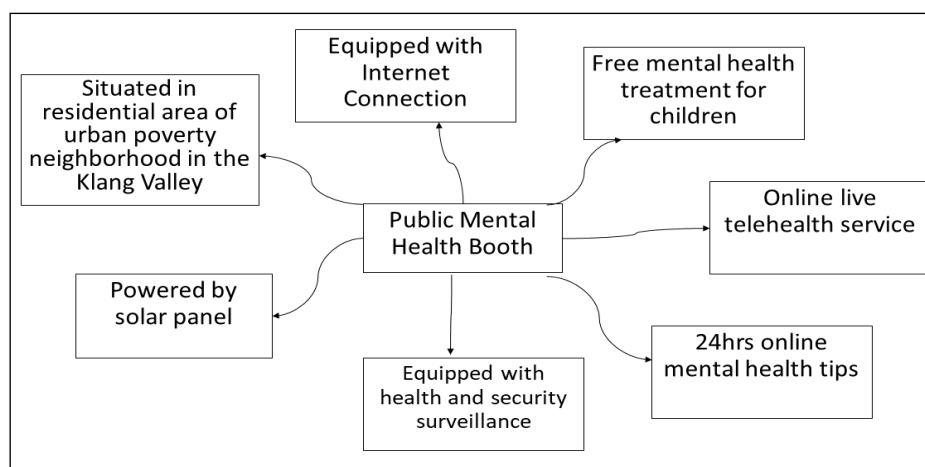


Fig. 3. The conceptual model for public mental health booth

As seen in **Fig. 3**, the New Product System for Child Mental Health Problem (as per root definition) is now phrased as Public Mental Health Booth. It outlines the activities that would make the booth effective, efficient and has efficacy:

- Effective: The system can contribute to higher level goals by being placed in residential area of the urban poverty community, has internet connection, and equipped with health and security surveillance
- Efficient: The system uses minimum resources as it is powered by solar panel
- Efficacy: The system is providing desired results by providing free mental health treatment for children, provides online live telehealth services as well as 24 hours online mental health tips

Step 5) Compare Models with the Real World: In this step, the conceptual model is compared to a real-world situation. The purpose of the comparison is to initiate a discussion on what changes can be observed to improve the situation. This approach uses models to provide a way to see a different view of reality by exploring possible but unfounded assumptions. It is the difference between reality and the logical model that raises questions that will lead to a change in the end. **Table 1** contrasts the difference between what happens in reality to the activities proposed in the conceptual model. It also summarises strategies that could be employed to bridge a reality.

Table 1 Comparison of the conceptual model of the proposed information technology solution with the Real-World Situation

Conceptual Model Elements	Real World	What could we do?
Place the technology in Klang Valley residential area of urban poverty community in	Urban poor families are usually scattered across the various residential areas. The children also face logistic constraints (i.e. lack of public transportation access) to go to the booth which might be located only in a selected urban poverty area.	Locate the booth in every Klang Valley residential area such as bus stops, mosques, or the residential public parks.
Equip the technology with Internet Connection	Some residential area has a poor internet connection	Analyze internet connection stability and determine the best internet implementation such as WIFI or Ethernet Cable.
Provide free mental health treatment for the children	Mental health consultation in public hospitals is free for government servants while some fee is chargeable for non-government servant	Obtain sponsorship from various NGOs for service stipends for consultants. Alternatively, tax exemption can be considered for consultants who volunteer for community service.
Provide online live telehealth service	Requires sufficient psychiatrist to operate each booth and shift hours	Promote the availability of psychiatrist job vacancies. Incentives must also be considered for the graveyard shift.
Provide 24 hours online mental health tips	Requires sustainable internet quota to run the technology for 24 hours	Document the internet quota requirements
Equip with health and security surveillance	Lack of technical staff to perform all booth surveillance	Install CCTV for remote booth surveillance
Power the booth with solar energy	Considering the weather in Malaysia, the PMH booth might not be able to operate well during the monsoon season	Install hybrid power generator. Enable the use of electricity during the monsoon season and use solar power during sunny and clear weather.

