Title: A DYNAMIC QUEUING MANAGEMENT SYSTEM

Abstract: The invention relates to a system and method of an interactive queue management through mobile phone wireless messaging. The system allows clients holding queue tickets to send a predefined wireless message inquiry and respond with a message which will allow the individual his probable time of being served in the transaction counter. The invention includes a queueing terminal provide individual with numbered queue ticket, a transaction counter configured to update the said queue management server of the number of queued individual currently served and the time spent serving each queued individual and a queue management server configured to communicate to a client the current individual holding numbered ticket that being served by the system and the average transaction time spent for each served individual.
TECHNICAL FIELD

The present invention is directed to a system for managing customer queues and more specifically for enabling customers to interact with the queuing system.

BACKGROUND OF THE INVENTION

Currently, customers of business establishments, service providers or government offices regularly have to wait before they can be served, be it for payment of bills, service requirements, requesting of public documents, etc. For most of the customers, these events are unpleasant experiences.

Traditionally, systems used for queuing include customers physically queues in waiting lines which is an unpleasant experience for an individual, a paging system where customer's name is called over an intercom or over a public address speaker which is cumbersome to some customers especially those who have slight hearing problems, and the widely used ticketing system where incoming customers are provided with numbered ticket and wait for their numbers to be called or displayed in a display monitor before they are served. Though these systems worked, the time and effort wasted by waiting
customers have led to concerted efforts to improve on these systems.

While, several paging systems were introduced by way of US Patent Nos. 6,542,751 and 6,529,786 wherein queuing customers were provided with pagers and electronic devices which are activated to notify customers when service is already available. Though these systems appear to be of help, queuing customers were still required to remain in certain local area for the pagers and electronic devices to be activated.

While US Patent Application Publication No. 2007/286220 provides for a virtual queuing system where individuals/groups are initially provided with ID tags which they need to register with the system together with their mobile phone. The system will then use these information to notify the queued individual through his mobile phone of the service availability. Though this latest innovation appear to have solved the problems of customers physically queuing and staying within a local area, this system, with the inclusion of the registration ID tags and its reader/scanner, is quite expensive and cumbersome to maintain. Furthermore, since customers were required to provide personal information, particularly their mobile phone identification, to the system upon registration, this allows the establishment to profile their customers. These profiled customers are now open to receiving unsolicited (SPAM) information through their mobile phones.
Therefore there still exist a need for a simple, inexpensive and non-intrusive interactive queuing system.

5 SUMMARY OF THE INVENTION

To overcome these disadvantages of the aforementioned queuing systems, the present invention herein proposes a queuing system wherein virtual queuing of individuals is allowed. The system also provides a simple and non-intrusive interactive queuing system where clients personal information are not required to be recorded in the system's database.

The present invention also provides a new and novel way for businesses to improve customer relationships by providing a simple interactive queue management to easily and efficiently interact with queued customers through their mobile phones.

The present invention comprises of the following components which allows a non-intrusive interactive queue management system: a queuing terminal being interfaced to a queue management server and configured to provide clients with numbered queue tickets, a transaction counter also being interfaced to the queue management server and configured to update the said queue management server of the number of queued individual currently serve and the time spent serving each queued individual, a queue management server configured to communicate to a queued individual the
numbered ticket of a queued individual being served by
the system and the average transaction time spent for
each served queued individual, a transaction display
monitor for displaying the number of the queued
individual being served in the transaction counter, and
a mobile phone infrastructure for enabling the system
to receive and send SMS messages to a client's mobile
phone device.

The present invention provides a system and method
for interacting with queued individuals comprising of
receiving a predefined wireless message from a queued
individual holding a numbered ticket and transmitting a
response containing the current numbered ticket of
queued individual being served and the average
transaction time spent for each served queued
individual.

