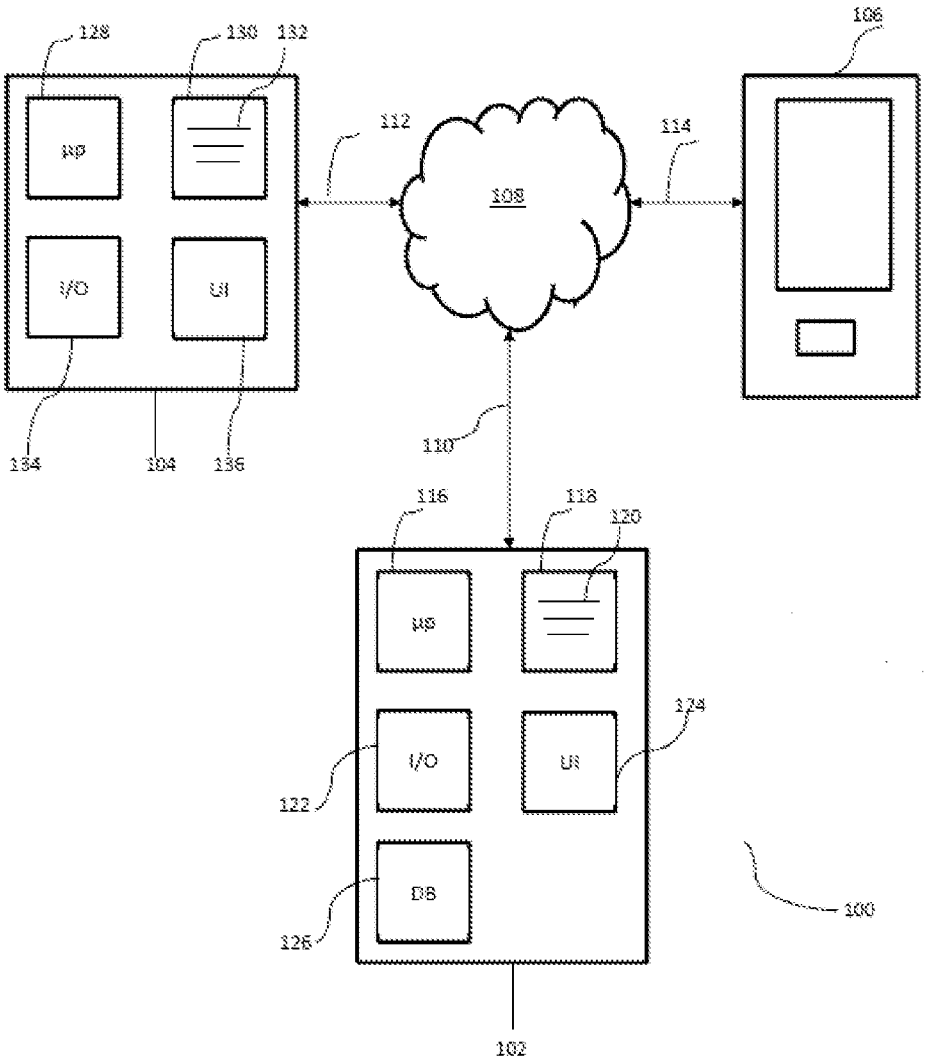

128
130
132
106
µp
112
114
108
I/O
UI
134
104
136
110
116
118
120
µp
124
I/O
UI
122
DB
126
100
102