Step 6) Define Changes that are both Desirable and Feasible: This stage brings together all prior stages and further analysis is conducted to determine desirable changes and means to make them feasible. The list can be seen in the third column of **Table 1**. The agreement of the final decisions is then transferred to the final stage for implementation.

Step 7) Take Action to Improve the Problem Situation: In this stage, the identified changes that are considered feasible and desirable are implemented. The final form of the proposed IT solutions will be described in more detail in the next section.

Results and Discussions

Children's mental health is a critical health concern within the urban poverty community residing in Klang Valley. Current systems perceived to address this problem are in reality very poor in terms of accessibility and affordability. To solve this impediment, we have proposed a Public Mental Health Booth. Public Mental Health (PMH) Booth is a kiosk equipped with an IT service that can help children navigate their mental health problems. This booth is proposed to increase the accessibility and affordability of mental health treatment. We believe urban poor children particularly those who do not own smartphones or digital devices to access existing online mental health services or have the affordability to travel to the hospital can benefit from this kiosk. The PMH Booth is proposed to be placed in every Klang Valley residential area considering that urban poverty community is typically scattered across different residential areas.

The proposed design would support the Door2Door (D2DD) Doctor service initiative which at present addresses issues of patients, incapability to go to hospitals due to economic factors (Chee, 2015) as well as to better facilitate access to mental health care. As direct removal from urban poverty may seem unlikely, a coping mechanism by empowering children's ability to manage their mental health and wellbeing should be realized from the early childhood period (Shahar et al, 2019). Placing the kiosk within the community ensures that the children can still get help whilst remaining in a familiar environment, enabling community integrated care as encouraged by (World Health Organisation, 2004).

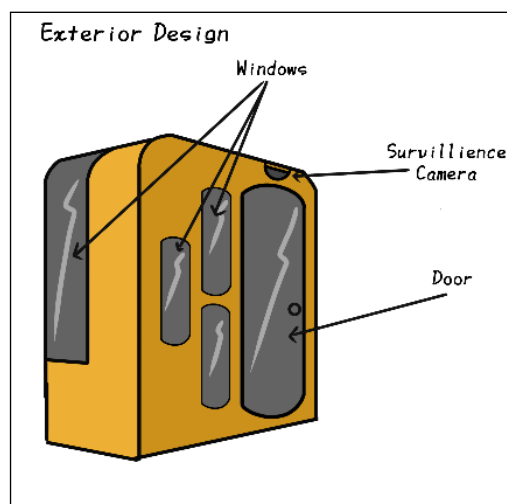


Fig. 4. The Exterior Design Concept of the Public Mental Health Booth

Fig. 4 shows the exterior design of the PMH Booth. Its container-like design ensures user privacy when using the Booth. It has tinted windows where the user can have an outside view to avoid a claustrophobic experience. Asians are found to be more reserved to discuss mental health issues due to the stigma associated with it. Moreover, the negative perceptions of the surrounding community can be overbearing should they know one is seeking help (Hassan, Mohd Hassan, Kassim & Hamzah, 2018). Hence, the design of the booth ensures privacy from prying eyes. It is equipped with CCTVs on the outside to monitor vandalism as

well as to capture video feeds in instances of an abusive family member who might come to disturb the children who are using the booth. The image feed can be sent to authorities via internet connection for immediate situation control.

The PMH Booth is equipped with internet connectivity to enable the children to fully utilize the telehealth service and online mental health tips software application. The booth is also powered by solar and electric energy, where the former is in use during the sunny season while the latter, is during the monsoon season. This ensures the Booth will be accessible and functional be it rain or shine.

