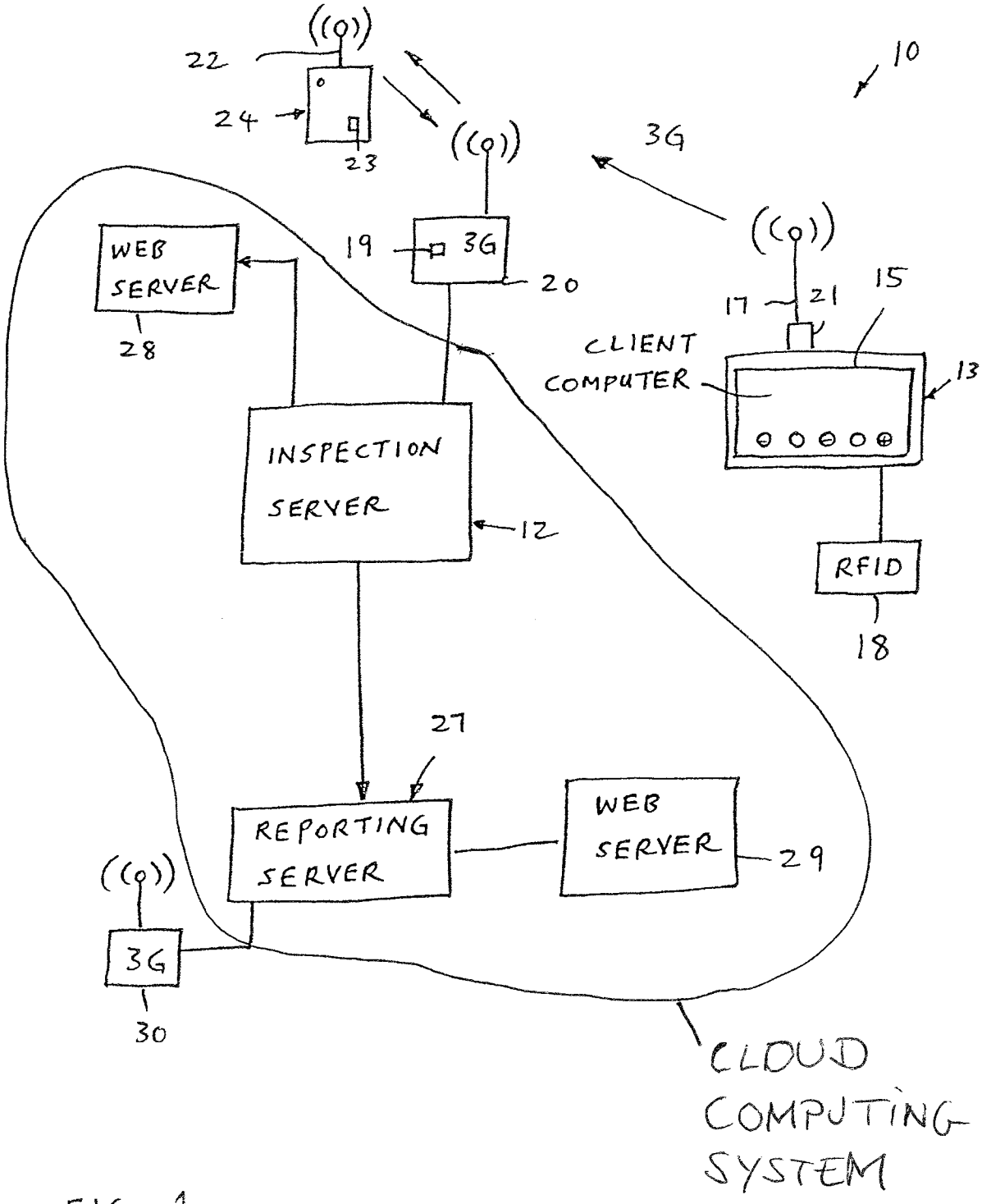
22
24
23
10
3G
19
3G
20
WEB SERVER
28
17
21
15
CLIENT COMPUTER
13
INSPECTION SERVER
12
RFID
18
27
REPORTING SERVER
WEB SERVER
29
3G
30
CLOUD COMPUTING SYSTEM