FIG. 1

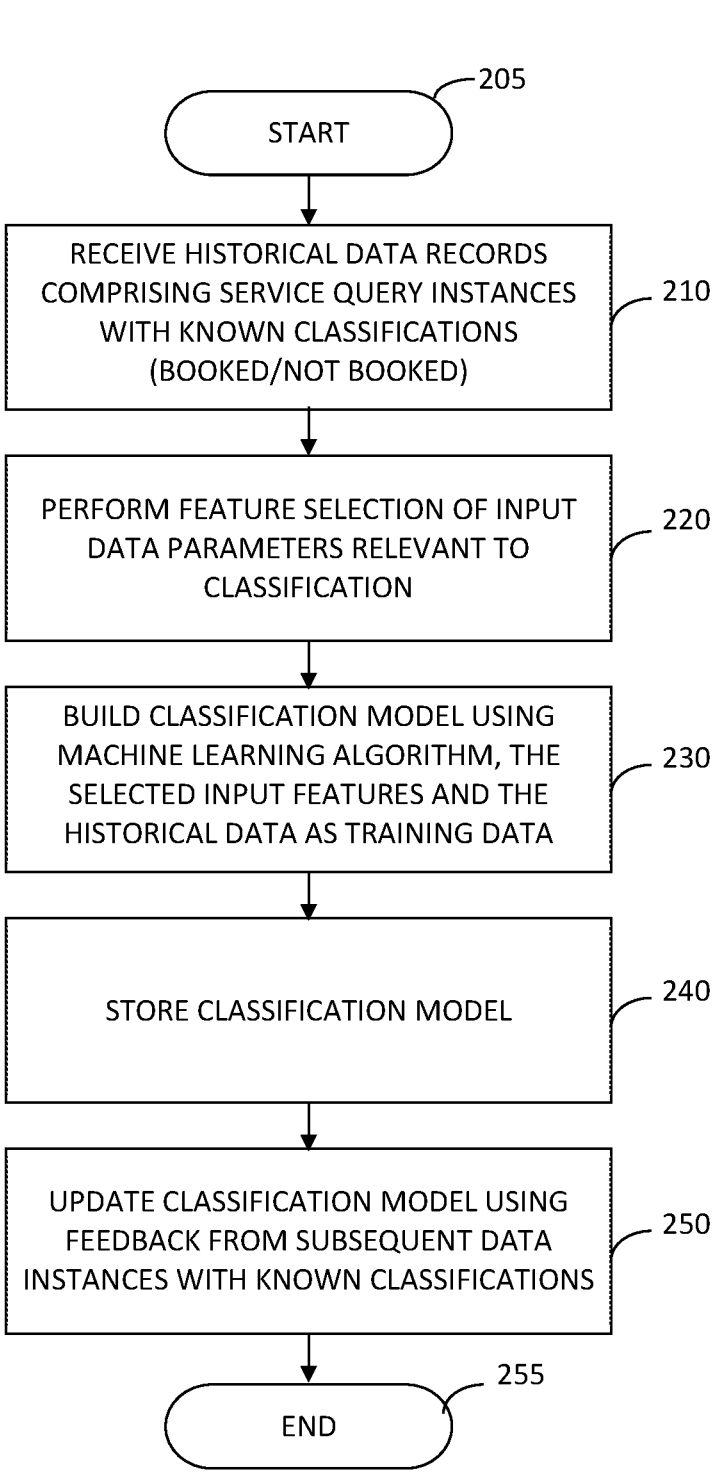

200
205
START
RECEIVE HISTORICAL DATA RECORDS COMPRISING SERVICE QUERY INSTANCES WITH KNOWN CLASSIFICATIONS (BOOKED/NOT BOOKED)
210
PERFORM FEATURE SELECTION OF INPUT DATA PARAMETERS RELEVANT TO CLASSIFICATION
220
BUILD CLASSIFICATION MODEL USING MACHINE LEARNING ALGORITHM, THE SELECTED INPUT FEATURES AND THE HISTORICAL DATA AS TRAINING DATA
230
STORE CLASSIFICATION MODEL
240
UPDATE CLASSIFICATION MODEL USING FEEDBACK FROM SUBSEQUENT DATA INSTANCES WITH KNOWN CLASSIFICATIONS
250
255
END

FIG. 2

Service Booking Records

Record/ Query ID	User ID	Query Time	Pick-up location (lat:long)	Drop-off location (lat:long)	Offer Time	Offer Price (CU)	Offer Wait Time (mins)	Booking Confirmed (Y/N)	...
035001	N1234	15:03	...	...	15:05	25	10	Y	...
035002	P4989	15:07	...	...	15:10	15	8	Y	...
035003	S5161	15.11	...	...	15:13	55	15	N	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...

FIG. 3A

Service Booking Patterns

User-based

User ID	Book-through rate (%)	Standard price book-through rate (%)	Higher price book-through rate (%)	Loyalty customer (Y/N)	...
N1234	90	95	85	Y	...
P4989	75	90	60	N	...
S5161	15	30	0	N	...
...	...	...	...	...	...

FIG. 3B

Geographical area-based

Area ID (lat:long)	Book-through rate (%)	Booking Density (morning)	Booking density (afternoon)	...
wxz16u	50	0.20	0.5	...
wxz154	70	0.60	0.35	...
...	...	...	...	...