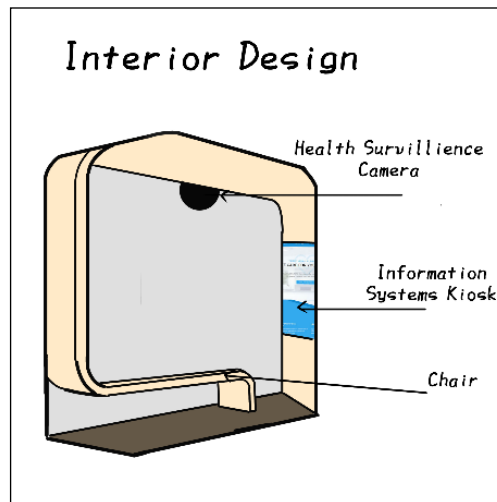


Fig. 5. The interior design concept of the public mental health booth

Fig. 5 illustrates the interior of the PMH Booth. A chair is provided for user comfort whilst an interior surveillance camera serves as user monitoring. This is used to capture user mood and make health assessments to mitigate any unnecessary scenarios such as extreme anger, anxiety, or suicide attempt.

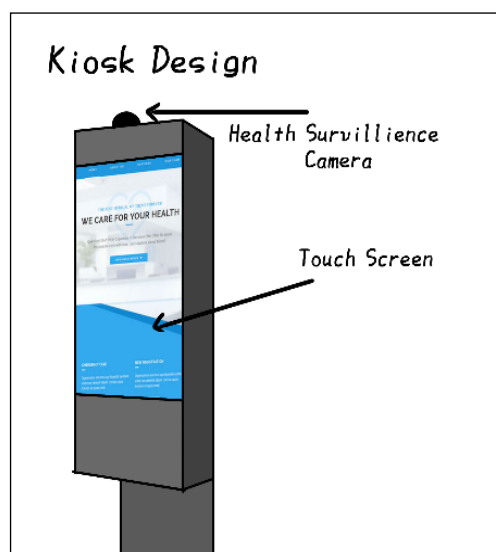


Fig. 6. The kiosk design concept which resides inside the public mental health booth

Fig. 6 on the other hand is the close-up view of the Information System Kiosk seen in **Fig. 5**. This telehealth feature enables children to seek help regarding their mental health problems

by communicating with the psychologist through the kiosk. It also comes with software that provides online mental health tips and information that should be approved and verified by a certified psychiatrist or psychologist.

We have considered the “Capability Approaches to Design” (Oosterlaken & van den Hoven, 2012) where the design and features facilitate users’ basic capabilities to manage their wellbeing. Simply put, the technology enhances user capabilities to achieve wellbeing. In doing so, engaging with the kiosks only requires basic capabilities to engage with content such as following instructions, expressing feelings verbally, and reading content. The decision to make the change based on advice and suggestions given via the online mediation is also based on the user’s decision. Largely, this is due to the constraints presented by the design where no mandatory progress is physically possible. However, as the artifact is environmentally contextual, serving as a motivation to use, extended engagement is plausible. Nussbaum (2003) argued that humans are essentially capable of life, bodily health, emotion, reasoning, play, affiliation, and environmental control and they would exercise actions to achieve those capabilities. Capability Approaches to Design focus on the utility of the artifact and product use is believed to have a much more lasting effect (Brey, 2015).

We believe our proposed design offers several productive benefits:

1. Increased Accessibility for Mental Health Treatment for the Children.

The PMH Booth is proposed to be situated in the residential areas of the Klang Valley, particularly within the radius of the urban poverty community. Thus, the children would have better treatment accessibility instead of spending time and money to travel out of the residential area to go to the hospital. It also compensates for the conventional practice of mental health agencies or community clinics which normally runs during business hours and appointment queues. Children would have better flexibility on preferred timing and their readiness to seek help. This also helps address the issue highlighted by Jaffar et al., (2010) where it was found that the majority of children were not aware of the availability of mental health services as it is usually not in-situ.

