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RESEARCH ARTICLE

Integrated Management Model of Malaysian Private Tahfiz Centers for User Acceptance Satisfaction by Using Linear Regression

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ABSTRACT

Tahfiz education is popular and accepted in Malaysia. Today, tahfiz centres and modern institutions offer it. Since these Islamic entities fulfil sacred religious obligations, good governance and accountability are essential. Modern Malaysian Islamic education requires innovative technology for Tahfiz education and administration. Tahfiz learning management is hampered by a lack of resources, infrastructure, and facilities. No model has been implemented to organise tahfiz institutions for better management. This study evaluates the Integrated Management Model of Malaysian Private Tahfiz Centres (I3M-Tahfiz) for practical education satisfaction efficiency. User satisfaction will be prioritised when implementing the I3M-Tahfiz Model at a random Malaysian Tahfiz institution. The framework implementation uses the subjective approach algorithm to calculate user Mean Opinion Score (MOS) from a user acceptability review study. A Tahfiz institution that prioritises QoE will likely gain community support and engagement. This can boost enrollment, donations, and word-ofmouth, expanding the institution's reach. After establishing MOS and Resource, linear regression is used to determine the relationship between user acceptability and a major tahfiz efficiency factor. MOS results show 78% relationship between user acceptability and I3M-Tahfiz frameworks. In conclusion, I3M-Tahfiz encompasses spiritual growth, efficient memorization, customised instruction, community support, long-term student effects, technology integration, flexibility, global competency, and education leadership.

Keywords: I3M-Tahfiz, Integrated management model, Mean opinion score, Tahfiz centers, User acceptance, Quality of experience

Introduction

One of the major tenets of Islam is the study of the Al-Quran. It begins with mastering the fundamentals of understanding *hijaiyah* letters, spelling, reading, and tajwid law, along with finishing the Al-Qur'an.

The primary foundation that needs to be developed before examining further Al-Quran knowledge is exposure to the early stages of Al-Quran education.[1] The main objective of Al-Quran instruction is to instill in individuals a sense of devotion to Allah SWT. The primary goal of the tahfiz study is al-if, which implies

that students should be able to remember the Qur'an without consulting the following *mushaf alwa'iy*, appreciate and comprehend the verses being read, and reflect on them in their souls. Without glancing at the book, pupils can reread the learned words after Istirja' according to the letters, lines, and other details.[2] Those who are adept at these three techniques can effectively remember the Quran. There are more than 278 tahfiz educational institutions in Malaysia, of which 14 are government-owned, and the remainder 254 are privately owned and registered under JAKIM, according to data sources provided by the Islamic Religious Department of Malaysia (JAKIM), and the number is rising every year.[3]

Tahfiz institutions are currently getting popular and becoming parents' first option for their children, intending to produce youngsters of excellent character and exceptional personalities in addition to understanding the Quran. The development also happened in every state of Malaysia with the existence of such institutions so much that it cannot be fully monitored by the party, especially the Malaysian Department of Religion. If parents want to send their kids to study tahfiz but believe that the federal or state governments cannot satisfy their wishes, then private Tahfiz Centers are the best option. Thus, the government's criteria must be satisfied following the Education Policy National Tahfiz, and the empowerment of unregistered private tahfiz facilities is considered crucial today.[4]

One of the challenges of tahfiz institutions is the non-uniform curriculum system does not synchronize with every private tahfiz management. The selection and arrangement of the appropriate curriculum play an essential role in producing a generation of quality tahfiz. In addition, the facility provided by Tahfiz Center or the institution does not meet the minimum requirements or school standards for learning purposes. To carry out tahfiz institution planning smoothly, it needs sufficient resources and diverse finances. This is because, if there are financial problems, it will impact administrative management, curriculum planning, student affairs, and co-curriculum development of the tahfiz institution.

A more resounding impact on financial issues in tahfiz institutions is well felt since the problem of the Covid-19 epidemic has spread to this country. The main challenge is due to the lack of financial resources, especially during the MCO period, and this is troubling the management, especially in paying staff salaries.

A comprehensive framework that addresses technological integration—the efficient application of technology in education—can help address all of these issues. A proposed tahfiz framework refers to the use of technology, such as interactive teaching tools, online resources, or remote learning opportunities, to improve the learning process. Next is community engagement and support within a tahfiz institution that prioritizes QoE is likely to gain the support and engagement of the community. This can lead to increased enrollment, financial support, and positive word-of-mouth, further enhancing the institution's impact and reach.

The rest of the paper is structured as follows. Section II presents the literature review of this study. Section III proposed a framework that caters to user satisfaction and the factor regarding the integrated tahfiz management system, and Section IV defines the experiment setup and final result for this study. Lastly, conclusions are drawn in Section V.

Literature review

Amid the excitement of establishing a private Tahfiz Center, some issues must be addressed and improved to ensure the long-term viability of these facilities in Malaysia. Most private tahfiz facilities and the private sector are heading in this direction, resulting in a lack of standardization in tahfiz learning techniques.[5] This results in the learning process being carried out solely based on the instructor's expertise, rather than any set and organized method. A study by Yuslina *et al.* emphasized the challenges encountered by the Tahfiz Center and proposed that the Tahfiz Center development plan and initiative be reinforced further to be viewed as capable of benefitting and generating excellent tahfiz goods that can be embraced in the market and society.[6] In addition, according to Mardhiah *et al.* to identify factors that can contribute to this Tahfiz Center not being as competitive as any mainstream education center.[7] It began with poor education administration, which finally led to inconsistencies in the curriculum and teaching techniques standards in the Tahfiz Center.[7,8]

The process of establishing user profiles based on their experiences, preferences, or behaviors may be involved if "QoE profiling" is used to evaluate or analyze the quality of experience in a particular setting. For instance, QoE profiling in the context of streaming services could entail figuring out how various users perceive buffering, overall satisfaction, and video quality to customize services to satisfy a range of user requirements. Regarding QoE profiling for user satisfaction with the research's suggested approach. This study employed for analyzing By fitting a linear equation to the observed data, the statistical technique known as linear regression is used to model the connection between a dependent variable and one or more independent variables.

