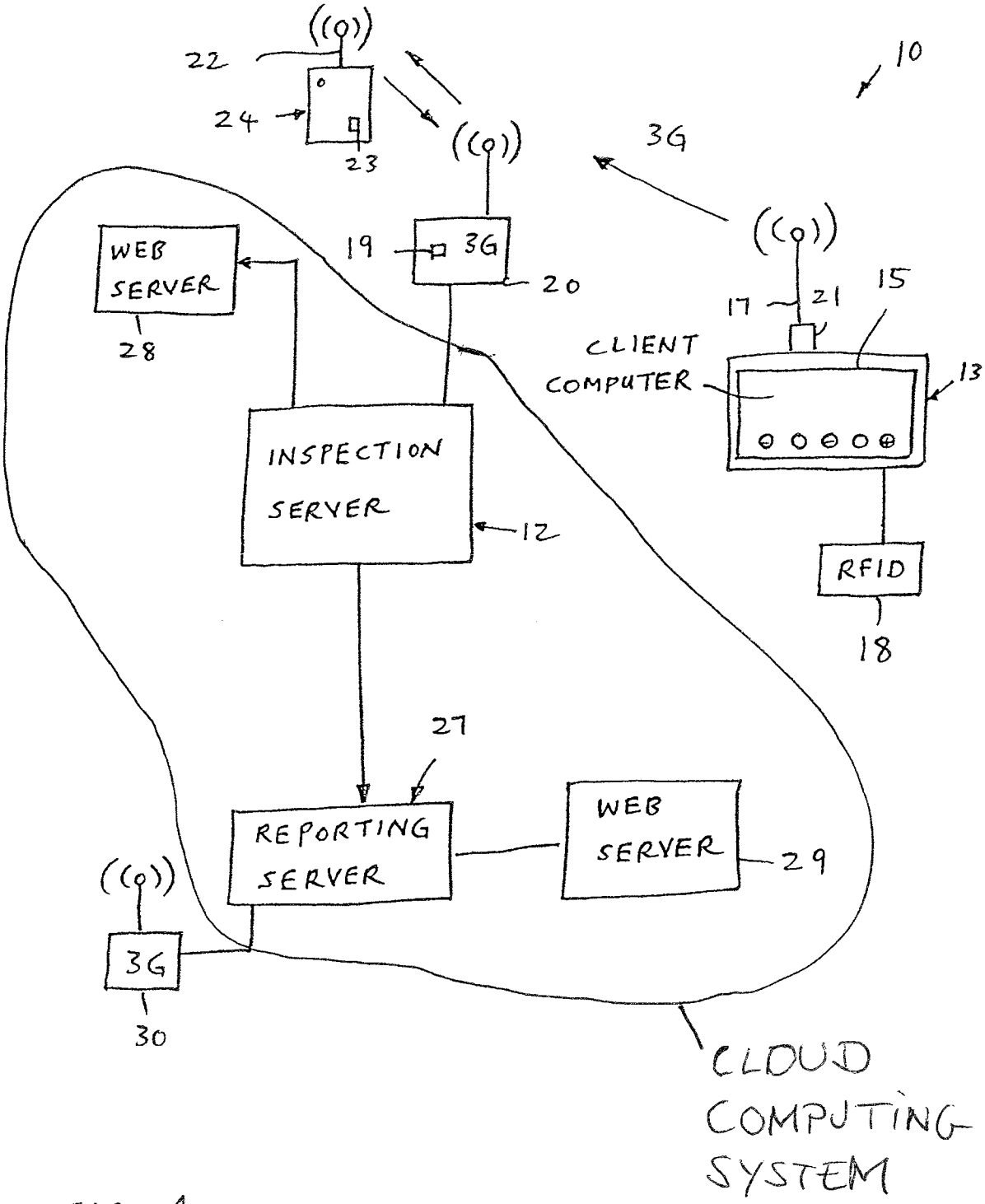

22
24
23
10
3G
19
3G
20
WEB SERVER
28
17
21
15
CLIENT COMPUTER
13
INSPECTION SERVER
12
RFID
18
27
REPORTING SERVER
WEB SERVER
29
3G
30
CLOUD COMPUTING SYSTEM

