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(54) **RANKING JOB OFFERINGS BASED ON GROWTH POTENTIAL WITHIN A COMPANY**

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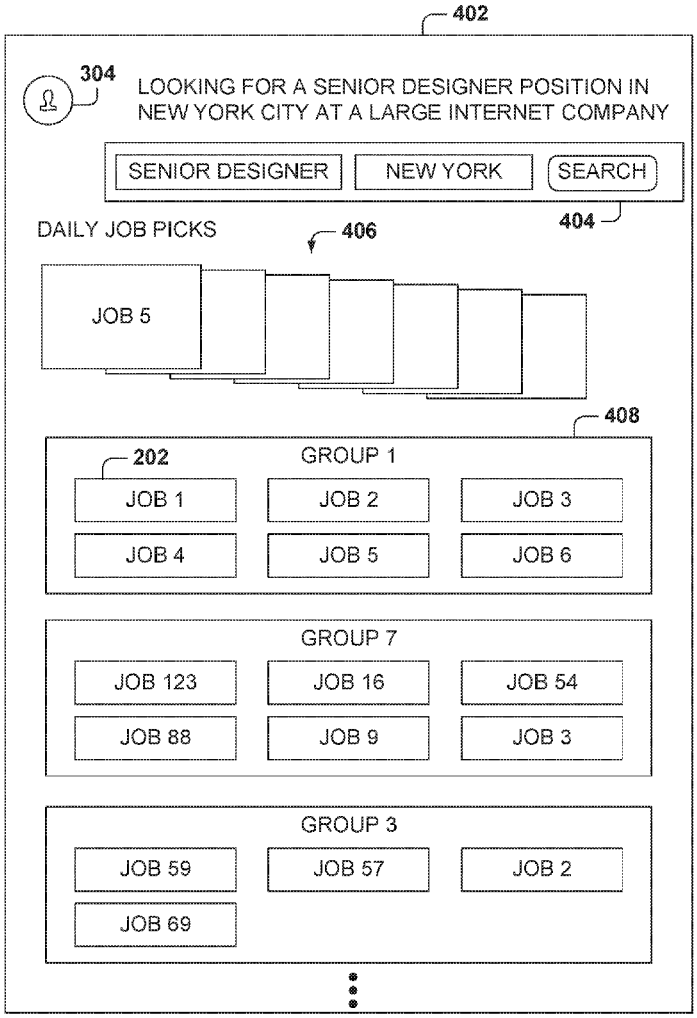
(57) **ABSTRACT**

Methods, systems, and computer programs are presented for ranking and presenting companies that are experiencing high growth in positions fulfillable by a user in response to a search for the user. A method includes identifying, on a social network, jobs that are available for presentation to the user and offered by one or more companies. The method further includes identifying proxy users who have similar skills as the user. For each company, a server determines a position growth score based on the number of proxy users who have transitioned to or from the company within a predetermined amount of time. The server additionally ranks the jobs within a high-growth companies group for the user based on the position growth score for each job. The jobs are then presented to the user on a user interface according to the job ranking.



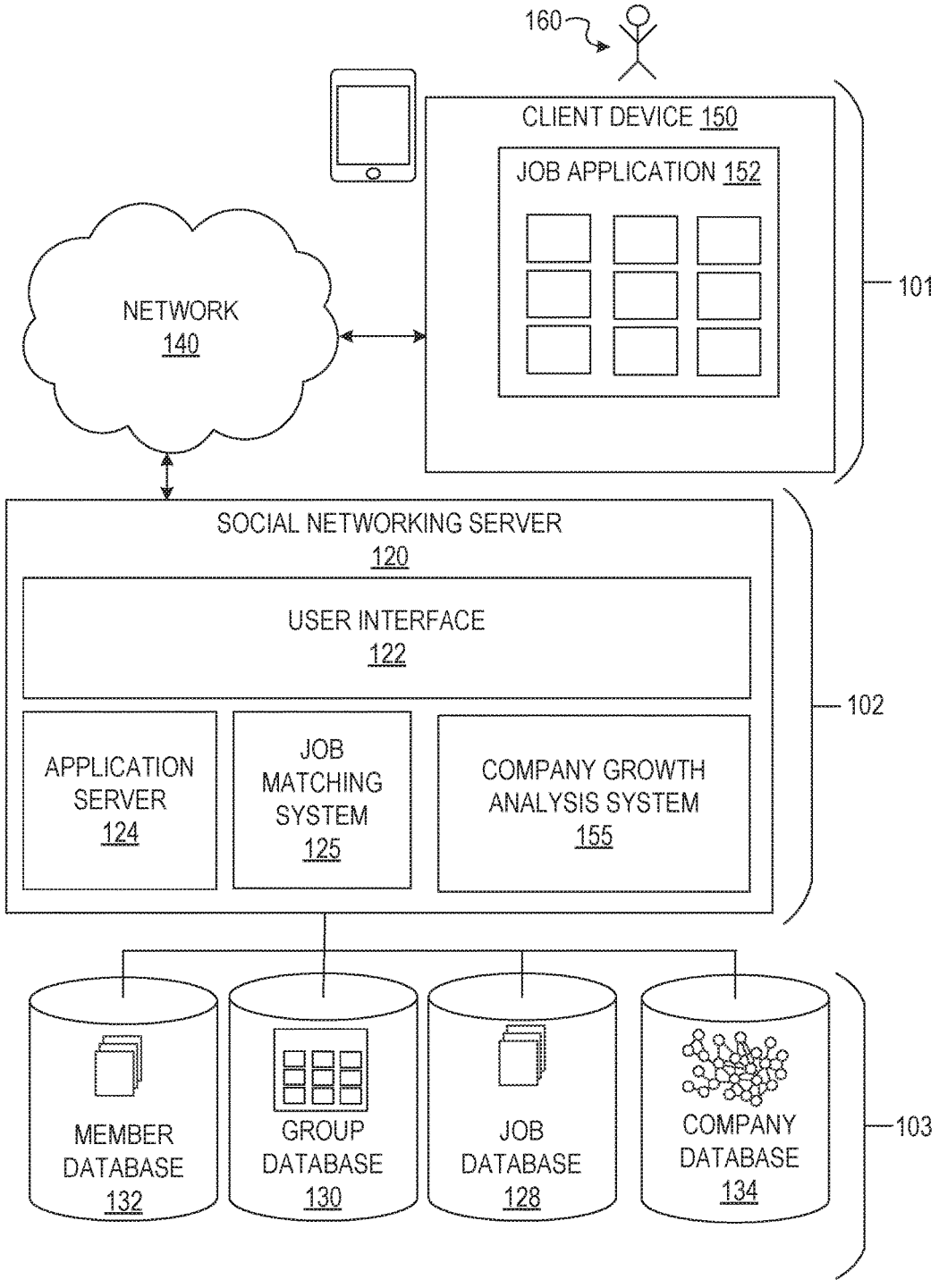

160
CLIENT DEVICE 150
JOB APPLICATION 152
101
NETWORK
140
SOCIAL NETWORKING SERVER
120
USER INTERFACE
122
102
APPLICATION SERVER
124
JOB MATCHING SYSTEM
125
COMPANY GROWTH ANALYSIS SYSTEM
155
MEMBER DATABASE
132
GROUP DATABASE
130
JOB DATABASE
128
COMPANY DATABASE
134
103

FIG. 1

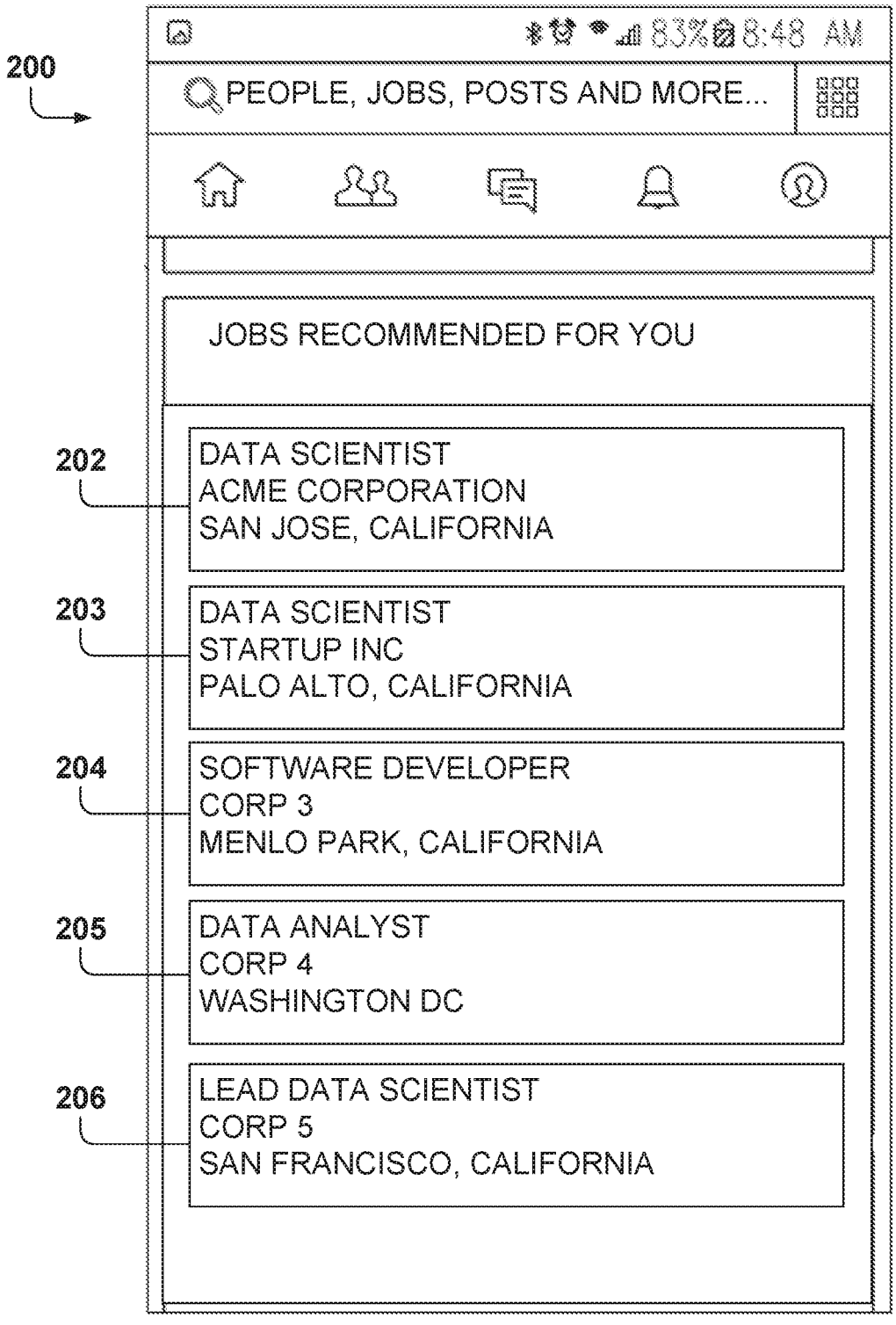

200
83% 8:48 AM
PEOPLE, JOBS, POSTS AND MORE...
JOBS RECOMMENDED FOR YOU
202
DATA SCIENTIST
ACME CORPORATION
SAN JOSE, CALIFORNIA
203
DATA SCIENTIST
STARTUP INC
PALO ALTO, CALIFORNIA
204
SOFTWARE DEVELOPER
CORP 3
MENLO PARK, CALIFORNIA
205
DATA ANALYST
CORP 4
WASHINGTON DC
206
LEAD DATA SCIENTIST
CORP 5
SAN FRANCISCO, CALIFORNIA

FIG. 2

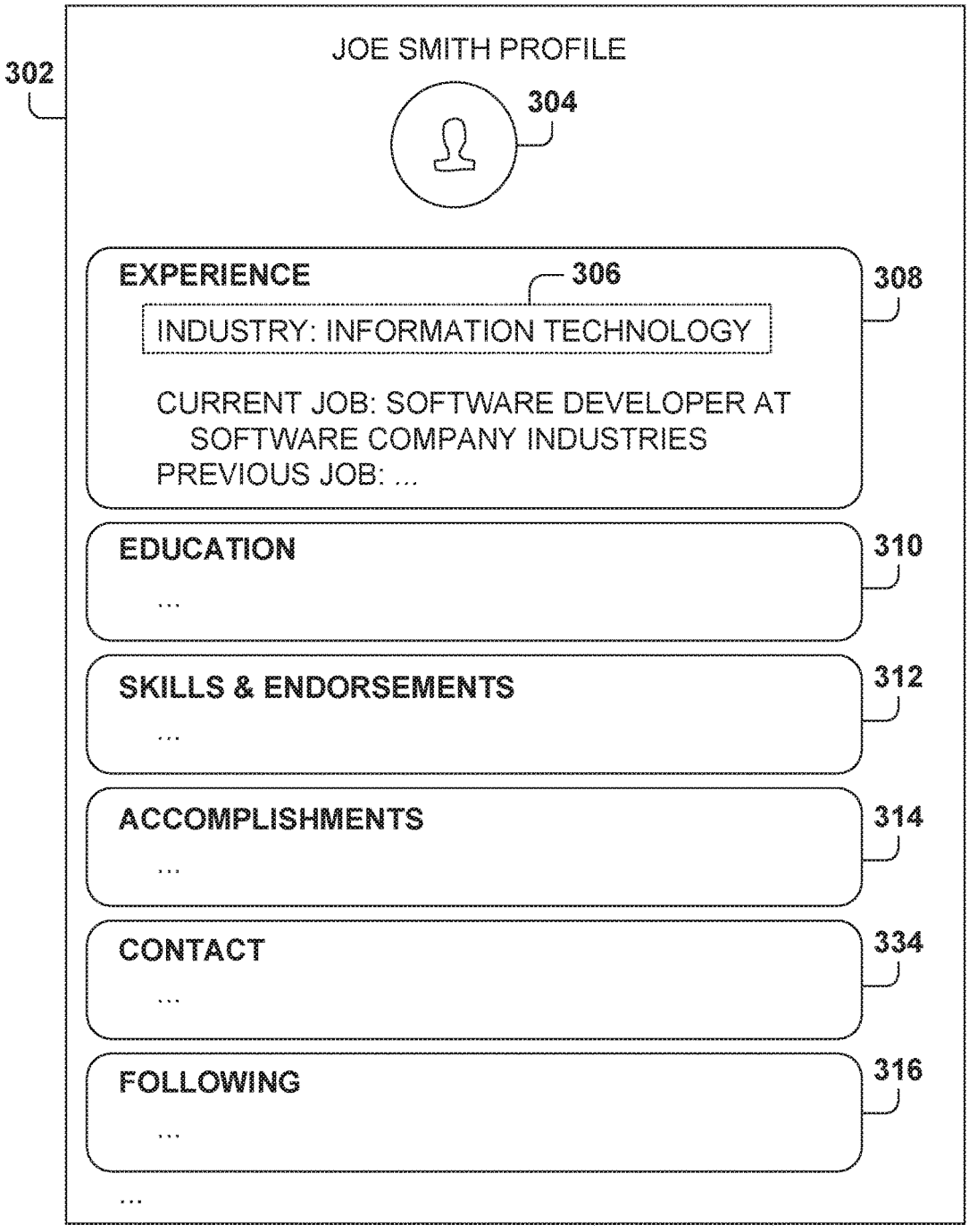

302
JOE SMITH PROFILE
304
EXPERIENCE
306
308
INDUSTRY: INFORMATION TECHNOLOGY
CURRENT JOB: SOFTWARE DEVELOPER AT SOFTWARE COMPANY INDUSTRIES
PREVIOUS JOB: ...
EDUCATION
310
...
SKILLS & ENDORSEMENTS
312
...
ACCOMPLISHMENTS
314
...
CONTACT
334
...
FOLLOWING
316
...
...