FIG. 1

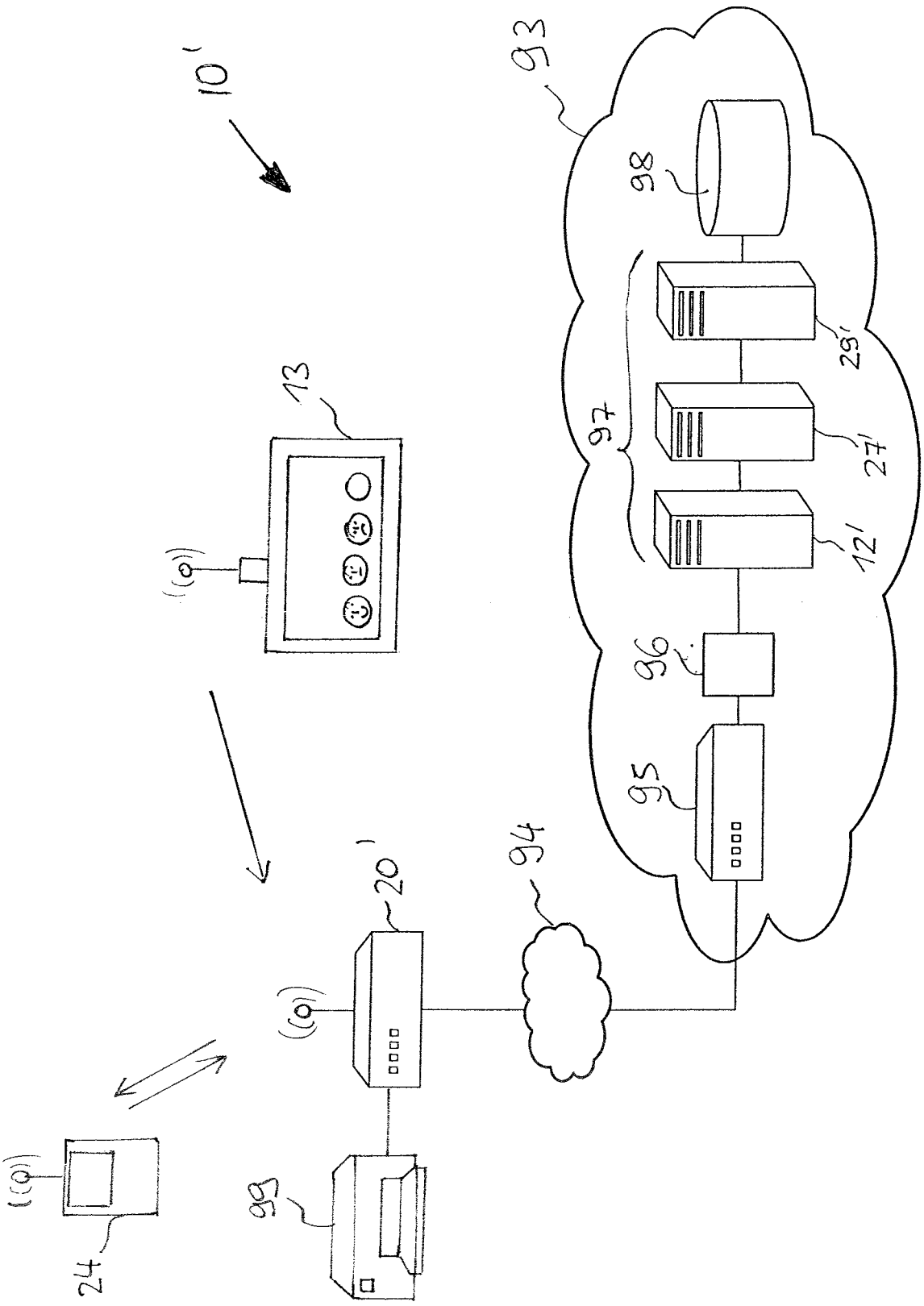

Fig. 2

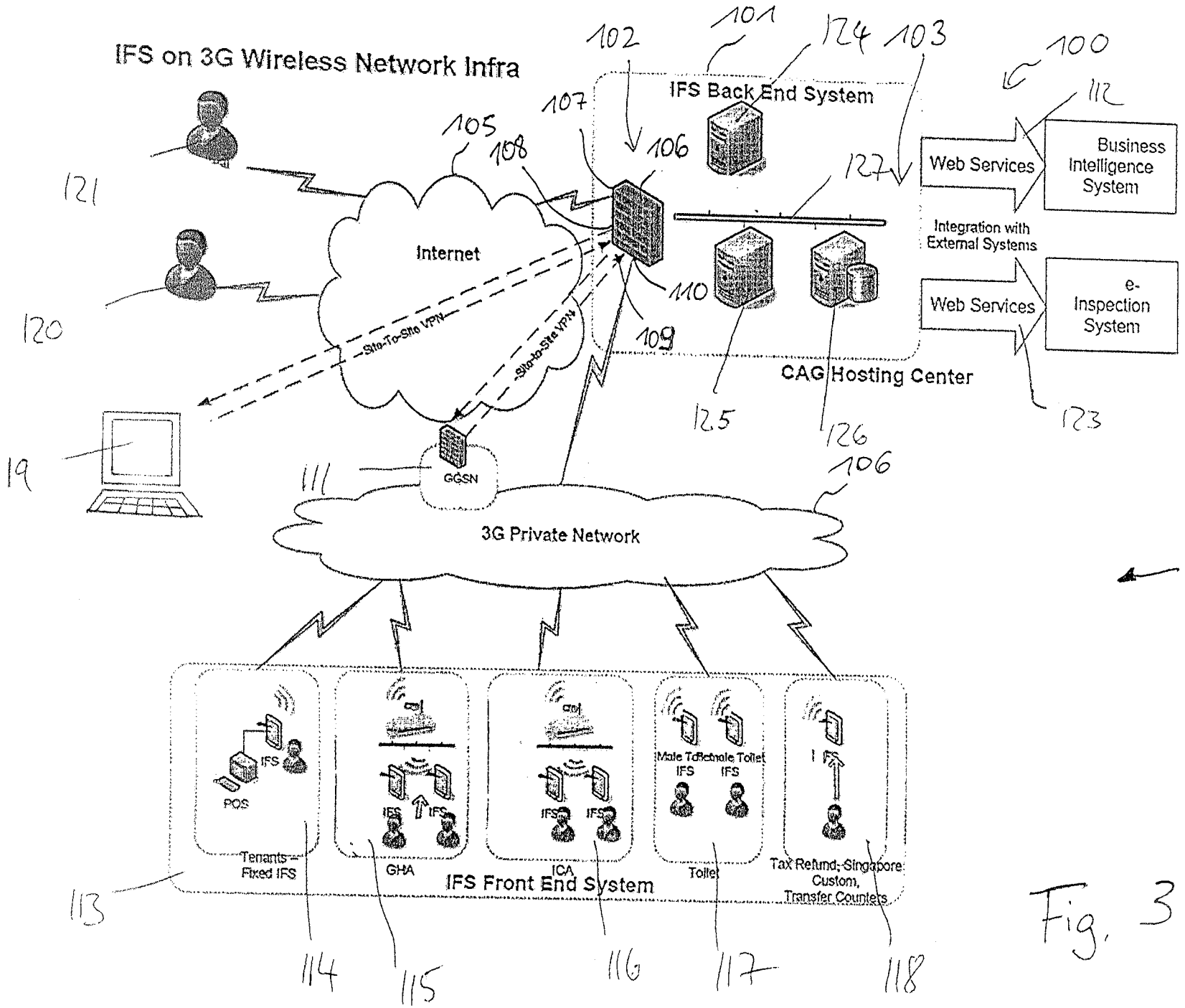
IFS on 3G Wireless Network Infra
IFS Back End System
Internet
Site-To-Site VPN
Site-to-Site VPN
CAG Hosting Center
Web Services
Business Intelligence System
Integration with External Systems
Web Services
e-Inspection System
GGSN
3G Private Network
IFS
POS
Tenants – Fixed IFS
GHA
ICA
Male Toilet
Female Toilet
Toilet
Tax Refund, Singapore Custom, Transfer Counters
IFS Front End System
100
101
102
103
105
106
107
108
109
110
111
112
113
114
115
116
117
118
120
121
123
124
125
126
127

Fig. 3

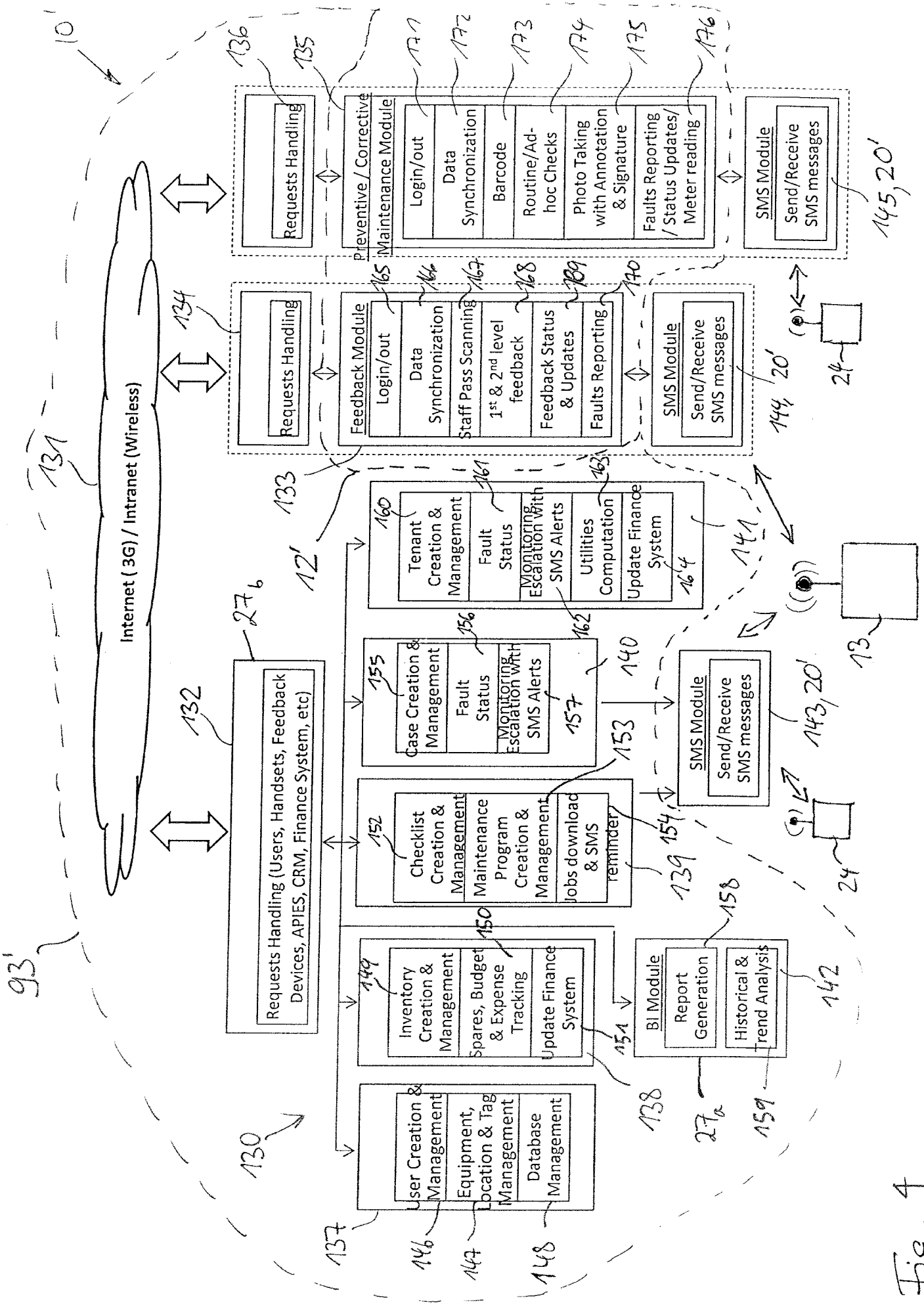
10
93'
131
Internet (3G) / Intranet (Wireless)
132
Requests Handling (Users, Handsets, Feedback Devices, APIES, CRM, Finance System, etc)
276
130
136
Requests Handling
135
Preventive / Corrective Maintenance Module
171 Login/out
172 Data Synchronization
173 Barcode
174 Routine/Ad-hoc Checks
175 Photo Taking with Annotation & Signature
176 Faults Reporting / Status Updates/ Meter reading
SMS Module
Send/Receive SMS messages
145, 20'
134
Requests Handling
Feedback Module
165 Login/out
166 Data Synchronization
167 Staff Pass Scanning
168 1st & 2nd level feedback
169 Feedback Status & Updates
170 Faults Reporting
SMS Module
Send/Receive SMS messages
144 20'
24
133
12'
160 Tenant Creation & Management
161 Fault Status Monitoring Escalation With SMS Alerts
162 Utilities Computation
163 Update Finance System
141
13
155 Case Creation & Management
156 Fault Status Monitoring Escalation With SMS Alerts
157
140
153
SMS Module
Send/Receive SMS messages
143, 20'
152 Checklist Creation & Management
154 Maintenance Program Creation & Management
Jobs download & SMS reminder
139
24
158
149 Inventory Creation & Management
150 Spares, Budget & Expense Tracking
151 Update Finance System
BI Module
Report Generation
Historical & Trend Analysis
142
138
27a
159
137
146 User Creation & Management
147 Equipment, Location & Tag Management
148 Database Management