FIG. 1

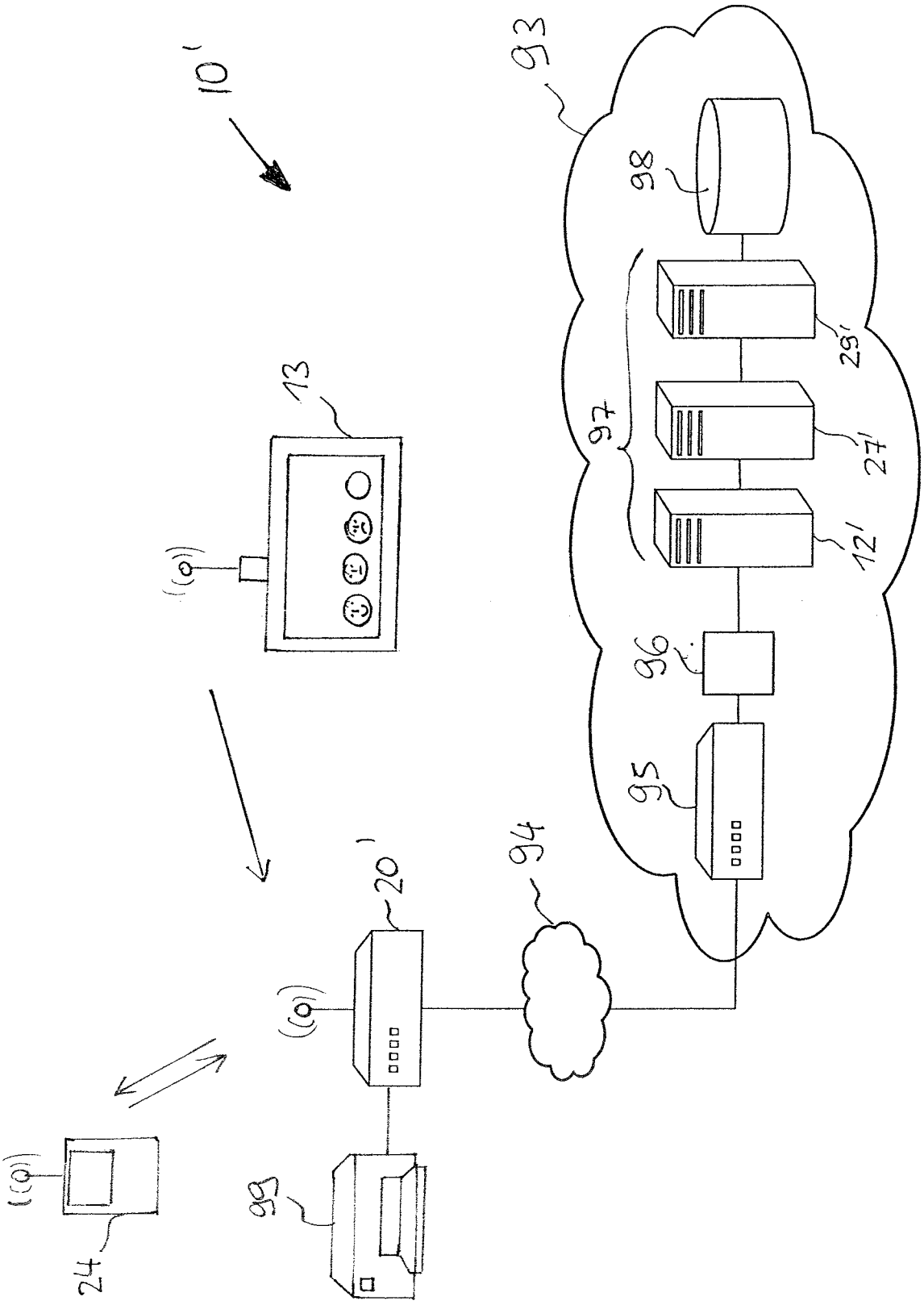