FIG. 3

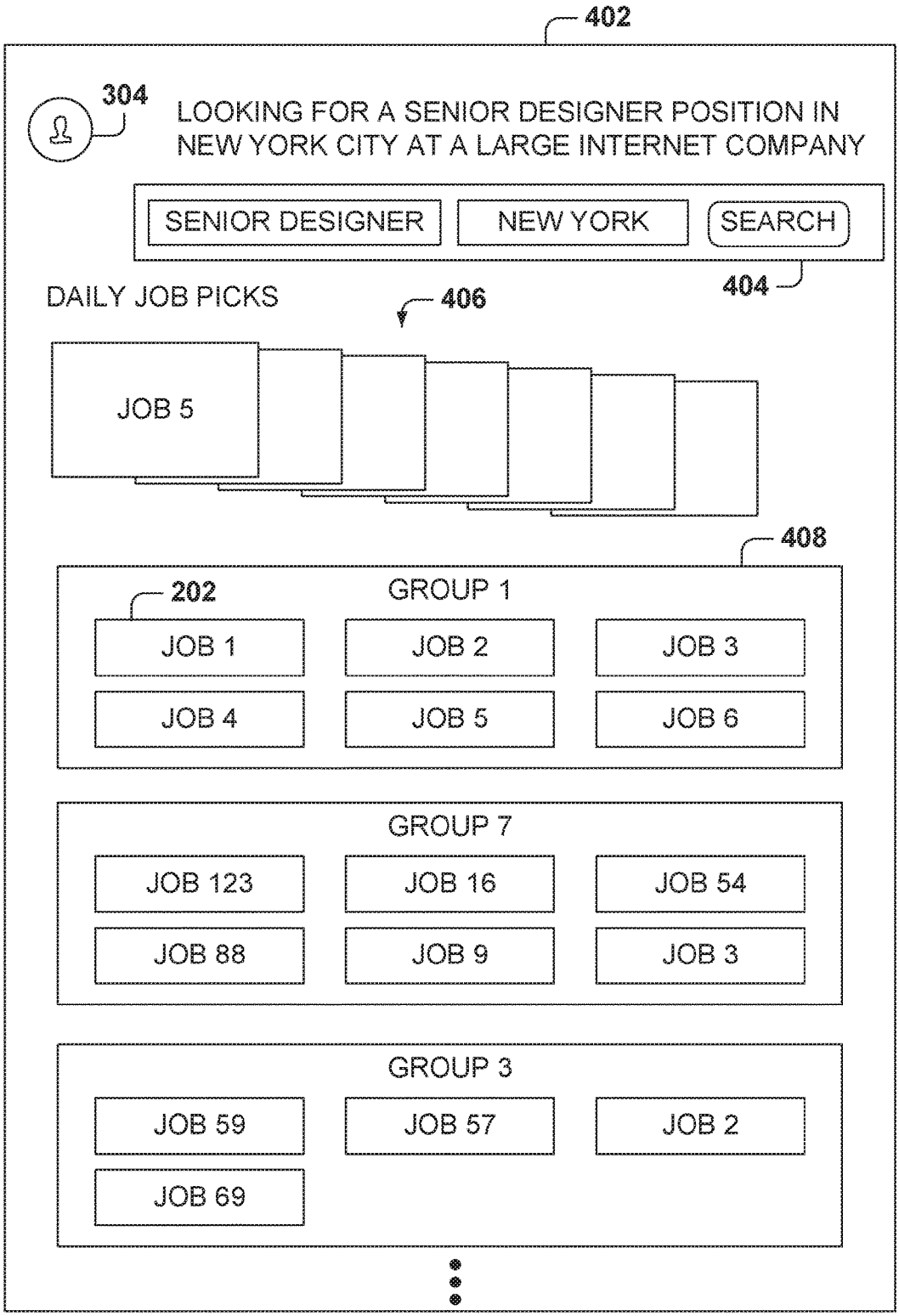

402
304
LOOKING FOR A SENIOR DESIGNER POSITION IN NEW YORK CITY AT A LARGE INTERNET COMPANY
SENIOR DESIGNER
NEW YORK
SEARCH
404
DAILY JOB PICKS
406
JOB 5
408
202
GROUP 1
JOB 1
JOB 2
JOB 3
JOB 4
JOB 5
JOB 6
GROUP 7
JOB 123
JOB 16
JOB 54
JOB 88
JOB 9
JOB 3
GROUP 3
JOB 59
JOB 57
JOB 2
JOB 69

FIG. 4

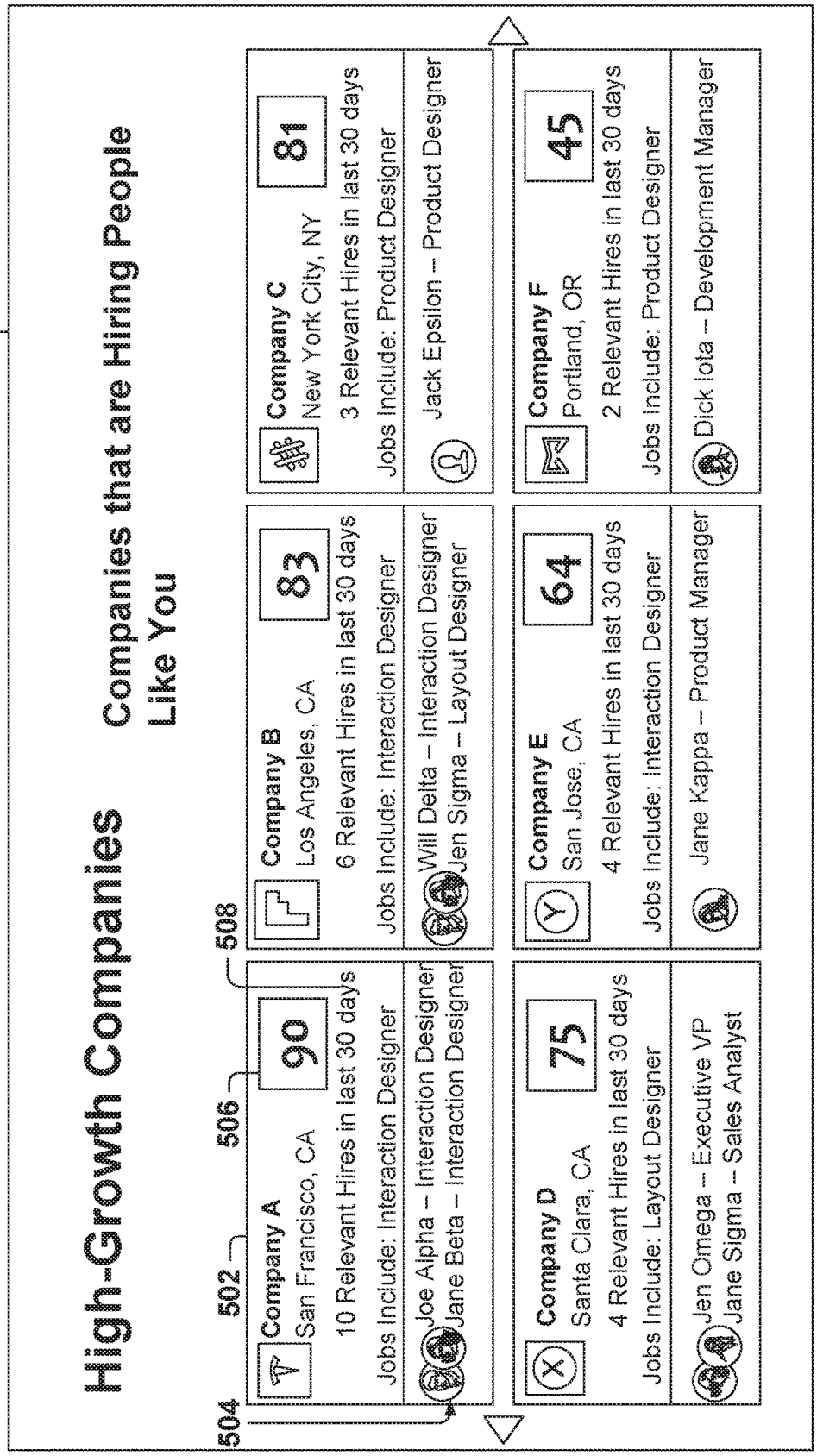

408
High-Growth Companies
Companies that are Hiring People Like You
504
502
506
508
Company A
San Francisco, CA
90
10 Relevant Hires in last 30 days
Jobs Include: Interaction Designer
Joe Alpha – Interaction Designer
Jane Beta – Interaction Designer
Company B
Los Angeles, CA
83
6 Relevant Hires in last 30 days
Jobs Include: Interaction Designer
Will Delta – Interaction Designer
Jen Sigma – Layout Designer
Company C
New York City, NY
81
3 Relevant Hires in last 30 days
Jobs Include: Product Designer
Jack Epsilon – Product Designer
Company D
Santa Clara, CA
75
4 Relevant Hires in last 30 days
Jobs Include: Layout Designer
Jen Omega – Executive VP
Jane Sigma – Sales Analyst
Company E
San Jose, CA
64
4 Relevant Hires in last 30 days
Jobs Include: Interaction Designer
Jane Kappa – Product Manager
Company F
Portland, OR
45
2 Relevant Hires in last 30 days
Jobs Include: Product Designer
Dick Iota – Development Manager

FIG. 5A

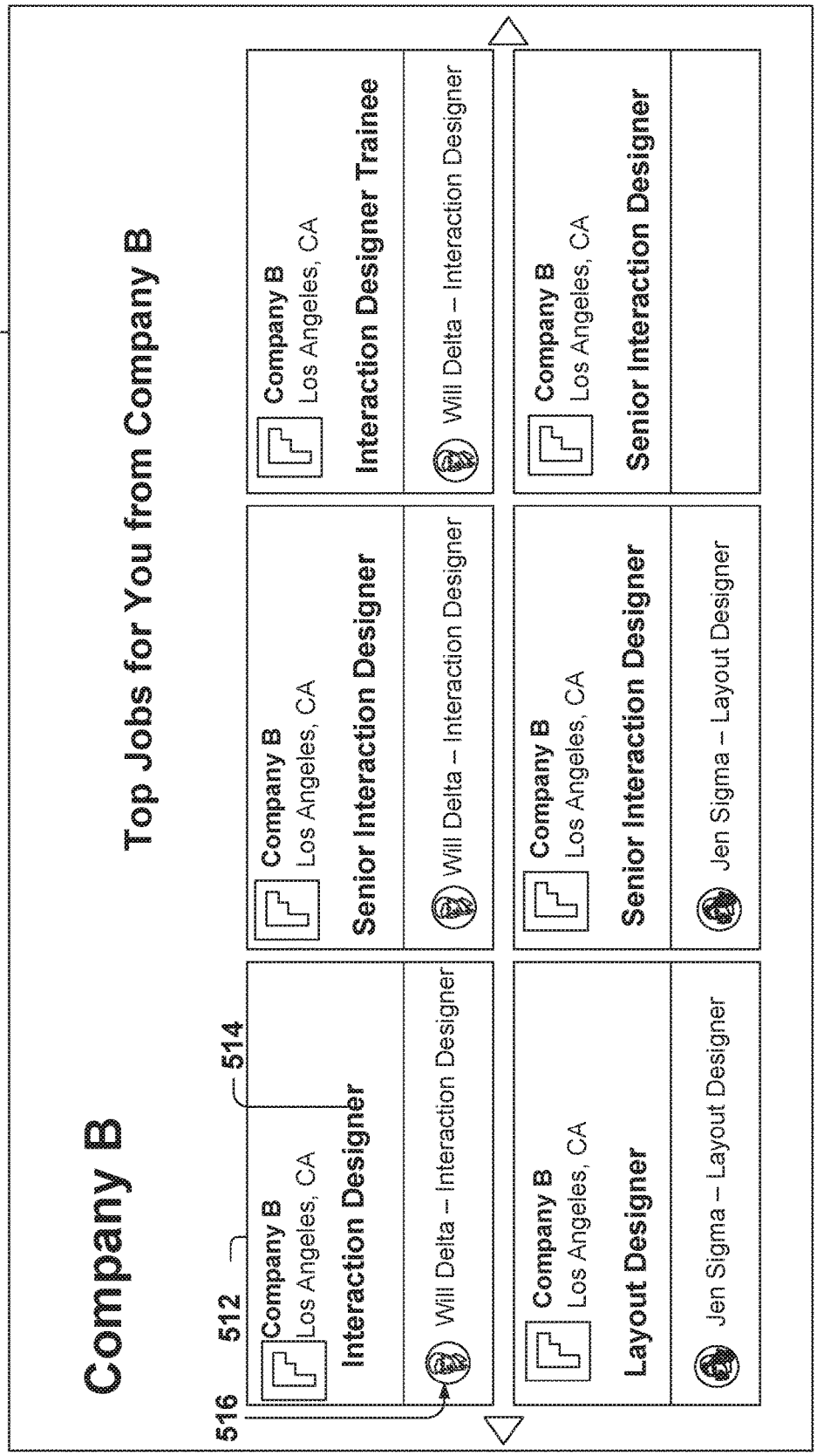

510
Company B
Top Jobs for You from Company B
516
512
514
Company B
Los Angeles, CA
Interaction Designer
Will Delta – Interaction Designer
Company B
Los Angeles, CA
Senior Interaction Designer
Will Delta – Interaction Designer
Company B
Los Angeles, CA
Interaction Designer Trainee
Will Delta – Interaction Designer
Company B
Los Angeles, CA
Layout Designer
Jen Sigma – Layout Designer
Company B
Los Angeles, CA
Senior Interaction Designer
Jen Sigma – Layout Designer
Company B
Los Angeles, CA
Senior Interaction Designer

FIG. 5B

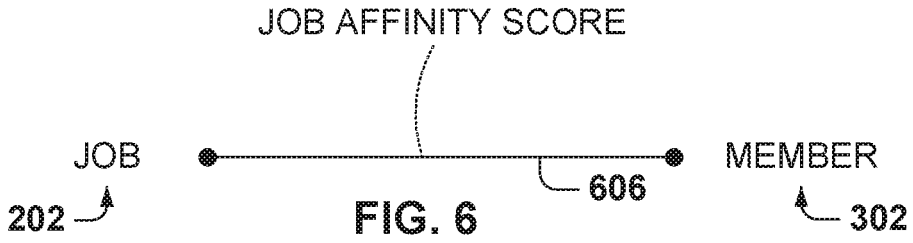

JOB AFFINITY SCORE
JOB
202
606
MEMBER
302

FIG. 6

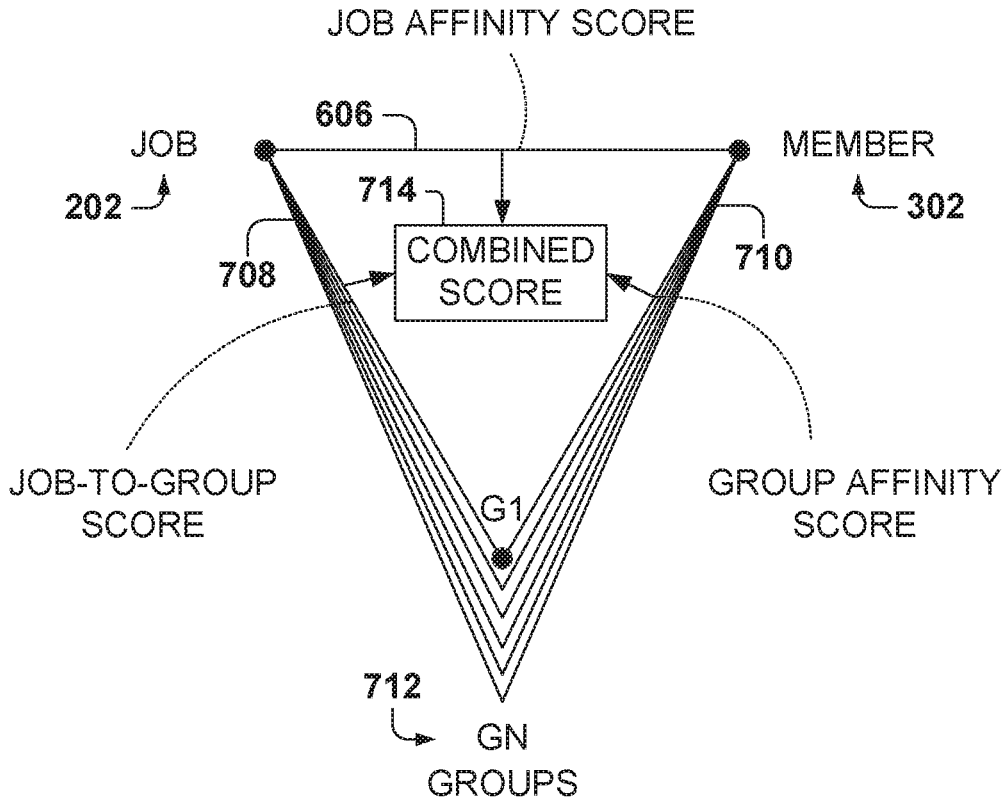

JOB AFFINITY SCORE
606
JOB
202
714
MEMBER
302
708
COMBINED SCORE
710
JOB-TO-GROUP SCORE
G1
GROUP AFFINITY SCORE
712
GN
GROUPS