2. Increase Affordability of Children’s Mental Health Treatment

This booth provides free access to children, primarily those from urban poverty communities. The children can use the kiosk by inserting their MyKID cards. The use of the MyKID is to help the PMH Booth identify the patient’s age. The CCTV also features AI technology for facial detection to validate if indeed the end-user is a child. This is because, despite being designed for children, other age groups are also able to use the PMH Booth with minimal charges. They can swipe their bank card or the “Touch n Go” smartcard. The chargeable fees would be similar to the fees stipulated by government agencies.

3. Reduce Mental Health Problems among Urban Poverty Children

The telehealth service allows communication with a certified psychiatrist or psychologist. Moreover, an online software containing validated mental health information and tips is also provided. Together it promotes better mental healthcare accessibility and affordability henceforth reducing affiliated mental health issues. The in-situ design and afforded a sense of connection (Kok & Lai, 2017) approach would promote and empower children to prioritize their mental

health needs. The physical presence of the psychiatrist or psychologist is facilitated through online interaction. Studies by Nicholas et al., (2012) found that online intervention is still capable to facilitate social support and reduce the feeling of alienation.

4. Facilitating Trusts Between Medical Health Providers and Children-Patients

The PMH Booth design which promotes privacy and personalization can create a trusted setting as it facilitates a better communication medium between the service provider and receiver. Despite taking the form of a kiosk, it nevertheless serves as an entryway for health providers to provide much-needed intervention to the young minds.

Conclusion and Future Studies

Malaysian urban poverty is exacerbated by the effects of urbanization. Children under the age of 18 are some of the most affected groups in poor urban communities facing a variety of daily problems and challenges. Growing up in this area ultimately affects their mental health. This paper calls for the need to re-examine how mental well-being among children requires attentive planning and design. The complexity of the urban poverty-related environment, the fragility of children's mental well-being, and economic anxiety necessitate a humane approach to social wellbeing by design. We found evidence that children particularly those affected by urban poverty do have significant mental health problems related to anger, depression, delinquency, withdrawal, anxiety, mental disorders, attention span, and social problem. We also found that the current system to address this issue has poor accessibility and affordability. This problem situation is identified using Soft System Methodology and as a result, The Public Mental Health Booth is proposed to help alleviate the problem. It is designed to provide free mental healthcare to children via telehealth services and mental health tips. With the booth located directly within Klang Valley residential areas, it promotes better affordability and accessibility. The overall design is believed to have the capability to support sustainable urban growth policy.

Improving children's mental health and well-being is not solely about achieving Sustainable Development Goals, but mostly it is to reduce the future societal problems for a better emphatical and humanistic future for all. For the next course of study, we intend to evaluate user engagement and accessibility to the well-being content provided via the kiosks. This would probe information design to cater to understanding, readability, and most importantly, correct information perception. Additionally, we would like to assess the attrition rate as we acknowledge that wellbeing support is not a one-time interaction but an ongoing process. Hence, there is a need to explore how to motivate sustainable participation whilst promoting positive and permanent behavioral change. The main contribution and motivation for this study are in the form of adaptation of SSM to the local context as a case study in guiding future research and application for Community IT-Based Projects. This research supports Sustainable Development Goals on Good Health and Well-Being and Quality Education. The research provides awareness for the postgraduate students about the situations of the targeted community.

