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(54) Title: SYSTEM AND METHOD FOR INTELLIGENT DISTRIBUTION/REDIRECTION OF GROUP EMAIL

(57) **Abstract:** System and method for re-distributing electronic mail (email) sent to a group email address such as the email address of an organization or business. The email server at the address scans the received message for keywords identifying the topic of the message and then redirects the message to an appropriate individual based on criteria (such as experience, workload, and availability) maintained in an employee database. The server tracks the message, maintaining a log of its receipt, redirection, and eventual response.

SYSTEM AND METHOD FOR INTELLIGENT DISTRIBUTION/REDIRECTION OF GROUP EMAIL

BACKGROUND OF THE INVENTION

The advent of Internet email in the business environment has been beneficial to many. In dealing with the increasing day-to-day volume of business email, it is appropriate to consider automation techniques that can ease response and improve the quality of responses.

It has become standard practice to assign a group email address for certain business functions that interface with the public and/or customers. "support@company.com" or "info@organization.org" might be configured in an organization to receive email intended for a functional group rather than an individual. Standard practice has been to have an individual person read each message and either respond directly to it or distribute or redirect the message to someone who can better respond to it.

Once the volume of email grows to the point that an individual cannot reasonably expect to read all of it, a means of distributing or redirecting the email to the appropriate individual(s) for response becomes necessary, as it is important that each email message gets a response in a timely fashion.

Accordingly, it is an object of the present invention to provide a novel system and method for re-distributing email which improves the message response time.

It is another object of the present invention to provide a novel system and method for uniformly distributing group email among the individuals within the group.

It is yet another object of the present invention to provide a novel system and method for facilitating the tracking of an email message directed to a group address.

It is still another object of the present invention to provide a novel system and method for responding email directed to a group address with less duplication of effort by the group members.

It is a further object of the present invention to provide a novel system and method for ensuring that an email message gets a response in a timely fashion.

It is still a further object of the present invention to provide a novel system and method for improving the quality of response to email messages.

It is yet another object of the present invention to provide a novel system and method for providing notice to senders of the receipt of email messages.

It is a further object of the present invention to provide a novel system and method for monitoring the performance of email distribution systems.

It is yet a further object of the present invention to provide a novel system and method for forwarding the received message to one or more additional parties in the event that a response is not timely forthcoming.

These and many other objects and advantages of the present invention will be readily apparent to one skilled in the art to which the invention pertains from a perusal of the claims, the

appended drawings, and the following detailed description of the
preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a functional block diagram showing the basic
organization of the email distribution system for one embodiment
of the present invention.

Figure 2 is a flowchart illustrating the email redirection
process for one embodiment of the present invention.

Figure 3 is a table illustrating the mapping of individuals
to areas of expertise implemented in one embodiment of the
present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1, illustrating an email distribution system for one
embodiment of the present invention, shows the interconnection of
a number of Internet Service Providers (ISPs) 10 via the Internet
12. Each of these ISPs provide Internet access to a number of
subscribers 14.

Normally, an ISP providing connection to the Internet also
acts as the email host computer for the subscriber. Each
subscriber has his own account on the host computer termed a
mailbox. Accessing a mailbox varies depending on the type of
Internet account the subscriber has. For example, with PPP or
SLIP accounts, client programs ("Client") running on the
subscriber's computer communicate with server programs (MAIL

SERVER) on the host computer to access the subscriber's email account. Upon request, the email stored at the host is transmitted to the client for storage and review. Alternatively, for example when a subscriber has a shell account, both the client and server programs run on the host computer requiring continuous host connection for review of the email.

In accordance with one embodiment of the present invention, each of the Service Providers 10 has an associated database 16 for maintaining information used to automatically re-direct and track email distribution. This re-direction process is based on a model of many-to-few information distribution where email messages are originated by many, and responses are expected of a few individuals.

Figure 2 illustrates this email distribution process for one embodiment of the present invention. Upon receipt of an email message by the group server 100, the email is scanned to determine a message topic 102. For efficiency the subject line of the email is scanned first 104. If a particular topic (keyword) can not be surmised from the subject line 106, the body of the email may be scanned 108.

Once the topic of the email is determined, a search of the employee database is performed to determine the employees knowledgeable on the topic 110. Upon locating the employees with the relevant expertise, the server selects a particular employee 112 based on predetermined criteria such as the workload and availability of each of the employees 114. The email is then re-

directed to the selected employee 116. The server logs the
receipt and redirection of the email to the selected employee in
the database (118), along with the eventual response 120.