FIG. 7

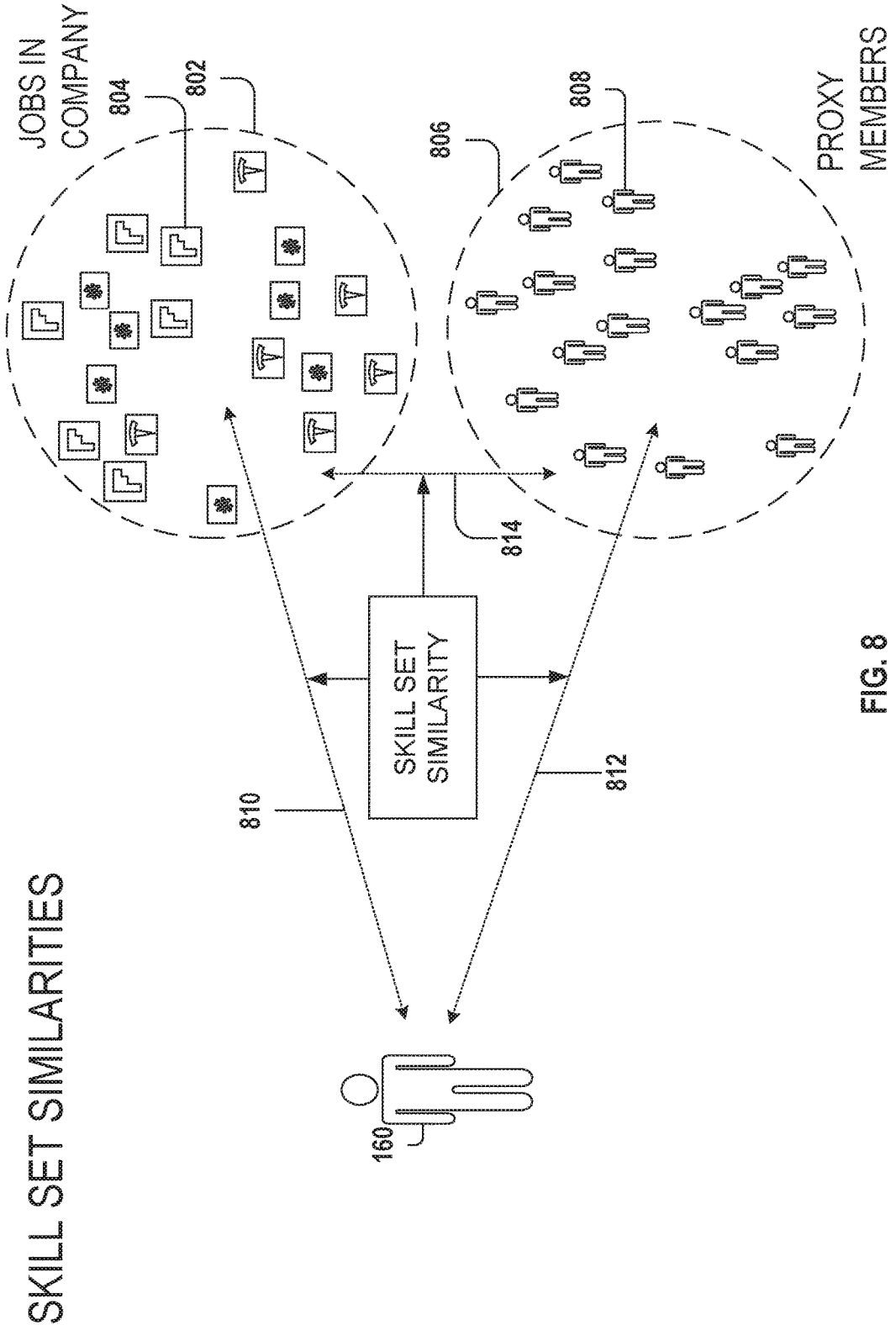

SKILL SET SIMILARITIES
JOBS IN COMPANY
804
802
806
808
PROXY MEMBERS
814
SKILL SET SIMILARITY
810
812
160

FIG. 8

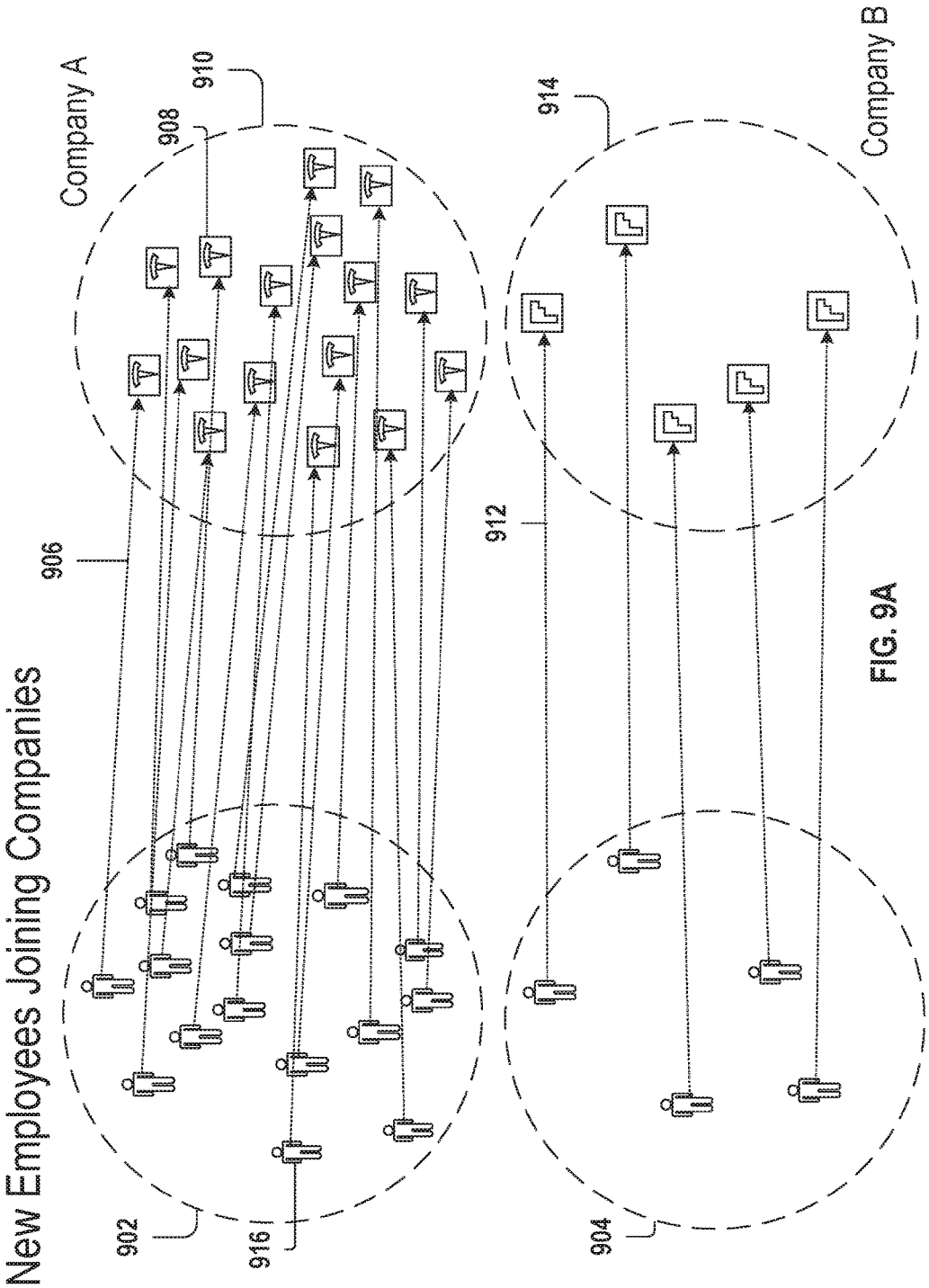

New Employees Joining Companies
Company A
Company B
902
904
906
908
910
912
914
916

FIG. 9A

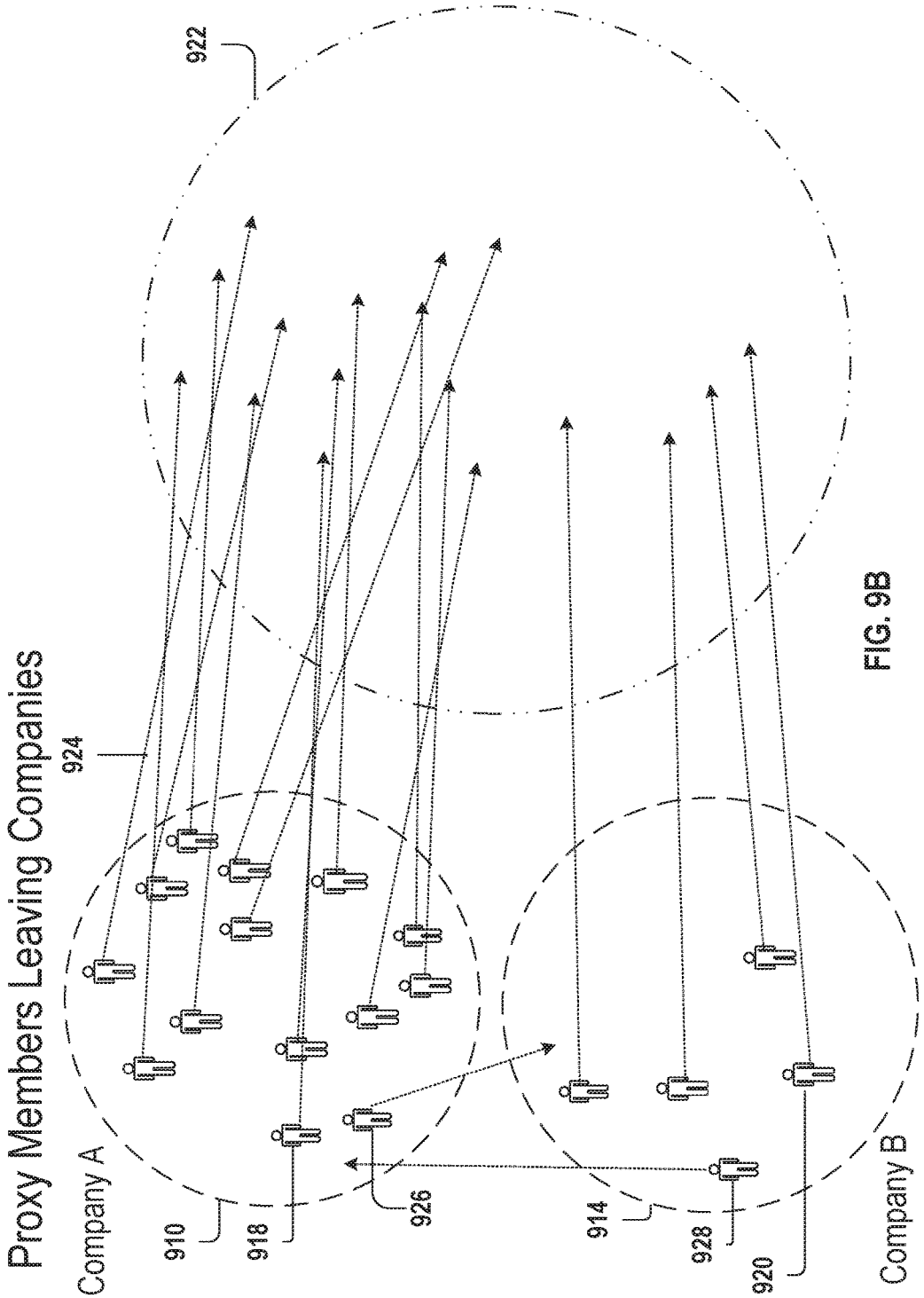

Proxy Members Leaving Companies
922
924
Company A
910
918
926
914
928
920
Company B

FIG. 9B

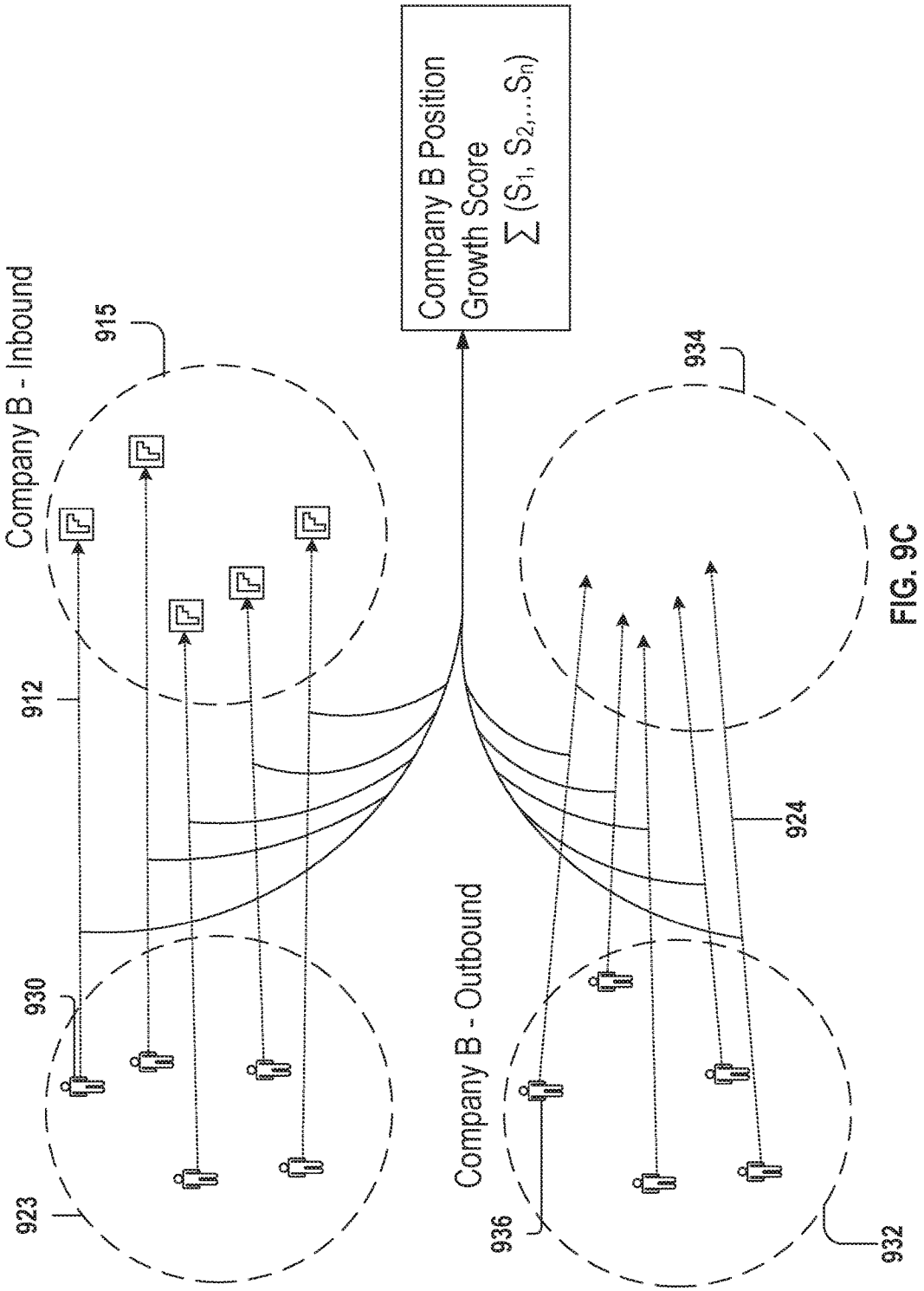

Company B Position
Growth Score
∑ (S1, S2,...Sn)
Company B - Inbound
915
912
923
930
Company B - Outbound
934
924
936
932

FIG. 9C

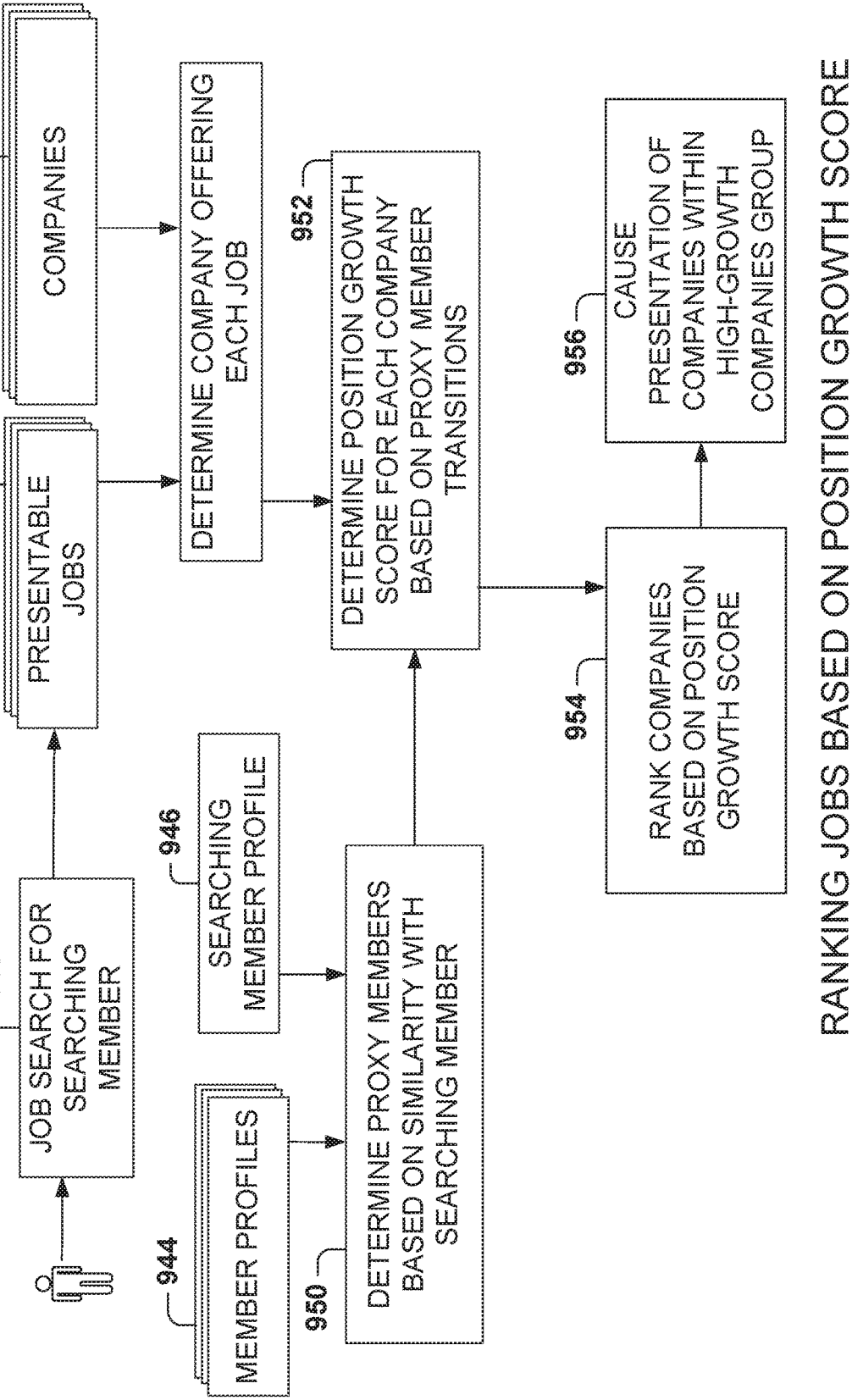

RANKING JOBS BASED ON POSITION GROWTH SCORE
938
JOB SEARCH FOR SEARCHING MEMBER
940
PRESENTABLE JOBS
942
COMPANIES
944
MEMBER PROFILES
946
SEARCHING MEMBER PROFILE
950
DETERMINE PROXY MEMBERS BASED ON SIMILARITY WITH SEARCHING MEMBER
DETERMINE COMPANY OFFERING EACH JOB
952
DETERMINE POSITION GROWTH SCORE FOR EACH COMPANY BASED ON PROXY MEMBER TRANSITIONS
954
RANK COMPANIES BASED ON POSITION GROWTH SCORE
956
CAUSE PRESENTATION OF COMPANIES WITHIN HIGH-GROWTH COMPANIES GROUP

