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Self-Help Maqam-Based Search System

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ABSTRACT

Self-help systems developed include the pervasive mental health applying machine learning to cognitive-behavior therapy and quality criteria for self-healing systems. However, access to a system offering a self-help assessment of a person's current state (maqam) with an opportunity to learn ways of improvement is not available. There is a need to offer such a system with tasawuf as the foundation and content for improvements. The system consists of texts, states of each maqam, transitions, questionnaire for self-help maqam analysis, and an effective user interface. Al Ghazali has written many publications including the Ihya' Ulumuddin, Tahafut al-Falasifah and Minhajul Abidin. In his Minhajul Abidin, al-Ghazali explained the seven climbings (Maqam): knowledge and acquisition; repentance; obstacles; hindrances; motivation; factors that ruin worship; and praise and gratitude. To each climbing, al-Ghazali gave an account of charateristics: sound mind; self-reflection; control man's self; full trust and patience; hope and fear; free from ostentation and pride; and praise and gratitude. This research aims at establishing a preliminary work on testing the self-help maqam based search system resulted from the finite state machine filled by the Seven Maqam as given in Minhajul Abidin. The objectives are: to investigate the use of finite state machine for self-help maqam analysis; assess the relevancy of the texts on Tasawuf against the passing level of the desired maqam; investigate the transition level set as the passing level of the maqam; and make recommendation based on the evaluation of the self-help maqam-based search system. The methodology includes finite state model (FSM), pre- and post questionnaires with items representing the transitions and passing levels developed in 7 different models and scales. Initial results include the prototype with all the 7 maqams with 7 different models of items, retrieval of items (texts) and maqams, and relevance built upon passing levels at varying degrees.

***Keywords*: Self-help system; Maqam-based search system; Minhaj al-Abidin; al-Ghazali's seven maqams; Finite State Machine.**

1. INTRODUCTION

A search system will soon progress into the wisdom level. Currently such works include the social wisdom for search and recommendation (e.g. Schenkel et al., 2008), words-of wisdom search (e.g. based on positive-negative degree by Takaoka & Nadamoto, 2010 and based on

multi-dimensional sentiment vector by Takaoka & Nadamoto, 2011), and web information credibility analysis system (WISDOM) by Akamine et al (2010). Recent works on finite state machine relevant to this topic include the multi-behaviors (Lin, 2009); and the induction using genetic algorithm with fitness function (Tsarev & Egorov, 2011). Self-help systems developed include the pervasive mental health applying machine learning to cognitive-behavior therapy (Xu et al., 2011) and quality criteria for self-healing systems (Neti & Muller, 2007). However, access to a system offering a self-help assessment of a person's current state (maqam) with an opportunity to learn ways of improvement is not available. Thus, there is a need to offer such a system with tasawuf as the foundation and content for improvements. The system consists of the texts, states of each maqam, transitions, questionnaire for self-help maqam analysis, and an effective user interface.

Life is full of hurdles, which one tries to overcome in different ways: taking consolation from families and friends; seeking professional help; and turning their face with faith and trust unto Allah (SWT). Reliance on Allah (SWT) is a coping strategy to deal with the negative influences of life (Al-Ghazzali, 2001). Such reliance on Allah (SWT) is an important stage of spiritual advancement (Sabzavari Khurasani, 2008). It is an encouraging move to revert to prayers and *al-Qur'an* to gain proximity to Allah (SWT). Studies have shown that there is a positive correlation between reliance on Allah (SWT) and mental health and self esteem. (Ghobari, et al. 2011).

The book by al-Ghazali on Sufism entitled "Minhaj al-Abidin ila Jannatu Rabbul Alamin" (The Exalted Path of the Worshipper Leading them to the Paradise of the Lord of the Universes) guides towards ultimate proximity to Allah (SWT). This book is considered by many as a summary of al-Ghazali's Ihya Ulum ud Din (The Revival of the Religions Sciences) which is widely regarded as one of the great works for the Self-Development of Muslims and has for centuries been a widely read and respected work in the Muslim world. Al-Ghazali dictated this book to a very few and selected students in his very last days ("Minhajul Abidin", n.d).