In a further embodiment of the present invention, the email
distribution system may include timing facilities and additional
redirection algorithms that allow the forwarding of messages to
(an) additional individual(s) in the event that the first
recipient doesn't provide a timely reply. As illustrated in
Figure 3A, the server would re-check the employees skills
database for the next best candidate for providing an appropriate
response, and then forward a copy of the original message to that
person.

Further, the system may optionally permit the increasing of
the priority of inbound messages based on the number of times the
system has forwarded the message and based on keywords found by
the system in either the subject line of the message or the body
of the text. Using this technique can provide a means for
escalating problem resolution in an automated fashion.

In a further embodiment of the invention, a response is sent
to the customer upon initial receipt of the message by the server
providing the customer with current expected response times,
other sources of answers and information, and perhaps product
and/or service advertising oriented toward the original message
topic.

In one embodiment of the invention, performance monitoring
of the email distribution process is performed. The system keeps

track of the number of responses to incoming email messages as well as statistics regarding the minimum, average and maximum times to respond to messages. It also keeps statistics on the type of skill required to properly respond to messages, providing feedback to group managers which can be used to help in leveling the workload among the group members. Time of day and day of week or month reporting is also an option.

Figure 3 illustrates the mapping in the employee database of individuals to areas of expertise used in one embodiment of the present invention for determining the candidates for receiving an email message. In scanning the email subject line or body, the email server will be scanning, for example, for a product name (PRODUCT W) or associated keywords (AAA, BBB, CCC). Upon finding the individuals with knowledge of PRODUCT W (i.e., EMPLOYEES #1, #4, and #N), the workloads of the individuals are evaluated to determine which should receive the email. In the case where a topic can not be determined, a default address may be designated for redirecting the email. Further, other criteria such as the availability of the employees may be considered in the redirection decision.

A typical scenario in which the present invention finds applicability could involve a consumer sending an email message to support@xyz.com requesting customer support from company XYZ. The email server at xyz.com could be programmed to scan the subject line of the email for a product name. On finding a known product in the subject line, the server accesses a table of

customer support email addresses which associates the customer support personnel with product knowledge. On finding, for example, that three members of the customer support group have knowledge of the relevant product, the server uses a workload leveling algorithm to select one support person to whom the email message should be redirected. The server then logs the receipt of the message and the redirection, and also the response to the message once it is sent.

There are many advantages associated with automating the email distribution and redirection processes. For example, redirecting the email to a single person qualified to respond to the message will improve the response time for answering the email and result in less duplication of effort among the members of the targeted group. Further, the ease of tracking the email request and response is improved with only a single redirection. Another advantage associated with the present invention is the uniformity of the distribution criteria.

While preferred embodiments of the present invention have been described, it is to be understood that the embodiments described are illustrative only and the scope of the invention is to be defined solely by the appended claims when accorded a full range of equivalence, many variations and modifications naturally occurring to those of skill in the art from a perusal hereof.

WHAT IS CLAIMED IS:

1. A method for automatically directing messages received in an electronic mail system addressed to a functional group comprising the steps of:

(a) electronically scanning a received message for keywords identified with a topic to thereby identify at least one individual with knowledge of the topic;

(b) redirecting the message to one of the identified individual; and

(c) tracking the receipt of the message and the individual to whom redirected.

2. The method of Claim 1 wherein the scanning is limited to the "subject" line of the received message.

3. The method of Claim 1 wherein the entire message is scanned in the absence of the detection of a keyword in the "subject" line of the received message.

4. The method of Claim 1 wherein a plurality of individuals are identified; and

redirecting the message as a function of a predetermined criteria.

5. The method of Claim 4 wherein the predetermined criteria is workload leveling.

6. The method of Claim 1 wherein the step of tracking further comprises the step of logging a response to the message.

7. A method of re-distributing messages received in an electronic mail system, said method comprising the steps of:

(a) determining a message topic;

(b) determining persons with knowledge of the message topic;

(c) determining workload constraints for each person knowledgeable on the message topic; and,

(d) redirecting the message to the person whose workload constraints are within a set criteria.