These and other objects and advantages of the
present invention will become apparent upon a reading
of the ensuing detailed description taken in
conjunction with the appended drawings.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 shows the block diagram of the preferred
embodiment of the present invention for a dynamic
queuing system;

Figure 2 shows the component of the queuing
server;
Figure 3 shows the an embodiment of a preferred queuing ticket as used in the present system; and Figure 4 shows a flow diagram of the initial processing of information based on the client securing a queue ticket. Figure 5 shows a flow diagram of the processing of information based on the client being served in the transaction counter. Figure 6 shows a flow diagram of the interactive queuing process based on system responding to a client's SMS inquiry.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

The present invention relates to a queuing management system application. More particularly, the present invention relates to an interactive queuing system and method. Hereinafter the system and method of the present invention shall be described according to the preferred embodiments and by referring to the accompanying description and drawings. However, it is to be understood that limiting the description to the preferred embodiments of the invention and to the drawings is merely to facilitate discussion of the present invention and it is envisioned that those skilled in the art may devise various modifications without departing from the scope of the appended claims.
The interactive queuing system and method of the present invention have been designed to operate in a data computing network environment, particularly Local Area Networks (LAN), public communications network, etc. The method and the system of the present invention provide an efficient and economical interactive queuing system.

In accordance with the disclosure of the present invention, the method and system provides for an efficient virtual queuing of individuals without the necessary requirements of client registration within the system.

The following is a description of a preferred embodiment of the present invention made in reference to Fig. 1 which illustrates the schematic block diagram of an interactive queuing management system, designated with reference numeral 10.

As shown in FIG. 1, the queuing system 10 comprises of a queue management and server system 20, a queuing terminal 30, a transaction terminal 40, a display monitor 50 a wireless messaging infrastructure 60, and a mobile phone 70.

The queue server 20 is the interface managing the virtual queuing of clients. It provides information to queued clients on the current client being served in the transaction counter and the possible time before each queued client may be served.

Queue server 20 is updated by the queuing terminal 30 on the number of clients in the virtual queue, while
the transaction counter terminal 40 regularly provides updated information on the client currently served and the amount of time spent by each client when served in the transaction counter. This information are processed and stored in the server's database.

Queue server 20 also interfaces with mobile phone infrastructure and other wireless computer telephony infrastructure and protocols in order for the system 10 to receive and send SMS, MMS or other messaging means to client's mobile 70.

In an embodiment of the system 10, the queue server 20 can work as standalone or in combination with multiple queuing terminals 30 and transaction counter terminals 40.

The queuing terminal 30 is primarily a user interface where incoming clients are required to input the type of transaction or service the client requires from the business office utilizing the system 10. Said queuing terminal 30 will then issue a numbered ticket 31 to the client providing his place or number in the queue in accordance to his transaction requirement.

While the transaction counter terminal 40 is a user interface operated by the office personnel in the transaction counter and regularly provides update information to the queue server 20, preferably the current queued client being served and the amount of time that was spent in the transaction counter to each served client and the number of clients that has already been served within the day. This information
are then processed by the queue server 20 which can then get the resulting average time spent by each served client in the transaction counter.

The queue server 20 upon receipt of a predefined SMS inquiry from a client's mobile phone 70 via the mobile phone infrastructure 60 will initiate a command response to said SMS inquiry which includes the required processed information and mobile information and transmit it back to the client's mobile phone 70 again via the mobile phone infrastructure 60. The mobile phone infrastructure 60 is an application designed to receive and transmit wireless messages to mobile phone 70 and is being provided by mobile phone network and service providers supporting wireless messaging application and protocols.

In an embodiment of the invention, a queuing monitor 50, preferably an LCD display monitor, for displaying current client being served in the counter is connected with the transaction counter terminal 40. It provides monitoring information to clients who prefer to wait in the office utilizing the present system 10 and wait for their turn to be served in the counter.

The display on said monitor 50 is automatically updated by the transaction counter terminal 40 after a client has been served. It is also preferred that said monitor 50 may display a plurality of information to waiting queued clients such as a plurality of transaction type counters and the current client being served on each counter.
In an embodiment of the invention, the queuing monitor 50 also provides updated information on the average time each queued client was served on each of the transaction counter.