Fig. 4

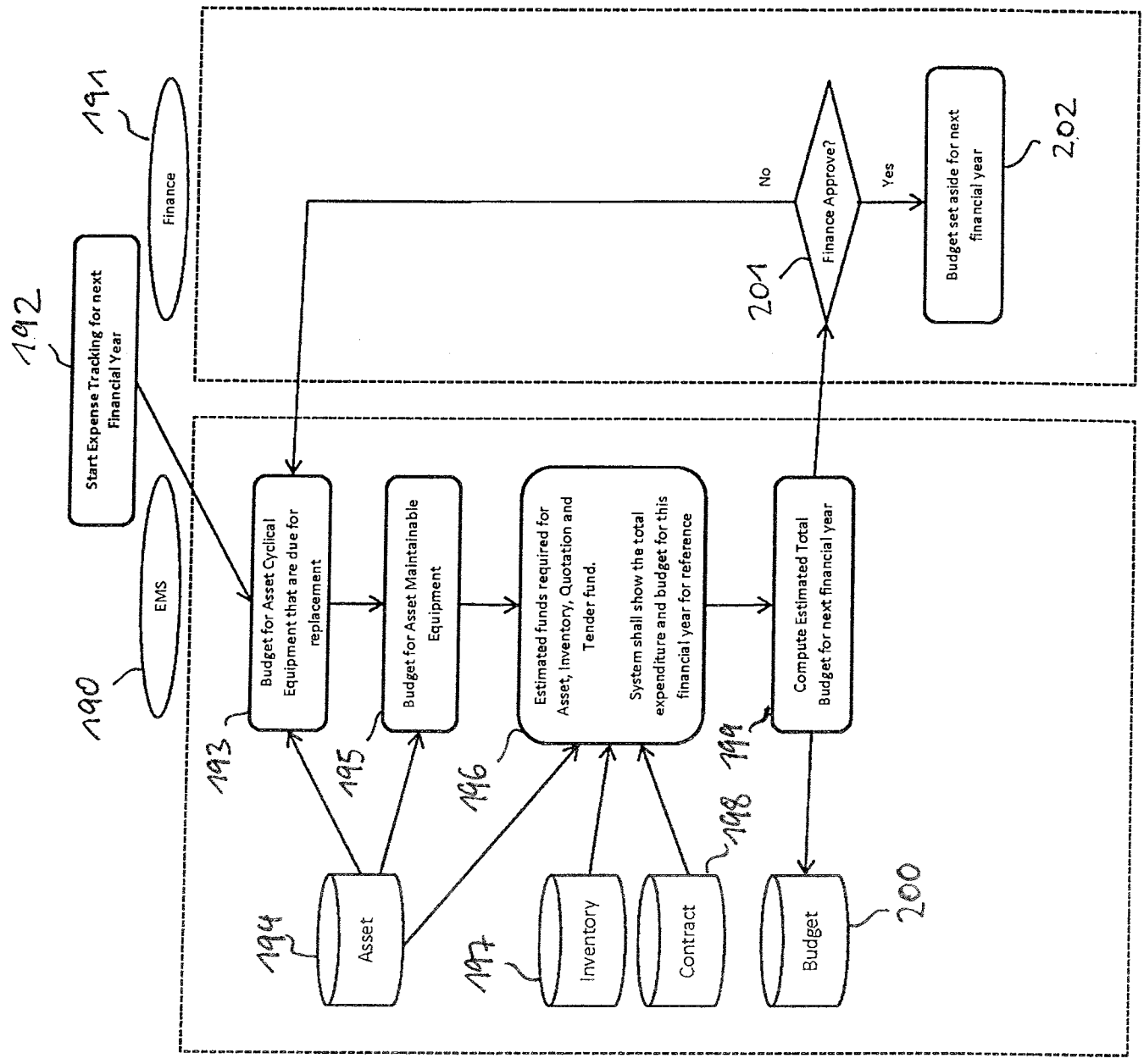
Start Expense Tracking for next Financial Year
192
EMS
190
Finance
191
Budget for Asset Cyclical Equipment that are due for replacement
193
Budget for Asset Maintainable Equipment
195
Estimated funds required for Asset, Inventory, Quotation and Tender fund.
System shall show the total expenditure and budget for this financial year for reference
196
Compute Estimated Total Budget for next financial year
199
Finance Approve?
201
No
Yes
Budget set aside for next financial year
202
Asset
194
Inventory
197
Contract
198
Budget
200

Fig. 5

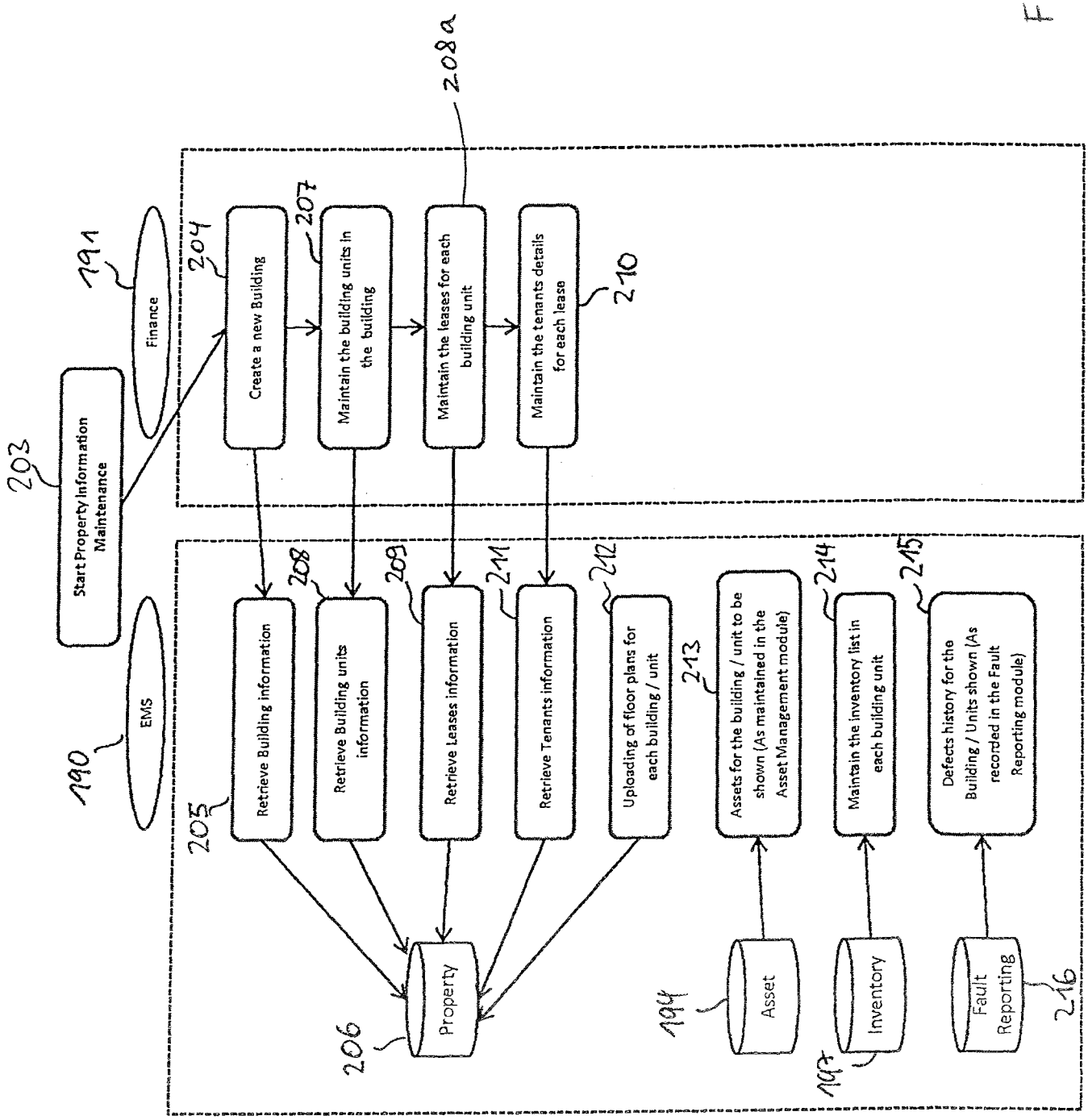
Start Property Information Maintenance
203
EMS
190
Finance
191
Create a new Building
204
Maintain the building units in the building
207
Maintain the leases for each building unit
208a
Maintain the tenants details for each lease
210
Retrieve Building information
205
Retrieve Building units information
208
Retrieve Leases information
209
Retrieve Tenants information
211
Uploading of floor plans for each building / unit
212
Assets for the building / unit to be shown (As maintained in the Asset Management module)
213
Maintain the inventory list in each building unit
214
Defects history for the Building / Units shown (As recorded in the Fault Reporting module)
215
Property
206
Asset
194
Inventory
197
Fault Reporting
216

Fig. 6

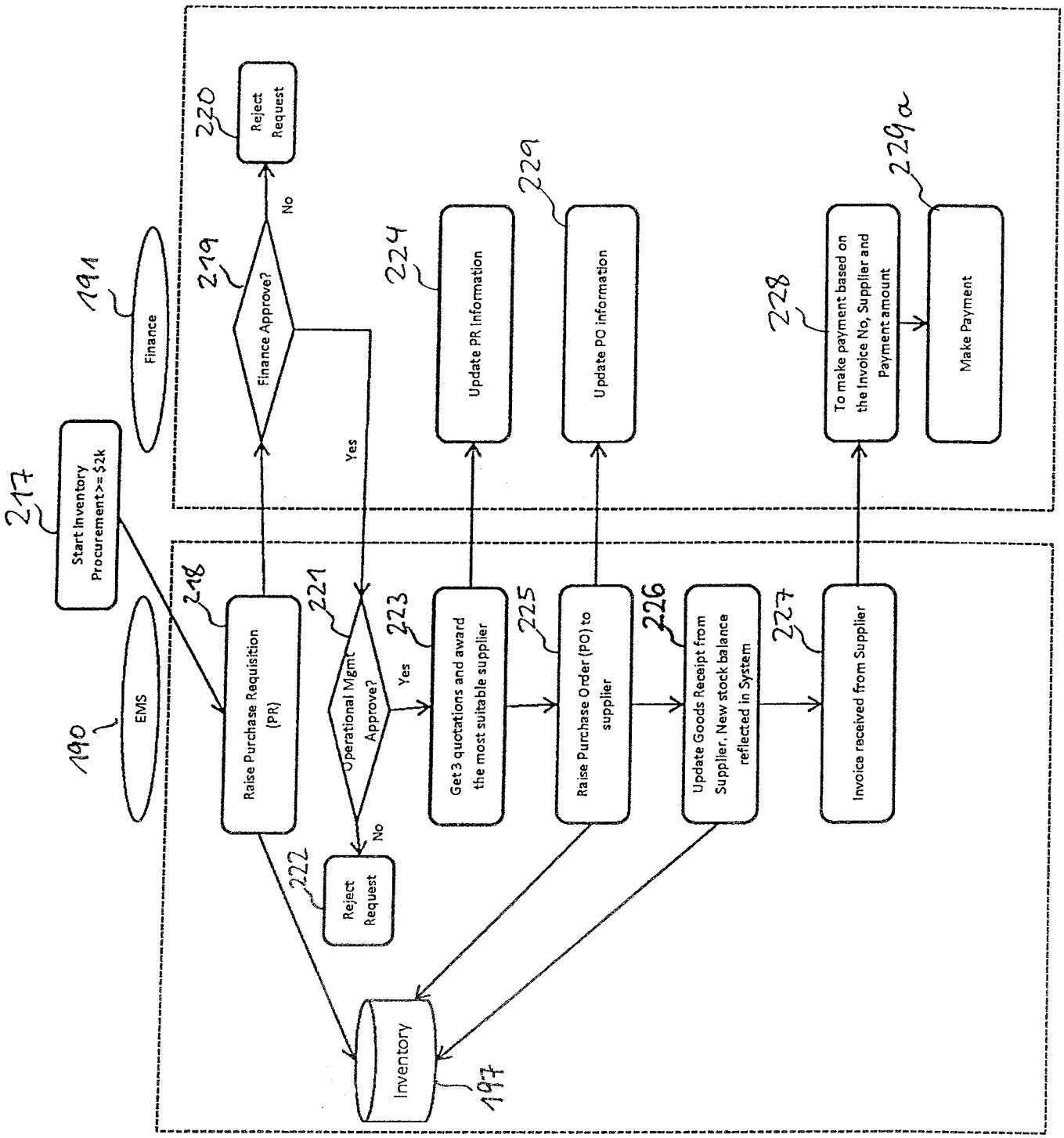
Start Inventory Procurement >= $2k
217
EMS
190
Finance
191
Raise Purchase Requisition (PR)
218
Operational Mgmt Approve?
221
Yes
No
Reject Request
222
Finance Approve?
219
Yes
No
Reject Request
220
Get 3 quotations and award the most suitable supplier
223
Update PR Information
224
Raise Purchase Order (PO) to supplier
225
Update PO information
229
Update Goods Receipt from Supplier. New stock balance reflected in System
226
Invoice received from Supplier
227
To make payment based on the Invoice No, Supplier and Payment amount
228
Make Payment
229a
Inventory
197