8. A method for automatically re-distributing a message received in an electronic mail system to an available person with knowledge on the topic of the message, the method comprising:

(a) maintaining a database having information pertaining to an employee's expertise/knowledge/experience;

(b) scanning the received message to determine a topic of the message;

(c) searching the database to find employees with expertise on the topic;

(d) utilizing a workload algorithm to determine which employee of those found during the database search has a lesser workload;

(e) redirecting the message to the employee with the lesser workload;

(f) logging the receipt and redirection of the message in the database; and,

(g) logging a response to the message in the database.

9. A method of automatically redirecting messages in an electronic mail system, the improvement wherein the redirecting of the message is a function of a message topic and a workload of personnel knowledgeable with respect to the message topic.

10. The method of Claim 9 further comprising tracking the redirection process.

11. The method of Claim 10 wherein said tracking comprises logging in a database the receipt of the message, the identity of the employee to whom redirected and the response to the message.

12. An electronic mail re-distribution system for redirecting messages to persons knowledgeable on a message topic comprising:

a database with employee information including an employee's areas of expertise;

scanning means for scanning the content of a received message to determine a topic of the message;

means for scanning the database to identify at least one employee having expertise in the area of the determined topic;

means for redirecting the received message to one of the identified individuals.

13. The system of Claim 12 wherein said scanning means scans only the "subject" line of the received message.

14. The system of Claim 12 wherein said scanning means scans the entire message in the absence of the detection of a keyword in the "subject" line of the received message.

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15. The system of Claim 12 including means for selectively modifying the criteria by which the plurality of individuals are identified.

16. The system of Claim 15 wherein the predetermined criteria is workload leveling.

17. The system of Claim 1 wherein said means for tracking further comprises means for logging a response to the message, and for redistributing the message in the absence of the detection of a response within a predetermined period of time.

18. A system for re-distributing messages received in an electronic mail system comprising:

means for determining a message topic;

means for determining persons with knowledge of the message topic;

means for determining workload constraints for each person knowledgeable on the message topic; and,

means for redirecting the message to the person whose workload constraints are within a set criteria.

19. A system for automatically re-distributing a message received in an electronic mail system to an available person with knowledge on the topic of the message comprising:

means for maintaining a database having information pertaining to an employee's expertise/knowledge/experience;

means for scanning the received message to determine a topic of the message;

means for searching the database to find employees with expertise on the topic;

means for utilizing a workload algorithm to determine which employee of those found during the database search has a lesser workload;

means for redirecting the message to the employee with the lesser workload;

means for logging the receipt and redirection of the message in the database; and,

means for logging a response to the message in the database.

20. In a system for automatically redirecting messages in an electronic mail system, the improvement wherein the redirecting of the message is a function of a message topic and a workload of personnel knowledgeable with respect to the message topic.

21. The system of Claim 20 further comprising means for tracking the redirection process.

22. The system of Claim 21 wherein said tracking means includes means for logging in a database the receipt of the message, the identity of the employee to whom redirected and the response to the message.