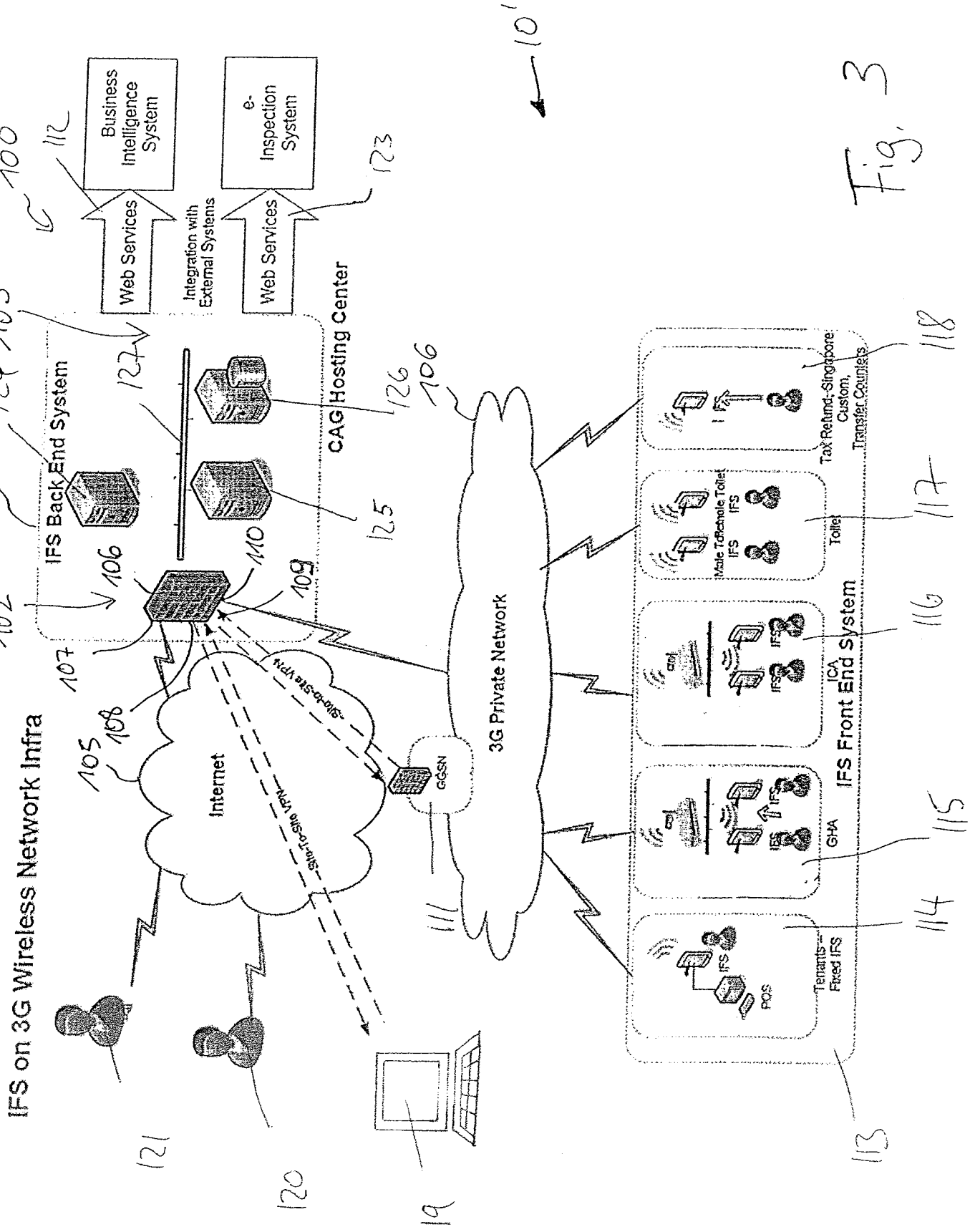