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References

- Ahmad, N., Yusoff, M. F., Ratnasingam, S., Mohamed, F., Nasir, N. H., Sallehuddin, M. S., Naidu, M. B., Ismail, R., & Aris, T. (2015). Trends and factors associated with mental health problems among children and adolescents in Malaysia. *International journal of culture and mental health*, 8(2), 125-136.
- Bobek, E., & Tversky, B. (2016). Creating visual explanations improves learning. *Cognitive research: principles and implications*, 1(1), 1-14.
- Boori, M. S., Netzband, M., Choudhary, K., & Vozenilek, V. (2015). Monitoring and modeling of urban sprawl through remote sensing and GIS in Kuala Lumpur, Malaysia. *Ecological Processes*, 4(1), 1-10
- Brey, P. (2015). Design for the value of human well-being. *Handbook of ethics, values, and technological design: Sources, theory, values and application domains*, 365-382.
- Burge, S. (2015). An overview of the soft systems methodology. *System Thinking: Approaches and Methodologies*, 1-14.
- Checkland, P., Poulter, J. (2020). *Soft Systems Methodology*. In: Reynolds, M., Holwell (Retired), S. (eds) *Systems Approaches to Making Change: A Practical Guide*. Springer, London
- Chee, J. (2015). "We Welcome Competitors": M'sian Doctor Launches A Startup To Disrupt The Healthcare System. *Vulcan Post*.
- Choudhry, F. R., Mani, V., Ming, L. C., & Khan, T. M. (2016). Beliefs and perception about mental health issues: a meta-synthesis. *Neuropsychiatric disease and treatment*, 12, 2807.
- Fowler, P. J., Tompsett, C. J., Braciszewski, J. M., Jacques-Tiura, A. J., & Baltes, B. B. (2009). Community violence: A meta-analysis on the effect of exposure and mental health outcomes of children and adolescents. *Development and psychopathology*, 21(1), 227-259.
- Hassan, M. F., Hassan, N. M., Kassim, E. S., & Hamzah, M. I. (2018). Issues and challenges of mental health in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 8(12), 1685-96.
- Hodgkinson, S., Godoy, L., Beers, L. S., & Lewin, A. (2017). Improving mental health access for low-income children and families in the primary care setting. *Pediatrics*, 139(1).
- Ibrahim, N., Sidik, M. S., Phang, C. K., Mukhtar, F., Awang, H., Ang, J. K., Osman, J. Z., & Ab Ghaffar, S. F. (2017). Prevalence and predictors of depression and suicidal ideation among adolescents attending government secondary schools in Malaysia. *Medical Journal of Malaysia*, 72(4), 221-227.
- Idris, I. B. (2017). Emotional and behavioural problems among children: Issues and trends in Malaysia. *International Journal of Public Health Research*, 7(2), 829-835.
- Izuan, A. Z., Azhar, S. S., Tan, M. K. S., & Syed-Sharizman, S. A. R. (2018). Neighbourhood influences and its association with the mental health of adolescents in Kuala Lumpur, Malaysia. *Asian journal of Psychiatry*, 38, 35-41.
- Jaafar, A., Muhammad, N. A., Radzniwan, M. A. R., Daud, M. T. I., Musa, R., Omar, K. (2010). Barriers to the utilization of primary care services for mental health problems among