According to Sharini, one source of weakness in the tahfiz teaching process is teachers who continue to employ the old teaching style. [9] When the tahfiz teacher himself does not have the requisite specialized skills in tahfiz college, this can be one of the challenges to getting the teaching and learning process systematic in Tahfiz Centers. Another encounter of the Tahfiz Center is that efficient governance would engage in responsible actions, policies, or programs to fulfill accountability to diverse stakeholders to maximize institution performance and deliver outcomes. Furthermore, it is difficult to verify that the activities are following the requirements of the law, rules, standards, and community expectations. However, many factors contribute to the influence of the selection of tahfiz as the choice of education standard for the future of Malaysian students. This study also acknowledged that many factors could frequently impact change throughout the analysis course, meaning that a tahfiz model capable of delivering prediction results would be ideal. This paper's research is intended to answer three key questions.

1. Which variables may have an impact on the Tahfiz Center's stakeholder selection process?
2. How might those elements be used by the Tahfiz Center to estimate student outcomes in predictive models?
3. Within the tahfiz learning population, how can the tahfiz center use projected models to successfully sustain student success rates?

Integrated management model of Malaysian private Tahfiz Centers (I3M-Tahfiz) framework propose

Expressed in different terms, integrated management is a comprehensive, intelligible, and open management system. Exhaustive indicates that all organizational operations are covered, standards are accepted and understood by all people in the organization, and available means competent management is attainable. One classification can be re-evaluated by superiors. The model formulation for this suggested paper contains three phases, which are the important required entity about the government, ministry of education, state government, and all engaged players.

Fig. 1 shows there are several entities involved in the IM-Tahfiz Model. These entities and all the elements will be explained further as follows:

A. Initial stage

The first stage is the Malaysian government will support the continuation of tahfiz education at the broad level. The stakeholders and government give feedback to each other for assessing the holistic tahfiz education. Then the Ministry of Education and The Department of Malaysian Islamic Advancement (JAKIM) discussed, organized, and created tahfiz education policies regarding the integrated model for private tahfiz education. Both of these organizations are critical to the development and management of tahfiz education.

Following that, the Malaysian state government, including the state Islamic department, oversees the tahfiz education system. The effort must also include managing processes and procedures and planning how the education necessity must be implemented. This involvement layer consists of the institutions, colleges, and schools using the I3M-Tahfiz paradigm. This study will not cover any of the government's in-depth education characteristics and models.

B. Execution stage

The second stage begins with the tahfiz institution being given by the state govt with three essential elements that are important to the stability and the efficiency of the Tahfiz Center to function correctly; financial, human resource, and facility. For the financial health of the Tahfiz Center, the Malaysian government and state government must play the leading role in supporting the continuation of tahfiz education. Other government agencies and private also must take responsibility for the Tahfiz Center to function well.

As for human resources, there should be a special program to ensure that teaching staff and principals meet minimum qualifications and moral standards. Because these tahfiz students usually 'set sail,' the teaching staff influences not only the students' memorization and knowledge of the Qur'an but also their ethics and personalities. Financially, most Tahfiz Centers are funded by parents' subscription charges and public donations/waqf. Inconsistent payment of fees and donations, combined with Tahfiz Centers with no side income, contribute significantly to the crisis that threatens the lives of the Tahfiz Centers involved. The financial element is critical and it will lead to the other components working well and being stable.

Then all these elements will be integrated with the proposed management elements that work out the Tahfiz Center problems; involvement, unity, equality, accountability, transparency, and Islamic legal compliance. Every aspect relatively has a relationship with the elements of the Tahfiz Center elements; financial, human resource, and facility, to establish a good and efficient tahfiz management center.
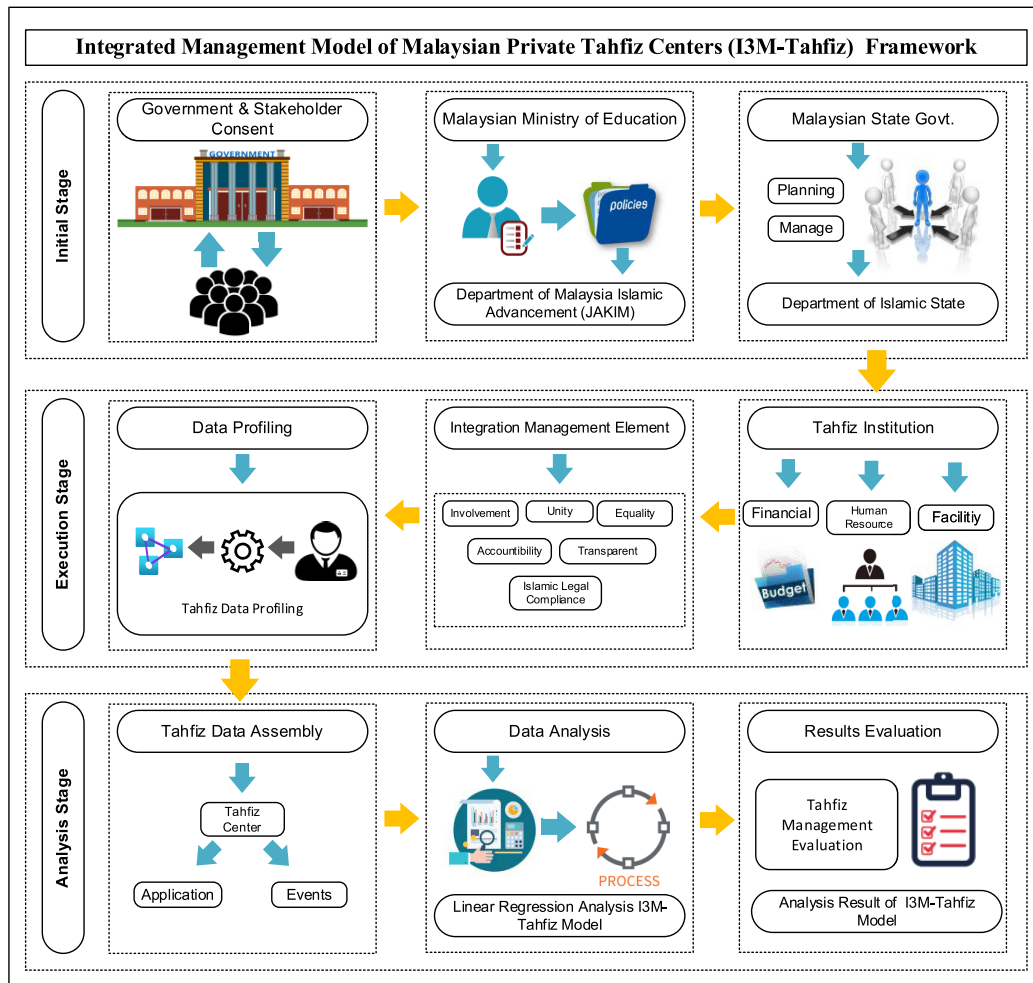
Fig. 1. Propose integrated management model of Malaysian private Tahfiz Centers (I3M-Tahfiz) framework.