FIG. 9D

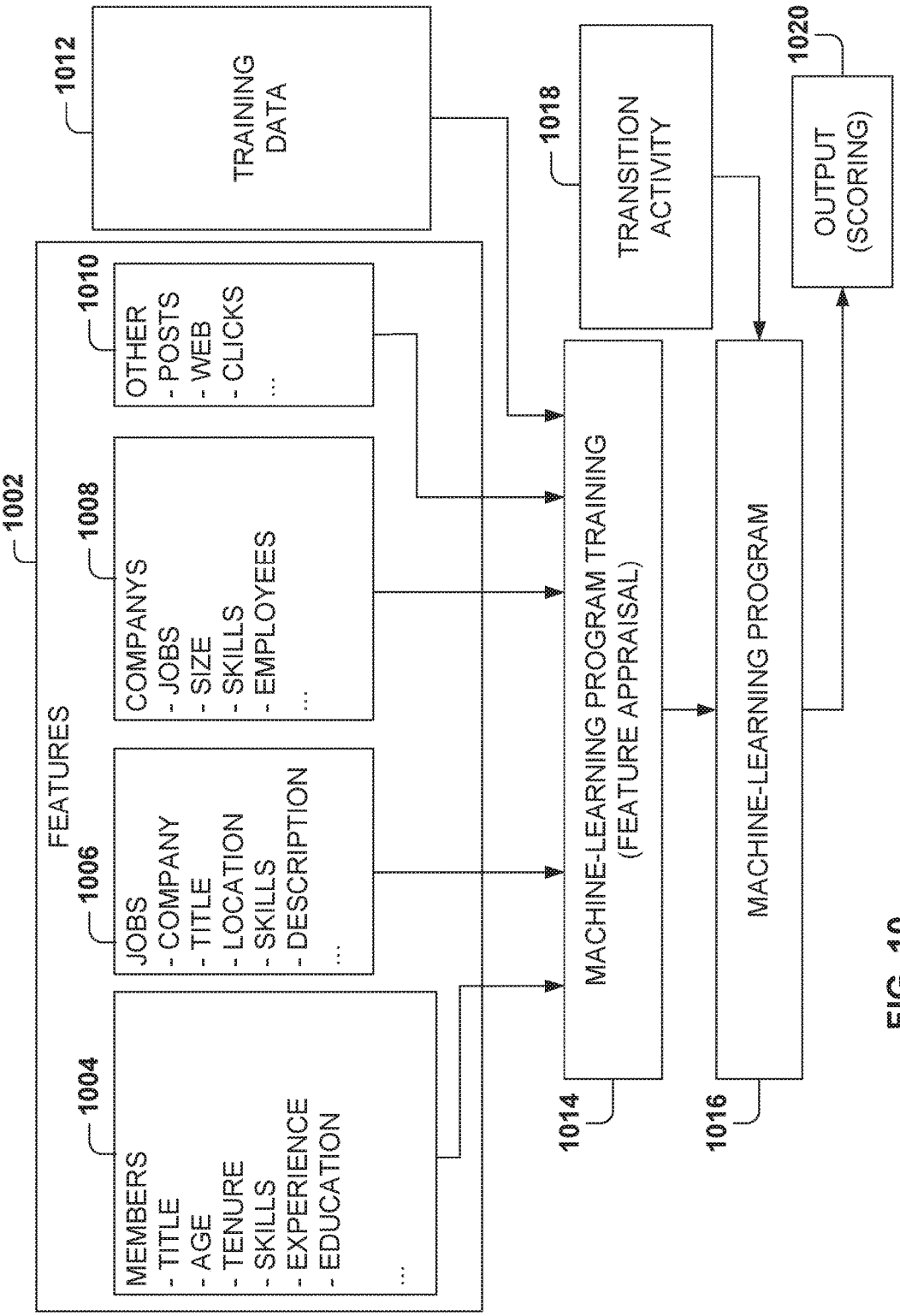

1002
FEATURES
1004
MEMBERS
- TITLE
- AGE
- TENURE
- SKILLS
- EXPERIENCE
- EDUCATION
...
1006
JOBS
- COMPANY
- TITLE
- LOCATION
- SKILLS
- DESCRIPTION
...
1008
COMPANYS
- JOBS
- SIZE
- SKILLS
- EMPLOYEES
...
1010
OTHER
- POSTS
- WEB
- CLICKS
...
1012
TRAINING DATA
1014
MACHINE-LEARNING PROGRAM TRAINING (FEATURE APPRAISAL)
1016
MACHINE-LEARNING PROGRAM
1018
TRANSITION ACTIVITY
1020
OUTPUT (SCORING)

FIG. 10

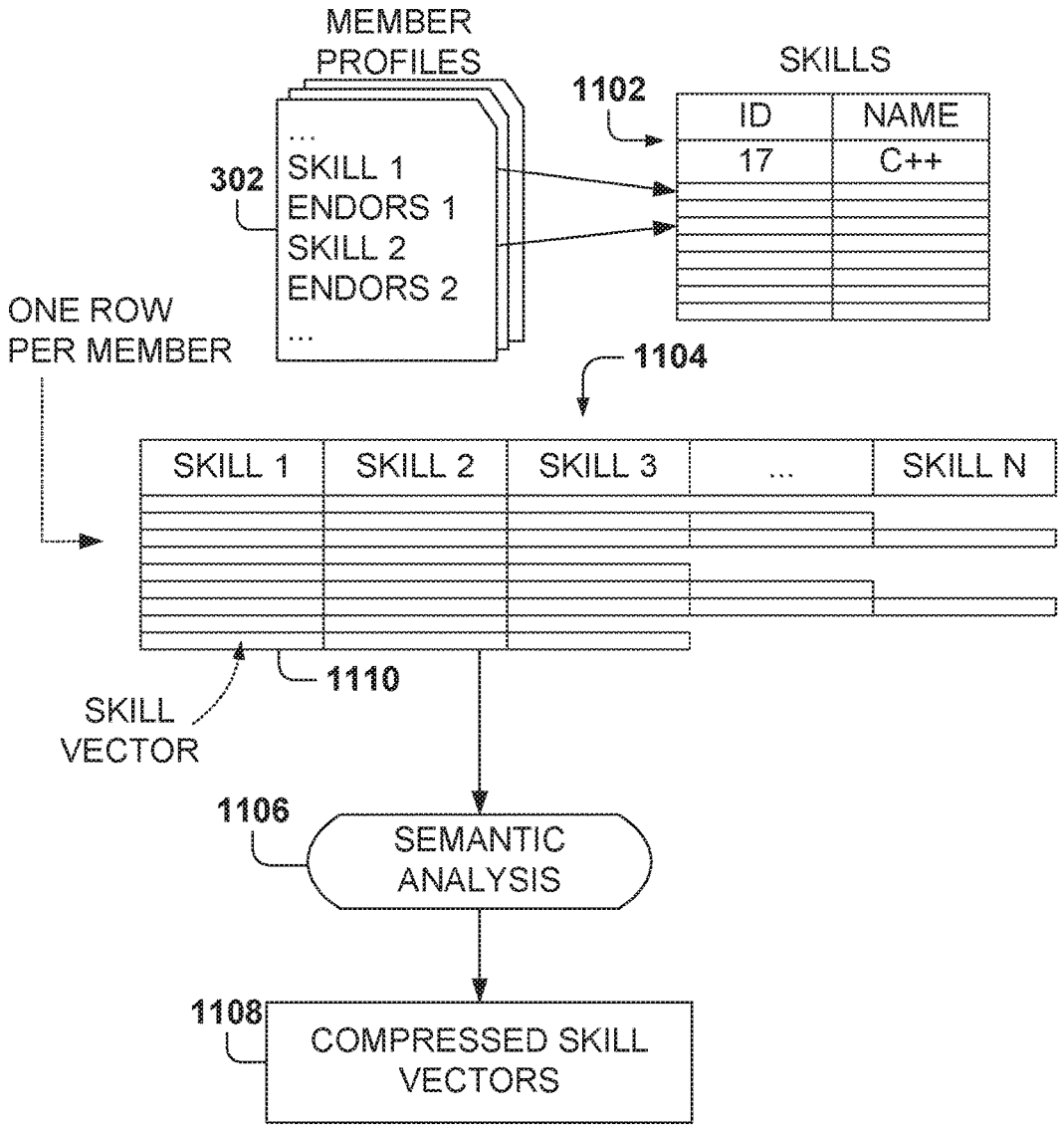

MEMBER PROFILES
SKILLS
1102
ID
NAME
17
C++
...
SKILL 1
ENDORS 1
SKILL 2
ENDORS 2
...
302
ONE ROW PER MEMBER
1104
SKILL 1
SKILL 2
SKILL 3
...
SKILL N
1110
SKILL VECTOR
1106
SEMANTIC ANALYSIS
1108
COMPRESSED SKILL VECTORS

FIG. 11

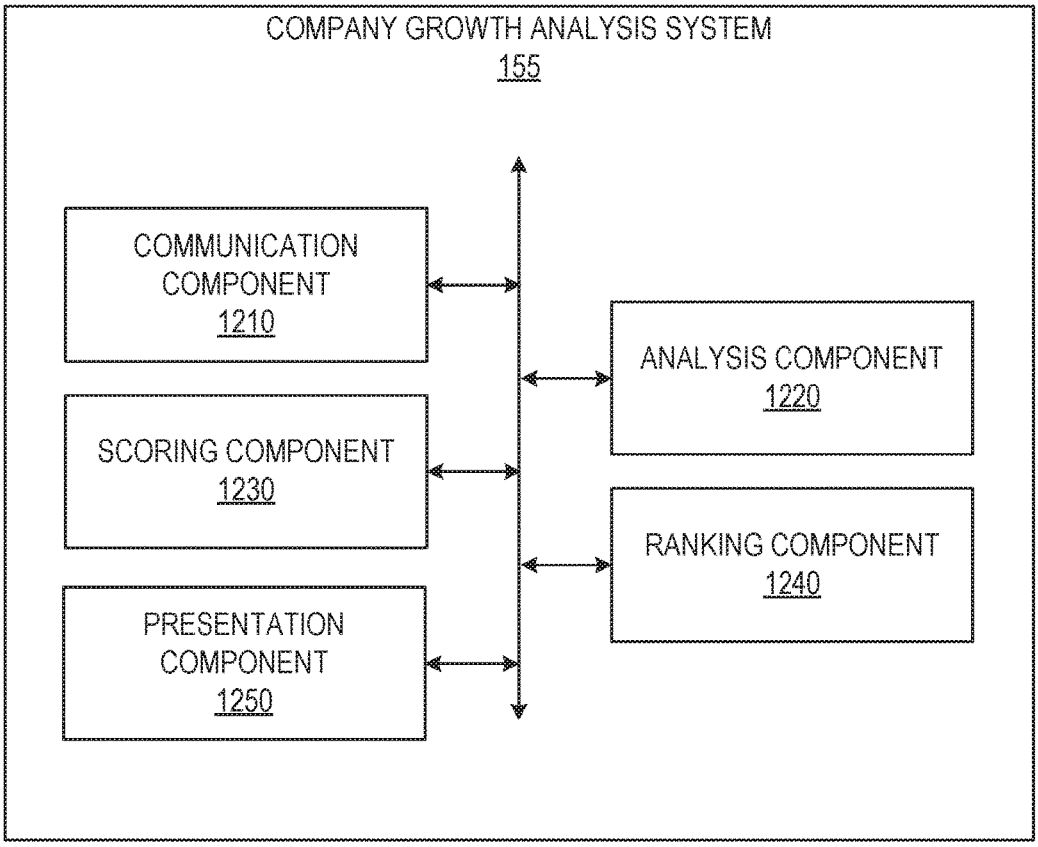

COMPANY GROWTH ANALYSIS SYSTEM
155
COMMUNICATION COMPONENT
1210
SCORING COMPONENT
1230
PRESENTATION COMPONENT
1250
ANALYSIS COMPONENT
1220
RANKING COMPONENT
1240

FIG. 12

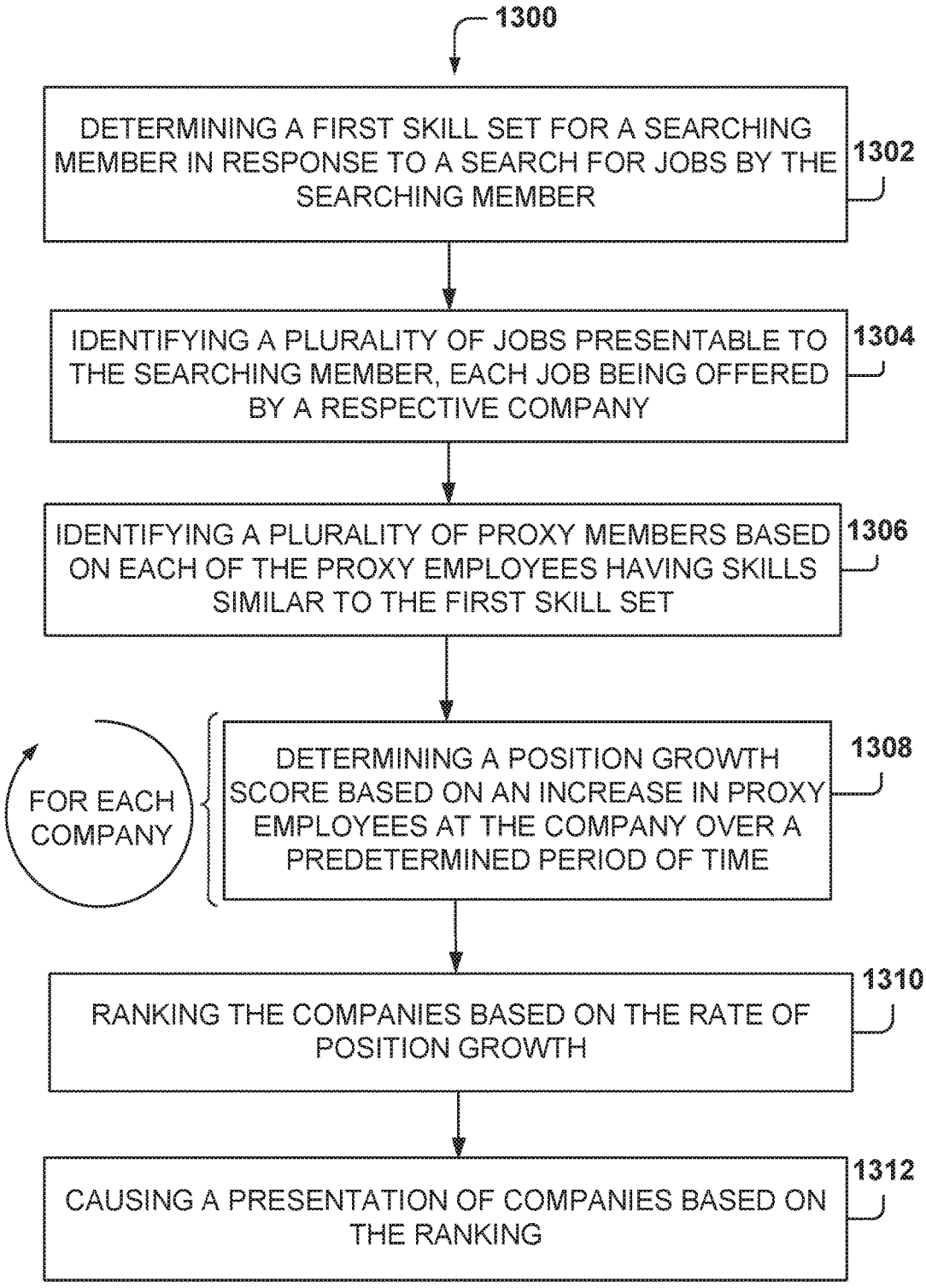

1300
DETERMINING A FIRST SKILL SET FOR A SEARCHING MEMBER IN RESPONSE TO A SEARCH FOR JOBS BY THE SEARCHING MEMBER
1302
IDENTIFYING A PLURALITY OF JOBS PRESENTABLE TO THE SEARCHING MEMBER, EACH JOB BEING OFFERED BY A RESPECTIVE COMPANY
1304
IDENTIFYING A PLURALITY OF PROXY MEMBERS BASED ON EACH OF THE PROXY EMPLOYEES HAVING SKILLS SIMILAR TO THE FIRST SKILL SET
1306
FOR EACH COMPANY
DETERMINING A POSITION GROWTH SCORE BASED ON AN INCREASE IN PROXY EMPLOYEES AT THE COMPANY OVER A PREDETERMINED PERIOD OF TIME
1308
RANKING THE COMPANIES BASED ON THE RATE OF POSITION GROWTH
1310
CAUSING A PRESENTATION OF COMPANIES BASED ON THE RANKING
1312

FIG. 13

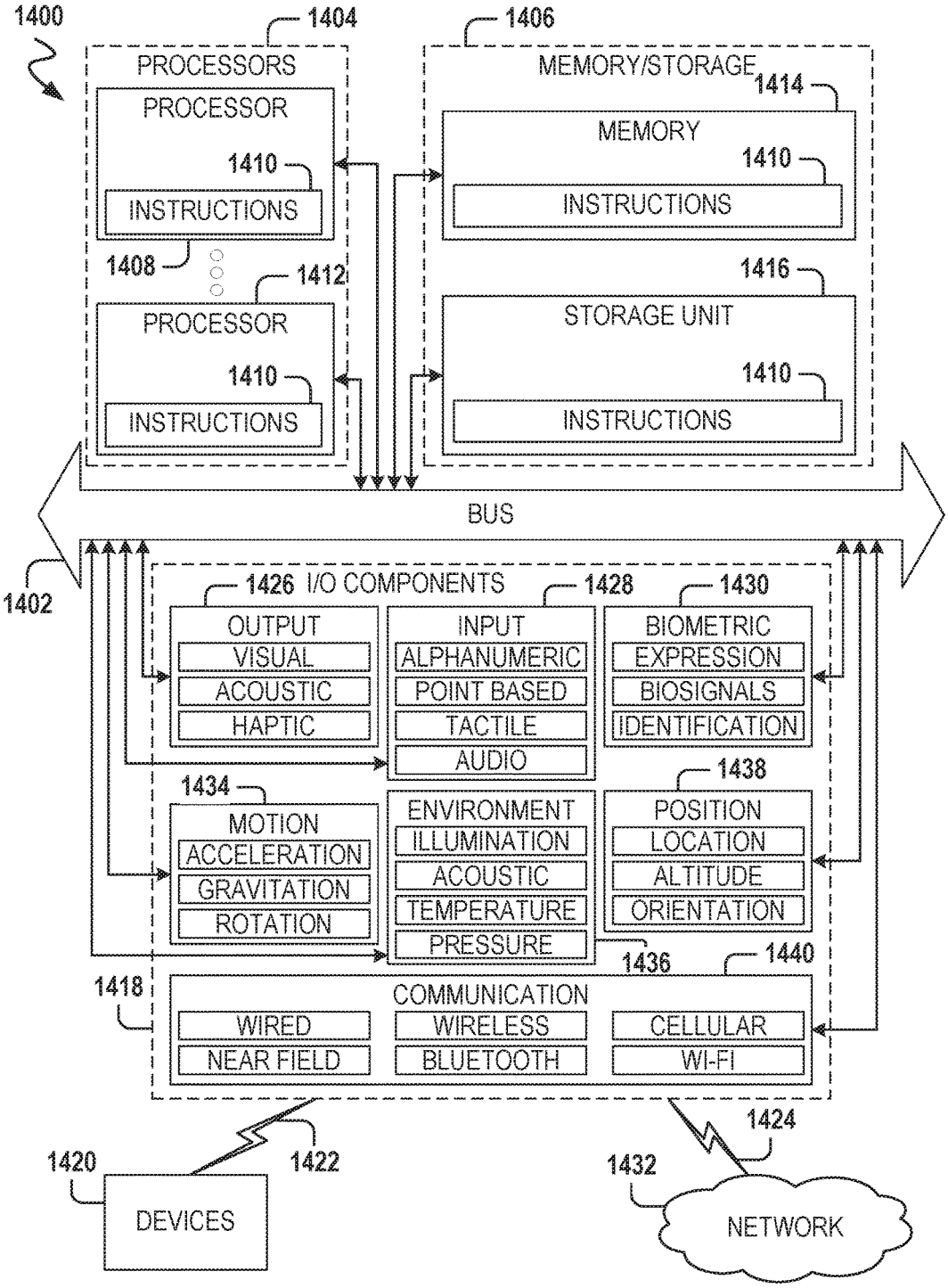

1400
1404
PROCESSORS
PROCESSOR
1410
INSTRUCTIONS
1408
1412
PROCESSOR
1410
INSTRUCTIONS
1406
MEMORY/STORAGE
1414
MEMORY
1410
INSTRUCTIONS
1416
STORAGE UNIT
1410
INSTRUCTIONS
BUS
1402
1426 I/O COMPONENTS
1428
1430
OUTPUT
VISUAL
ACOUSTIC
HAPTIC
INPUT
ALPHANUMERIC
POINT BASED
TACTILE
AUDIO
BIOMETRIC
EXPRESSION
BIOSIGNALS
IDENTIFICATION
1434
MOTION
ACCELERATION
GRAVITATION
ROTATION
ENVIRONMENT
ILLUMINATION
ACOUSTIC
TEMPERATURE
PRESSURE
1438
POSITION
LOCATION
ALTITUDE
ORIENTATION
1436
1440
1418
COMMUNICATION
WIRED
NEAR FIELD
WIRELESS
BLUETOOTH
CELLULAR
WI-FI
1424
1420
1422
1432
DEVICES
NETWORK