In another embodiment of the system 10, queuing monitor 50 can also be in the form of a paging system where clients to be served are called one by one via a microphone or intercom.

The queue server 20 shown in detailed in Figure 2, comprises of a queuing terminal interface 21, a counter terminal interface 22, a processor 23, a queue server database 24 and a wireless messaging interface 25.

The queuing terminal interface 21 controls and organizes the incoming information from the queuing terminal 30. This information includes new client's queue number and the transaction counter where the transaction type he requires will be served. This information will allow the system 10 to know how many clients are already in the queue. This also allow the business office to account for the number of clients served by the system 10 in any given day.

The transaction terminal interface 22 receives data coming from the transaction terminal 40 which includes information on the time spent to serve each client on each transaction counter.

The processor 23 contains the commands in computing the information the terminal interface 22 received from the transaction terminal 40. It also
updates the average time spent by each client in the transaction counter.

The queue server database 24 stores, organizes and maintains all updated information coming from the queuing terminal 30 and transaction terminal 40. It also stores information on the list of all mobile phone numbers and the incoming and outgoing messages from said clients' mobile phones 70.

Wireless messaging interface 25 provides and controls the protocols for the queue server 20 to communicate with mobile phone infrastructure 40.

Shown in Figure 3 is a sample ticket 31 issued by the queuing terminal 30 which preferably includes the client's queue number and the transaction counter, both identifying the customer's place in the virtual queue and to which transaction counter he is assigned. The ticket 31 also contains a predefined information 32 which includes the predefined SMS or MMS message inquiry which the client needs to send to the system 10 should the client wish to inquire the status of the virtual queue. The date and time when the ticket is secured is also preferably included in the said ticket 31 for confirmation of its validity. A barcode may also be employed to be part of the said ticket 31 for added security to the system 10.

The predefined message inquiry which the client needs to send to the system 10 is preferably a simple alphanumeric number or letter corresponding to the transaction counter where the client's required
transaction is assigned. In this case, the system 10 could easily validate the SMS inquiry and obtain the required information, which is the present client queue number being served in the transaction counter and the average time spent for each of the served client, from the server database 24 and initiate a command response to said SMS inquiry.

In another embodiment of the invention, the predefined message inquiry preferably includes the inquiring client queue number and the transaction counter. In such case, the system 10 will provide information to the client's inquiry regarding the present client queue number being served in the transaction counter, the average time spent for each of the served client and the probable time the inquiring client may be served in the transaction counter. This is due to the fact that the system will be able to determine the time, based on the updated average time spent on all served clients, needed to serve all the clients still in queue between the message inquiry sender and the current client being served in the transaction counter.

In a further embodiment of the invention, using the predefined message inquiry that includes the client's queue number and the transaction counter, the system can be adapted to further send an SMS schedule notice to the client, in addition to the earlier response, on a prearranged schedule according to the client's queue ticket number, eg. at least the
currently served client has a queue number prior to the
inquiring client's queue number.

The system and process of the present invention
allows business offices to receive a predefined SMS
inquiry from queued clients via their mobile phones in
order to manage the queued clients' wait experience and
place in a queue. The present invention allows clients
to inquire from the system thru their mobile phone SMS
capability, while the system pull together a sorted
response from a database and transmit said response to
the queued client.

The process and method of operation of the present
invention is shown in the schematic flow diagram of
FIGURES 4-6.

Figure 4 shows a flow diagram of the initial
processing of information based on the client securing
a queue ticket. The description of the method shown in
FIG. 4 comprises the following:

The client secures a queuing ticket 31 from the
queuing terminal 30 upon entering the business office
employing the dynamic queuing terminal 10 of the
present invention. The queuing ticket 31 already
secured the client place in the virtual queue being
supported by the invention.