Following is data profiling, which is required for model evaluation, and this is where the initial raw data is gathered. These data will be converted to appropriate parameters based on what modeling suits the finalized data. Data parameters such as management financial, management resources, and other conceivable variables directly impact data collection management.

Subjective Tahfiz Center profiling quality assessment is accomplished by presenting specific stimulations to human subjects to obtain results or user feedback on profiling quality assessment. There are typically two methods for achieving profiling quality: objective and subjective.[10] Combining the two approaches will assess quality subjectively; context-aware measurement approaches and direct metrics methods will be used.[11] Because data is explicitly captured from the user's point of view, this technique is somewhat accurate.[12] Both data profiling will be divided into two categories; application and event. The application depends on past and previous data

with numerical values, such as the candidate or on-site facility data. On the other hand, the event data is obtained depending on the data collection in real-time. This study combines the technique for obtaining profiling results from the user's perspective with the capability of the Tahfiz Center.

Tahfiz Profiling Definition 1. A context feature defines user values concerning the profiling capability module; financial. The first primary attribute is the user's or respondent's attitude toward the efficiency of the Tahfiz Center. Integrated management characteristics in the Tahfiz Center determine the element.

$$financial_{Def1} = \{PE_{min}, \ PE_{med}\ldots.PE_{max}\}$$

$financial_{Def1}$ is defined as the data profiling from tahfiz financial component. PE_{min} can be described as the minimum profiling elements from the integration management such as the involvement of facility assets from the financial point-of-view.

Tahfiz Profiling Definition 2. A context characteristic defines user values with the profiling capability module; human resource. The first important attribute is the user's or respondent's attitude about Tahfiz Center's efficiency. Integrated management qualities in the Tahfiz Center govern the part.

$$human\_resource_{Def2} = \{PE_{min}, \ PE_{med} \ldots .PE_{max}\}$$

$human\_resource_{Def2}$ is defined as the data profiling from tahfiz financial component. $\{PE_{min}, \ PE_{med} \ldots .PE_{max}\}$ can be described as the minimum number, average, and highest number of profiling elements from the integration management, such as the transparency of the staff hires approval depending on the high certification obtained or suitable qualification.

Tahfiz Profiling Definition 3. A specific context is the user values with the profiling capability module; facility. The vital attribute in this equivalence is the user's or respondent's viewpoint about the Tahfiz Center's efficiency towards the facility established in the Tahfiz Center and whether it met the minimum requirement. This tahfiz profiling definition can be described as follows.

$$facility_{Def3} = \{PE_{min}, \ PE_{med} \ldots .PE_{max}\}$$

where $facility_{Def3}$ is well-defined as the tahfiz data profiling from facility components depending on financial and human resource placement. $\{PE_{min}, \ PE_{med} \ldots .PE_{max}\}$ can be described as the minimum number, median, and utmost number of profiling factors from the integration management that affect the facility in Tahfiz Center.

Profiling Definition 4. The outcome of $financial_{Def1}$, $human\_resource_{Def2}$ and $facility_{Def3}$ are depending on MOS adequate degree (*MaD*) based on the quantitative finding and user satisfaction towards profiling attributes (p_i^e). p_i^e requirement must be attained at least $p_i^e \geq MaD$.

$$profiling = \{financial_{Def1} + human\_resource_{Def2}$$
$$+ \ facility_{Def3}\}$$

Where the e value is an acceptable degree of the user conditions, in this circumstance, e is set on the respondent MOS solution. Furthermore, the *profiling* is an attribute accessibility environment for the user depending on the *MaD* acceptability. The whole data reliability will be covered in the *tProfiling*, and the results will be analyzed in the next stage.

C. Analysis stage

The third stage begins with the tahfiz data assembly from the data profiling stages. Before the server receives metadata from the following step's data profiling phase, it involves several processes on to the cloud services. The node metadata is used in the Azure cloud services for the particular setup by utilizing the data content repositories from the Microsoft Azure server tester. On a management dashboard, a server management system would often collect operational data such as profiling, sampling, and memory use and display it in real time.

The data for the user acceptance setup for the result sampling user profiling step was supplied. The gathering of user data for the tahfiz sampling data is now one of the uses of user data obtained through crowdsourcing for profiling trials. An analysis based on user demographics was carried out to get MOS findings. Thus, the preliminary setup and results are completed in two phases. The subjective MOS on user acceptability profile generally is comprised of four phases.[13] In the early setup, the control stage determines whether respondents will participate in the study. This stage will be done using apps that run through the server. However, the device's usage will not be discussed further since the conducted testing is based on reliable results. Fig. 2 illustrates this process further. For the aim of processing data, the initial findings on the respondents who took part in the investigation will be gathered. The respondent's demographic is chosen at random for this reason. However, the various testing sample is divided into groups (gender, age).[14] The user's demography will now be tested and determined. The flow of the sampling experimentation is illustrated in Fig. 3.

Sampling data from the tahfiz institution is selected randomly within the peninsular Malaysia region. The sample used 20 samples for (σ) where $\sigma = \{f, hr, fc\}$. The user data selection will be followed by reliability testing. The validity of the reliable first result for the next phase will be verified using the Alpha-Cronbach reliability test. This research supports the standardizing bodies. (e.g., ITU) reference Mean Opinion Score (MOS) for determining the user's acceptance level. The MOS scored 1 (Imperceptible), 2 (Perceptible but not annoying), 3 (Slightly Annoying), 4 (Annoying), and 5 (Very Annoying).