- adolescents in a secondary school in Malaysia. *Malaysian family physician: the official journal of the Academy of Family Physicians of Malaysia*, 5(1), 31.
- Jacobs, N. (2020). Capability sensitive design for health and wellbeing technologies. *Science and engineering ethics*, 26(6), 3363-3391.
- Kok, J. K., & Lai, W. Y. (2017). Not myself and the connected self: Cases of youth depression and recovery in Malaysia. *British Journal of Guidance & Counselling*, 45(1), 32-41.
- Leighton, S., & Dogra, N. (2009). Defining mental health and mental illness. *Nursing in child and adolescent mental health*, 7-18.
- Lewis, B. A., Napolitano, M. A., Buman, M. P., Williams, D. M., & Nigg, C. R. (2017). Future directions in physical activity intervention research: expanding our focus to sedentary behaviors, technology, and dissemination. *Journal of behavioral medicine*, 40(1), 112-126.
- Mackenzie, C., Rogers, W., & Dodds, S. (2014). Introduction: What is vulnerability and why does it matter for moral theory. *Vulnerability: New essays in ethics and feminist philosophy*, 1-29.
- Mayan, S. N. A., & Nor, R. M. (2020). The Resistance of the Urban Poor in Selangor, Malaysia to Get Out of the Shackles of Poverty. *Int. J. Acad. Res. Bus. Soc. Sci*, 10, 602-611
- Mehregan, M. R., Hosseinzadeh, M., & Kazemi, A. (2012). An application of soft system methodology. *Procedia-Social and Behavioral Sciences*, 41, 426-433.
- Miller, T., Pedell, S., Lopez-Lorca, A. A., Mendoza, A., Sterling, L., & Keirnan, A. (2015). Emotion-led modelling for people-oriented requirements engineering: the case study of emergency systems. *Journal of Systems and Software*, 105, 54-71.
- Ministry of Health. (1997). National Health and Morbidity Survey. Kuala Lumpur: Public Health Institute
- National Institutes of Health, Ministry of Health Malaysia. (2019). *National Health and Morbidity Survey 2019. Technical Report – Volume 1. NCDs – Non-Communicable Diseases: Risk Factors and other Health Problems*. (Publication No. MOH/S/IKU/144.20(TR)-e).
- Nicholas, D. B., Fellner, K. D., Frank, M., Small, M., Hetherington, R., Slater, R., & Daneman, D. (2012). Evaluation of an online education and support intervention for adolescents with diabetes. *Social Work in Health Care*, 51(9), 815-827.
- Nussbaum, M. (2003). Capabilities as fundamental entitlements: Sen and social justice. *Feminist economics*, 9(2-3), 33-59.
- Oosterlaken, I. (2012). Inappropriate artefact, unjust design? human diversity as a key concern in the capability approach and inclusive design. In *The capability approach, technology and design* (pp. 223-244). Springer, Dordrecht.
- Oosterlaken, I., & Van den Hoven, J. (2012). The Capability Approach, Technology and Design, *Philosophy of Engineering and Technology*.
- Peters, D., Calvo, R. A., & Ryan, R. M. (2018). Designing for motivation, engagement and wellbeing in digital experience. *Frontiers in psychology*, 9, 797.
- Peters, H. (2010). Mental health: Special needs and education. *Asean Journal of Psychiatry*, 11(1; June), 1-7
- Rashid, M. F. A. (2017). Characteristics, trends and spatial distribution of urban migration in Malaysia: A case study of the Klang Valley region. *UPLanD-Journal of Urban Planning, Landscape & environmental Design*, 2(2), 107-127.