Fig. 7

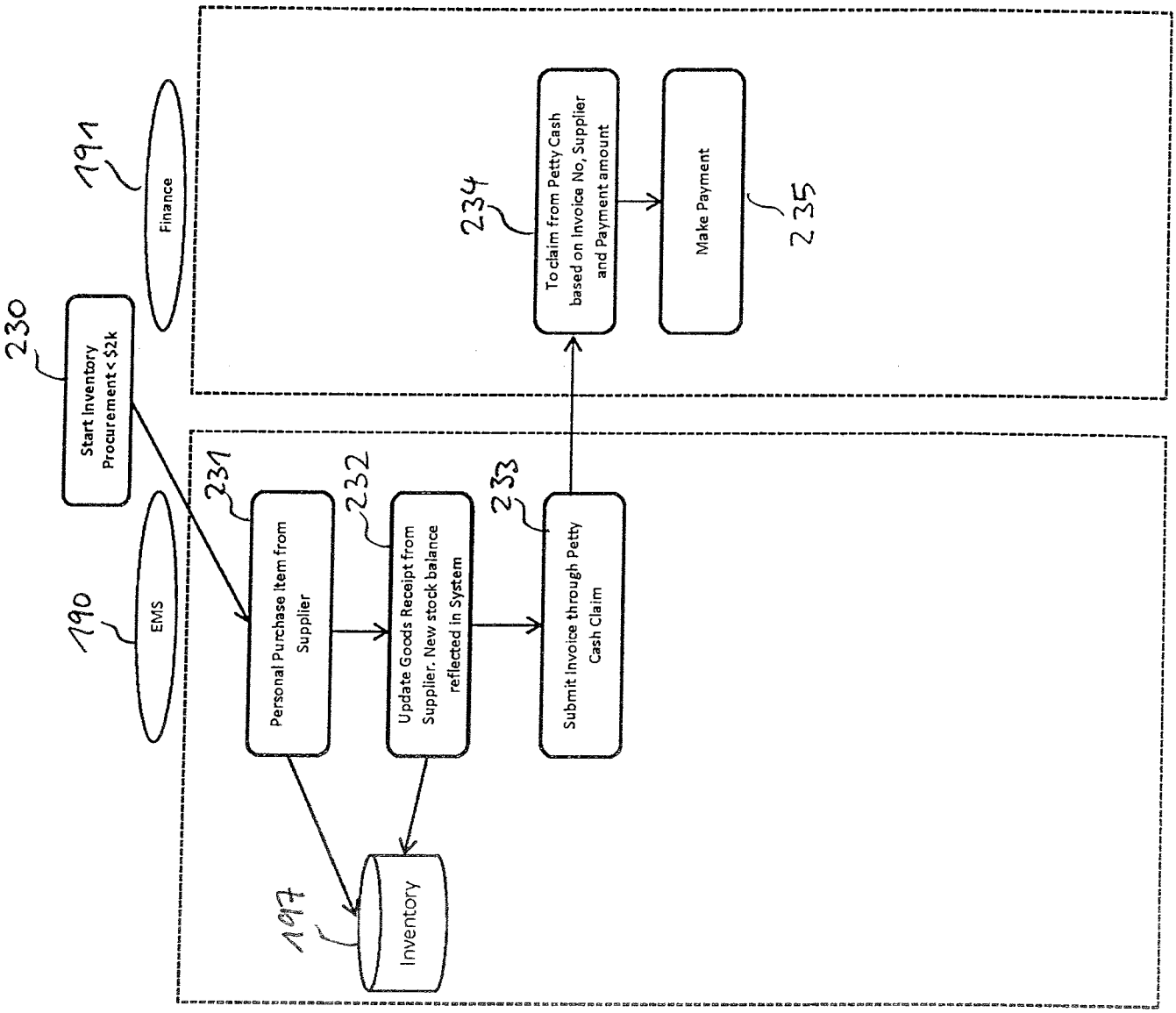
Finance
191
230
Start Inventory Procurement < $2k
234
To claim from Petty Cash based on Invoice No, Supplier and Payment amount
Make Payment
235
231
232
233
190
EMS
Personal Purchase Item from Supplier
Update Goods Receipt from Supplier. New stock balance reflected in System
Submit Invoice through Petty Cash Claim
197
Inventory

Fig. 8

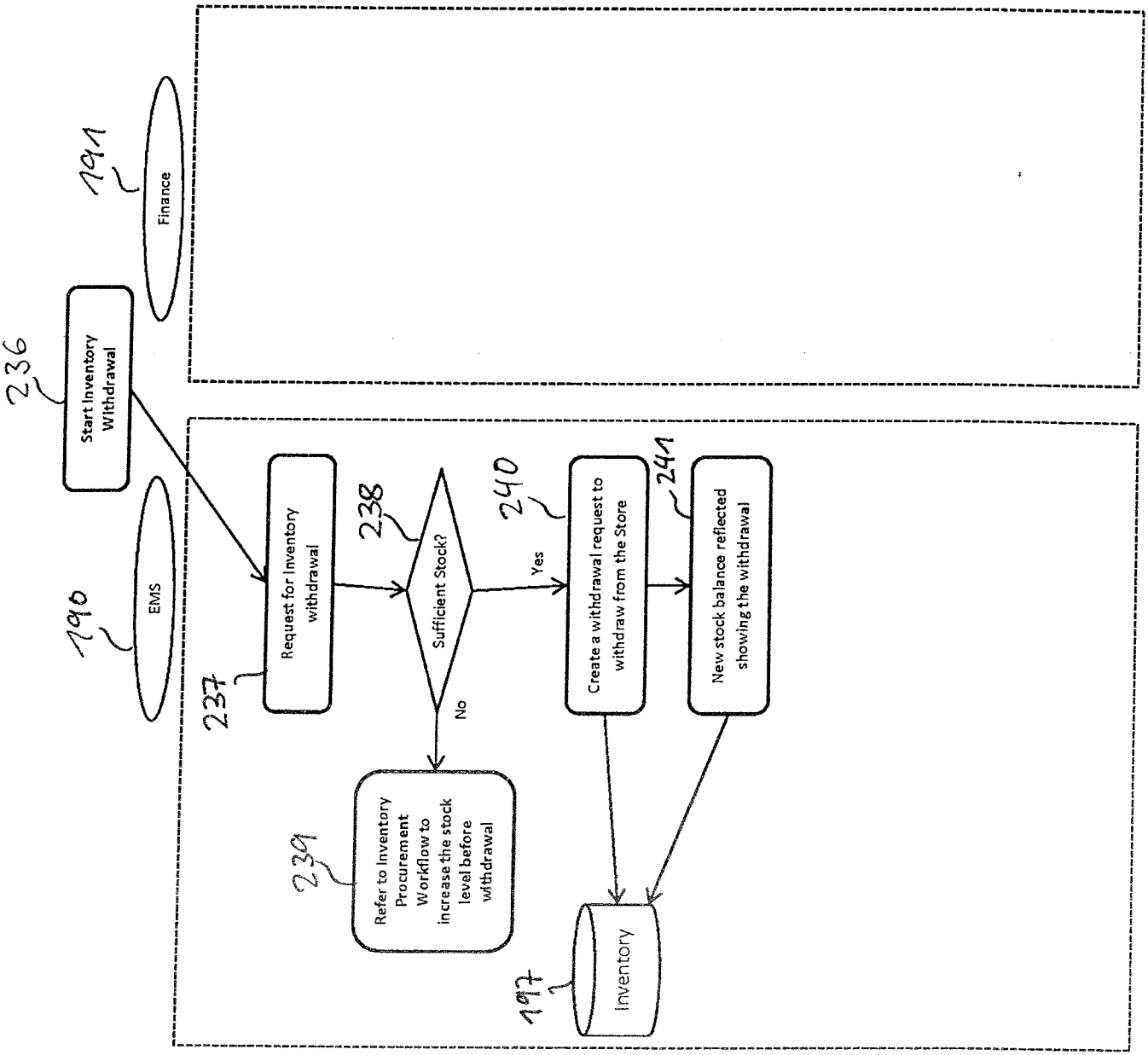
Finance
191
Start Inventory Withdrawal
236
EMS
190
Request for Inventory withdrawal
237
Sufficient Stock?
238
Yes
No
Create a withdrawal request to withdraw from the Store
240
New stock balance reflected showing the withdrawal
241
Refer to Inventory Procurement Workflow to increase the stock level before withdrawal
239
Inventory
197