Abū Hāmid Muhammad ibn Muhammad Al-Ghazālī (c. 1058–1111); (ابو حامد محمد ابن محمد الغزالي), was a Muslim theologian, jurist, philosopher and mystic of Persian descent. He was honored with the unique title *Hujjat al-Islam*, meaning 'The Proof of Islam', a title given to no other scholar or personality in Islamic history, further displaying his status within the religion ("Al-Ghazali", 2013).

As the book is written in the Arabic language, we have used the Malay translated version published by Jahabersa in 2007 as the base of the passing levels, while we adopted the English translated version published by Darul Isha'at in 1998 by Iqbal Hussain Ansari as texts in the system.

Minhaj al-Abidin outlines a journey through 7 maqams or valleys, which leads one to the bounties of Allah (SWT). The seven maqams or Valleys that a true Muslim needs to climb in order to attain tasawuf, the highest spiritual level attainable by a Muslim. To go through each maqam or valley one needs to fulfill certain objectives and duties sincerely. The seven maqams are:

1) The Valley of Knowledge and Acquaintance

At this valley, one has to reflect on the creation of the universe to acquire knowledge of its creator. One needs to know that knowledge is superior to worship; and one should gain the knowledge from al-Qu'ran and compilations of learned writers and religious scholars. (Al-Ghazali, 1998)

2) The Valley of Repentance:
After having learnt the necessary knowledge, one turns to obedience and service. One remembers the countless sins and excesses one has committed in his life and is urged first to repent for all his sins before establishing relationship with Allah SWT. (Al-Ghazali, 1998)

3) The Valley of Obstacles:
This is the *maqam* of which one must overcome the negative forces that will deter one from obedience and devotion. Now one finds that he cannot do full justice to worship and devotions owing to obstacles, which are the world, the creatures, the self and Satan. Here al-Ghazali explained on the necessary actions required to overcome these obstacles. (Al-Ghazali, 1998)

4) The Valley of Hindrances:
After having crossed the valley of obstacles with Allah's help, one will face major hindrances, which will not let him devote himself to worship with full attention and submission. These are also four in number, which are sustenance, fear and misgivings, hardship and calamities and lastly Divine Decree. In order to cross them successfully, one needs to have full trust in Exalted Allah, to entrust everything to Exalted Allah in fears and misgivings, to bear with patience the calamities and hardships that fall on him, and to submit passively to the will of Exalted Allah with regards to Divine Decree. (Al-Ghazali, 1998)

5) The Valley of Urge and Impetus
One shall feel that his self is not inclined to indulge in worship and has fallen a victim to extraordinary negligence in this matter; it has become adverse to righteousness and is interested in sins and vices. Now in such a situation an impetus is needed to create an interest in the self to turn to worship and obedience and to keep away from sins and vices and create in it a fear of Exalted Allah. This impetus lies in two acts: hope and fear of Exalted Allah. (Al-Ghazali, 1998)

6) The Valley of Factors Ruining worship:
After having crossed all these valleys, one should not stop devoting himself to worship and good deeds with full concentration of mind and due submission. After engaging oneself in worship, one shall feel that two major calamities are still spoiling his worship. One of these calamities is ostentation and the other is pride. To pass this valley safely one stands in need of two other attributes: sincerity and Allah's grace and mercy. (Al-Ghazali, 1998)

7) The Valley of Praise and Gratitude:
At this stage one now realizes that he is permanently placed in the bounties and mercy of Exalted Allah. It is due only to Allah's infinite mercy that he is enjoying the virtue of worship, good deeds and total freedom from sins and vices. So it will be a grievous

> loss if he becomes neglectful of this fact. In that case he shall lose his status as a favored servant of Allah. He may be deprived of His blessings and his good deeds. He therefore praises Exalted Allah and pays thanks to Him. (Al-Ghazali, 1998)

When a man crosses this last valley also with the help of, Allah (SWT), he realizes that he is about to reach his destination and attain his objective.