The Mean Opinion Score (MOS) used to gauge user acceptability, is displayed in Table 1. If the test results are less than 0.6, the reliability is low. The reliability of the survey questions is assessed using Alpha Cronbach tests when utilizing a MOS survey.[10] For the subjective method testing in this pilot study, the number of male and female respondents is equal. Both
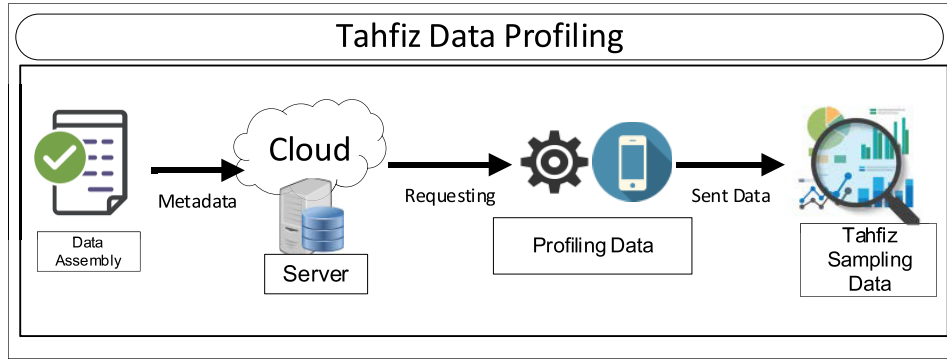
Fig. 2. Data profiling sampling for Tahfiz acceptance.

Fig. 3. The flow of sampling experimentation.

Table 1. Mean opinion score (MOS).

MOS	Quality	Impairment
5	Excellent	Imperceptible
4	Good	Perceptible but not annoying
3	Fair	Slightly annoying
2	Poor	Annoying
1	Bad	Very Annoying

genders provide the 20-sample, and the Alpha Cronbach alpha value is 0.86. Specific algorithms will be used in user acceptance profiling, and this algorithm will measure how satisfied users are with the establishment of outcome data profiles. The suggested algorithm is derived from the user profiling sample general profiling approach. The steps involved in data collecting via a cloud application include device metadata capture, user preference apps, and network capabilities. Despite all other factors, the catered experimentation depends on a reliable connection for the duration of the testing. The proposed algorithm is one of the most important components between these levels. The use of a profiling element in this section also requires the construction of an appropriate algorithm.[15]

Algorithm 1 shows the algorithm for tahfiz acceptance profiling. Line 1 and line 2 show the setup for the input for MOS profiling and all the nodes involved. In line 3, the system checks on the initial running application related to an algorithm. Since the Android platform is open source and can be readily controlled, distorted, and modified in terms of algorithm alteration and modification for research, this method is applied in the algorithm.[15] The parameter for profiling is based on the Tahfiz Profiling Definition in the previous section. *node, financial$_{Def1}$* from Tahfiz Profiling Definition 1, *human_resource$_{Def2}$* is from Tahfiz Profiling Definition 2 while *facility$_{Def3}$* is from Tahfiz Profiling Definition 3. The next phase in the profiling process is the initialization of algorithm implementation where $V \leftarrow 0$ state the execution of session starting.

In line 7, **IF** (*financial$_{Def1}$ node < profiling*) is specified as the constraint to profiling the financial node and test the user node for MOS demographic capability. The $financial_{Def1} = \{PE_{min}, PE_{med}....PE_{max}\}$ node will be executed. Next is in Line 9 **ELSE IF** (*human_resource$_{Def2}$ node ≤ profiling*) where the node $human\_resource_{Def2} = \{PE_{min}, PE_{med}....PE_{max}\}$ will be performed for the profiling and lastly is the **ElSE IF** (*facility$_{Def3}$ node ≤ profiling*) where is the profiling $facility_{Def3} = \{PE_{min}, PE_{med}....PE_{max}\}$ nodes is executed for the final results. In line 13 the **ElSE** (*total_node == profiling*) will be performed based on all the nodes that have been executed. The profiling node results will be reviewed in the list of path trees in the next section.

Experiment setup and results

A. User profiling

The user profile demography for experimentation is first chosen in the setup for user acceptability. This study categorizes the user profiling setting based on

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Algorithm 1. Algorithm for Tahfiz acceptance profiling.

1. **INPUT**: *profiling$_{(n)}$ node, financial$_{Def1}$, human_resource$_{Def2}$, facility$_{Def3}$;*   *// parameter input node*
2. **BEGIN**
3.   Initialization (*n*)   *// system check session*
4.   *V* ← 0   *// initial session starting*
5.   **{**
6.   **Enable**
7.   **IF** (*financial$_{Def1}$ node < profiling*)**THEN**   *//node user acceptance setup low/high*
8.   {*user acceptances interchange for node$_{(1)}$*};   *// node MOS attribute $_{def1}$*
9.   **ELSE IF** (*human_resource$_{Def2}$ node ≤ profiling*) **THEN**   *// node user acceptance setup medium*
10.   {*user acceptances interchange for node$_{(2)}$*};   *// node MOS attribute $_{def2}$*
11.   **ElSE IF** (*facility$_{Def3}$ node ≤ profiling*) **THEN**   *// node user acceptance setup medium*
12.   {*user acceptances interchange for node$_{(2)}$*};   *// node MOS attribute $_{def3}$*
13.   **ElSE** (*total_node == profiling*) **THEN**   *// total_node for MOS attribute acceptance*
14.   {*MOS interchange for total_node$_{(n)}$*}
15.   **}**
16.   **RETURN 0;**
17. **END**

---

the responder region characteristic since numerous nodes are available there. The user's requirements will determine how the profiling node attribute, such as the financial components and facility, is automatically established or modified. With the option to select a satisfaction level between 1 and 5, the control ability within the applications and the MOS methods will be enabled for user satisfaction, according to the user's rating.