Fig. 9

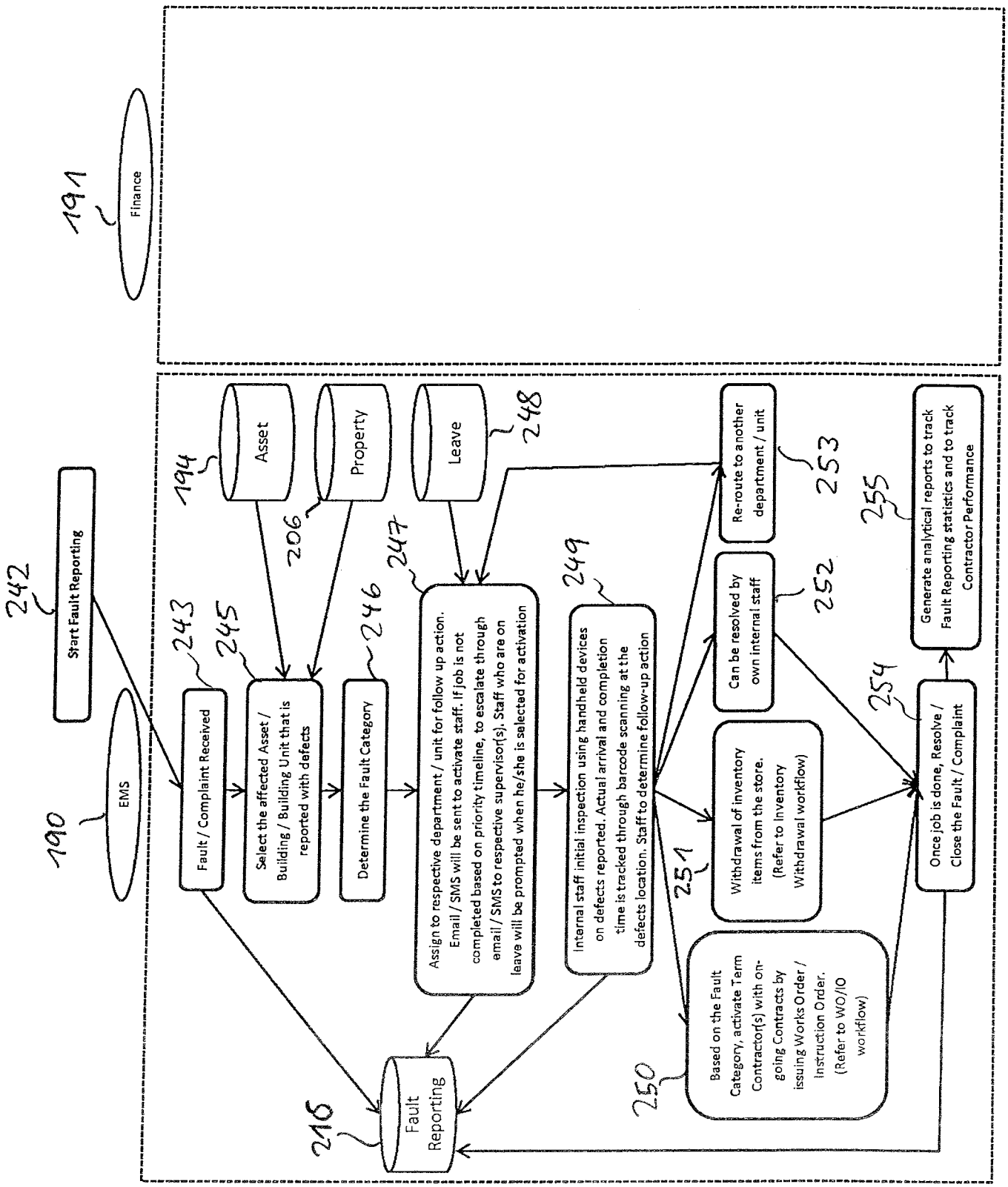
191
Finance
190
EMS
242
Start Fault Reporting
194
Asset
206
Property
Leave
248
243
245
246
247
249
Fault / Complaint Received
Select the affected Asset / Building / Building Unit that is reported with defects
Determine the Fault Category
Assign to respective department / unit for follow up action. Email / SMS will be sent to activate staff. If job is not completed based on priority timeline, to escalate through email / SMS to respective supervisor(s). Staff who are on leave will be prompted when he/she is selected for activation
Internal staff initial inspection using handheld devices on defects reported. Actual arrival and completion time is tracked through barcode scanning at the defects location. Staff to determine follow-up action
Re-route to another department / unit
253
Can be resolved by own internal staff
252
Withdrawal of inventory items from the store. (Refer to Inventory Withdrawal workflow)
251
Based on the Fault Category, activate Term Contractor(s) with on-going Contracts by issuing Works Order / Instruction Order. (Refer to WO/IO workflow)
250
254
Once job is done, Resolve / Close the Fault / Complaint
255
Generate analytical reports to track Fault Reporting statistics and to track Contractor Performance
216
Fault Reporting

Fig. 10

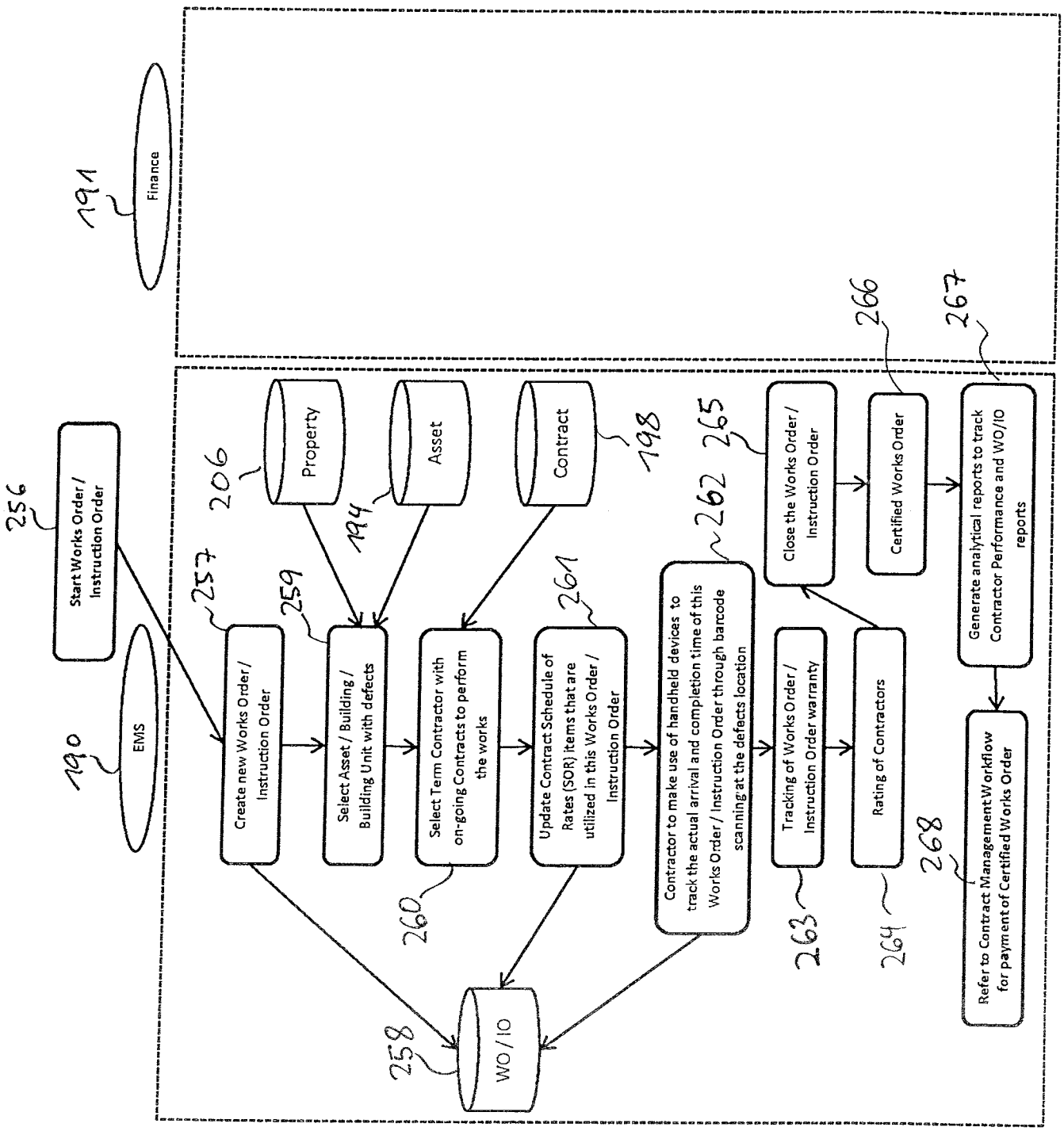
Finance
191
Start Works Order / Instruction Order
256
EMS
190
Property
206
Asset
194
Contract
198
Create new Works Order / Instruction Order
257
Select Asset / Building / Building Unit with defects
259
Select Term Contractor with on-going Contracts to perform the works
260
Update Contract Schedule of Rates (SOR) items that are utilized in this Works Order / Instruction Order
261
Contractor to make use of handheld devices to track the actual arrival and completion time of this Works Order / Instruction Order through barcode scanning at the defects location
262
Close the Works Order / Instruction Order
265
Certified Works Order
266
Generate analytical reports to track Contractor Performance and WO/IO reports
267
Tracking of Works Order / Instruction Order warranty
263
Rating of Contractors
264
Refer to Contract Management Workflow for payment of Certified Works Order
268
WO / IO
258