Based on this book, we propose a Self-Help *Maqam*-Based search system that will guide an individual through the 7 valleys or *maqams* mentioned in "Minhaj al-Abidin". It will allow an individual the access to attain all relevant knowledge and information to improve his level of spirituality. Tassawuf is one branch of knowledge and wisdom that a muslim wishes to acquire to reach inner peace and be closer to Allah (SWT). A system offering a self-help assessment of a person's current state of spirituality, with the opportunity to learn ways of improvement has not been developed yet. A system that will help provide resources and appropriate guidance to improve one's spiritual state of mind is required. To have an efficient system we also study the relevancy of using the finite state model to create the proposed self-help system model.

Finite State Machines are abstract machines, consisting of a set of states, set of input events, a set of output events and a state transition function. The state transition function takes the current state and an input event and returns the new set of output events and the next state. Therefore, it can be seen as a function, which maps an ordered sequence of input events into a corresponding sequence, or set, of output events. (Aziz & Cackler & Yung, n.d).

Finite-state machines are ideal for simple computational models that can reach finite number of states and transitions between these states (Brownlee, n.d).

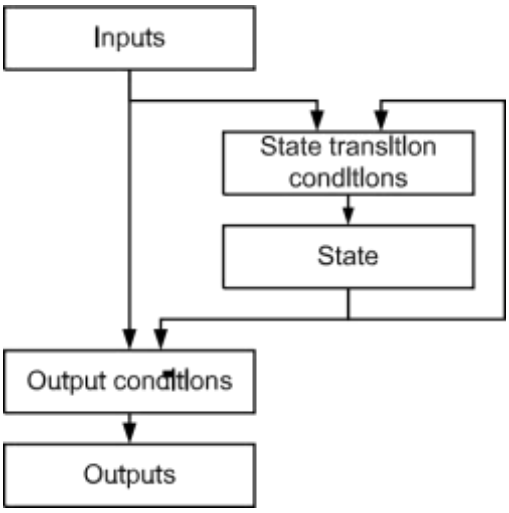

Figure 1*:* The State Machine Definition.,From *Finite State Modeling Approach- A practical Approach* by F. Wagner et al, 2006, New York, NY;Auerbach Publications.

Referring to Figure 1, a finite state machines consist states which indicates a certain behavior, state rules or conditions that must be met to cause the transition from one state to the other. And of course input events that can be generated externally and internally that trigger the state transitions too. (Brownlee, n.d)

Finite-state Machines are very versatile in applications and are ideal for modeling systems. FSMs allow the improvement of the processes and allow the organization of the logic of the systems, so that it can also be applied to the analysis and design of abstract and physical systems and should be used to model any type of system. (Mapletech Productions LLC, n.d)

So for a system mentioned before that can assess input events to evaluate certain rules to allow the person to transit from *maqam* to the other thus allowing a person to improve upon his or her spiritual state while climbing the *maqams*, usage of finite state modeling shall be appropriate. The system has a familiarity with states and transitions. The states will be related to the 7 states or *maqams* as mentioned in the book "Minhaj al-Abidin" by al-Ghazali. The system will also provide relevant search criteria for the user to not only assess his or her state but also provide access to resources and information that will help the user to journey through the states or *maqams* accordingly.

So our objectives at this phase are

1) To investigate the use of finite state machine for self-help maqam analysis.
2) To assess the relevancy of the texts on Tasawuf against the passing level of the desired maqam.
3) To investigate the transition level set as the passing level of the maqam.
4) To make recommendations based on the evaluation of the self-help maqam-based search system.

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2. RESEARCH METHODOLOGY

2.1 To investigate the use of finite state machine for self-help maqam analysis.

The proposed Self-help Maqam-based Search System is unique in its application. Extensive literature review of the applicability of using finite-state modeling to create the framework was done for systems having similar context. But it was seen that all systems benefitted from the advantages of using the finite-state modeling.

The system will also provide relevant search criteria for the user to not only assess his or her state but also provide access to resources and information that will help the user to journey through the states accordingly.

The system proposed will be based on non-deterministic finite state model where given the current state; the state transition is not predictable. It may be the case that multiple inputs are

received at various times, means the transition from the current state to another state cannot be known until the inputs are taken. This will be shown in the state diagram designed shown in figure no. 1 for the proposed self-help system. From the design it can be seen that as all the states and transitions triggers were identified for the whole process, which will result a more efficient system design.