Fig. 2


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

Fig. 3

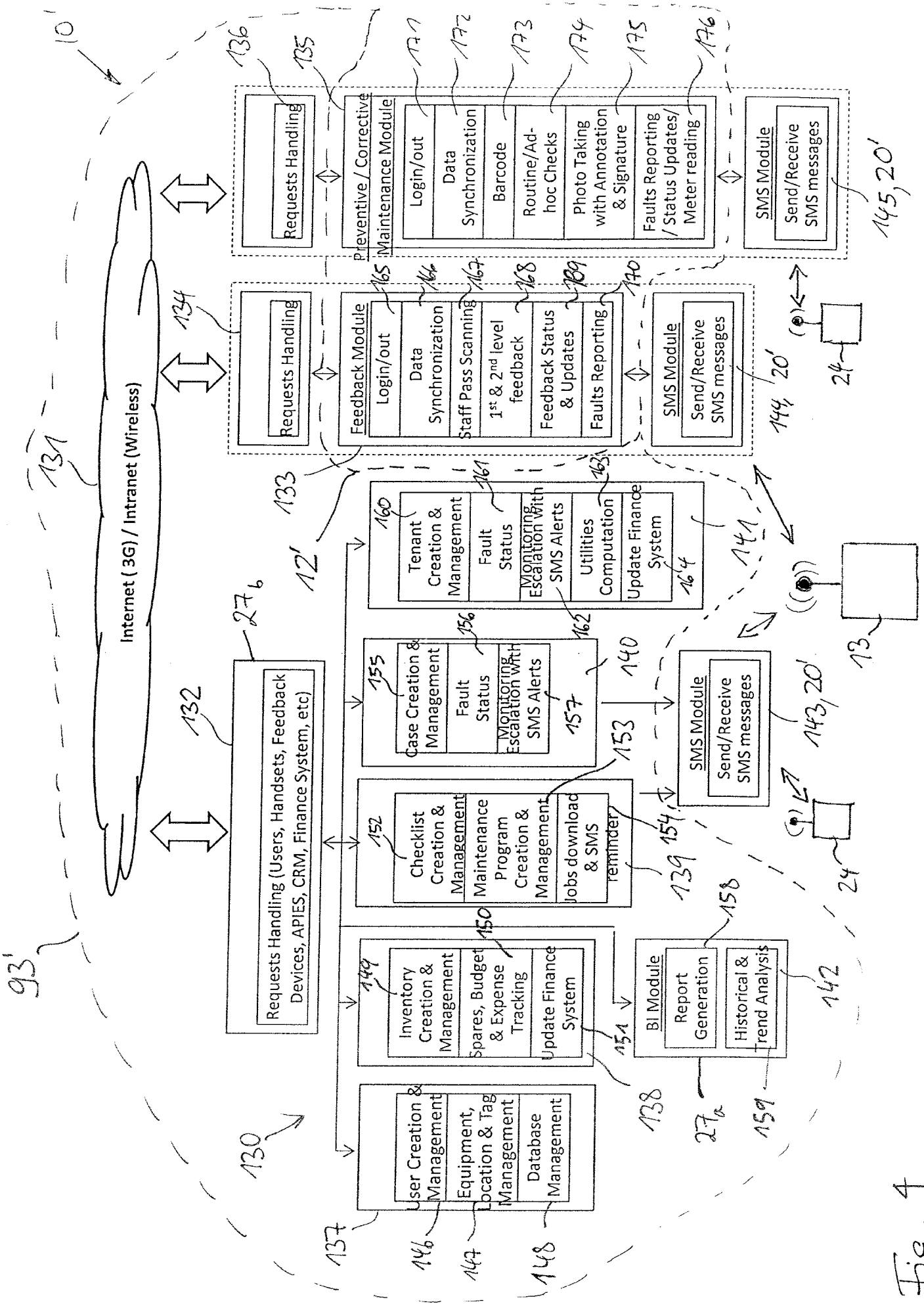
Internet (3G) / Intranet (Wireless)
Requests Handling (Users, Handsets, Feedback Devices, APIES, CRM, Finance System, etc)
Requests Handling
Preventive / Corrective Maintenance Module
Login/out
Data Synchronization
Barcode
Routine/Ad-hoc Checks
Photo Taking with Annotation & Signature
Faults Reporting / Status Updates/ Meter reading
SMS Module
Send/Receive SMS messages
Feedback Module
Staff Pass Scanning
1st & 2nd level feedback
Feedback Status & Updates
Faults Reporting
Tenant Creation & Management
Fault Status Monitoring
Escalation With SMS Alerts
Utilities Computation
Update Finance System
Case Creation & Management
Checklist Creation & Management
Maintenance Program Creation & Management
Jobs download & SMS reminder
Inventory Creation & Management
Spares, Budget & Expense Tracking
BI Module
Report Generation
Historical & Trend Analysis
User Creation & Management
Equipment, Location & Tag Management
Database Management