Table 2 shows the Tahfiz Center (***ap, bp, cp, dp, ep***) random sampling with the average number of demographic respondents for data capturing. A hundred respondents male and female are gathered for the tahfiz profiling results. $\sum \mu$ shows the average of profiling respondents in the Tahfiz Center while μ represents the average/mean of respondent's ages. The following step is to examine the data profile for node outcome once the data has been collected. As a result, the connection can remain stable during the profiling session without being interrupted.

If the user does not change any attribute controls throughout the profiling experimentation session, a different outcome can occur. The next stage is to set up the experiment for profiling the node method from the respondent's findings after the profiling instruments element from the node capability selection and the user profiling has been completed.

B. Node profiling

The simulated environment is the first step in the experiment's setup. The first experiment's foundation is the uninterrupted use of the laboratory space for testing. The network cloud server for the profiling session is the first step in the configuration. Because of the stability and lack of complicated setup required, this choice was selected. Additionally, it will be less expensive than purchasing a server outright, and developers must configure the experiments. After that, the whole node sampling will be inserted into this server for profiling experiments purposes. The sampling rate of data transferring for transcoding will be stated in stable condition in 10 Mbps back and forth through the selected network. [16] The user profile demography for experimentation is first chosen in the setup for user acceptability. This study categorizes the user profiling setting based on the responder region characteristic since numerous nodes are available there. Three different node profiling results have been given to the user profile demography for experimentation, which is first chosen in the setup for user acceptability.

Fig. 4 shows the node profiling results for tahfiz acceptance model. The node is categorized depending on the three main elements' attribute

$profiling = \{financial_{Def1} + human\_resource_{Def2} + facility_{Def3}\}$ that related to the study proposed. First is *f* is define as the *financial$_{Def1}$* while *hr* is define as *human_resource$_{Def2}$* and *fc* as *facility$_{Def3}$* respectively.

The node profiling, such as the *profiling,* will be auto-set or manipulated by the users for user satisfaction. Additionally, this method deliberates factors that directly affect the user opinion through the tahfiz acceptance elements (e.g., staffing, fees, and facility quality). The most appropriate measures in the field of evaluating subjective quality are direct measurements, which come in a wide range of

Table 2. User profiling demographics for MOS experiments.

Sampling respondents	financial$_{Def1}$	human_resource$_{def2}$	facility$_{def3}$
Tahfiz Respondents (ap$_1$)	**Profiling Data (n$_1$)**	**Profiling Data (n$_2$)**	**Profiling Data (n$_3$)**
Male = 10	$\sum \mu = 4.75$	$\sum \mu = 3.2$	$\sum \mu = 2.3$
Female = 10	$\sum \mu = 4.4$	$\sum \mu = 3.12$	$\sum \mu = 2.5$
Tahfiz Respondents (ap$_2$)			
Male	$\mu = 40.8$	$\mu = 40$	$\mu = 40$
Female	$\mu = 38.2$	$\mu = 39$	$\mu = 37$
Tahfiz Respondents (bp$_1$)	**Profiling Data (n$_1$)**	**Profiling Data (n$_2$)**	**Profiling Data (n$_3$)**
Male = 10	$\sum \mu = 4.8$	$\sum \mu = 3.61$	$\sum \mu = 3.2$
Female = 10	$\sum \mu = 4.3$	$\sum \mu = 4.1$	$\sum \mu = 3.6$
Tahfiz Respondents (bp$_2$)			
Male	$\mu = 40.8$	$\mu = 41$	$\mu = 39$
Female	$\mu = 41.3$	$\mu = 41$	$\mu = 38.3$
Tahfiz Respondents (cp$_1$)	**Profiling Data (n$_1$)**	**Profiling Data (n$_2$)**	**Profiling Data (n$_3$)**
Male = 10	$\sum \mu = 4.21$	$\sum \mu = 3.61$	$\sum \mu = 2.8$
Female = 10	$\sum \mu = 4.32$	$\sum \mu = 3.7$	$\sum \mu = 3.12$
Tahfiz Respondents (cp$_2$)			
Male	$\mu = 35.8$	$\mu = 38$	$\mu = 39.5$
Female	$\mu = 38.2$	$\mu = 34.5$	$\mu = 36.3$
Tahfiz Respondents (dp$_1$)	**Profiling Data (n$_1$)**	**Profiling Data (n$_2$)**	**Profiling Data (n$_3$)**
Male = 10	$\sum \mu = 4.8$	$\sum \mu = 4.1$	$\sum \mu = 3.1$
Female = 10	$\sum \mu = 4.31$	$\sum \mu = 4.12$	$\sum \mu = 3.9$
Tahfiz Respondents (dp$_2$)			
Male	$\mu = 41.8$	$\mu = 37.1$	$\mu = 39.5$
Female	$\mu = 39.4$	$\mu = 36.5$	$\mu = 34.3$
Tahfiz Respondents (ep$_1$)	**Profiling Data (n$_1$)**	**Profiling Data (n$_2$)**	**Profiling Data (n$_3$)**
Male = 10	$\sum \mu = 4.5$	$\sum \mu = 4.09$	$\sum \mu = 3.8$
Female = 10	$\sum \mu = 4.5$	$\sum \mu = 4.2$	$\sum \mu = 3.9$
Tahfiz Respondents (ep$_2$)			
Male	$\mu = 39.8$	$\mu = 39$	$\mu = 38.5$
Female	$\mu = 39.2$	$\mu = 38.1$	$\mu = 38.3$

$\sum \mu$: average of profiling *n* data; μ: average/mean.
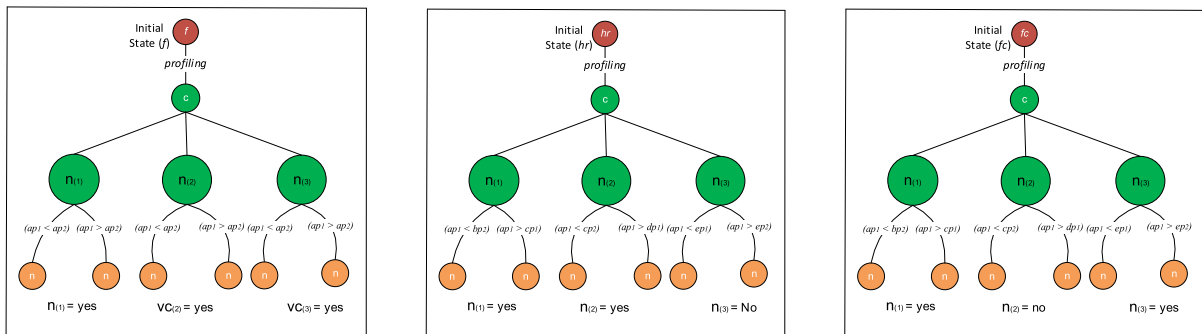