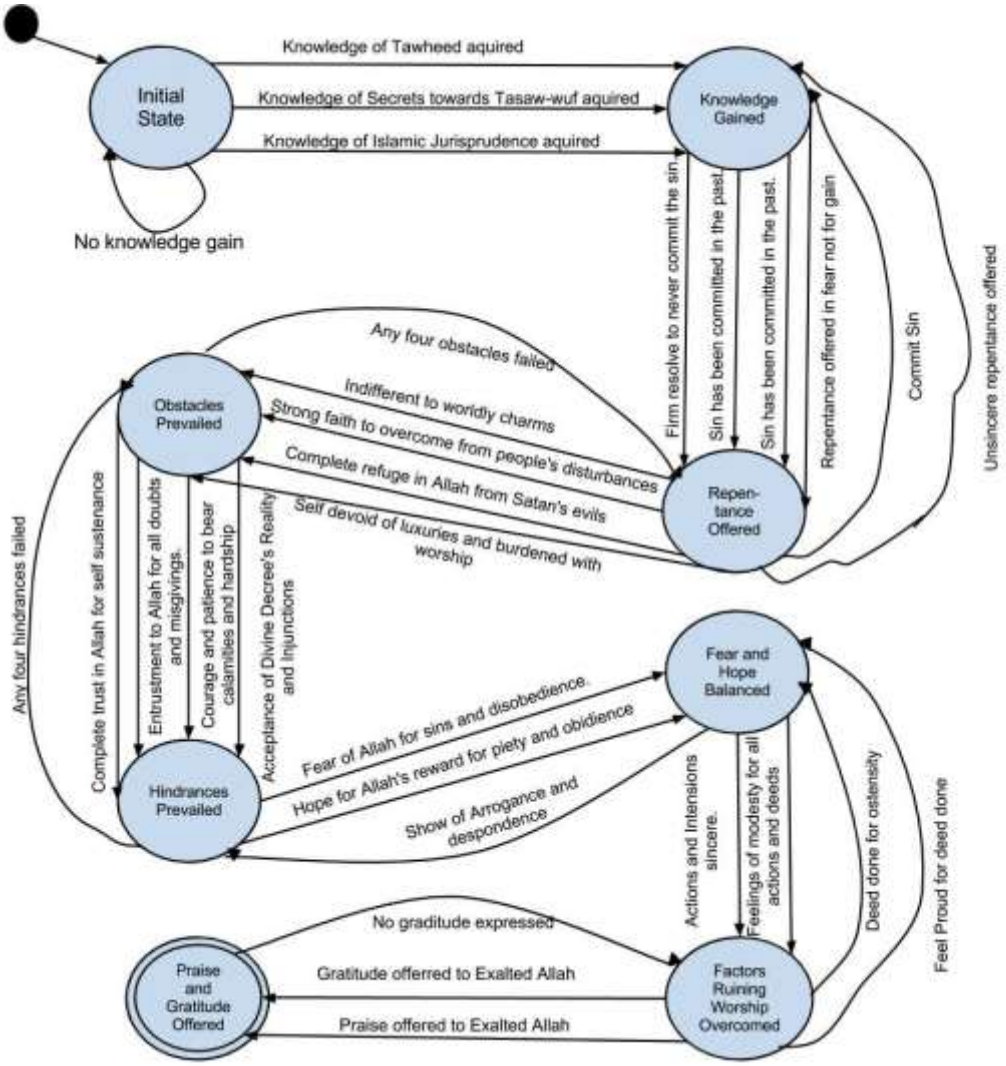

Figure 2: Finite State Model for Self Help Maqam Based System.

2.2 To assess the relevancy of the texts on Tasawuf against the passing level of the desired maqam.

Next we have already assessed the relevancy of the texts against the state transitions identified for each maqam for the proposed Self-help Maqam-based system. Manual deep extraction and analysis approach was taken due to the nature of the system. As the semantic content and the relationship association was of subjective and spiritual in nature the above methodology was chosen to avoid imperfect mapping.

We have extracted texts to create a semantic annotation on the basis of the state transitions between maqams. Each state or maqam must relate to relevant texts embedded in the book.