Fig. 11

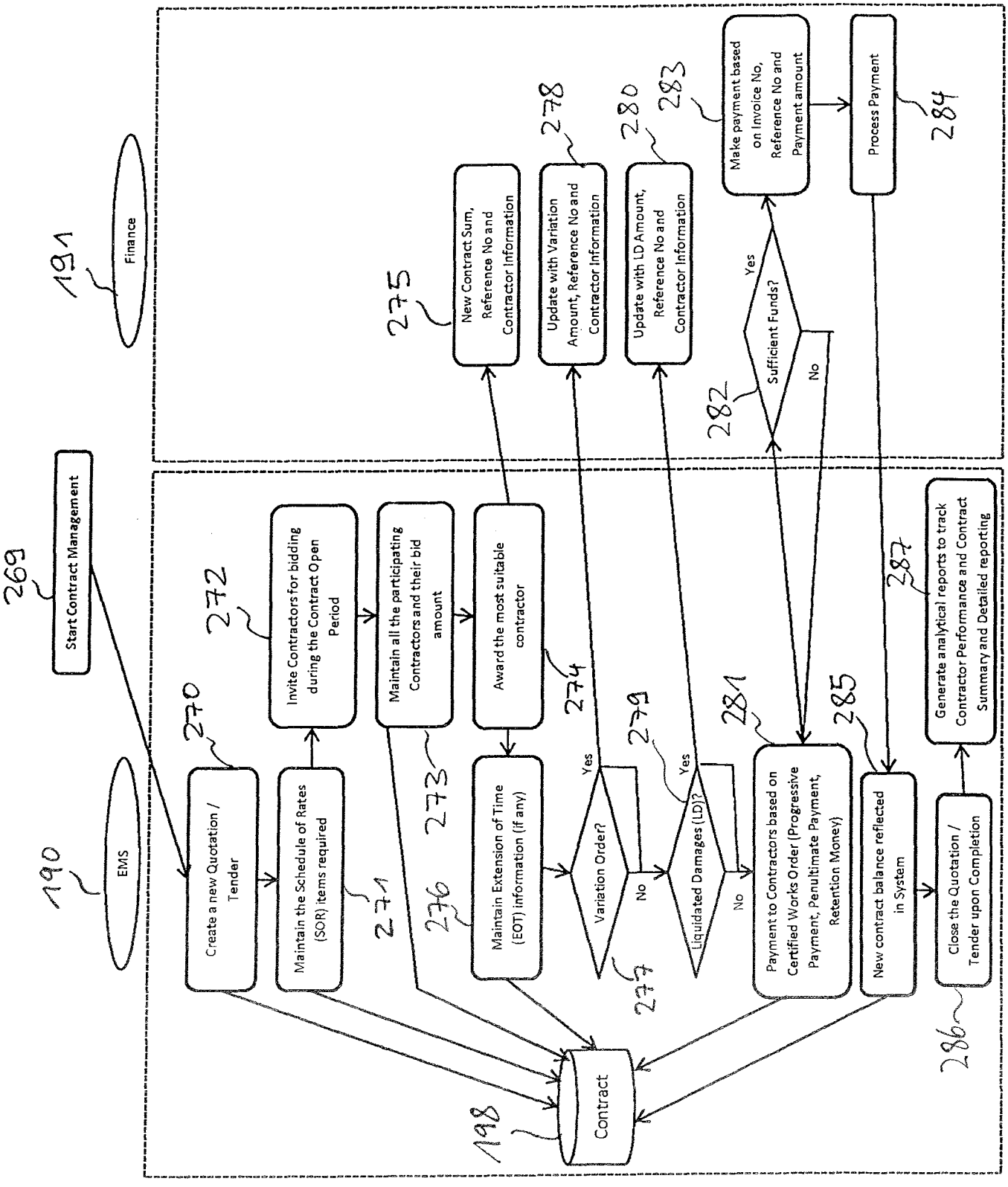
190
EMS
191
Finance
269
Start Contract Management
270
Create a new Quotation / Tender
271
Maintain the Schedule of Rates (SOR) items required
272
Invite Contractors for bidding during the Contract Open Period
273
Maintain all the participating Contractors and their bid amount
274
Award the most suitable contractor
275
New Contract Sum, Reference No and Contractor Information
276
Maintain Extension of Time (EOT) information (if any)
277
Variation Order?
Yes
No
278
Update with Variation Amount, Reference No and Contractor Information
279
Liquidated Damages (LD)?
Yes
No
280
Update with LD Amount, Reference No and Contractor Information
281
Payment to Contractors based on Certified Works Order (Progressive Payment, Penultimate Payment, Retention Money)
282
Sufficient Funds?
Yes
No
283
Make payment based on Invoice No, Reference No and Payment amount
284
Process Payment
285
New contract balance reflected in System
286
Close the Quotation / Tender upon Completion
287
Generate analytical reports to track Contractor Performance and Contract Summary and Detailed reporting
198
Contract

Fig. 12

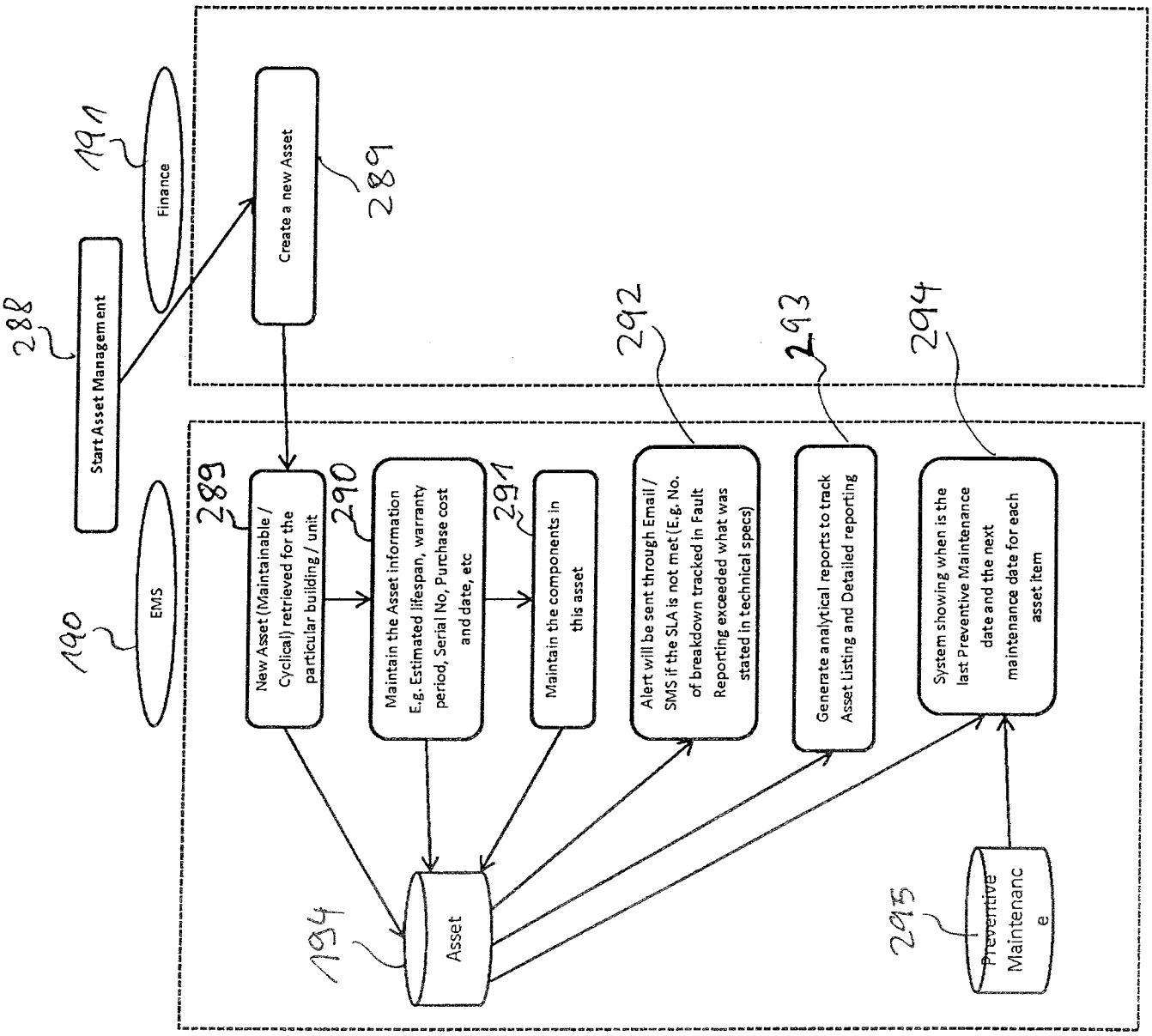
Start Asset Management
288
EMS
190
Finance
191
Create a new Asset
289
New Asset (Maintainable / Cyclical) retrieved for the particular building / unit
289
Maintain the Asset information E.g. Estimated lifespan, warranty period, Serial No, Purchase cost and date, etc
290
Maintain the components in this asset
291
Alert will be sent through Email / SMS if the SLA is not met (E.g. No. of breakdown tracked in Fault Reporting exceeded what was stated in technical specs)
292
Generate analytical reports to track Asset listing and Detailed reporting
293
System showing when is the last Preventive Maintenance date and the next maintenance date for each asset item
294
Asset
194
Preventive Maintenanc e
295