The information contained on said queuing ticket
31, preferably the client's queue number or customer
number and the transaction counter where the client's
transaction is being served, is updated to the queue
server database 24.
The server database 24 is constantly updated
everytime a queue ticket 31 is issued by the queuing
terminal 30. This allows the business office to provide changes and alternatives to hasten the
transaction process including providing additional personnel to help in the transaction of queued clients particularly in counters where there is a volume of queued clients.

After securing the queue ticket 31, a client has the option to wait in the business office for his number to be displayed in the queuing monitor 50 or be called and transact in the counter where his transaction is assigned, or, based on the currently displayed information on the display monitor 50, particularly the current customer number that is being served in the transaction counter and the average time spent in transacting with the previously served clients which the client can use to determine the probable time for his turn in the transaction counter, may decide to just come back to the business office when his number is nearing to be called.

Figure 5 describes the process of transacting with queued clients and updating of information on the server database 24 based on the queue number of the current client being served in the transaction counter and the time spent on each served client. The description of the process shown in Figure 5 comprises of the following:

After a client has been served in the transaction counter, the monitor 50 will be updated by the
transaction counter terminal 40 to display the next client number. At the same time, the queue server 20 will also be updated with the new queued client to be served in the transaction counter and the time spent serving the previous client. This information will be processed by the processor 23 to get the new updated average time spent on each served queued client and sent to the server database 24.

The new client will then be served after the queue ticket has been validated. Should the client holding the displayed number be unavailable, display monitor 50 together with the server database 24 will again be updated with the time spent for this unavailable client be recorded as zero.

After the client's transaction has been finished updating of the display monitor 50 and server database 24 will again be initiated by the system 10 until all queued clients have been served.

Figure 6 describes the invention's process for responding to a queued client's SMS inquiry via mobile phone 70. The description of the process shown in FIG. 5 comprises the following:

At an appropriate time deemed by a client in virtual queue to inquire with the queuing system 10 the status of queue on the transaction counter, the predefined SMS inquiry, as written on the queue ticket 31, is sent to the queuing system 10 via the mobile phone infrastructure 60 thru a pre-assigned number as
provided in the predefined information 32 of the queue ticket.

Upon receiving the SMS inquiry, the queue server 20 determines if the message inquiry is valid before initiating a command response to the said inquiry.

The queue server 20 will then communicate and request from the server database 24 the latest updated information on the transaction counter where the queue client is assigned and the updated average time serving clients on said transaction counter.

This information will then be sent by the queue server to the client's mobile phone 70 through the mobile phone infrastructure 60.

The client upon receipt of the response to his inquiry will be informed of the current numbered ticket that is being served in the transaction counter and the average time each served individual spent in the transaction counter, which the inquiring client may used to determine the probable time before his queued ticket is called or displayed in the monitor 50.

In this case the client may plan his schedule during the time he is in the virtual queue and the time he should return to the business office.

Since time spent on the transaction counter varies with respect to the client's transaction requirements. The system 10 is designed to accept repeated SMS inquiries from a waiting client.
While there have been illustrated and described, what are considered to be preferred embodiment of the present invention, it will be apparent to those skilled in the art that various modifications and variations can be made, and equivalents may be substituted for the elements thereof without departing from the spirit or scope of the present invention. Thus, it is intended that the present invention is not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out the present invention, but that the present invention includes all embodiments falling within the scope of the appended claims and their equivalents.
CLAIMS:

1. A method for interacting with individuals holding queued tickets, comprising the steps of:

   receiving a predefined wireless message inquiry from a queued individual holding a numbered ticket, wherein said predefined message contains the transaction counter where the individual is queued; and

   transmitting a response to said message inquiry, wherein said response contains the current numbered ticket of queued individual being served and the average transaction time spent for each served queued individual.

2. A method for interacting with individuals holding queued tickets in accordance with claim 1,

   wherein said predefined message contains the queue number of the said queued individual and the transaction counter where the individual is queued, and

   wherein said response contains the current numbered ticket of queued individual being served, the average transaction time spent for each served queued individual, and the time that the inquiring individual is to be served.