FIG. 14

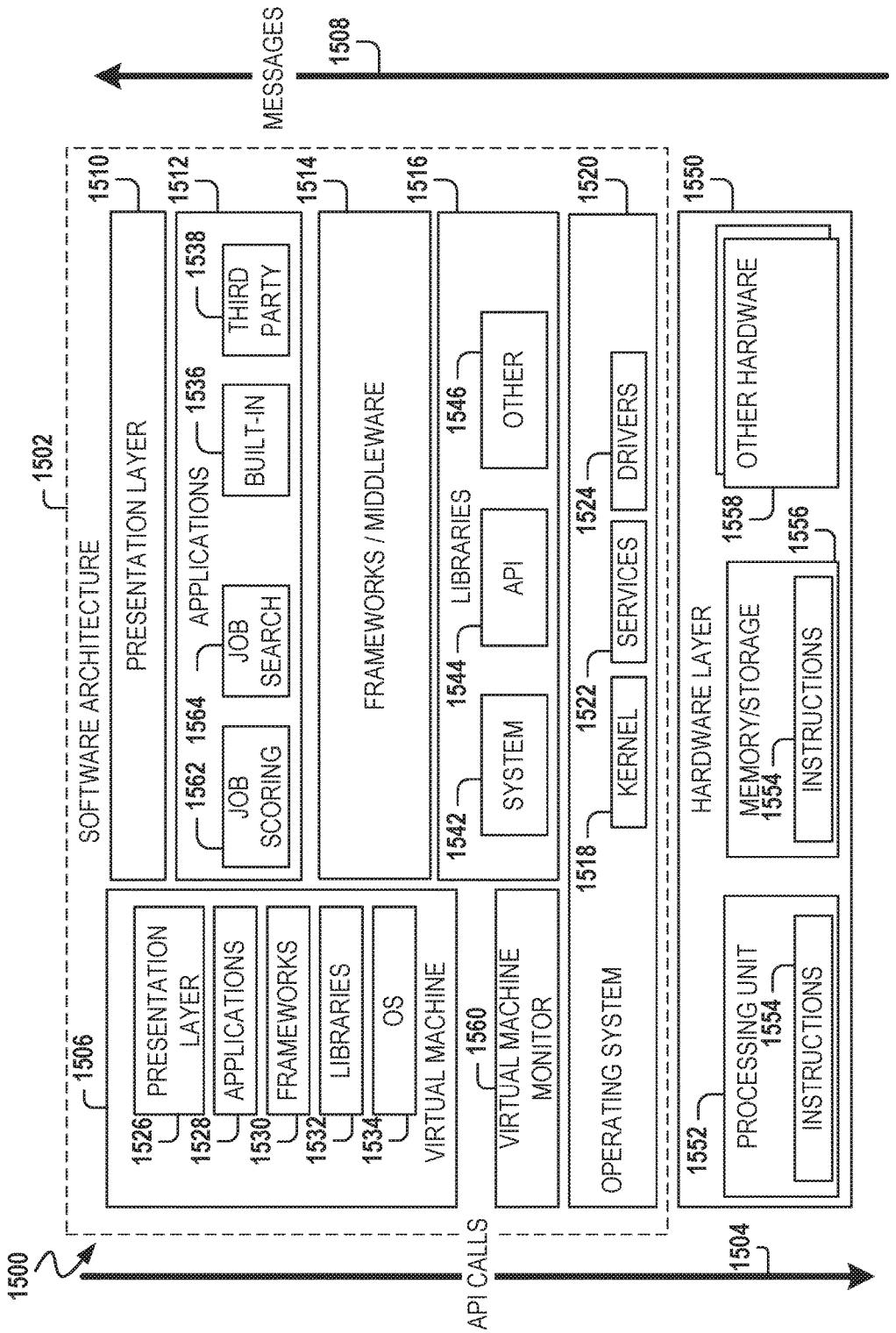

1500
1502
SOFTWARE ARCHITECTURE
MESSAGES
1508
API CALLS
1504
1506
PRESENTATION LAYER
1526
APPLICATIONS
1528
FRAMEWORKS
1530
LIBRARIES
1532
OS
1534
VIRTUAL MACHINE
1510
PRESENTATION LAYER
1512
APPLICATIONS
1562
JOB SCORING
1564
JOB SEARCH
1536
BUILT-IN
1538
THIRD PARTY
1514
FRAMEWORKS / MIDDLEWARE
1516
LIBRARIES
1542
SYSTEM
1544
API
1546
OTHER
1560
VIRTUAL MACHINE MONITOR
1518
OPERATING SYSTEM
1522
KERNEL
1524
SERVICES
1520
DRIVERS
1550
HARDWARE LAYER
1552
PROCESSING UNIT
1554
INSTRUCTIONS
1554
MEMORY/STORAGE
1556
INSTRUCTIONS
1558
OTHER HARDWARE

FIG. 15

RANKING JOB OFFERINGS BASED ON GROWTH POTENTIAL WITHIN A COMPANY

TECHNICAL FIELD

[0001] The subject matter disclosed herein generally relates to methods, systems, and programs for finding quality job offerings for a member of a social network.

BACKGROUND

[0002] Some social networks provide job postings to their members. The member may perform a job search by entering a job search query, or the social network may suggest jobs that may be of interest to the member. However, current job search methods may miss valuable opportunities for a member because the job search engine limits the search to specific parameters. For example, the job search engine may look for matches of a job title to the member's job title, but there may be quality jobs that are associated with a different title that would be of interest to the member.

[0003] Further, existing job search methods may focus only on the job description or the member's profile, without considering the member's preferences for job searches that go beyond the job description or other information that may help find the best job postings for the member.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Various ones of the appended drawings merely illustrate example embodiments of the present disclosure and cannot be considered as limiting its scope.

[0005] FIG. **1** is a block diagram illustrating a network architecture, according to some example embodiments, including a social networking server.

[0006] FIG **2** is a screenshot of a user interface that includes job recommendations, according to some example embodiments.

[0007] FIG. **3** is a screenshot of a user's profile view, according to some example embodiments.

[0008] FIG. **4** is a diagram of a user interface, according to some example embodiments, for presenting job postings to a member of a social network.

[0009] FIG. **5**A is a detail of a "high-growth companies" group area in a user interface, according to some example embodiments.

[0010] FIG. **5**B is a detail of a company display showing jobs available within a specific company, according to some example embodiments.

[0011] FIG. **6** illustrates the scoring of a job for a member, according to some example embodiments.

[0012] FIG. **7** further shows the scoring of the job for the member while incorporating groups, according to some example embodiments.

[0013] FIG. **8** is a diagram that depicts a comparison of skills included in the profile of a searching member with skills included in the profiles of a plurality of proxy members and skills in jobs offered by a company, according to some example embodiments.

[0014] FIG. **9**A is a diagram that depicts groups of proxy members who have attained employment at two companies during a predetermined period of time, according to some example embodiments.

[0015] FIG. **9**B is a diagram that depicts groups of proxy members, employed at a first company or a second company, leaving their respective company, according to some example embodiments.

[0016] FIG. **9**C is a diagram that depicts a group of proxy members joining a company and another group of proxy members leaving the company during the predetermined period of time, and how a position growth score is calculated, according to some embodiments.

[0017] FIG. **9**D is an additional illustration of a method for calculating a position growth score for each company by analyzing transitions of proxy members.

[0018] FIG. **10** illustrates the training and use of a machine-learning program, according to some example embodiments.

[0019] FIG. **11** illustrates a method for identifying similarities among member skills, according to some example embodiments.

[0020] FIG. **12** illustrates a company growth analysis system for implementing example embodiments.

[0021] FIG. **13** is a flowchart of a method, according to some example embodiments, for presenting companies ranked by position growth rate in response to a search for a member.

[0022] FIG. **14** is a block diagram illustrating an example of a software architecture that may be installed on a machine, according to some example embodiments.

[0023] FIG. **15** is a diagrammatic representation of a machine in the form of a computer system within which a set of instructions may be executed for causing the machine to perform any one or more of the methodologies discussed herein, according to an example embodiment.

DETAILED DESCRIPTION

[0024] Example methods, systems, and computer programs are directed to grouping job postings for presentation to a user in response to a search. Examples merely typify possible variations. Unless explicitly stated otherwise, components and functions are optional and may be combined or subdivided, and operations may vary in sequence or be combined or subdivided. In the following description, for purposes of explanation, numerous specific details are set forth to provide a thorough understanding of example embodiments. It will be evident to one skilled in the art, however, that the present subject matter may be practiced without these specific details.

[0025] One of the goals of the present embodiments is to personalize and redefine how job postings are searched and presented to job seekers. Another goal is to explain better why particular candidate jobs are recommended to the job seekers. The presented embodiments provide, to both active and passive job seekers, valuable job recommendation insights, thereby greatly improving their ability to find and assess jobs that meet their needs.

[0026] Instead of providing a single job recommendation list for a member, embodiments presented herein define a plurality of groups, and the job recommendations are presented within the groups. Each group provides an indication of a feature that is important to the member for selecting from the group, such as the growth potential within the hiring company, how many people have transitioned from the university of the member to the company of the job, who would be a virtual team for the member if the member joined the company, and so forth. Thus, the embodiments are able

to provide insight into the methods of job selection to the member by providing groups of jobs, with all jobs in each group sharing one or more features. Thus, the member is given insight into why certain jobs are presented within a particular group.

[0027] Embodiments presented herein determine companies that are rapidly growing with regard to employment of people similar to the member. Thus, the system is able to provide insight about which companies are hiring people with similar skills or backgrounds to those of the member. Further, insight can be provided as to a rate of how each company is hiring people similar to a member. Additionally, how many employees are leaving the company may be tracked to measure the attrition rate of employees similar to the member. Thus, the member can be notified of which companies, and thus which jobs, would be worthwhile to apply when considering current hiring trends.

[0028] One general aspect includes a method for determining a first skill set for the searching member on a social network, the first skill set being based on one or more skills identified in a profile of the searching member. The method also includes operations for identifying a plurality of jobs presentable to the searching member, each job offered by a company, and identifying a plurality of proxy members based on each of the proxy members having a skill set similar to the first skill set. The method also includes operations for determining a position growth score for each company offering one or more of the plurality of jobs, the position growth score based on a change in the number of proxy members at the company over a predetermined period of time. The method also includes operations to rank the companies based on the position growth scores and operations for presenting the jobs within a high-growth companies group area in an order based on the ranking.

[0029] In some embodiments, the identifying of proxy members having a skill set similar to the first skill set further includes identifying a similarity value for each proxy member, the similarity value derived using a machine-learning program. Further, the determining of the position growth score for a company may be based on the similarity values of proxy members that joined the company during a predetermined period of time and proxy members that left the company during the predetermined period of time. In some embodiments, the position growth score for a company may further be based a number jobs offered by the company that are associated with one or more skills in the first skill set. In some embodiments, the position growth score may further be based on the number of employees who have joined or left the company relative to the size of the company, or on how recently the proxy members have joined or left the company. Finally, in some embodiments, the identifying of the plurality of proxy members is further based identifying an education background within the profile of the searching member and the proxy member, the education background indicating a level of education.

[0030] FIG. **1** is a block diagram illustrating a network architecture, according to some example embodiments, including a social networking server **120**. As shown in FIG. **1**, the network architecture includes three layers: a data layer **103**, an application logic layer **102**, and a device layer **101**. The layers communicate over a network **140** (e.g., the Internet). The data layer **103** includes several databases, including a member database **132** for storing data for various entities of the social networking server **120**, including member profiles, company profiles, and educational institution profiles, as well as information concerning various online or offline groups. Of course, in various alternative embodiments, any number of other entities might be included in a social graph, and as such, various other databases may be used to store data corresponding with other entities.

[0031] Consistent with some embodiments, when a person initially registers to become a member of the social networking server **120**, the person will be prompted to provide some personal information, such as his or her name, age (e.g., birth date), gender, interests, contact information, home town, address, spouse's and/or family members' names, educational background (e.g., schools, majors, etc.), current job title, job description, industry, employment history, skills, professional organizations, interests, and so on. This information is stored, for example, as member attributes in the member database **132**.

[0032] Additionally, the data layer **103** includes a job database **128** for storing job data. The job data includes information collected from a company offering a job, including experience required, location, duties, pay, and other information. This information is stored, for example, as job attributes in the job database **128**.

[0033] Additionally, the data layer **103** includes a company database **134** for storing data such as company data, including company name, industry associated with the company, number of employees at the company, address of the company, overview description of the company, and job postings associated with the company. Additionally, the company data includes inbound information that tracks members who have joined (i.e., become employed at) a company over a predetermined period of time, such as the last 30 days. Similarly, the company data includes outbound information that tracks members who have left the company over the predetermined period of time.

[0034] Once registered, a member may invite other members, or be invited by other members, to connect via the social networking server **120**. A "connection" may specify a bilateral agreement by the members, such that both members acknowledge the establishment of the connection. Similarly, in some embodiments, a member may elect to "follow" another member. In contrast to establishing a connection, the concept of "following" another member typically is a unilateral operation, and at least in some embodiments, does not prompt acknowledgement or approval by the member who is being followed. When one member connects with or follows another member, the member who is connected to or following the other member may receive messages or updates (e.g., content items) in his or her personalized content stream about various activities undertaken by the other member. More specifically, the messages or updates presented in the content stream may be authored and/or published or shared by the other member, or may be automatically generated based on some activity or event involving the other member. In addition to following another member, a member may elect to follow a company, a topic, a conversation, a web page, or some other entity or object, which may or may not be included in the social graph maintained by the social networking server **120**. In some example embodiments, because the content selection algorithm selects content relating to or associated with the particular entities that a member is connected with or is following, as a member connects with and/or follows other

entities, the universe of available content items for presentation to the member in his or her content stream increases.

[0035] Additionally, the data layer **103** includes a group database **130** for storing group data. The group database **130** includes information about groups (e.g., clusters) of jobs that have job attributes in common with each other. The group data includes various group features comprising a characteristic for the group, as discussed in more detail below. This information is stored, for example, as group attributes in the group database **130**.

[0036] As members interact with various applications, content, and user interfaces of the social networking server **120**, information relating to the member's activity and behavior may be stored in a database, such as the member database **132** and the job database **128**.

[0037] The social networking server **120** may provide a broad range of other applications and services that allow members the opportunity to share and receive information, often customized to the interests of the member. In sonic embodiments, members of the social networking server **120** may be able to self-organize into groups, or interest groups, organized around subject matter or a topic of interest. In some embodiments, members may subscribe to or join groups affiliated with one or more companies. For instance, in some embodiments, members of the social networking server **120** may indicate an affiliation with a company at which they are employed, such that news and events pertaining to the company are automatically communicated to the members in their personalized activity or content streams. In some embodiments, members may be allowed to subscribe to receive information concerning companies other than the company with which they are employed. Membership in a group, a subscription or following relationship with a company or group, and an employment relationship with a company are all examples of different types of relationships that may exist between different entities, as defined by the social graph and modeled with social graph data of the member database **132**.

[0038] The application logic layer **102** includes various application server modules **124**, which, in conjunction with a user interface module **122**, generate various user interfaces with data retrieved from various data sources or data services in the data layer **103**. In some embodiments, individual application server modules **124** are used to implement the functionality associated with various applications, services, and features of the social networking server **120**. For instance, a messaging application, such as an email application, an instant messaging application, or some hybrid or variation of the two, may be implemented with one or more application server modules **124**. A photo sharing application may be implemented with one or more application server modules **124**. Similarly, a search engine enabling users to search for and browse member profiles may be implemented with one or more application server modules **124**. Of course, other applications and services may be separately embodied in their own application server modules **124**. As illustrated in FIG. **1**, the social networking server **120** may include a job matching system **125**, which creates a job display on a job application **152** on a client device **150**. Also included in the social networking server **120** is a company growth analysis system **155**, which calculates scores representing company growth of companies associated with members similar to a searching member **160**, ranks the companies based on the scores, and causes a display of companies ranked by score that is viewable on the job application **152** by the searching member **160**.

[0039] FIG. **2** is a screenshot of a user interface **200** that includes recommendations for jobs **202-206** within the job application **152**, according to some example embodiments. In one example embodiment, the user interface **200** provides job recommendations, which are job postings that match the job interests of the user and that are presented without a specific job search request from the user (e.g., job suggestions).

[0040] In another example embodiment, a job search interface is provided for entering job searches, and the resulting job matches are presented to the user in the user interface **200**.

[0041] As the user scrolls down the user interface **200**, more job recommendations are presented to the user. In some example embodiments, the job recommendations are prioritized to present jobs in an estimated order of interest to the user.

[0042] The user interface **200** presents a "flat" list of job recommendations as a single list. Other embodiments presented below utilize a "segmented" list of job recommendations where each segment is a group that is associated with a related reason indicating why these jobs are being recommended within the group.

[0043] FIG. **3** is a screenshot of a member's profile view, according to some example embodiments. Each member in the social network has a member profile **302**, which includes information about the member. The member profile **302** is configurable by the member and also includes information based on the member's activity in the social network (e.g., likes, posts read).

[0044] In one example embodiment, the member profile **302** may include information in several categories, such as a profile picture **304**, experience **308**, education **310**, skills and endorsements **312**, accomplishments **314**, contact information **334**, following **316**, and the like. Skills include professional competences that the member has, and the skills may be added by the member or by other members of the social network. Example skills include C++, Java, Object-oriented Programming, Data Mining, Machine Learning, Data Science, and the like. Other members of the social network may endorse one or more of the skills and, in some example embodiments, the member's account is associated with the number of endorsements received for each skill from other members.