Fig. 4. Three node profiling results for Tahfiz acceptance.

varieties.[17–19] Fig. 2 shows the three essential elements for experiment tahfiz acceptance results. The first element is the financial (*f*), node results that impact the user's acceptance of the tahfiz management model. $f = n_{(1)}$ represents the factor that affects the finances of human resources in the tahfiz management model. In contrast, $f = n_{(2)}$, signify the factor that impacts the facility, such as building maintenance or else. $f = n_{(3)}$ represents the node's path for the impact factor for the financing for other affected elements related to the user's acceptance, such as the financial reliability of tahfiz management model. $hr = n_{(1)}$, $hr = n_{(2)}$, and $hr = n_{(3)}$ represent the human resource that has a significant impact on others in the tahfiz management model. $fc = n_{(1)}$, $hr = n_{(2)}$, and $hr = n_{(3)}$ denote the impact of the facility on financial or human resources, such as staff needing more facility and financial support.
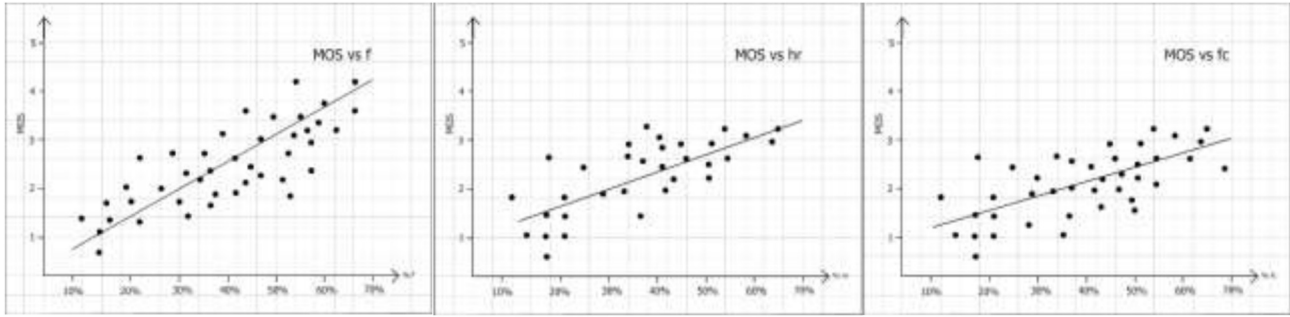
Fig. 5. Linear regression results of Tahfiz elements (σ).

All the node's path impacts each other, and the main experiment focuses on the elements that significantly affect the tahfiz management model. The node profiling setup uses the self-development applications associated with the Android Studio development program. Due to the Software Development Kit's many support upgrades, Android Studio was chosen as the platform for developing apps (SDK). [14] By default, the setting for user profiling used a smartphone for data gathering.

C. I3M-Tahfiz linear regression analysis

The following stage is to establish a relation between the user's acceptance and the element's efficiency after the whole experimentation result has been achieved. The slope value must first be calculated before the values of $\beta 0$ and $+\beta 1$ are established. To determine the value of the σ, (average tahfiz profiling results). The elements' efficiency must depend on the value of x, while the MOS result determines the value of y.

In Eq. (1):

$$\sigma = \sum \frac{(x - \bar{x})(y - y)}{(x - \bar{x})^2},\tag{1}$$

it refer to the liner regression for MOS user acceptance relationship where σ represents the least square method. $\bar{x}$ is the mean value of x, and y is the mean of y value. The total of $(x - \bar{x})^2$ and $(x - \bar{x})(y - y)$ will be derivatives on equation σ for the value of $\beta 0$. The least-square method is the technique to measure the regression line (line of best fit) possibility. It will be done by assembling the whole of the square of the errors as small as possible. Usually, the common use of the least-squares method, denoted as linear or a straight line lessens the sum of the squares of the errors. [20–22]

Fig. 5 depicts the linear regression results of tahfiz elements (σ) where $\sigma = \{f, hr, fc\}$ depending on MOS user acceptance. The σ linear regression will be catered with the 20 subjective sampling results for the similarities from both results. The result displayed by calculating the average of $\sigma = \{f, hr, fc\}$ and MOS, is simple to calculate by converting the value of R^2 for σ. By using *RapidMiner* tool σ can be calculated. Since the dependent and independent variables of β_0 and $+\beta_1$ values are included in the regression, the calculation is based on the equation below.

In Eq. (2):

$$R^2 = \sum \frac{(\hat{y} - y)^2}{(y - y)^2},\tag{2}$$

it refer to the least-square method regression where R^2 is the R-square of β_0 and $+\beta_1$ values, $\hat{y}$ is anticipated y value and y is definite value. R^2 is defined as a percentage value; the value $= 0$ depends on data reliability and is unable to fit real data. Otherwise, the value $= 1$, explaining the data is perfectly fit with accurate data. The expected data for R^2 is around 0.6, at least for the calculation to achieve fitting data. The first result of MOS vs f (financial element) shows the average of higher MOS results 4.5 MOS. The data can be seen in Fig. 6.