Fig. 13

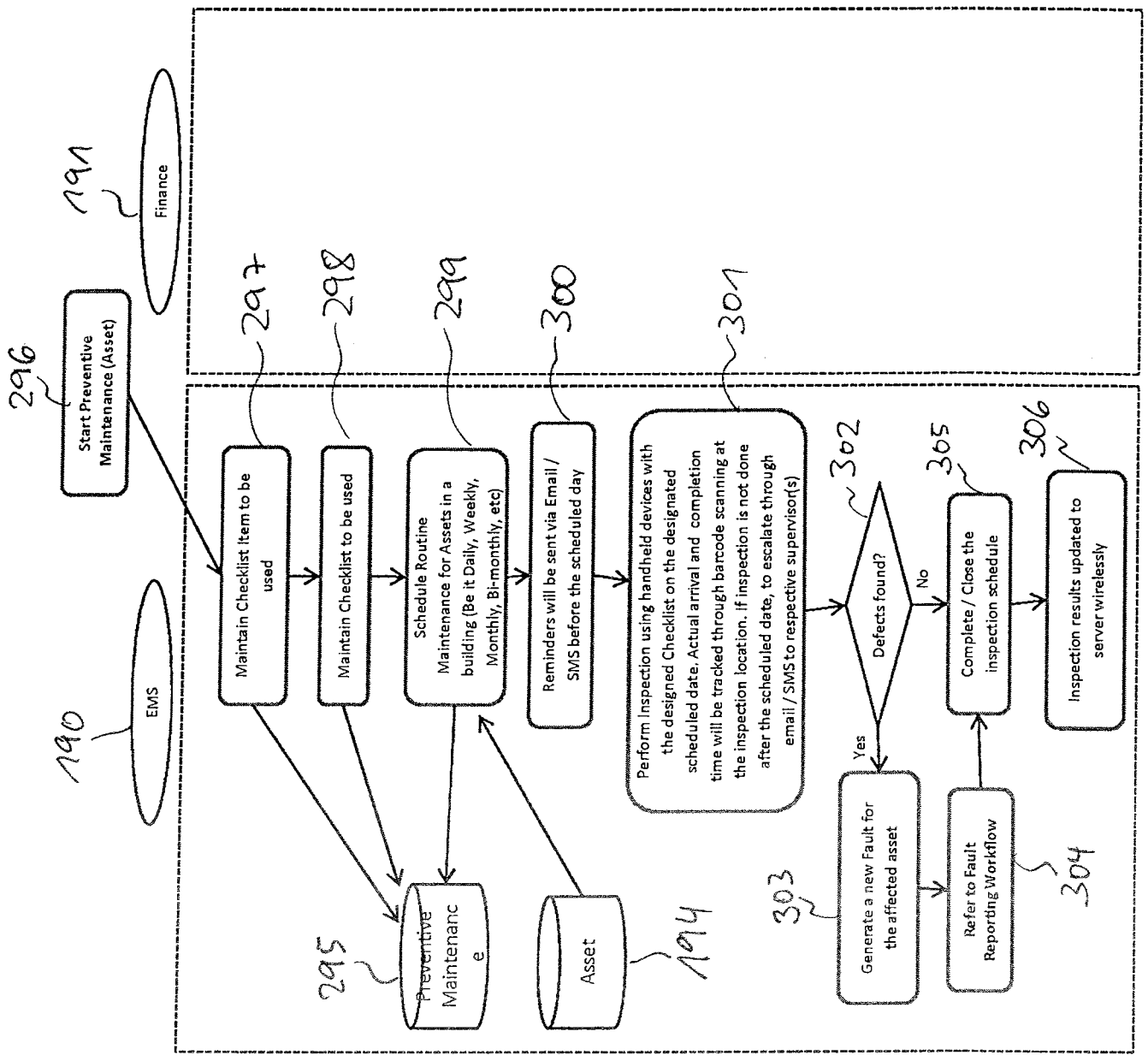
190
EMS
191
Finance
296
Start Preventive Maintenance (Asset)
297
Maintain Checklist Item to be used
298
Maintain Checklist to be used
299
Schedule Routine Maintenance for Assets in a building (Be it Daily, Weekly, Monthly, Bi-monthly, etc)
300
Reminders will be sent via Email / SMS before the scheduled day
301
Perform Inspection using handheld devices with the designed Checklist on the designated scheduled date. Actual arrival and completion time will be tracked through barcode scanning at the inspection location. If inspection is not done after the scheduled date, to escalate through email / SMS to respective supervisor(s)
302
Defects found?
Yes
No
303
Generate a new Fault for the affected asset
304
Refer to Fault Reporting Workflow
305
Complete / Close the inspection schedule
306
Inspection results updated to server wirelessly
295
Preventive Maintenance
194
Asset

Fig. 14

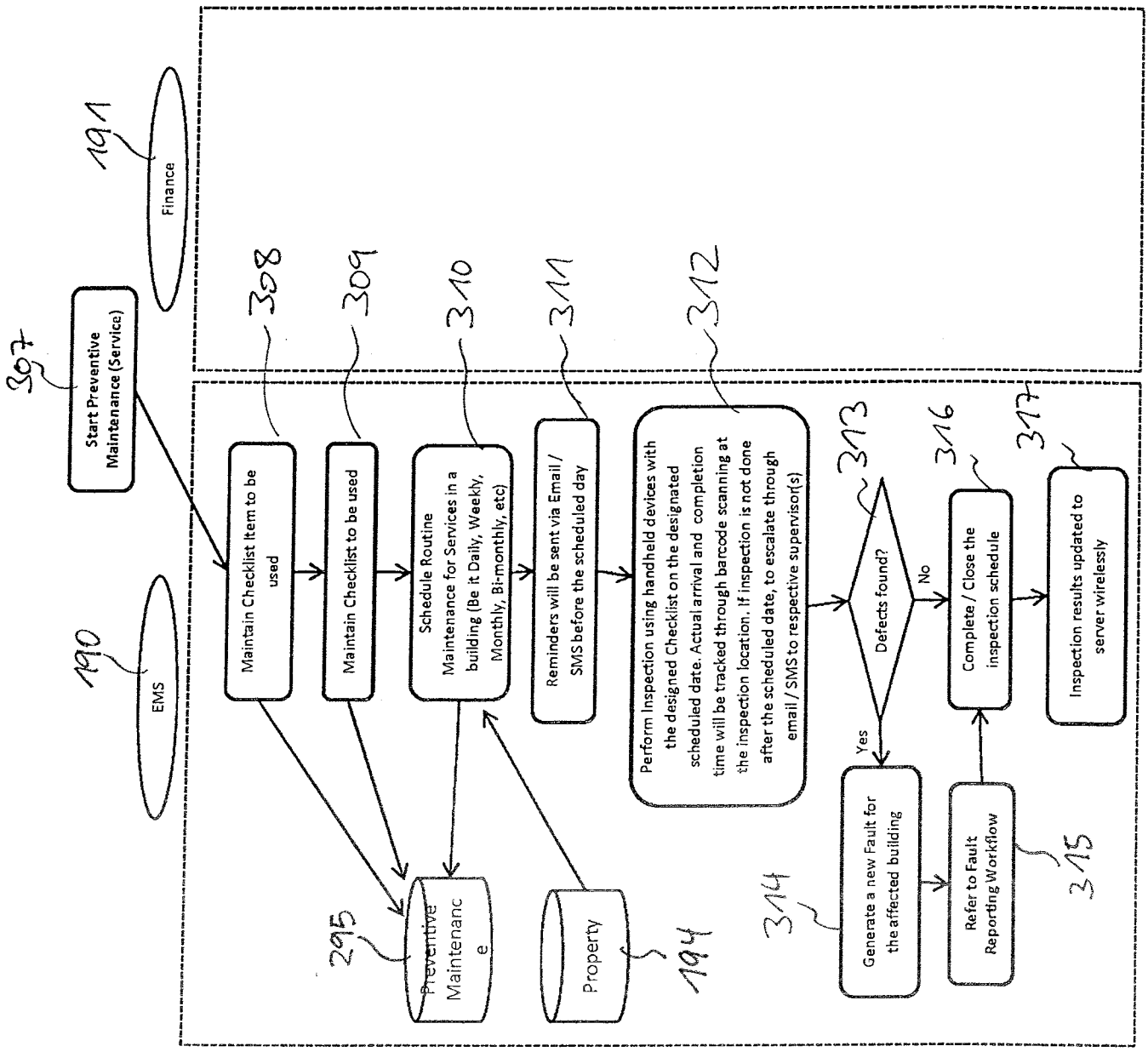
Start Preventive Maintenance (Service)
307
EMS
190
Finance
191
Maintain Checklist Item to be used
308
Maintain Checklist to be used
309
Schedule Routine Maintenance for Services in a building (Be it Daily, Weekly, Monthly, Bi-monthly, etc)
310
Reminders will be sent via Email / SMS before the scheduled day
311
Perform Inspection using handheld devices with the designed Checklist on the designated scheduled date. Actual arrival and completion time will be tracked through barcode scanning at the inspection location. If inspection is not done after the scheduled date, to escalate through email / SMS to respective supervisor(s)
312
Defects found?
313
Yes
No
Generate a new Fault for the affected building
314
Refer to Fault Reporting Workflow
315
Complete / Close the inspection schedule
316
Inspection results updated to server wirelessly
317
Preventive Maintenanc e
295
Property
194