[0045] The experience **308** information includes information related to the professional experience of the member. In one example embodiment, the experience **308** information includes an industry **306**, which identifies the industry in which the member works. In one example embodiment, the member is given an option to select an industry **306** from a plurality of industries when entering this value in the member profile **302**. The experience **308** information area may also include information about the current job and previous jobs held by the member.

[0046] The education **310** information includes information about the educational background of the member, including the educational institutions attended by the member, the degrees obtained, and the field of study of the degrees. For example, a member may list that the member attended the University of Michigan and obtained a graduate degree in computer science. For simplicity of description, the embodiments presented herein are presented with refer-

ence to universities as the educational institutions, but the same principles may be applied to other types of educational institutions, such as high schools, trade schools, professional training schools, and the like.

[0047] The skills and endorsements **312** information includes information about professional skills that the member has identified as having been acquired by the member and endorsements entered by other members of the social network supporting the skills of the member. The accomplishments **314** area includes accomplishments entered by the member, and the contact information **334** includes contact information for the member, such as an email address and phone number. The following **316** area includes the names of entities in the social network being followed by the member.

[0048] The skills within the skills and endorsements **312** information are aggregated by the system to form a skill set for the member that can be compared to skill sets of other members. In some embodiments, this skill set is part of a member characteristic for the member, the member characteristic including information such as the skill set for the member, profile information, education **310** information, and other data that is further comparable to data of other members.

[0049] FIG. **4** is a diagram of a user interface **402**, according to some example embodiments, for presenting job postings to a member of the social network. The member interface **402** includes the profile picture **304** of the member, a search section **404**, a daily jobs section **406**, and one or more group areas **408**. In some example embodiments, a message next to the profile picture **304** indicates the goal of the search, e.g., "Looking for a senior designer position in New York City at a large Internet company."

[0050] The search section **404**, in some example embodiments, includes two boxes for entering search parameters: a keyword input box for entering any type of keywords for the search (e.g., job title, company name, job description, skill, etc.), and a geographic area input box for entering a geographic area for the search (e.g., New York). This allows members to execute searches based on keyword and location. In some embodiments, the geographic area input box includes one or more of city, state, ZIP code, or any combination thereof.

[0051] In some example embodiments, the search boxes may be prefilled with the member's title and location if no search has been entered yet. Clicking the search button causes the search of jobs based on the keyword inputs and location. It is to be noted that the inputs are optional, and only one search input may be entered at a time, or both search boxes may be filled in,

[0052] The daily jobs section **406** includes information about one or more jobs selected for the member, based on one or more parameters, such as member profile data, search history, job match to the member, recentness of the job, whether the member is following the job, and so forth.

[0053] Each group area **408** includes one or more jobs **202** for presentation in the user interface **402**. In one example embodiment, the group area **408** includes one to six jobs **202** with an option to scroll the group area **408** to present additional jobs **202**, if available.

[0054] In some embodiments for a high-growth-companies group area **408**, as described below, instead of presenting one to six jobs **202**, the high-growth companies group area **408** presents one to six companies **502**, as further shown on FIG. **5**A. Each of the companies **502** in this embodiment can be selected to display a company display **510** with one to six jobs **512** offered by the selected company, as shown in FIG. **5**B.

[0055] Each group area **408** provides an indication of why the member is being presented with those jobs, which identifies the characteristic of the group. There could be several types of reason related to factors such as the connection of the member to the job, the affinity of the member to the group, the desirability of the job, or the time deadline of the job (e.g., urgency). The reasons related to the connection of the member to the job may include relationships between the job and the social connections of the member (e.g., "Your connections can refer you to this set of jobs"), a quality of a fit between the job and the member characteristics (e.g., "This is a job from a company that hires from your school"), a quality of a match between the member's talent and the job (e.g., "You would be in the top 90% of all applicants), and so forth.

[0056] In some example embodiments, the system accesses data about proxy members who are employed or have formerly been employed at the company. Proxy members, as used herein, are members who have similar skills to the searching member **160**, e.g., the skill similarity score is above a predetermined threshold, as discussed in more detail below. Since there is a high degree of skill similarity between the searching member **160** and the proxy members, the system may use the proxy members to calculate an affinity between the searching member and a job or company, which indicates a likelihood that the company will hire the searching member based on the company recently hiring a greater number of proxy members, while losing a lesser number of proxy members (thus, the company is growing with respect to the proxy members)

[0057] For example, the system assigns a score to each company based on the number of proxy members who are connections with the member, in addition to a level of similarity between each proxy member and the member. Further, the system can use data about the connections to determine a rate at which proxy members are joining or leaving the company and determine a score based on the rate of growth of the number of jobs, of people with similar skills to the member, within the company.

[0058] Further, the group characteristics may be implicit (e.g., "These jobs are recommended based on your browsing history") or explicit (e.g., "These are jobs from companies you followed"). The desirability reasons may include popularity of the job in the member's area (e.g., most-viewed by other members or most applications received), popularity of the company associated with the job in the member's area, and popularity of the job among people with the same title as the member. Further yet, the time-urgency reasons may include "Be the first to apply to these jobs" or "These jobs will be expiring soon."

[0059] It is to be noted that the embodiments illustrated in FIG. **4** are examples and do not describe every possible embodiment. Other embodiments may utilize different layouts or groups, present fewer or more jobs, present fewer or more groups, etc. The embodiments illustrated in FIG. **4** should therefore not be interpreted to be exclusive or limiting, but rather illustrative.

[0060] FIG. **5**A is a detail of a high-growth-companies group area **408** in the user interface, according to some example embodiments. In one example embodiment, the

high-growth-companies group area **408** includes recommendations of companies, and one or more jobs offered by the companies. The high-growth-companies group area **408** provides a plurality of company displays **502** that are currently trending among proxy members. For example, the information about the company includes the name of the company, the location of the company, and an example of what jobs the company is offering ("Jobs Include"). In an example embodiment, each company display **502** includes a position growth score **506**. As used herein, a position growth score is a measure of how rapidly the number of proxy members in the company is growing, giving insight into how the company is growing relative to members who are similar to the searching member **160**. Further, as used herein "position" represents a scope of duties at a company that can be fulfilled by a skill set. For example, the jobs "software developer" and "programmer" may have different titles, but could both be positions for a member who has a software coding background.

[0061] In some embodiments, the system determines proxy members by determining a similarity value between the searching member **160** and other members, such as by using a machine-learning system. Proxy members are those members of the social network having a similarity value above a predetermined threshold. The system may use the similarity values of the proxy members to calculate the position growth score. The position growth score may also be based on interactions from other members, the location of the jobs held by the proxy members, and interactions of members in the searching member's **160** social network that are currently or formerly employed by the company offering the job.

[0062] in some example embodiments, the high-growth-companies group area **408** includes profile pictures **504** within the company displays **502** of members who are connected to the searching member **160** and also are employed at the respective company. In some example embodiments, the high-growth companies group area **408** further includes a proxy counter display **508** that shows the number of proxy members who have been hired (relevant hires) at the company within a predetermined time period (in this example display, the time period is 30 days, but other periods may be used, such as a week, six months, a year, two years, etc.).

[0063] FIG. **5**B is a detail of a company display **510** showing jobs **512** available within a specific company, according to some example embodiments. The company display **510** is a screen that the system presents to the member in response to the member selecting a specific company within the high-growth-companies group area **408**, such as Company B, as shown in FIG. **5**B. In some example embodiments, the jobs **512** are presented to the member in response to a selection of the company by the member. Additionally, the company display **510** shows the title of the job **514** within each job **512**, employees who work for the company and have a similar job **516**, and optionally other information about the job. In some example embodiments, the jobs **512** are ranked within each company display **510** by one or more of the scores described in FIGS. **6-7**, such as by a job-to-group score or job affinity score, with the jobs having higher scores ranked and displayed ahead of jobs that have lower scores.

[0064] In some embodiments, the relationships between the searching member **160**, proxy members, and jobs **512** are used in determining the position growth score for the company. FIGS. **6-7** illustrate the scoring of a job for a member, according to some example embodiments. FIG. **6** illustrates the scoring, also referred to herein as ranking, of a job **202** for a member associated with a member profile **302** based on a job affinity score **606**.

[0065] The job affinity score **606**, between the job **202** and the member profile **302**, is a value that measures how well the job **202** matches the interest of the member associated with the member profile **302** in finding the job **202**. A so-called "dream job" for a member would be the perfect job for the member and would have a high, or even maximum, job affinity score **606**, while a job that the member is not interested in at all (e.g., in a different professional industry) would have a low job affinity score **606** in sonic example embodiments, the job affinity score **606** is a value between zero and one, or a value between zero and **100**, although other ranges are possible.

[0066] In some example embodiments, a machine-learning program is used to calculate the job affinity scores **606** for the jobs **202** available to the member. The machine-learning program is trained with existing data in the social network, and the machine-learning program is then used to evaluate jobs **202** based on the features used by the machine-learning program. In some example embodiments, the features include any combination of job data (e.g., job title, job description, company, geographic location, etc.), member profile data, member search history, employment of social connections of the member, job popularity in the social network, number of days the job has been posted, company reputation, company size, company age, company type (profit vs. nonprofit), and pay scale. More details are provided below with reference to FIG. **10** regarding the training and use of the machine-learning program.

[0067] FIG. **7** illustrates the scoring of a job **202** for a member associated with the member profile **302**, according to some example embodiments, based on three parameters: the job affinity score **606**, a job-to-group score **708**, and a group affinity score **710**. Broadly speaking, the job affinity score **606** indicates how relevant the job **202** is to the member, the job-to-group score **708** indicates how relevant the job **202** is to a group **712**, and the group affinity score **710** indicates how relevant the group **712** is to the member. Multiple groups **712** ranging from G**1** (first group) to GN (final group) are shown in FIG. **7** as related to the job **202** and the member **302**.

[0068] The group affinity score **710** indicates how relevant the group **712** is to the member, where a high group affinity score **710** indicates that the group **712** is very relevant to the member and should be presented in the user interface, while a low group affinity score **710** indicates that the group **712** is not relevant to the member and may be omitted from presentation in the user interface.

[0069] The group affinity score **710** is used, in some example embodiments, to determine which groups **712** are presented in the user interface, as discussed above, and the group affinity score **710** is also used to order the groups **712** when presenting them in the user interface, such that the groups **712** may be presented in the order of their respective group affinity scores **710**. It is to be noted that if there is not enough "liquidity" of jobs for a group **712** (e.g., there are not enough jobs for presentation in the group **712**), the group **712** may be omitted from the user interface or presented with lower priority, even if the group affinity score **710** is high.

[0070] In some example embodiments, a machine-learning program is utilized for calculating the group affinity score **710**. The machine-learning program is trained with member data, including interactions of members with the different groups **712**. The data for the particular member is then utilized by the machine-learning program to determine the group affinity score **71.0** for the member with respect to a particular group **712**. The features utilized by the machine-learning program include the history of interaction of the member with jobs from the group **712**, click data for the member (e.g., a click rate based on how many times the member has interacted with the group **712**), member interactions with other members who have a relationship to the group **712**, and the like. For example, one feature may include an attribute that indicates whether the member is a student. If the member is a student, features such as social connections or education-related attributes will be important to determine which groups are of interest to the student. On the other hand, a member who has been out of school for 20 years or more may not be as interested in education-related features.

[0071] Other data of interest includes the employee composition of a company, specifically whether employees of a company are similar to the searching member **160**. This data can further indicate an increase (growth) or decrease of similar employees over a specified time, such as the previous 30 days. Such data can be located on a company database **134**. An advantage to determining companies that are showing increases, or growth, in regard to members who are similar to the searching member **160**, is that these companies may be more likely to hire the searching member **160**. For example, a first company may be expanding their sales department and thus may have recently hired a large number of sales personnel relative to sales personnel who have left the company. In this example, the sales personnel are members who are similar to the searching member **160** because they share similar skills (e.g., sales). Thus, it would be beneficial for the member to see high-growth companies.

[0072] The job-to-group score **708** between a job **202** and a group **712** indicates the job **202**'s strength within the context of the group **712**, where a high job-to-group score **708** indicates that the job **202** is a good candidate for presentation within the group **712** and a low job-to-group score **708** indicates that the job **202** is not a good candidate for presentation within the group **712**. In some example embodiments, a predetermined threshold is identified, wherein jobs **202** with a job-to-group score **708** equal to or above the predetermined threshold are included in the group **712**, and jobs **202** with a job-to-group score **708** below the predetermined threshold are not included in the group **712**.

[0073] In some embodiments, companies that are offering jobs that proxy members of the searching member **160** are interacting with may provide better employment opportunities for the searching member **160** than other companies. For example, the system may determine a high position growth score for a first job based on a surge in applications by proxy members for the first job in the past year, as well as on the fact that a high number of proxy members are also applying to jobs offered by the company that is offering the first job. Similarly, the system may determine a high position growth score for a first company based on a surge of jobs offered by the first company being filled by proxy members. Further, the system may determine a high position growth score for a first company in response to a surge in jobs offered by the first company being filled, where the searching member **160** has a high job affinity score **606** for the jobs.

[0074] In some example embodiments, the job affinity score **606**, the job-to-group score **708**, and the group affinity score **710** are combined to obtain a combined affinity score **714** for the job **202**. The scores may be combined utilizing addition, weighted averaging, or other mathematical operations,

[0075] FIG. **8** is a diagram that depicts a comparison of skills included in the profile of a searching member with skills included in the profiles of a plurality of proxy members and skills in jobs offered by a company, according to some example embodiments. FIG. **8** includes the searching member **160**, a job aggregation **802** of jobs **804** from a first company, and a population **806** of proxy members **808**. The searching member **160**, each of the jobs **804**, and each of the proxy members **808** have respective skill sets. In some embodiments, a machine-learning program compares the skill sets, such as the skill set of the searching member **160** to the skill set of one of the jobs **804** as shown in **810**. In some embodiments, the result of this comparison may be used to calculate the job affinity score **606**. Further, the machine-learning program may compare the skill set of a job **804** to the skill set of one of the proxy members **808** as shown in **814**, and may compare the skill set of the searching member **160** to the skill set of one of the proxy members **808** as shown in **812**. Techniques for determining a similarity between members and jobs and between members and other members are further disclosed below with reference to FIG. **10**.

[0076] FIG. **9**A is a diagram that depicts groups of proxy members who have attained employment at two companies during a predetermined period of time, according to some example embodiments. FIG. **9**A shows each of the proxy members **916** either joining **906** company A **910**, or joining **912** company B **914**. FIG. **9**A further shows the proxy members **916** accepting specific jobs **908** within company A and company B.

[0077] In an example embodiment, a machine-learning program determines similarity values between the searching member **160** and other members on the social network based on the searching member **160** and the other members skills. The system then identifies proxy members **916** with similarity values above a predetermined threshold. The system then identifies proxy members who have joined new companies within a certain period (e.g., the last 90 days). FIG. **9**A specifically shows movement into company A or into company B by proxy members **916** during the past 30 days, with each proxy member **916** moving into a specific job **908** with company A or company B.

[0078] FIG. **9**B is a diagram that depicts groups of proxy members, employed at a first company or a second company, leaving their respective company, according to some example embodiments. It is helpful to assess the number of employees that join or leave a company to determine the growth of a company in regard to a certain position (e.g., associated with a certain skill set). For example, there is no growth in a position for a company when the same number of employees having a position in the company leave as employees who join the company in the position.

[0079] FIG. **9**B shows an outbound transition **924** by the proxy members **918**, **920** from both company A **910** and company B **914**. The departing proxy members **918**, **920** are moving into other employment positions **922**, outside com-

pany A or company B. Further, some proxy members may leave company A for company B **926**, or may leave company B for company A **928**.

[0080] Continuing the above example for FIG. **9**A, in FIG. **9**B, the system has identified proxy members based on similarity values. The system then selects proxy members who have transitioned employment during the last 30 days. Displayed in the figure are specifically proxy members **918** in Company A and proxy members **920** in company B who have left the respective company within the last 30 days. Further, as shown in FIG. **9**B, more employees have left company A during the last 30 days than have left company B.

[0081] FIG. **9**C is a diagram that depicts a group of proxy members joining a company and another group of proxy members leaving the company during the predetermined period of time, and how a position growth score is calculated, according to some embodiments. FIG. **9**C focuses on proxy members who are joining company B (inbound) **930** compared to proxy members who are leaving company **13** (outbound) **936** during a predetermined period of time. These inbound transitions **912** and outbound transitions **924** show proxy members **930**, **936** migrating from other employment positions **923** and to other employment positions **934** (e.g., any employment position other than company B, including unemployment). Based on these transitions, the system calculates a position growth score that reflects a growth population **915** or an attrition population **932** of proxy members at company B.

[0082] In the example shown in FIG. **9**C, 5 proxy members are part of the growth population **915** and 5 proxy members are part of the attrition population **936**. If all proxy members were valued equally, the system would determine that company B displays no growth and no attrition since the same number of employees have joined the company as have left the company within the last 30 days. However, additional factors beyond the number of proxy members may affect the position growth score, such as a skill set similarity between the searching member **160** and the proxy members, the number of proxy members relative to the size of the company, the job titles of proxy members within the company, how recently a proxy member has transitioned to or from the company, etc.

[0083] In some example embodiments, the similarity value between the searching member **160** and each proxy member is utilized to calculate the position growth score. In some example embodiments, the position growth score (PUS) for a company B associated with a member M**1** over a period of time may be calculated according to the following equation:

$$PGS_{M1,B}=\alpha_1 \cdot S_{M1P1}+\alpha_2 \cdot S_{M1P2}+\alpha_3 \cdot S_{M1P3}+\ldots +\alpha_n \cdot S_{M1,Pn}$$

[0084] Within the above formula, $PGS_{M1,B}$ represents the position growth score for the searching member M**1** at the company B, $S_{M1,Pi}$ represents the similarity value between M**1** and proxy member Pi, and at represents a dampening coefficient applied to each of the similarity values based on additional factors associated with the proxy member as described above, such as the number of proxy members relative to the size of the company, the job titles of proxy members within the company, and how recently the proxy member has transitioned to or from the company. In some embodiments, the proxy members leaving a company are given a negative dampening coefficient, causing a negative effect on the position growth score.