3. A method for interacting with individuals holding queued tickets in accordance with claims 1 or 2, further comprising the step of:
transmitting a schedule notice of transaction to said queued individual on a prearranged schedule.

4. A method for interacting with individuals holding queued tickets in accordance with claim 3, wherein said schedule notice of transaction is transmitted on a prearranged schedule of at least a queue number prior to the inquiring client's queue number.

5. An interactive queuing management system comprising:
   a queuing terminal enabled to interface with a queue management server and is configured to provide individual with numbered queue ticket;
   a transaction counter enabled to interface with a queue management server and configured to update the said queue management server of the number of queued individual currently serve and the time spent serving each queued individual; and
   a queue management server configured to communicate to a queued individual the numbered ticket of a queued individual being served by the system and the average transaction time spent for each served queued individual.

6. An interactive queuing management system of claim 5 further comprising of a transaction display monitor for displaying the number of the queued individual being served in the transaction counter.

7. An interactive queuing management system of claim 6 wherein said transaction display monitor further
displays the average time spent for each served queued individual in the transaction counter.

8. An interactive queuing management system of claim 5 further comprising of a mobile phone infrastructure for enabling the system to receive and send SMS messages to a client's mobile phone device.

9. An interactive queuing management system of claim 5 wherein said queue ticket contained a predefined information on interacting with the system.
To inquire on the status of the queue on your assigned transaction counter, you may type the letter <B> on your mobile phone and send it to XXXX. The system will response to you with information on the current Client No. being served in your counter.

**FIG. 3**

- **INCOMING CLIENT CHECKS AND CHOOSES OPTIONS ON THE QUEUING TERMINAL**
- **QUEUING TERMINAL PRINTS QUEUING TICKET BASED ON THE OPTIONS CHOOSES BY CLIENTS AND UPDATES THE DATABASE**
- **CLIENT WAIT FOR HIS TURN TO TRANSACT WITH THE BUSINESS OFFICE**

**FIG. 4**
FIG. 5

DISPLAY MONITOR DISPLAYS A NEW CLIENT NO. TO TRANSACT WITH THE TRANSACTION COUNTER AND TRANSACTION QUEUING TERMINAL UPDATES SERVER DATABASE

DATABASE

IS CLIENT AVAILABLE?

Y

CLIENT TRANSACTION IS PROCESS AND THE TRANSACTION QUEUING TERMINAL UPDATES THE SERVER DATABASE

NEW CLIENT NO. AVAILABLE?

Y

Z

END
FIG. 6

START

CUSTOMER SENDS SMS MESSAGE INQUIRY TO THE SYSTEM

SMS VALID?

SYSTEM REPLIES AN INVALID MESSAGE TO THE CUSTOMER

DATABASE

SYSTEM GETS THE REQUIRED INFORMATION FROM THE DATABASE AND TRANSMIT IT TO THE CLIENT'S MOBILE PHONE

END
### INTERNATIONAL SEARCH REPORT

**International application No.**

PCT/PH2011/000007

**A. CLASSIFICATION OF SUBJECT MATTER**

Int.Cl. H04M3 / 523 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl. H04M3 / 523

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

- Published examined utility model applications of Japan 1922-1996
- Published unexamined utility model applications of Japan 1971-2011
- Registered utility model specifications of Japan 1986-2011
- Published registered utility model applications of Japan 1994-2011

Electronic database consulted during the international search (name of database and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>Y</td>
<td>JP 2001-357162 A (Sony Corporation) 2001.12.26, paragraphs [0022], [0034], [0039] - [0044] and [0057], fig.1 and 2 (Family: none)</td>
<td>1-9</td>
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☑ Further documents are listed in the continuation of Box C.  
☐ See patent family annex.

* Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
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### DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>A</td>
<td>JP 2004-173106 A (Nippon Telegraph and Telephone Corporation) 2004.06.17, paragraph [0085] (Family: none)</td>
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