Fig. 15

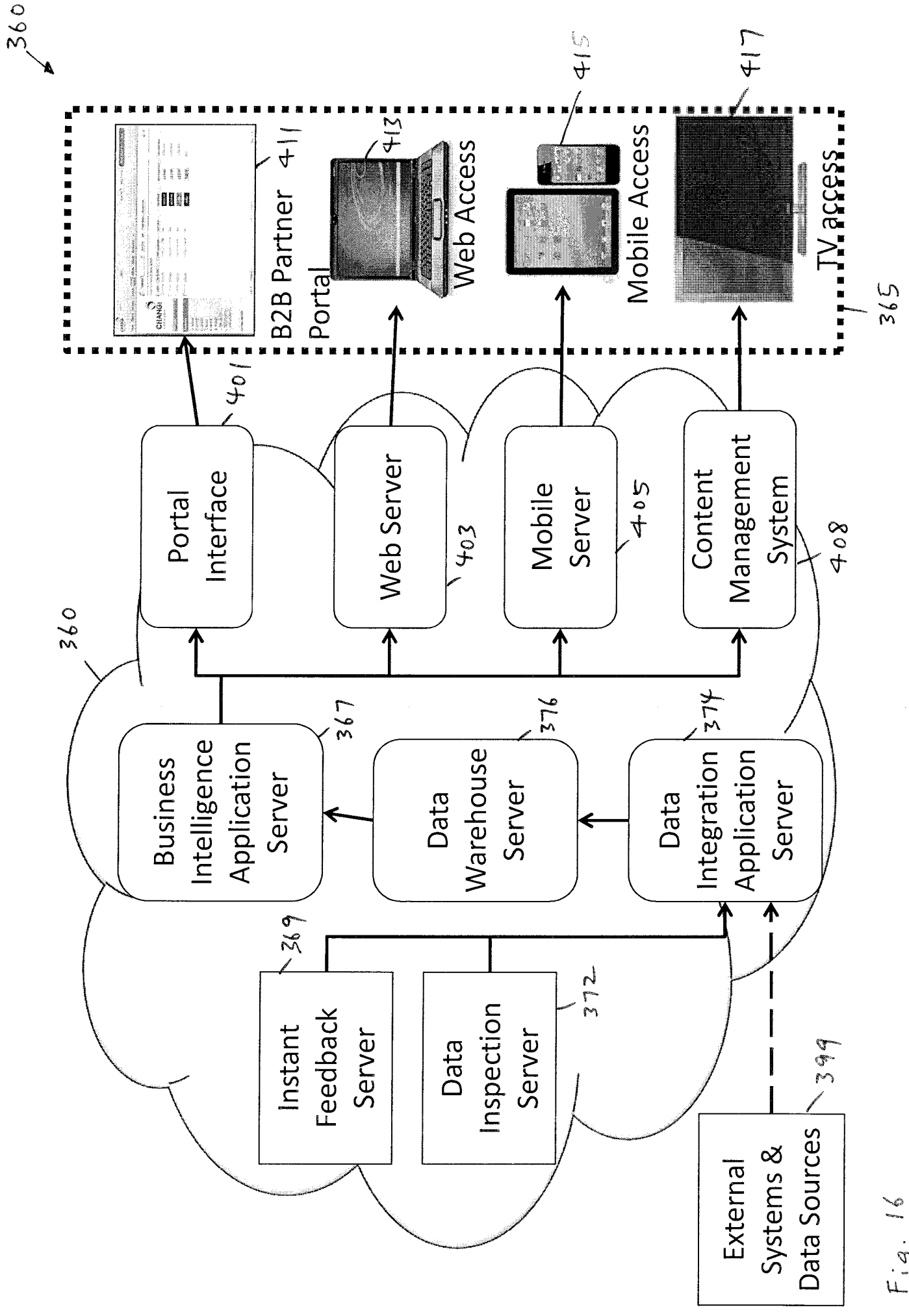
360
B2B Partner Portal
411
Web Access
413
Mobile Access
415
TV access
417
365
401
Portal Interface
Web Server
403
Mobile Server
405
Content Management System
408
360
Business Intelligence Application Server
367
Data Warehouse Server
376
Data Integration Application Server
374
Instant Feedback Server
369
Data Inspection Server
372
External Systems & Data Sources
399

Fig. 16

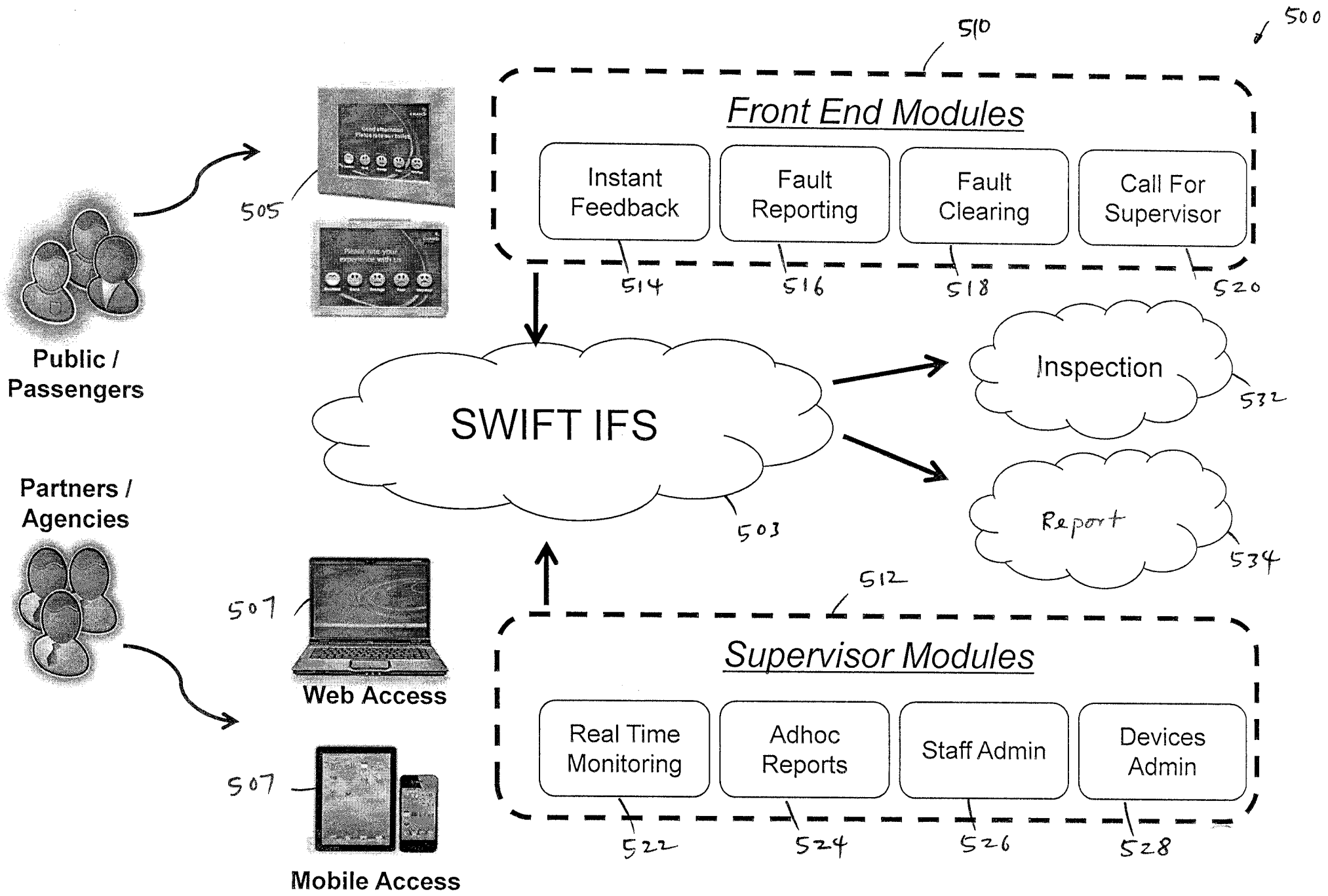
500
510
Front End Modules
Instant Feedback
Fault Reporting
Fault Clearing
Call For Supervisor
514
516
518
520
505
Public / Passengers
SWIFT IFS
503
Inspection
532
Report
534
Partners / Agencies
512
Supervisor Modules
Real Time Monitoring
Adhoc Reports
Staff Admin
Devices Admin
522
524
526
528
507
Web Access
507
Mobile Access

Fig. 17

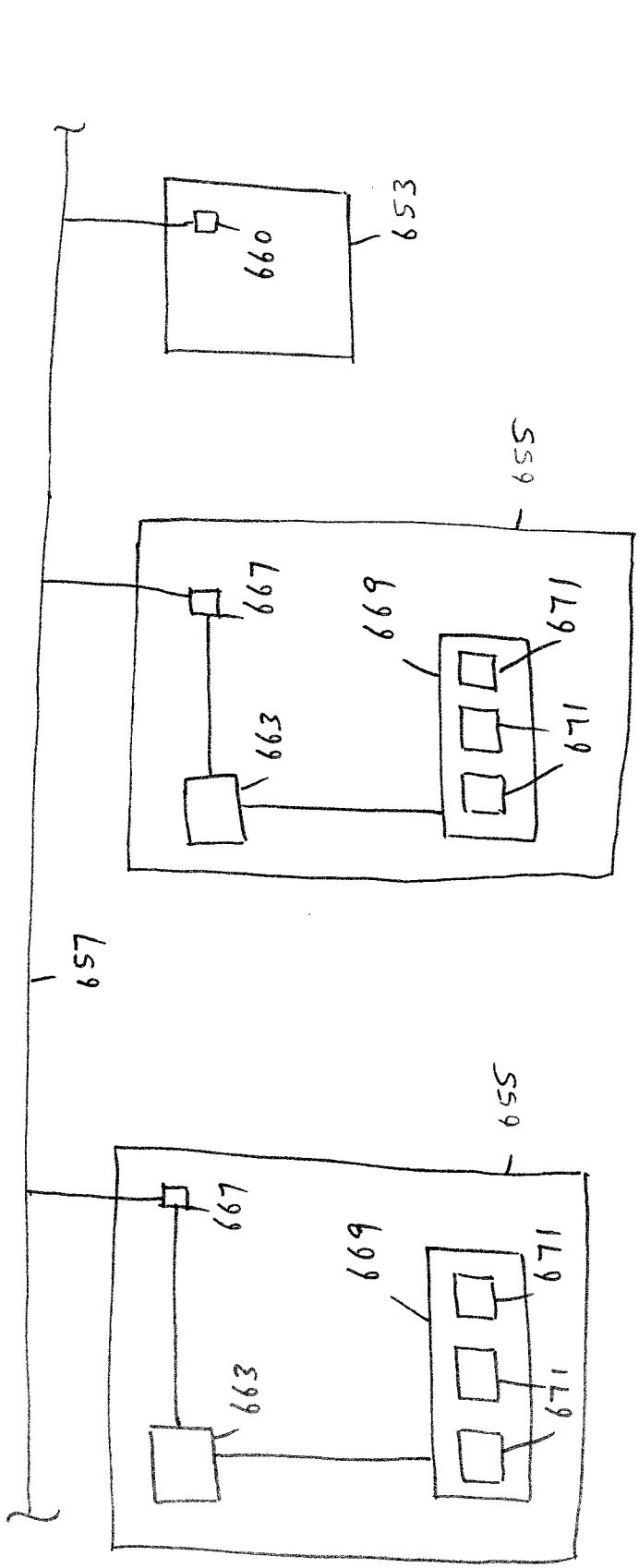

FIG. 18