[0085] In the example of FIG. **9**C, the 5 proxy members joining the company have a summed position growth score of 68.25 and the 5 proxy members leaving the company have a summed score of −22.25. These scores would yield a position growth score PSG for the searching member **160** of 46. This PSG score is used, in addition to other scores described in FIG. **7**, to rank the company among other companies for presentation to the searching member **160**, such as for selecting companies for the group, or ranking the group among other groups. Finally, the PSG score is displayed to the searching member **160** in the high-growth companies group area **408**, as shown in FIG. **5**A.

[0086] FIG. **9**D is an additional illustration of a method for calculating a position growth score for each company by analyzing transitions of proxy members. A search for jobs is performed (at operation **938**) for a member, such as the searching member **160**. The search may be initiated by the member, such as by navigating to a "high-growth companies" page on a user interface, or may be initiated by the system to suggest jobs to the member. The system then accesses a plurality of jobs **940**, such as from the job database **128**, and companies **942**, such as from the group database **130**, to determine which of the companies **942** is offering each job **940**. The system then calculates a similarity value between skills in a member profile of the searching member **946** and skills in member profiles **944** of other members on the social network. Based on these similarity values, the system determines which of members of the social network are proxy members **950**, such as by determining whether the similarity value calculated for each member of the social network exceeds a similarity value. In some embodiments, the system further determines proxy members based on other factors, such as an education level of the searching member (e.g., what education degree) compared to the education level of each of the other members. For example, where the searching member **160** has a bachelor's degree in computer science, the system may determine that another member is a proxy member based on the first other member having a bachelor's degree in computer science, among other factors.

[0087] At operation **952**, the system calculates a position growth score for each company based on transitions of proxy members within a predetermined period of time. A proxy member transition includes a proxy member joining a company or leaving a company within the predetermined time (such as the last 30 days). The position growth score can further be calculated pursuant a formula such as the equation shown in FIG. **9**C.

[0088] At operations **954** and **956**, the system ranks the companies **942**, based on the position growth scores, and presents the companies to the searching member **106** within the high-growth companies group area **408** based on the ranking. For example, a first company with a position growth score that is higher than a second company will be ranked ahead of the second company. Then, at operation **956**, when the system presents the companies within the company high-growth companies group area **408**, the first company will be presented higher within the high-growth companies group area **408** than the second company, and thus will be viewable to the searching member **160** before the second company.

[0089] FIG. **10** illustrates the training and use of a machine-learning program **1016**, according to some example embodiments. In some example embodiments, machine-learning programs, also referred to as machine-learning algorithms or tools, are utilized to perform operations associated with job searches.

[0090] Machine learning is a field of study that gives computers the ability to learn without being explicitly programmed. Machine learning explores the study and construction of algorithms, also referred to herein as tools, that may learn from existing data and make predictions about new data. Such machine-learning tools operate by building a model from example training data **1012** in order to make data-driven predictions or decisions expressed as outputs or assessments (e.g., a score) **1020**. Although example embodiments are presented with respect to a few machine-learning tools, the principles presented herein may be applied to other machine-learning tools.

[0091] In some example embodiments, different machine-learning tools may be used. For example, Logistic Regression (LR), Naive-Bayes, Random Forest (RF), neural networks (NN), matrix factorization, and Support Vector Machines (SVM) tools may be used for classifying or scoring job postings.

[0092] In general, there are two types of problems in machine learning: classification problems and regression problems. Classification algorithms aim at classifying items into one of several categories (for example, is this object an apple or an orange?). Regression algorithms aim at quantifying some items (for example, by providing a value that is a real number). In some embodiments, example machine-learning algorithms provide a job affinity score **606** (e.g., a number from 1 to 100) to qualify each job as a match for the member (e.g., calculating the job affinity score **606**). In other example embodiments, machine learning is also utilized to calculate the group affinity score **710** and the job-to-group score **708**. The machine-learning algorithms utilize the training data **1012** to find correlations among identified features **1002** that affect the outcome.

[0093] In one example embodiment, the features **1002** may be of different types and may include one or more of member features **1004**, job features **1006**, company features **1008**, and other features **1010**. The member features **1004** may include some or all of the data in the member profile **302**, as described in FIG. **3**, such as title, skills, experience, education, and so forth. The job features **1006** may include any data related to the job **202**, and the company features **1008** may include various data related to the company, such as skills within a job profile of the company, skills desired for positions within the company, job titles for positions within the company, etc. In some example embodiments, additional data in the other features **1010** may be included, such as post data, message data, web data, click data, and so forth.

[0094] With the training data **1012** and the identified features **1002**, the machine-learning tool is trained at operation **1014**. The machine-learning tool appraises the value of the features **1002** as they correlate to the training data **1012**. The result of the training is the trained machine-learning program **1016**.

[0095] When the machine-learning program **1016** is used to generate a score, new data, such as transition activity **1018**, is provided as an input to the trained machine-learning program **1016**, and the machine-learning program **1016** generates the score **1020** as output. For example, when a member performs a job search, a machine-learning program, such as the machine-learning program **1016**, trained with similarity data, such as from the company database **130** uses the member data from the member database **132** and job data from the jobs in the job database **128** to search for jobs that match the member's member profile **302** and activity.

[0096] As discussed above, the machine-learning program **1016** may be used, in some example embodiments, to determine a similarity value between the searching member **160** and a proxy member of the social network based on a comparison of skills within a first skill set associated with a member profile of the searching member **160** and skills associated with a member profile of the proxy member. In some example embodiments, the machine learning program **1016** can similarly be used to determine a similarity value between skills within member profiles and skills desired for the job.

[0097] In an example, the machine-learning program **1016** determines a high similarity value for the searching member **160** and a proxy member because they have both held jobs for several years that give them experience in coding in the Python programming language. Further, the machine-learning program **1016** determines high similarity values between the searching member **160** and jobs in a first company based on the first company offering jobs that involve Python coding, such that the searching member **160** would fill one or more positions within the company. As shown above, the similarity values can be used to determine a position growth for the company in relation to the searching member **160**.

[0098] In some example embodiments, the machine-learning program **1016** accesses various data about transitions that members have made within a previous predetermined time period, such as leaving a first company, joining a second company, etc. (e.g., transition activity **1018**). For example, when the machine-learning program **1016** aggregates member interactions in which the searching member **160** displays a high rate of growth in direct connections to company connections (e.g., the searching member **160** is making more connections to current or former employees), the machine-learning program **1016** may add a weighting factor to increase the social connection strength of company connections for the searching member **160**. In some embodiments, the machine-learning program **1016** may further apply a weighting factor to the connection strengths of the social connections based on how recently (e.g., a number of days) the last activity, such as a browsing action, of the searching member **160** related to a company connection occurred. In some embodiments, the machine-learning program **1016** may further weight the company connections based on the searching member **160** having a high job affinity score **606** for jobs within the company.

[0099] FIG. **11** illustrates a method for identifying similarities among member skills, such as by the machine-learning program **1016**, according to some example embodiments. In some example embodiments, the system compares skills from a member's skill set to skills of other members. In some example embodiments, the skills of the members of the social network are represented within a vector in a small dimensional space (e.g., with a dimension of 200).

[0100] Some example embodiments are presented for comparing member skills, but the same principles may be applied by comparing other features in addition to the skills, such as title, position, years of experience, etc., or any

combination thereof. In some example embodiments, semantic vectors are created for the skills of members, and in other embodiments, the semantic vectors include the skills, the title, and the job function, for example.

[0101] Reducing vector dimension from a sparse vector representation to a compressed vector representation may be done in several ways. In one embodiment, the skills and title of each member are placed within a row, and then matrix factorization is utilized to reduce the vectors to a smaller dimension, such as 50 or 100. Then, in the reduced-dimension space, a nearest-neighbor computation from the member is performed, and can optionally be restricted to members who have engaged in member interactions with at least one job (good candidate proxy members). This way, proxy members with similar skills are found.

[0102] As used herein, the similarity coefficient between a first skill vector associated with the searching member and a second skill vector associated with a second member is a real number that quantifies a similarity between the skills of the searching member and the skills of the second member. The similarity coefficient is also referred to herein as the similarity value. In some example embodiments, the similarity coefficient is in the range 0 to 1, but other ranges are also possible. In some embodiments, cosine similarity is utilized to calculate the similarity coefficient between the skill vectors.

[0103] In some example embodiments, skill data **1102** includes a skill identifier (e.g., an integer value) and a skill description text (e.g., C++). The member profiles **302** are linked to the skill identifier, in some example embodiments.

[0104] Semantic analysis finds similarities among member skills by creating a vector for each member such that members with similar skills have skill vectors **1108** near each other. In one example embodiment, the tool Word2vec is used to perform the semantic analysis, but other tools may also be used, such as Gensim, Latent Dirichlet Allocation (LDA), or Tensor flow,

[0105] These models are shallow, two-layer neural networks that are trained to reconstruct linguistic contexts of words. Word2vec takes as input a large corpus of text and produces a high-dimensional space (typically between a hundred and several hundred dimensions). Each unique word in the corpus is assigned a corresponding vector in the space. The vectors are positioned in the vector space such that words that share common contexts in the corpus are located in close proximity to one another in the space. In one example embodiment, each element of the skill vector **1108** is a real number.

[0106] Initially, a simple skill vector **1110** is created for each skill, where each simple skill vector **1110** includes a plurality of zeros and a 1 at the location corresponding to the skill. Afterwards, a concatenated skill table **1104** included in the member features **1004** is created, where each row includes a sequence with all the skills for a corresponding member. Thus, the first row of the concatenated skill table **1104** includes all the simple skill vectors **1110** for the skills of the searching member, the second row includes all the simple skill vectors **1110** for the skills of the second member, and so forth.

[0107] A semantic analysis operation **1106** is then performed on the concatenated skill table **1104**. In one example embodiment, Word2vec is utilized, and the result is compressed skill vectors **1108**, or simply "skill vectors," such that members with similar skills have skill vectors **1108** near each other (e.g., with a similarity coefficient below a predetermined threshold).

[0108] Using these models, the system can determine a similarity value between the searching member **160** and a proxy member on the social network. In an example, the similarity value between the searching member **160** and a first proxy member is determined by the machine-learning program **1016** to be 0.5678 on a scale of 0 to 1. This similarity value can be used, according to the position growth formula, to weight the proxy members who have transitioned to or from a company over the predetermined time period. Based on these weighted interactions and the weighted interactions from other proxy members, a position growth score for the first job can be determined

[0109] FIG. **12** illustrates the company growth analysis system **155** for implementing example embodiments. In one example embodiment, the company growth analysis system **155** includes a communication component **1210**, an analysis component **1220**, a scoring component **1230**, a ranking component **1240**, and a presentation component **1250**.

[0110] The communication component **1210** provides various data retrieval and communications functionality. In example embodiments, the communication component **1210** retrieves data from the databases **132**, **128**, **130**, and **134**, including member data, jobs data, group data, company features **1008**, job features **1006**, and member features **1004**. The communication component **1210** can further retrieve data from the databases **132**, **128**, **130**, and **134** related to rules such as an education background that is fulfillable by an education indicator (for example, an engineering bachelor's degree) within the searching member's profile. In some embodiments, the communication component **1210** additionally retrieves data relating to the predetermined period of time, such as whether the period is 20 days or 30 days, from the databases **132**, **128**, **130**, and **134**.

[0111] The analysis component **1220** performs operations such as determining proxy members based on similarity values between the searching member **160** and each member on the social network. This comparison may be performed using the machine-learning program **1016** described in FIG. **10**. In some embodiments, the analysis component **1220** further determines whether the proxy members have transitioned to or from a company within a predetermined period of time.

[0112] The scoring component **1230** calculates various scores as illustrated above with reference to FIGS. **6**-**9**C, The scoring component **1230** calculates the job affinity scores **606**, job-to-group scores **708**, group affinity scores **710**, similarity values, and position growth scores as illustrated above with reference to FIGS. **6**-**9**C. In some embodiments, the scoring component **1230** conducts a summation calculation, as described in FIG. **9**C, to determine a position growth score for one or more companies that are offering jobs presentable to the searching member **160**.

[0113] The ranking component **1240** provides functionality to rank the companies based on the position growth scores for the searching member **160**, as determined by the scoring component **1230**, within a high-growth companies group. In some example embodiments, the companies are ranked from highest to lowest position growth score.

[0114] The presentation component **1250** provides functionality to present a display of the high-growth companies

group area **408** including the jobs with a display of the position growth scores to the searching member **160**, such as on the user interface **402**.

[0115] It is to be noted that the embodiments illustrated in FIG. **12** are examples and do not describe every possible embodiment. Other embodiments may utilize different servers or additional servers, combine the functionality of two or more servers into a single server, utilize a distributed server pool, and so forth. The embodiments illustrated in FIG. **12** should therefore not be interpreted to be exclusive or limiting, but rather illustrative.

[0116] FIG. **13** is a flowchart of a method **1300**, according to some example embodiments, for presenting companies ranked by position growth rate in response to a search for a member. While the various operations in this flowchart are presented and described sequentially, one of ordinary skill will appreciate that some or all of the operations may be executed in a different order, be combined or omitted, or be executed in parallel.

[0117] Operation **1302** is for determining, by a server having one or more processors, a first skill set comprising skills located within the profile of the searching member **160** in response to a job search requested by the searching member **160**. This can be accomplished via a machine-learning program **1016**. From operation **1302**, the method **1300** flows to operation **1304**, where the server identifies a plurality of job listings (jobs) that are currently active and presentable to the searching member **160**, each job being offered by a respective company. From operation **1304**, the method **1300** flows to operation **1306**, where the server identifies proxy members for each job based on a similarity of skills contained in the first skill set (from the searching member **160**) and skills in the profile of each proxy member. This can be accomplished by ranking similarity values based on a comparison of skills contained in the first skill set and skills contained in the profile of each proxy member.

[0118] From operation **1306**, the method **1300** flows to operation **1308**, where the server calculates a position growth score for each company that is based on the number of proxy members that joined the companies over a predetermined period of time compared to the number of proxy members that left the companies over the predetermined period of time. In some embodiments, the calculation further accounts for the similarity values associated with each proxy member, such as by assigning higher position growth scores to companies that have employed proxy members with high similarity values and lower position growth scores to companies that have employed proxy members with low similarity values.

[0119] From operation **1308**, the method **1300** then flows to operation **1310**, where the companies are ranked by the server based on the position growth score of each company. Finally, from operation **1310**, the method **1300** flows to operation **1312**, where the system causes presentation of the companies within the high-growth companies group area **408** based on the ranking of the companies by position growth score.

[0120] FIG. **14** is a block diagram illustrating components of a machine **1400**, according to some example embodiments, able to read instructions from a machine-readable medium (e.g., a machine-readable storage medium) and perform any one or more of the methodologies discussed herein. Specifically, FIG. **14** shows a diagrammatic representation of the machine **1400** in the example form of a computer system, within which instructions **1410** (e.g., software, a program, an application, an applet, an app, or other executable code) for causing the machine **1400** to perform any one or more of the methodologies discussed herein may be executed. For example, the instructions **1410** may cause the machine **1400** to execute the flow diagram of FIG. **13**. Additionally, or alternatively, the instructions **1410** may implement the job-scoring programs and the machine-learning programs associated with them. The instructions **1410** transform the general, non-programmed machine **1400** into a particular machine **1400** programmed to carry out the described and illustrated functions in the manner described.

[0121] In alternative embodiments, the machine **1400** operates as a standalone device or may be coupled (e.g., networked) to other machines. In a networked deployment, the machine **1400** may operate in the capacity of a server machine or a client machine in a server-client network environment, or as a peer machine in a peer-to-peer (or distributed) network environment. The machine **1400** may comprise, but not be limited to, a switch, a controller, a server computer, a client computer, a personal computer (PC), a tablet computer, a laptop computer, a netbook, a set-top box (STB), a personal digital assistant (PDA), an entertainment media system, a cellular telephone, a smart phone, a mobile device, a wearable device (e.g., a smart watch), a smart home device (e.g., a smart appliance), other smart devices, a web appliance, a network router, a network switch, a network bridge, or any machine capable of executing the instructions **1410**, sequentially or otherwise, that specify actions to be taken by the machine **1400**. Further, while only a single machine **1400** is illustrated, the term "machine" shall also be taken to include a collection of machines **1400** that individually or jointly execute the instructions **1410** to perform any one or more of the methodologies discussed herein.

[0122] The machine **1400** may include processors **1404**, memory/storage **1406**, and **110** components **1418**, which may be configured to communicate with each other such as via a bus **1402**. In an example embodiment, the processors **1404** (e.g., a Central Processing Unit (CPU), a Reduced Instruction Set Computing (RISC) processor, a Complex Instruction Set Computing (CISC) processor, a Graphics Processing Unit (GPU), a Digital Signal Processor (DSP), an Application Specific Integrated Circuit (ASIC), a Radio-Frequency Integrated Circuit (RFIC), another processor, or any suitable combination thereof) may include, for example, a processor **1408** and a processor **1412** that may execute the instructions **1410**. The term "processor" is intended to include multi-core processors that may comprise two or more independent processors (sometimes referred to as "cores") that may execute instructions contemporaneously. Although FIG. **14** shows multiple processors **1404**, the machine **1400** may include a single processor with a single core, a single processor with multiple cores (e.g., a multi-core processor), multiple processors with a single core, multiple processors with multiples cores, or any combination thereof.

[0123] The memory/storage **1406** may include a memory **1414**, such as a main memory, or other memory storage, and a storage unit **1416**, both accessible to the processors **1404** such as via the bus **1402**. The storage unit **1416** and memory **1414** store the instructions **1410** embodying any one or more of the methodologies or functions described herein. The instructions **1410** may also reside, completely or partially,

within the memory **1414**, within the storage unit **1416**, within at least one of the processors **1404** (e.g., within the processor's cache memory), or any suitable combination thereof during execution thereof by the machine **1400**. Accordingly, the memory **1414**, the storage unit **1416**, and the memory of the processors **1404** are examples of machine-readable media.

[0124] As used herein, "machine-readable medium" means a device able to store instructions and data temporarily or permanently and may include, but is not limited to, random-access memory (RAM), read-only memory (ROM), buffer memory, flash memory, optical media, magnetic media, cache memory, other types of storage (e.g., Erasable Programmable Read-Only Memory (EPROM)), and/or any suitable combination thereof. The term "machine-readable medium" should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, or associated caches and servers) able to store the instructions **1410**. The term "machine-readable medium" shall also be taken to include any medium, or combination of multiple media, that is capable of storing instructions (e.g., instructions **1410**) for execution by a machine (e.g., machine **1400**), such that the instructions, when executed by one or more processors of the machine (e.g., processors **1404**), cause the machine to perform any one or more of the methodologies described herein. Accordingly, a "machine-readable medium" refers to a single storage apparatus or device, as well as "cloud-based" storage systems or storage networks that include multiple storage apparatus or devices. The term "machine-readable medium" excludes signals per se.