- Rashid, M. F. A., & Ishak, A. G. (2009). The importance of internal migration: in the context of urban planning decision making. In *International Conference on Built Environment in Developing Countries, Penang Malaysia* (pp. 2-3).
- Rashid, M. F. A., Ab Ghani, I., Ngah, I., & Yasin, S. M. (2014). EVALUATION OF MIGRATION DECISION-SELECTIVITY FACTORS IN METROPOLITAN AREA: A CASE OF KLANG VALLEY REGION, MALAYSIA. *e-BANGI*, 9(1), 34.
- Robeyns, I. (2005). The capability approach: a theoretical survey. *Journal of human development*, 6(1), 93-117.
- Scarpa, M., Prilleltensky, I., McMahan, A., Myers, N., Prilleltensky, O., Lee, S., Pfeiffer, K., Bateman, A. G., & Brincks, A. M. (2021). Is fun for wellness engaging? Evaluation of user experience of an online intervention to promote well-being and physical activity. *Frontiers in Computer Science*, 3, 59.
- Shahar, S., Lau, H., Puteh, S. E. W., Amara, S., & Razak, N. A. (2019). Health, access and nutritional issues among low-income population in Malaysia: introductory note. *BMC Public Health*, 19(4), 1-5.
- Sherkat, M., Miller, T., Mendoza, A., & Burrows, R. (2018). Emotionalism within People-Oriented Software Design. *arXiv preprint arXiv:1810.12547*.
- Shneiderman, B., Plaisant, C., Cohen, M. S., Jacobs, S., Elmqvist, N., & Diakopoulos, N. (2016). *Designing the user interface: strategies for effective human-computer interaction*. Pearson.
- Sidhu, A. S. (2005). The rise of crime in Malaysia: An academic and statistical analysis. *Journal of the Kuala Lumpur Royal Malaysia Police College*, 4(1), 17-28.
- Siwar, C., Ahmed, F., Bashawir, A., & Mia, M. S. (2016). Urbanization and urban poverty in Malaysia: consequences and vulnerability. *Journal of Applied Sciences*, 16(4), 154-160.
- Smith, L., Li, V., Dykema, S., Hamlet, D., & Shellman, A. (2013). "Honoring somebody that society doesn't honor": Therapists working in the context of poverty. *Journal of Clinical Psychology*, 69(2), 138-151.
- Sterling, L., Pedell, S., and Craig, C. (2022) Editorial: Designing Technology for Emotions to Improve Mental Health and Wellbeing. *Front. Comput. Sci.* 4:898839
- Teoh, H. J. (2010). A survey of urban child and adolescent mental health problems in an urban Malaysian population. *Malaysian Journal of Psychiatry*, 19(1).
- Treanor, M. (2012). Impacts of poverty on children and young people. Scottish Childcare and Protection Network Research Briefing, Edinburgh.
- The Office of WB Wong Chen. (2017). Doubly Disadvantaged: Investigating Mental Health and Poverty. <https://www.wongchen.com/wp-content/uploads/2017/08/Doubly-Disadvantaged-Investigating-Mental-Health-and-Poverty.pdf>
- UNICEF & UNDP (2020). Families on the Edge (Report). Available at: <https://www.unicef.org/malaysia/families-edge>
- UNICEF. (2018). *Children Without; A Study of Urban Child Poverty and Deprivation in Low-Cost Flats in Kuala Lumpur*. United Nations Children's Fund, Malaysia. <https://www.unicef.org/malaysia/reports/children-without>
- Mohd Isa, W. A. R., Noordin, N., Suhaimi, A. I. H., Ismail, I. N., Mahat, S. R., Abdul Aziz, N. S., Tumin, M., & Yaakob, M. N. H. (2020). Framing soft system methodology in community it-based project: case of asnaf. *International Journal of Advanced Science and Technology*, 29(6 Special Issue), 1580-1587.
- Isa, W. M. W. A. R., Suhaimi, A. I. H., Noordin, N., Safiq, M. S., Azmi, W. N. N., Norham, N. A., & Hammami, S. (2020). Applying soft system methodology in community it-based

- project: case of poverty tramps. *International Journal of Advanced Science and Technology*, 9(1.4), 131-137. <https://doi.org/10.30534/ijatcse/2020/2091.42020>
- World Health Organization. (2004). *Promoting mental health: concepts, emerging evidence, practice (Summary Report)* Geneva: World Health Organization; 2004
- Wright, J. H., & Caudill, R. (2020). Remote treatment delivery in response to the COVID-19 pandemic. *Psychotherapy and Psychosomatics*, 89(3), 1.
- Yeap, R., & Low, W. Y. (2009). Mental health knowledge, attitude and help-seeking tendency: a Malaysian context. *Singapore Med J*, 50(12), 1169-1176.
- Yoshikawa, H., Aber, J. L., & Beardslee, W. R. (2012). The effects of poverty on the mental, emotional, and behavioral health of children and youth: implications for prevention. *American Psychologist*, 67(4), 272.
- Yigitcanlar, T., & Sarimin, M. (2015). Multimedia Super Corridor, Malaysia: knowledge-based urban development lessons from an emerging economy. *Vine*.
- Zainuddin, N. F. A. B. M., & How, V. (2016). The Disparities of Environmental Health Awareness Among Rural-Urban Community in Klang Valley, Malaysia. *Indian Journal of Environmental Protection*, 36(10), 818-825.