Simple pipeline architecture as shown below was used for manual extraction and to detect relevancy to the states and transitions. After the text is extracted and associated with each maqam, it is also identified as a positive influence or negative influence. Then these attributes are mapped to the state transition questions, which already have been identified before.

The following tables represent a sample of the extracted results as per the simple pipeline technique.

Table 1: Text extracted for relevant maqam, example for Maqam 1

State	Positive Attributes	Negative Attributes
Maqam 1	Trust in Allah Contentment with Allah's Decree Patience Repentance Sincerity	Anger Prolonged Hopes Ostentation Pride & Vanity Jealousy

Table 2: Text semantic (positive attributes) associated with state transition triggers for relevant maqam, example for Maqam 1

Positive Attributes	Relation to State Transition Statements
Trust in Allah	Do you believe Allah is Eternal and Everlasting?
Knowledge	Do you think that you have adequate knowledge of your essential duties in accordance to Sharee'ah?
Repentance	Do you think you have adequate knowledge of vices and evils that spoil worship? Do you think that you have adequate knowledge of Allah SWA to install His fear and His respect in your heart?

Table 3: Text semantic (negative attributes) associated with state transition triggers for relevant maqam, example for Maqam 1

Negative Attributes	**Relation to State Transition Statements**
Anger	Can you control your anger?
Prolonged Hopes	Are you in despair?
Ostentation	Do you show ostentation to other people?
Pride	Do you show and pride for all your deeds?
Vanity	Are you vain?
Jealousy	Are you jealous of people better of than you?

2.3 To investigate the transition level set as the passing level of the maqam.

The finite-state model of the proposed system was designed and illustrated in the paper. From the design it can be seen that as all the states and transitions triggers were identified for the whole process, which will result a more efficient system design.

The transition triggers have been identified as questions to be asked to the users. Each state has certain associated triggers, which the user has to fulfill. All of these triggers have been identified as questions and tagged with each individual state. The list shown below represents a sample of the questions identified as triggers for Maqam 1 on a scale of 7.

1. You desire salvation and worship
2. Knowledge and acquaintance is essential to worship
3. Knowledge is superior to worship
4. Without knowledge all other activities are vain and useless
5. You know details and revelations about events of the Hereafter
6. You have adequate knowledge of your essential duties in accordance to Shari'ah
7. You perform Salat five times a day
8. You fast during Ramadan
9. You perform all your essential duties with sincerity and diligently

All questions for the rest of the maqam from two to seven have been also identified and documented. These questions act as the triggers that will help a user to transit from one maqam to the other. Next based on the states and triggers we plan to integrate the system interfaces and its process flow.

2.4 Make recommendation based on the evaluation of the self-help maqam-based search system.

The development the Self-help search system is underway. User interfaces were identified, designed and then implemented. The system now has the basic functionality where the user can register and then go through a series of questions where his/her state can be identified. The user then can start crossing the individual maqams as he/she being truthful in using the system. The system identifies what the user lacks to cross to a certain level and will provide

the resources to the user based on "Minhaj al-Abidin", the book authored by al-Ghazali. Thus this allows a user to self-assess his/her state and provides the opportunity to learn ways to move to a higher state which will lead to the highest spiritual level attainable by a Muslim. Some screen shots of the application are shown below:

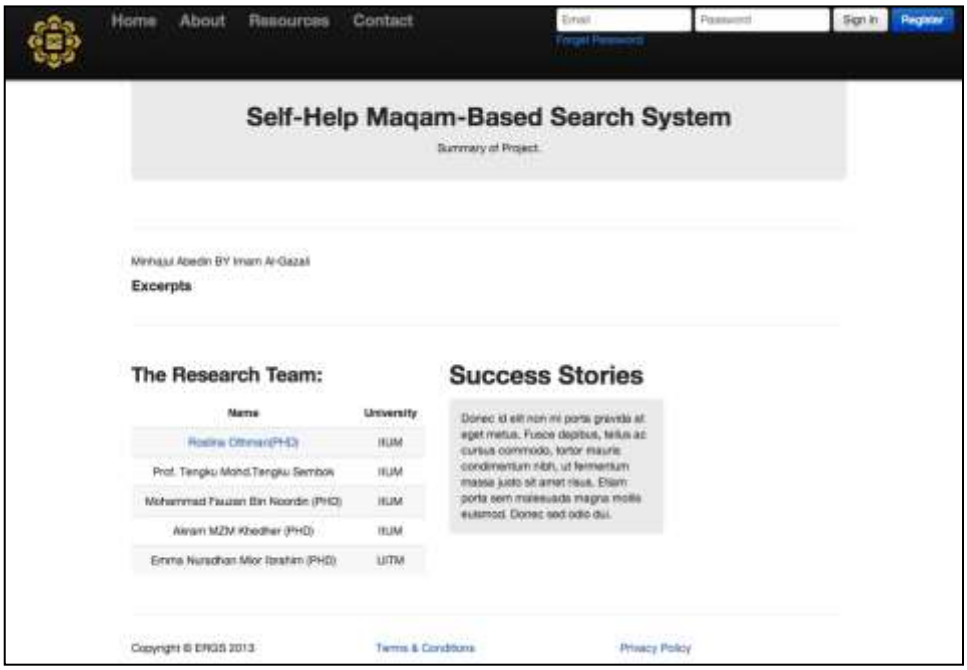

Figure 3: Screen shot of Home page

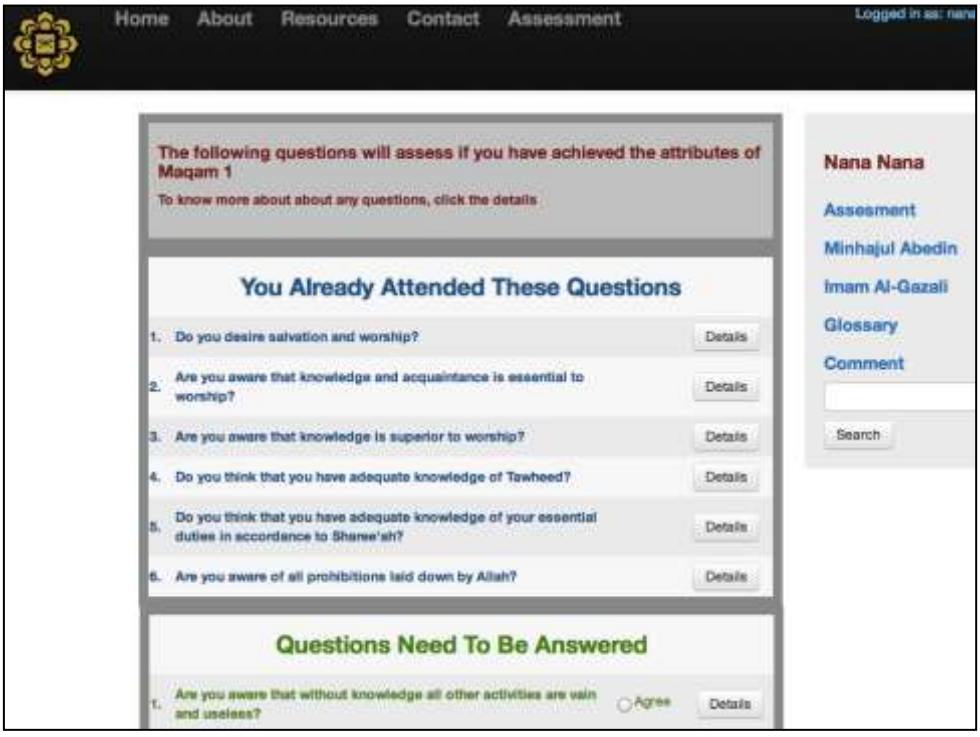

Figure 4:Screen Shot of Maqam One

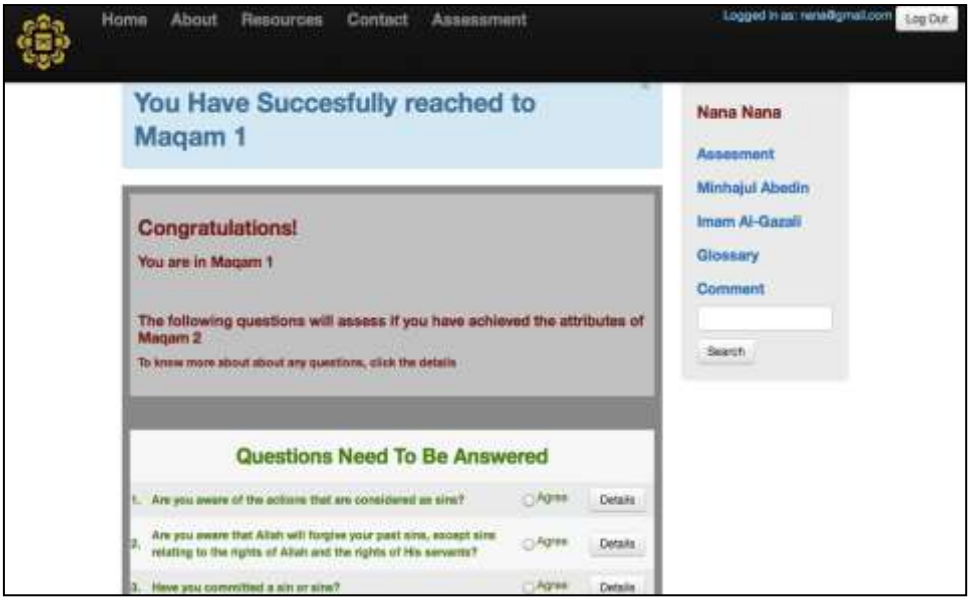

Figure 5: Screen Shot of Transition to Maqam 2

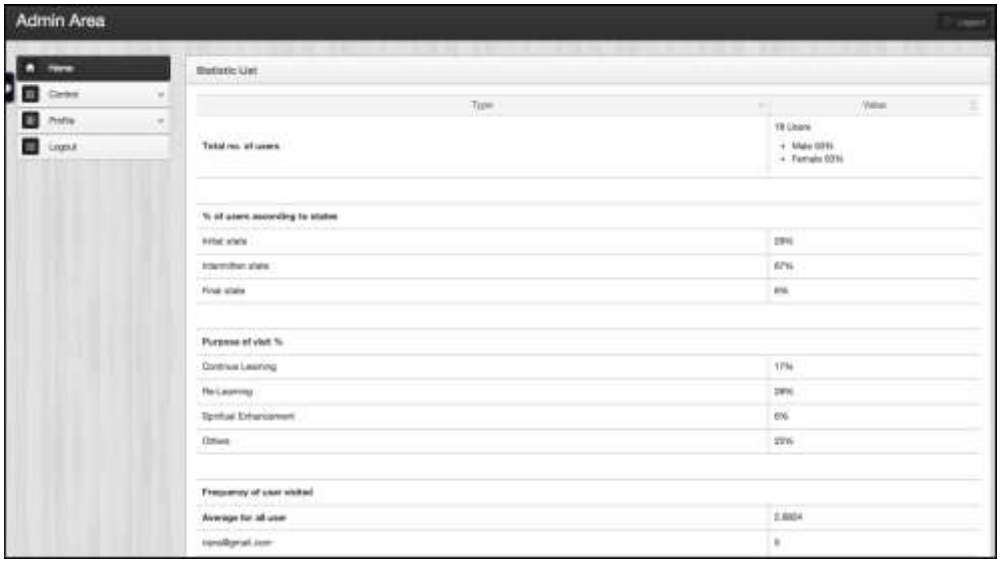

Figure 6: Screen Shot of User statistics

3. CONCLUSION

Initial results include the prototype with all the 7 maqams with 7 different models of items, retrieval of items (texts) and maqams, and relevance built upon passing levels at varying degrees. The crossings from one maqam to another (either up or down) form one method of declaring from one initial state to another state reaching levels and the uppermost level. Unlike the ordinary finite state models, this Minhaj al-Abidin's model involves a scale of values with variations strictly following the level achievable on the positive/negative attributes. The basis for this passing levels has been on the premise that faith fluctuates and situational. The questions are currently in the process of revision, due to the need for

elaborations. The basic functionality has been completed. We shall focus on fine tuning of the system to improve the process flow.

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