Fig. 6. shows the acceptability for financial results depicting that financial considerations have a significant impact on institutions, including Tahfiz institutions. This result indicates the result of 78% of respondents agree with the alignment of MOS 4.5 results. The financial health of an institution can affect various aspects of its operations, sustainability, and the quality of education provided. Resource Allocation: Adequate financial resources are crucial for providing essential resources such as qualified teachers, educational materials, and infrastructure. Financial constraints may limit the institution's ability to allocate resources effectively, potentially affecting the quality of education. Then it will affect student support services; where financial
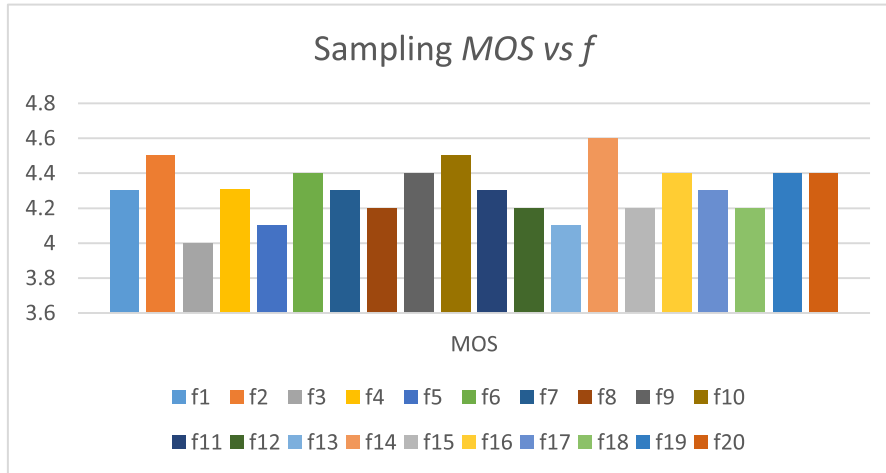
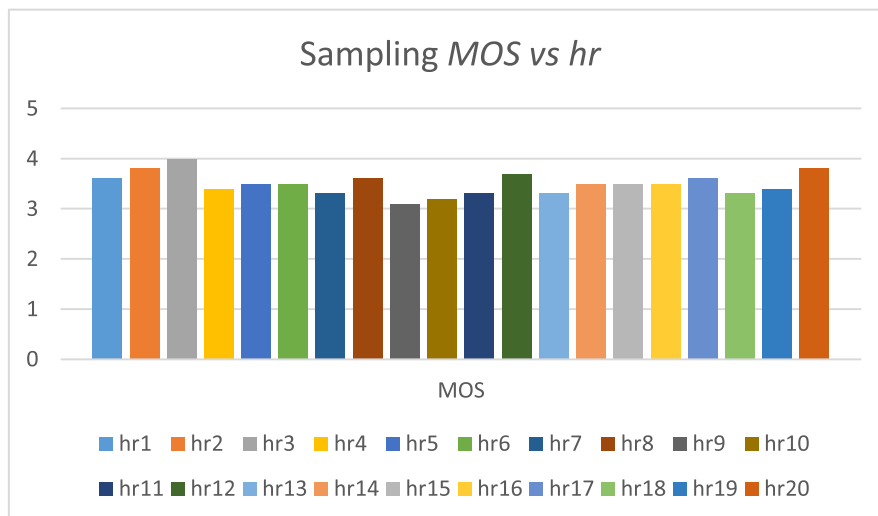**Fig. 6.** Sampling result MOS vs *f*.

Fig. 7. Sampling result MOS vs *hr*.

constraints can impact the availability of student support services such as counseling, academic advising, and extracurricular activities. These services are essential for the holistic development of students. Next is Fig. 7 depict the human resources (*hr*) elements for MOS vs *hr* impact.

For the second result of regression of MOS vs *hr* (human resources element) with the average of 3.38 MOS result. And the result of 67% of the sampling agrees on the effectiveness of the human resources element towards tahfiz efficiency. Fig. 8 indicates the sampling result affects staffing and faculty quality; financial stability enables the institution to attract and retain qualified teachers and administrative staff. A lack of funding may result in difficulties in hiring experienced educators, which

can impact the overall educational experience for students.

Lastly is the Fig. 8 shows MOS vs *fc* (facility element) with an average of 3.12 MOS results with a sampling of 59% sampling results. These results reflect the relationship between MOS and the tahfiz element's percentages. The more percentage of tahfiz element increases, the more MOS result that satisfies user acceptance. The infrastructure and facilities that adequate funding is essential for maintaining and improving infrastructure and facilities. This includes classrooms, libraries, dormitories, and recreational spaces. Insufficient funds may lead to suboptimal conditions that can affect the learning environment. Also, technology integration with education resources is necessary
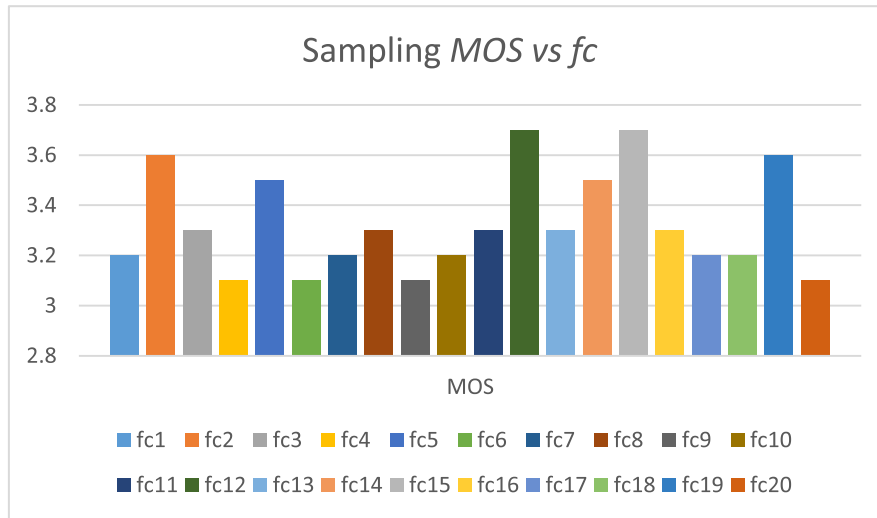
Fig. 8. Sampling result MOS vs *fc*.

for integrating technology into the educational process. This includes providing computer labs, internet connectivity, and educational software. Without adequate funding, the institution may lag in adopting modern educational technologies.