FIG. 3C

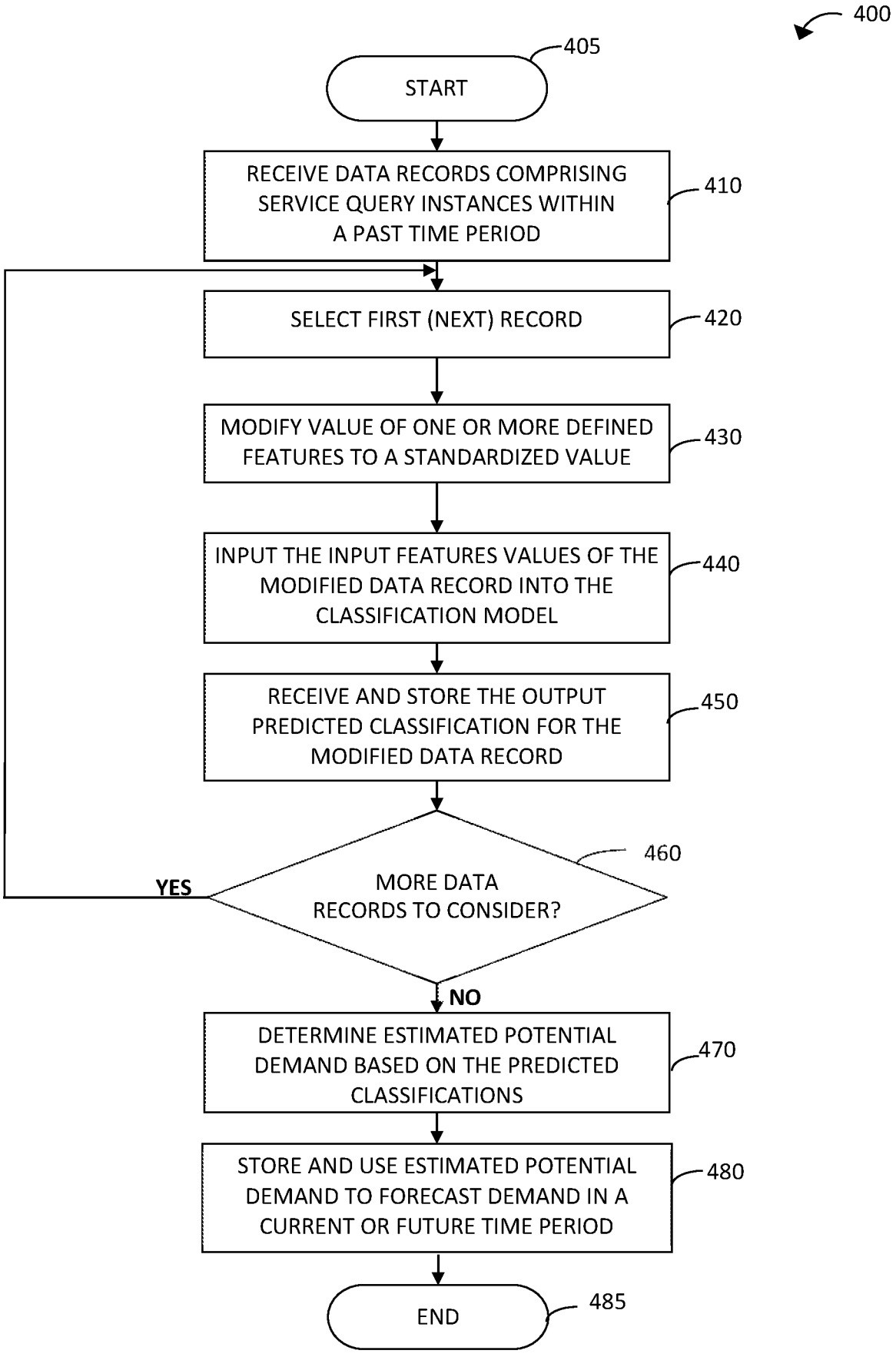

400
405
START
RECEIVE DATA RECORDS COMPRISING SERVICE QUERY INSTANCES WITHIN A PAST TIME PERIOD
410
SELECT FIRST (NEXT) RECORD
420
MODIFY VALUE OF ONE OR MORE DEFINED FEATURES TO A STANDARDIZED VALUE
430
INPUT THE INPUT FEATURES VALUES OF THE MODIFIED DATA RECORD INTO THE CLASSIFICATION MODEL
440
RECEIVE AND STORE THE OUTPUT PREDICTED CLASSIFICATION FOR THE MODIFIED DATA RECORD
450
MORE DATA RECORDS TO CONSIDER?
460
YES
NO
DETERMINE ESTIMATED POTENTIAL DEMAND BASED ON THE PREDICTED CLASSIFICATIONS
470
STORE AND USE ESTIMATED POTENTIAL DEMAND TO FORECAST DEMAND IN A CURRENT OR FUTURE TIME PERIOD
480
END
485