FIG. 1

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        ┌──────────────┐
        │ RECEIVE GROUP │
        │ EMAIL        │
  100   └──────┬───────┘
               │
        ┌──────▼───────┐         ┌─────────────┐         ◇ 106           ┌──────────┐
        │ SCAN EMAIL TO │   104   │ SCAN SUBJECT │      ╱ KEYWORDS ╲  No  │ SCAN     │
  102   │ DETERMINE TOPIC├───────▶│ LINE         ├─────▶◇ FOUND    ◇─────▶│ BODY     │
        │ OF MESSAGE   │         └─────────────┘      ╲         ╱        │ 108      │
        └──────┬───────┘◀──────────────────────────────╲───────╱◀────────└──────────┘
               │                                        YES
        ┌──────▼───────┐
        │ SEARCH DATABASE│
        │ FOR EMPLOYEES │
  110   │ W/ EXPERTISE ON│
        │ MESSAGE TOPIC │
        └──────┬───────┘
               │                              ┌─────────────┐
        ┌──────▼───────┐            114       │ DETERMINE   │
        │ SELECT EMPLOYEE├─────────────────▶ │ WORKLOAD    │
  112   │ TO RECEIVE EMAIL│◀─────────────────│ OF EMPLOYEES │
        └──────┬───────┘                      │ /OTHER CRITERIA│
               │                              └─────────────┘
        ┌──────▼───────┐
        │ REDIRECT EMAIL│
        │ TO SELECTED   │               FIG 2.
  116   │ EMPLOYEE      │
        └──────┬───────┘
               │
        ┌──────▼───────┐
        │ LOG RECEIPT + │
        │ REDIRECTION OF │
  118   │ EMAIL IN      │
        │ DATABASE      │
        └──────┬───────┘
               │
        ┌──────▼───────┐
        │ LOG RESPONSE  │
        │ TO EMAIL IN   │
  120   │ DATABASE      │
        └──────────────┘
```
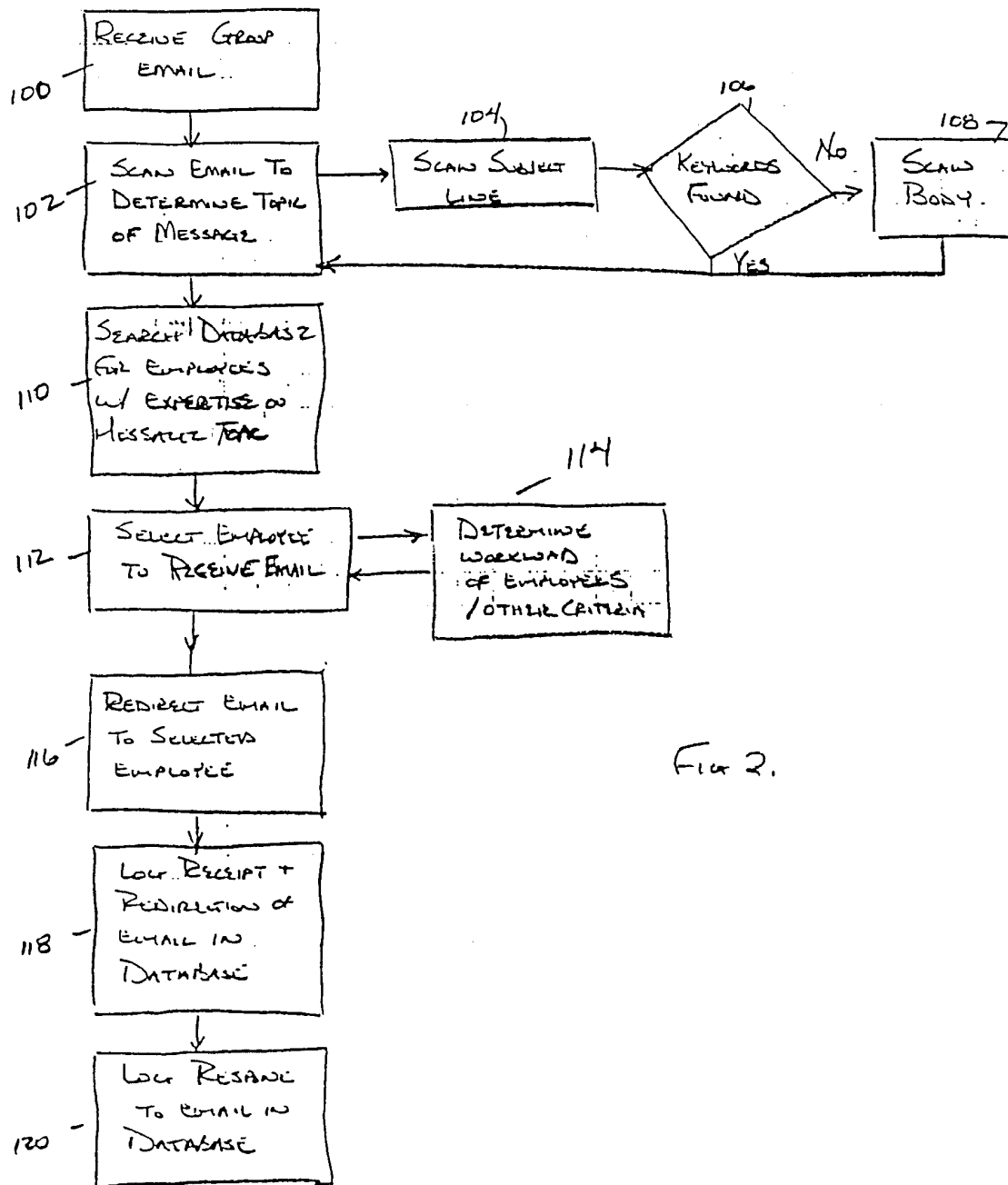
FIG 2.

	Product W	Product X	Product Y	Product Z
Employee #1	X		X	
Employee #2		X	X	X
Employee #3		X		X
Employee #M	X	X	X	
...	..	..	..	..
Employee #N	X	X	X	
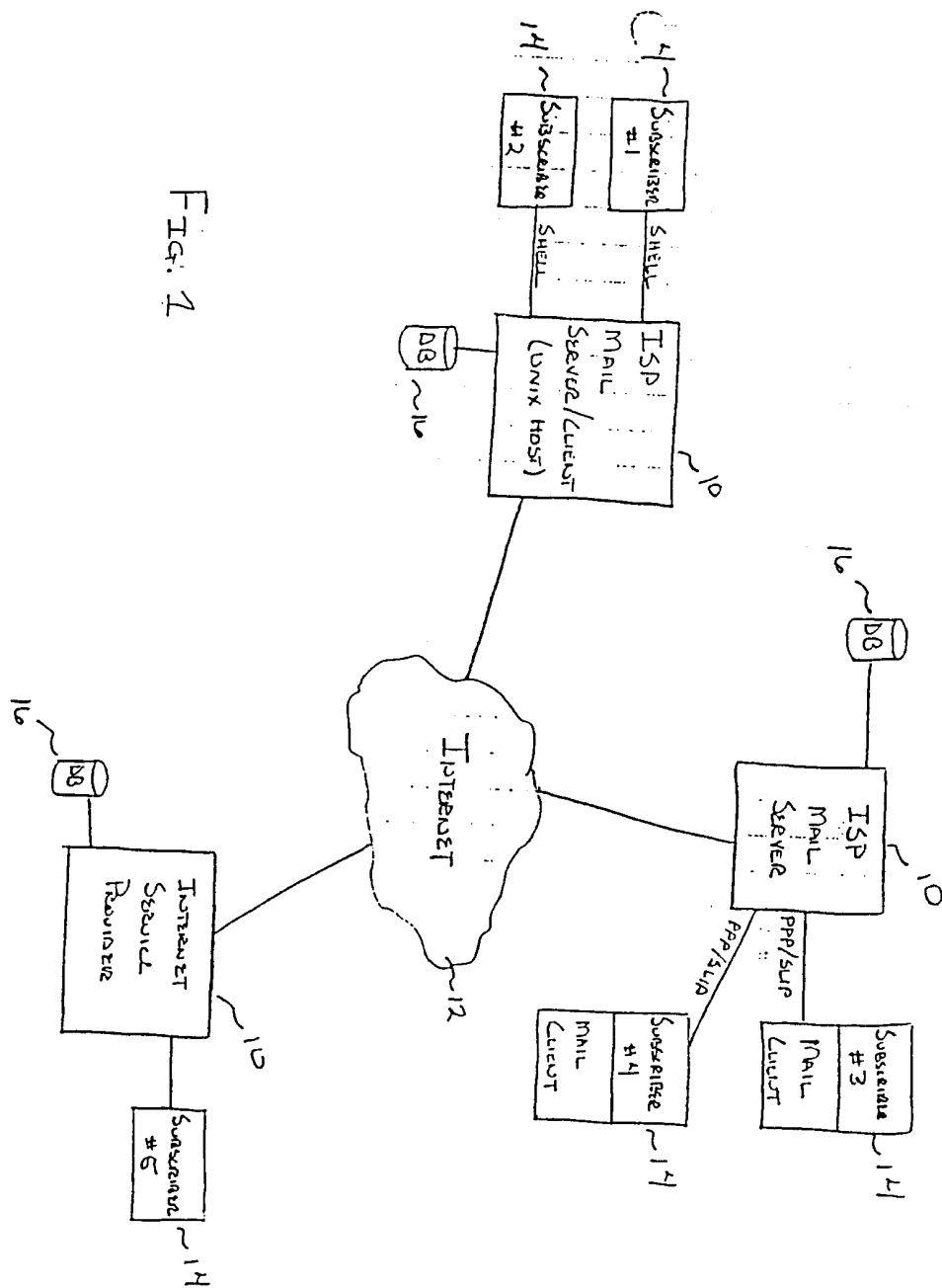
Keywords: AAA, BBB, CCC

Keywords: DDD, EEE

Keywords: FFF, GGG

Keywords: HHH, III

FIG. 3