[0125] The **110** components **1418** may include a wide variety of components to receive input, provide output, produce output, transmit information, exchange information, capture measurements, and so on. The specific **110** components **1418** that are included in a particular machine will depend on the type of machine. For example, portable machines such as mobile phones will likely include a touch input device or other such input mechanisms, while a headless server machine will likely not include such a touch input device. It will be appreciated that the I/O components **1418** may include many other components that are not shown in FIG. **14**. The I/O components **1418** are grouped according to functionality merely for simplifying the following discussion, and the grouping is in no way limiting. In various example embodiments, the components **1418** may include output components **1426** and input components **1428**. The output components **1426** may include visual components (e.g., a display such as a plasma display panel (PDP), a light emitting diode (LED) display, a liquid crystal display (LCD), a projector, or a cathode ray tube (CRT)), acoustic components (e.g., speakers), haptic components (e.g., a vibratory motor, resistance mechanisms), other signal generators, and so forth. The input components **1428** may include alphanumeric input components (e.g., a keyboard, a touch screen configured to receive alphanumeric input, a photo-optical keyboard, or other alphanumeric input components), point-based input components (e.g., a mouse, a touchpad, a trackball, a joystick, a motion sensor, or other pointing instruments), tactile input components (e.g., a physical button, a touch screen that provides location and/or force of touches or touch gestures, or other tactile input components), audio input components (e.g., a microphone), and the like.

[0126] In further example embodiments, the I/O components **1418** may include biometric components **1430**, motion components **1434**, environmental components **1436**, or position components **1438** among a wide array of other components. For example, the biometric components **1430** may include components to detect expressions (e.g., hand expressions, facial expressions, vocal expressions, body gestures, or eye tracking), measure biosignals (e.g., blood pressure, heart rate, body temperature, perspiration, or brain waves), identify a person (e.g., voice identification, retinal identification, facial identification, fingerprint identification, or electroencephalogram-based identification), and the like. The motion components **1434** may include acceleration sensor components (e.g., accelerometer), gravitation sensor components, rotation sensor components (e.g., gyroscope), and so forth. The environmental components **1436** may include, for example, illumination sensor components (e.g., photometer), temperature sensor components (e.g., one or more thermometers that detect ambient temperature), humidity sensor components, pressure sensor components (e.g., barometer), acoustic sensor components (e.g., one or more microphones that detect background noise), proximity sensor components (e.g., infrared sensors that detect nearby objects), gas sensors (e.g., gas detection sensors to detect concentrations of hazardous gases for safety or to measure pollutants in the atmosphere), or other components that may provide indications, measurements, or signals corresponding to a surrounding physical environment. The position components **1438** may include location sensor components (e.g., a Global Positioning System (GPS) receiver component altitude sensor components (e.g., altimeters or barometers that detect air pressure from which altitude may be derived), orientation sensor components (e.g., magnetometers), and the like.

[0127] Communication may be implemented using a wide variety of technologies. The I/O components **1418** may include communication components **1440** operable to couple the machine **1400** to a network **1432** or devices **1420** via a coupling **1424** and a coupling **1422**, respectively. For example, the communication components **1440** may include a network interface component or other suitable device to interface with the network **1432**. In further examples, the communication components **1440** may include wired communication components, wireless communication components, cellular communication components, Near Field Communication (NEC) components, Bluetooth® components (e.g., Bluetooth® Low Energy), Wi-Fi® components, and other communication components to provide communication via other modalities. The devices **1420** may be another machine or any of a wide variety of peripheral devices (e.g., a peripheral device coupled via a Universal Serial Bus (USB)).

[0128] Moreover, the communication components **1440** may detect identifiers or include components operable to detect identifiers. For example, the communication components **1440** may include Radio Frequency Identification (RFID) tag reader components, NFC smart tag detection components, optical reader components (e.g., an optical sensor to detect one-dimensional bar codes such as Universal Product Code (UPC) bar code, multi-dimensional bar codes such as Quick Response (QR) code, Aztec code, Data Matrix, Dataglyph, MaxiCode, PDF417, Ultra Code, UCC RSS-2D bar code, and other optical codes), or acoustic detection components (e.g., microphones to identify tagged

audio signals). In addition, a variety of information may be derived via the communication components **1440**, such as location via Internet Protocol (IP) geo-location, location via Wi-Fi® signal triangulation, location via detecting an NEC beacon signal that may indicate a particular location, and so forth.

[0129] In various example embodiments, one or more portions of the network **1432** may be an ad hoc network, an intranet, an extranet, a virtual private network (VPN), a local area network (LAN), a wireless LAN (WLAN), a wide area network (WAN), a wireless WAN (WWAN), a metropolitan area network (MAN), the Internet, a portion of the Internet, a portion of the public switched telephone network (PSTN), a plain old telephone service (POTS) network, a cellular telephone network, a wireless network, a Wi-Fi® network, another type of network, or a combination of two or more such networks. For example, the network **1432** or a portion of the network **1432** may include a wireless or cellular network and the coupling **1424** may be a Code Division Multiple Access (CDMA) connection, a Global System for Mobile communications (GSM) connection, or another type of cellular or wireless coupling. In this example, the coupling **1424** may implement any of a variety of types of data transfer technology, such as Single Carrier Radio Transmission Technology (1×RTT), Evolution-Data Optimized (EVDO) technology, General Packet Radio Service (GPRS) technology, Enhanced Data rates for GSM Evolution (EDGE) technology, third Generation Partnership Project (3GPP) including 3G, fourth generation wireless (4G) networks, Universal Mobile Telecommunications System (UMTS), High Speed Packet Access (HSPA), Worldwide Interoperability for Microwave Access (WiMAX), Long Term Evolution (LTE) standard, others defined by various standard-setting organizations, other long range protocols, or other data transfer technology.

[0130] The instructions **1410** may be transmitted or received over the network **1432** using a transmission medium via a network interface device (e.g., a network interface component included in the communication components **1440**) and utilizing any one of a number of well-known transfer protocols (e.g., hypertext transfer protocol (HTTP)). Similarly, the instructions **1410** may be transmitted or received using a transmission medium via the coupling **1422** (e.g., a peer-to-peer coupling) to the devices **1420**. The term "transmission medium" shall be taken to include any intangible medium that is capable of storing, encoding, or carrying the instructions **1410** for execution by the machine **1400**, and includes digital or analog communications signals or other intangible media to facilitate communication of such software.

[0131] Throughout this specification, plural instances may implement components, operations, or structures described as a single instance. Although individual operations of one or more methods are illustrated and described as separate operations, one or more of the individual operations may be performed concurrently, and nothing requires that the operations be performed in the order illustrated. Structures and functionality presented as separate components in example configurations may be implemented as a combined structure or component. Similarly, structures and functionality presented as a single component may be implemented as separate components. These and other variations, modifications, additions, and improvements fall within the scope of the subject matter herein.

[0132] The embodiments illustrated herein are described in sufficient detail to enable those skilled in the art to practice the teachings disclosed. Other embodiments may be used and derived therefrom, such that structural and logical substitutions and changes may be made without departing from the scope of this disclosure. The Detailed Description, therefore, is not to be taken in a limiting sense, and the scope of various embodiments is defined only by the appended claims, along with the full range of equivalents to which such claims are entitled.

[0133] As used herein, the term "or" may be construed in either an inclusive or exclusive sense. Moreover, plural instances may be provided for resources, operations, or structures described herein as a single instance. Additionally, boundaries between various resources, operations, modules, engines, and data stores are somewhat arbitrary, and particular operations are illustrated in a context of specific illustrative configurations. Other allocations of functionality are envisioned and may fall within a scope of various embodiments of the present disclosure. In general, structures and functionality presented as separate resources in the example configurations may be implemented as a combined structure or resource. Similarly, structures and functionality presented as a single resource may be implemented as separate resources. These and other variations, modifications, additions, and improvements fall within a scope of embodiments of the present disclosure as represented by the appended claims. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense.

[0134] FIG. **15** is a block diagram **1500** illustrating a representative software architecture **1502**, which may be used in conjunction with various hardware architectures herein described. FIG. **15** is merely a non-limiting example of a software architecture **1502**, and it will be appreciated that many other architectures may be implemented to facilitate the functionality described herein. The software architecture **1502** may be executing on hardware such as the machine **1400** of FIG. **14** that includes, among other things, processors **1404**, memory/storage **1406**, and input/output (I/O) components **1418**. A representative hardware layer **1550** is illustrated and can represent, for example, the machine **1400** of FIG. **14**. The representative hardware layer **1550** comprises one or more processing units **1552** having associated executable instructions **1554**. The executable instructions **1554** represent the executable instructions of the software architecture **1502**, including implementation of the methods, modules, and so forth of the previous figures. The hardware layer **1550** also includes memory and/or storage modules **1556**, which also have the executable instructions **1554**. The hardware layer **1550** may also comprise other hardware **1558**, which represents any other hardware of the hardware layer **1550**, such as the other hardware illustrated as part of the machine **1400**.

[0135] In the example architecture of FIG. **15**, the software architecture **1502** may be conceptualized as a stack of layers where each layer provides particular functionality. For example, the software architecture **1502** may include layers such as an operating system **1520**, libraries **1516**, frameworks/middleware **1514**, applications **1512**, and a presentation layer **1510**. Operationally, the applications **1512** and/or other components within the layers may invoke application programming interface (API) calls **1504** through the software stack and receive a response, returned values,

and so forth, illustrated as messages **1508**, in response to the API calls **1504**. The layers illustrated are representative in nature, and not all software architectures have all layers. For example, some mobile or special-purpose operating systems may not provide a frameworks/middleware layer **1514**, while others may provide such a layer. Other software architectures may include additional or different layers.

[0136] The operating system **1520** may manage hardware resources and provide common services. The operating system **1520** may include, for example, a kernel **1518**, services **1522**, and drivers **1524**. The kernel **1518** may act as an abstraction layer between the hardware and the other software layers. For example, the kernel **1518** may be responsible for memory management, processor management (e.g., scheduling), component management, networking, security settings, and so on. The services **1522** may provide other common services for the other software layers. The drivers **1524** may be responsible for controlling or interfacing with the underlying hardware. For instance, the drivers **1524** may include display drivers, camera drivers, Bluetooth® drivers, flash memory drivers, serial communication drivers (e.g., USB drivers), Wi-Fi® drivers, audio drivers, power management drivers, and so forth depending on the hardware configuration.

[0137] The libraries **1516** may provide a common infrastructure that may be utilized by the applications **1512** and/or other components and/or layers. The libraries **1516** typically provide functionality that allows other software modules to perform tasks in an easier fashion than by interfacing directly with the underlying operating system **1520** functionality (e.g., kernel **1518**, services **1522**, and/or drivers **1524**). The libraries **1516** may include system libraries **1542** (e.g., C standard library) that may provide functions such as memory allocation functions, string manipulation functions, mathematic functions, and the like. In addition, the libraries **1516** may include API libraries **1544** such as media libraries (e.g., libraries to support presentation and manipulation of various media formats such as MPEG4, H.264, MP3, AAC, AMR, JPG, PNG), graphics libraries (e.g., an OpenGL framework that may be used to render two-dimensional and three-dimensional graphic content on a display), database libraries (e.g., SQLite that may provide various relational database functions), web libraries (e.g., WebKit that may provide web browsing functionality), and the like. The libraries **1516** may also include a wide variety of other libraries **1546** to provide many other APIs to the applications **1512** and other software components/modules,

[0138] The frameworks **1514** (also sometimes referred to as middleware) may provide a higher-level common infrastructure that may be utilized by the applications **1512** and/or other software components/modules. For example, the frameworks **1514** may provide various graphic user interface (GUI) functions, high-level resource management, high-level location services, and so forth. The frameworks **1514** may provide a broad spectrum of other APIs that may be utilized by the applications **1512** and/or other software components/modules, some of which may be specific to a particular operating system or platform.

[0139] The applications **1512** include job-scoring applications **1562**, job search/suggestions **1564**, built-in applications **1536**, and third-party applications **1538**. The job-scoring applications **1562** comprise the job-scoring applications, as discussed above with reference to FIG. **11**. Examples of representative built-in applications **1536** may include, but are not limited to, a contacts application, a browser application, a book reader application, a location application, a media application, a messaging application, and/or a game application. The third-party applications **1538** may include any of the built-in applications **1536** as well as a broad assortment of other applications. In a specific example, the third-party application **1538** (e.g., an application developed using the Android™ or iOS™ software development kit (SDK) by an entity other than the vendor of the particular platform) may be mobile software running on a mobile operating system such as iOS™, Android™, Windows® Phone, or other mobile operating systems. In this example, the third-party application **1538** may invoke the API calls **1504** provided by the mobile operating system such as the operating system **1520** to facilitate functionality described herein.

[0140] The applications **1512** may utilize built-in operating system functions (e.g., kernel **1518**, services **1522**, and/or drivers **1524**), libraries (e.g., system libraries **1542**, API libraries **1544**, and other libraries **1546**), or frameworks/middleware **1514** to create user interfaces to interact with users of the system. Alternatively, or additionally, in some systems, interactions with a user may occur through a presentation layer, such as the presentation layer **1510**. In these systems, the application/module "logic" can be separated from the aspects of the application/module that interact with a user.

[0141] Some software architectures utilize virtual machines. In the example of FIG. **15**, this is illustrated by a virtual machine **1506**. A virtual machine creates a software environment where applications/modules can execute as if they were executing on a hardware machine (such as the machine **1400** of FIG. **14**, for example). The virtual machine **1506** is hosted by a host operating system (e.g., operating system **1520** in FIG. **15**) and typically, although not always, has a virtual machine monitor **1560**, which manages the operation of the virtual machine **1506** as well as the interface with the host operating system (e.g., operating system **1520**). A software architecture executes within the virtual machine **1506**, such as an operating system **1534**, libraries **1532**, frameworks/middleware **1530**, applications **1528**, and/or a presentation layer **1526**. These layers of software architecture executing within the virtual machine **1506** can be the same as corresponding layers previously described or may be different.

What is claimed is:

1. A method comprising:

determining, by one or more processors, in response to a search for a first member, a first skill set for the first member on a social network, the first skill set being based on one or more skills identified in a profile of the first member;

identifying, by the one or more processors, a plurality of jobs presentable to the first member, each job offered by a company;

identifying a plurality of proxy members having a skill set similar to the first skill set;

for each company offering one or more of the plurality of jobs to the first member, determining, by the one or more processors, a position growth score based on a change in a number of proxy members at the company over a predetermined period of time;

ranking, by the one or more processors, the companies based on the position growth score of each company; and

causing presentation of the companies in a user interface based on the ranking.

2. The method of claim **1**, wherein identifying the plurality of proxy members having a skill set similar to the first skill set further includes:

identifying a similarity value for each proxy member, the similarity value representing a similarity between the first skill set and the skill set of the proxy member.

3. The method of claim **2**, wherein the similarity values of the proxy members are calculated using a machine-learning program.

4. The method of claim **2**, wherein determining the position growth score for each company is further based on the similarity values of proxy members that joined the company during the predetermined period of time.

5. The method of claim **2**, wherein determining the position growth score for each company is further based on the similarity values of proxy members that left the company during the predetermined period of time.

6. The method of claim **1**, wherein determining the position growth score for each company is further based on a number of jobs offered by the company that are associated the first skill set.

7. The method of claim **1**, wherein the position growth score for each company is further based on a number of proxy members who have joined or left the company relative to a size of the company.

8. The method of claim **1**, wherein the position growth score for each company is further based on how recently within the predetermined period of time one or more of the proxy members joined or left the company.

9. The method of claim **1**, wherein the identifying the plurality of proxy members is further based on identifying that an education background within the profile of the searching member matches an education background within the profile of each proxy member.

10. A system comprising:

at least one processor of a machine; and

a memory storing instructions that, when executed by the at least one processor, cause the machine to perform operations comprising:

determining in response to a search for a first member, a first skill set for the first member on a social network, the first skill set being based on one or more skills identified in a profile of the first member;

identifying a plurality of jobs presentable to the first member, each job offered by a company;

identifying a plurality of proxy members having a skill set similar to the first skill set;

for each company offering one or more of the plurality of jobs to the first member, determining a position growth score based on a change in a number of proxy members at the company over a predetermined period of time;

ranking the companies based on the position growth score of each company, and

causing presentation of the companies in a user interface based on the ranking.

11. The system of claim **10**, wherein identifying the plurality of proxy members having a skill set similar to the first skill set further includes:

identifying a similarity value for each proxy member, the similarity value representing a similarity between the first skill set and the skill set of the proxy member.

12. The system of claim **11**, wherein the similarity values of the proxy members are calculated using a machine-learning program.

13. The system of claim **11**, wherein determining the position growth score for each company is further based on the similarity values of proxy members that joined the company during the predetermined period of time.

14. The system of claim **11**, wherein determining the position growth score for each company is further based on the similarity values of proxy members that left the company during the predetermined period of time.

15. The system of claim **10**, wherein determining the position growth score for each company is further based on a number of jobs offered by the company that are associated the first skill set.

16. The system of claim **10**, wherein the position growth score for each company is further based on a number of proxy members who have joined or left the company relative to a size of the company.

17. The system of claim **10**, wherein the position growth score for each company is further based on how recently within the predetermined period of time one or more of the proxy members joined or left the company.

18. The system of claim **10**, wherein the identifying the plurality of proxy members is further based on identifying that an education background within the profile of the searching member matches an education background within the profile of each proxy member.

19. A non-transitory machine-readable storage medium comprising instructions that, when executed by one or more processors of a machine, cause the machine to perform operations comprising:

determining in response to a search for a first member, a first skill set for the first member on a social network, the first skill set being based on one or more skills identified in a profile of the first member;

identifying a plurality of jobs presentable to the first member, each job offered by a company;

identifying a plurality of proxy members having a skill set similar to the first skill set;

for each company offering one or more of the plurality of jobs to the first member, determining a position growth score based on a change in a number of proxy members at the company over a predetermined period of time;

ranking the companies based on the position growth score of each company; and

causing presentation of the companies in a user interface based on the ranking.

20. The non-transitory machine-readable storage medium of claim **19**, wherein identifying the plurality of proxy members having a skill set similar to the first skill set further includes:

identifying a similarity value for each proxy member, the similarity value representing a similarity between the first skill set and the skill set of the proxy member.

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