FIG. 4

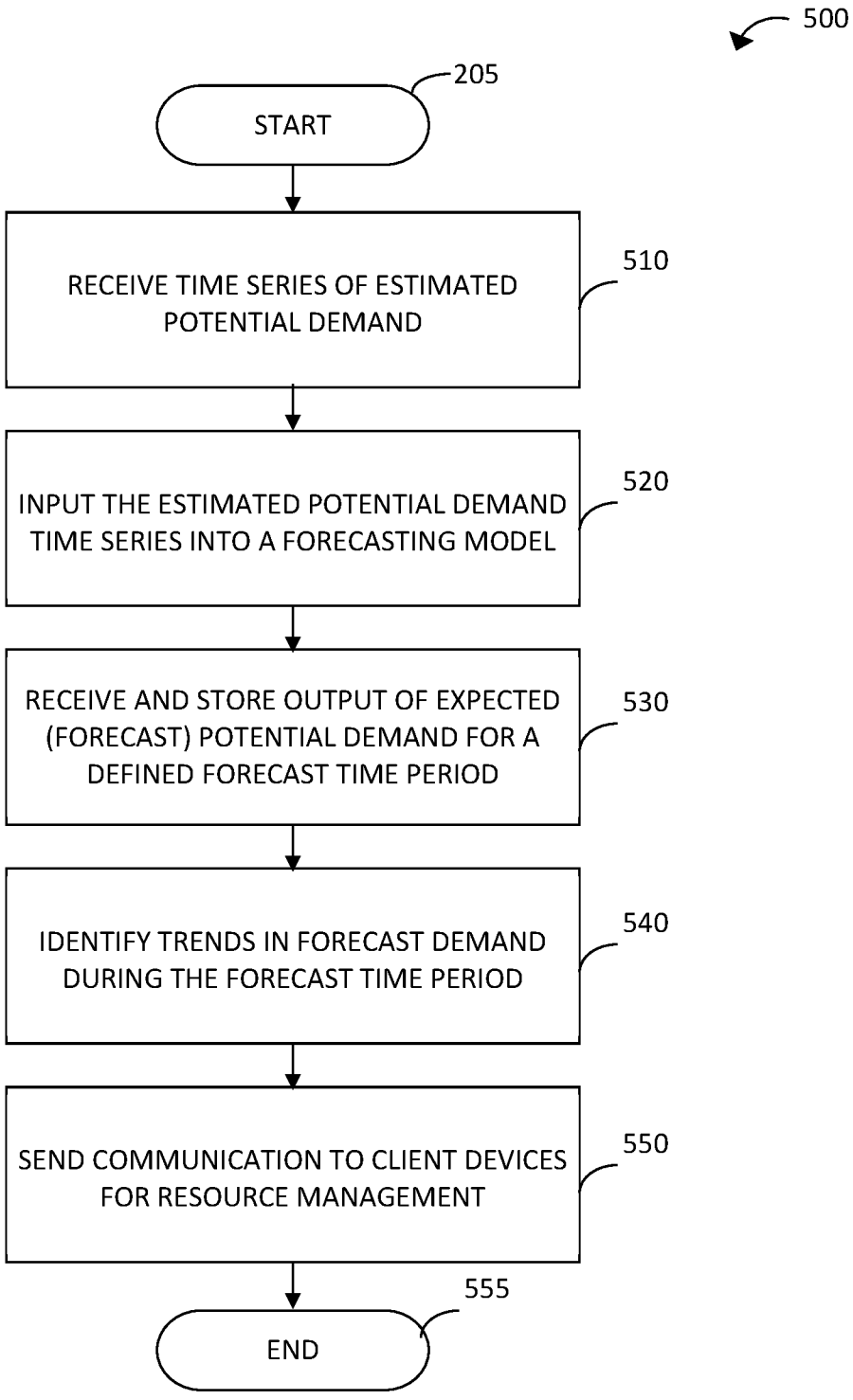

500
205
START
RECEIVE TIME SERIES OF ESTIMATED POTENTIAL DEMAND
510
INPUT THE ESTIMATED POTENTIAL DEMAND TIME SERIES INTO A FORECASTING MODEL
520
RECEIVE AND STORE OUTPUT OF EXPECTED (FORECAST) POTENTIAL DEMAND FOR A DEFINED FORECAST TIME PERIOD
530
IDENTIFY TRENDS IN FORECAST DEMAND DURING THE FORECAST TIME PERIOD
540
SEND COMMUNICATION TO CLIENT DEVICES FOR RESOURCE MANAGEMENT
550
555
END