Analysis discussion

MOS vs f: from this study research question 1, **Which variables may have an impact on the Tahfiz Center's stakeholder selection process** where the acceptability from the user is relatively low for the average result of MOS because of the poor quality in terms of the *f* node attribute for tahfiz elements. Moreover, the respondents have no control over the alteration of node attributes such as how the formulated survey is conducted and the elements have a relationship with another attribute. With the *MOS vs f* relationship the more *f* input for the tahfiz element on the independent variable the more satisfied respondents regarding the changing quality of other elements. In this scenario, all the respondents agree that tahfiz financial strength is the main factor for the succession of the Tahfiz Center.

MOS vs hr: from the research question 2; **How might those elements be used by the Tahfiz Center to estimate student outcomes in predictive models?** The second analysis is regarding the human resources independent variable for tahfiz elements. The respondent's results state that the average number of staff is sufficient with a sufficient attribute. Human resources such as the management staff and teachers can manage quite several tahfiz students as long the number does not reach a certain value. Regression shows the respondent value if the number of

human resources must be in balance not less or more. Also the sampling show the average of MOS If the *hr* number is high the MOS value will be low and it goes the same way if the number of *hr* is low the MOS user acceptance is still low.

MOS vs fc: from research question 3; **Within the tahfiz learning population, how can the tahfiz centre use projected models to successfully sustain student success rates?** Indicates that the third analysis on tahfiz elements is the facility element in regression results similar to sampling. This element shows the value that if *fc* result is high the MOS satisfaction is relatively very high because of how conducive the office and classes are for the staff and students changing the mood and morale to a better one. Tahfiz institutions often include religious facilities such as mosques or prayer halls. Adequate funding is necessary for the maintenance and upkeep of these facilities, ensuring a conducive environment for religious activities.

All the tahfiz elements still need to be improved with the resources available, the element's result touches on one essential element which is financial stability. Every element that is related to the tahfiz such as the human resource or facility and organization always related to good financial management. In the node profiling testing, some of the test subjects on the survey related all the financial aspects of tahfiz elements always issuing the financial management in Tahfiz Center first. To support ongoing educational progress, to continue operations, and to instruct students for the next level, Tahfiz Center must have a variety of money streams. In conclusion, a Tahfiz institution that prioritizes quality of education reaps some benefits, such as successful learning experiences, spiritual development, successful

memorization, community support, long-term effects on students, preservation of culture, flexibility to meet individual needs, parental satisfaction, and life preparation. It advances the overarching goal of offering a thorough and significant Islamic education. Several impacts from this research are as follows:

Parental Satisfaction: When parents witness their children practicing the lessons taught in the Quran, in addition to learning its words, they are likely to feel more satisfied. Positive word-of-mouth and ongoing support for the institution can result from this satisfaction.

Holistic Development: Quality of Education seeks to foster both academic and holistic growth. It combines moral education, character development, and the nurturing of good values to produce well-rounded people.

Conclusion

In this paper, a unique structure for user I3M-Tahfiz framework for the quality of good practice in management and the future of Tahfiz Center has been presented to satisfy user acceptance. Using node profiling in a method for adapting the MOS user acceptance, the tahfiz elements satisfaction can be achieved in terms of management quality selection. This research proceeds to the framework phase in three stages; the initial stage, the execution stage, and the analysis stage. This stage is essential for determining the final result quality of the I3M-Tahfiz framework. The continuance of the Tahfiz Center and the engagement of stakeholders for sustainable operation would first be supported by official organizations like the government and non-governmental institutions. The second stage where the profiling method is executed for user acceptance and experimentation is implemented. The third phase is where the analysis stage is performed. By using the linear regression method the analysis can be performed for the MOS final results.

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Authors' declaration

- Conflicts of Interest: None.
- We hereby confirm that all the Figures and Tables in the manuscript are ours. Furthermore, any Figures and images, that are not ours, have been included with the necessary permission for republication, which is attached to the manuscript.
- No animal studies are present in the manuscript.
- No human studies are present in the manuscript.
- Ethical Clearance: The project was approved by the local ethical committee at University of Universiti Teknologi MARA (UiTM), Malaysia.

Authors' contribution statement

MFAH and MTMS: conceptualization, writing, and proofreading; MHJ: methodology and implementation of the computer code and supporting algorithms; KAM: validation and data curation; MFMA: conducting a research and investigation process and formal analysis; MSA: resources.

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نموذج الإدارة المتكامل لمراكز تحفيظ الخاصة الماليزية لرضا المستخدم باستخدام الانحدار الخطي

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الخلاصة

تعليم تحفيظ هو أحد أكثر أشكال التعليم شعبية ومقبولة في ماليزيا. لقد تطورت عبر الزمن وهي متوفرة الآن في مراكز تحفيظ وكذلك في مؤسسات تحفيظ الحديثة. تعتبر إجراءات الحوكمة والمساءلة الفعالة مرغوبة للغاية في هذه الكيانات الإسلامية لأنها تتعامل مع واجب الوفاء بالالتزامات الدينية المقدسة. يستلزم نظام التعليم الإسلامي في ماليزيا اليوم اعتماد تقنية مبتكرة للتدريس والتعلم في تعليم وإدارة تحفيظ. يؤدي الافتقار إلى الموارد والبنية التحتية والمرافق إلى تفاقم حالة إدارة التعلم الخاصة بتحفيز. هدف البحث هذا باستخدام نموذج الإدارة المتكاملة لمراكز تحفيظ الخاصة الماليزية (I3M-Tahfiz) لكفاءة الرضا عن التعليم على المستوى العملي. بسبب تطبيق نموذج (I3M-Tahfiz) في مؤسسة تحفيظ عشوائية في ماليزيا ، سيكون التركيز على أساس رضا المستخدم. يتم استخدام النهج الشخصي للحصول على متوسط نقاط الرأي (MOS) للمستخدمين من دراسة مراجعة قبول المستخدم. بعد إنشاء كل من النتائج التجريبية (MOS) والموارد، يتم استخدام نهج الانحدار الخطي لتحديد العلاقة بين قبول المستخدم والكيان الذي يسبب التأثير الرئيسي لكفاءة تحفيظ.

الكلمات المفتاحية: I3M-Tahfiz، نموذج الإدارة المتكاملة، قبول المستخدم، متوسط نقاط الرأي.