FIG. 5

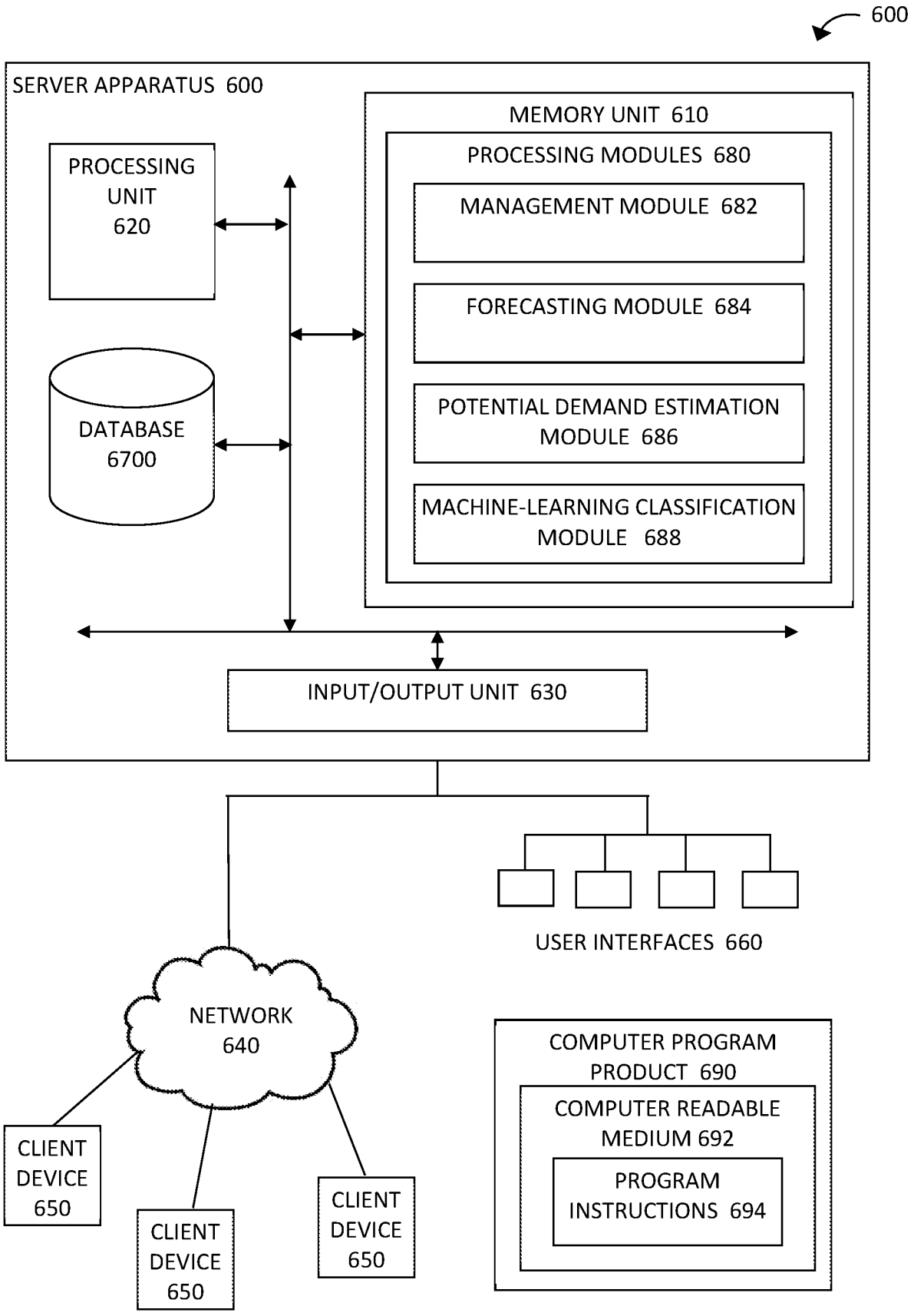

600
SERVER APPARATUS 600
MEMORY UNIT 610
PROCESSING MODULES 680
MANAGEMENT MODULE 682
FORECASTING MODULE 684
POTENTIAL DEMAND ESTIMATION MODULE 686
MACHINE-LEARNING CLASSIFICATION MODULE 688
PROCESSING UNIT 620
DATABASE 6700
INPUT/OUTPUT UNIT 630
USER INTERFACES 660
NETWORK 640
CLIENT DEVICE 650
CLIENT DEVICE 650
CLIENT DEVICE 650
COMPUTER PROGRAM PRODUCT 690
COMPUTER READABLE MEDIUM 692
PROGRAM INSTRUCTIONS 694

FIG. 6