Fig. 4

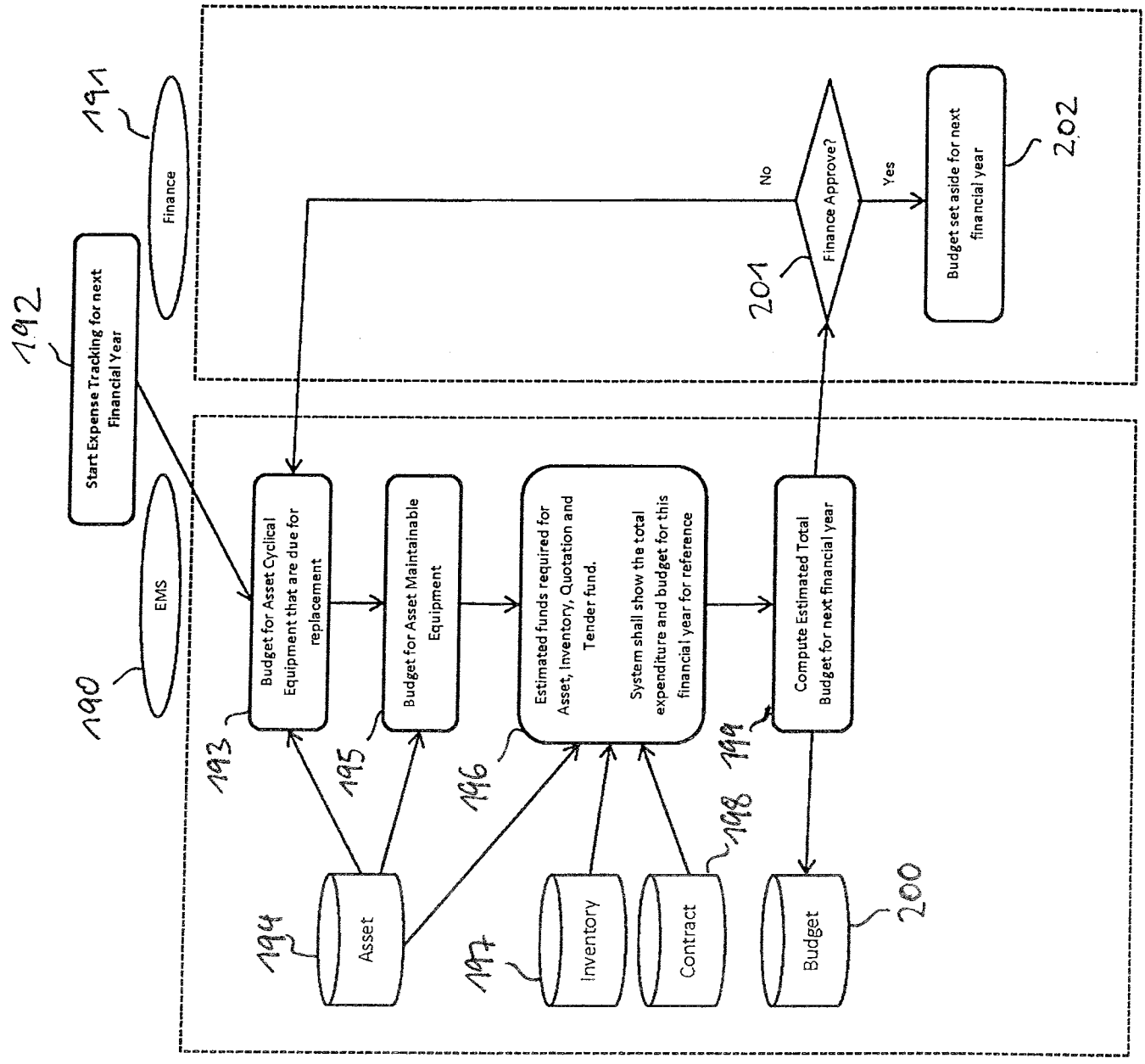
Finance
191
Start Expense Tracking for next Financial Year
192
EMS
190
Budget for Asset Cyclical Equipment that are due for replacement
193
Budget for Asset Maintainable Equipment
195
Estimated funds required for Asset, Inventory, Quotation and Tender fund.
System shall show the total expenditure and 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

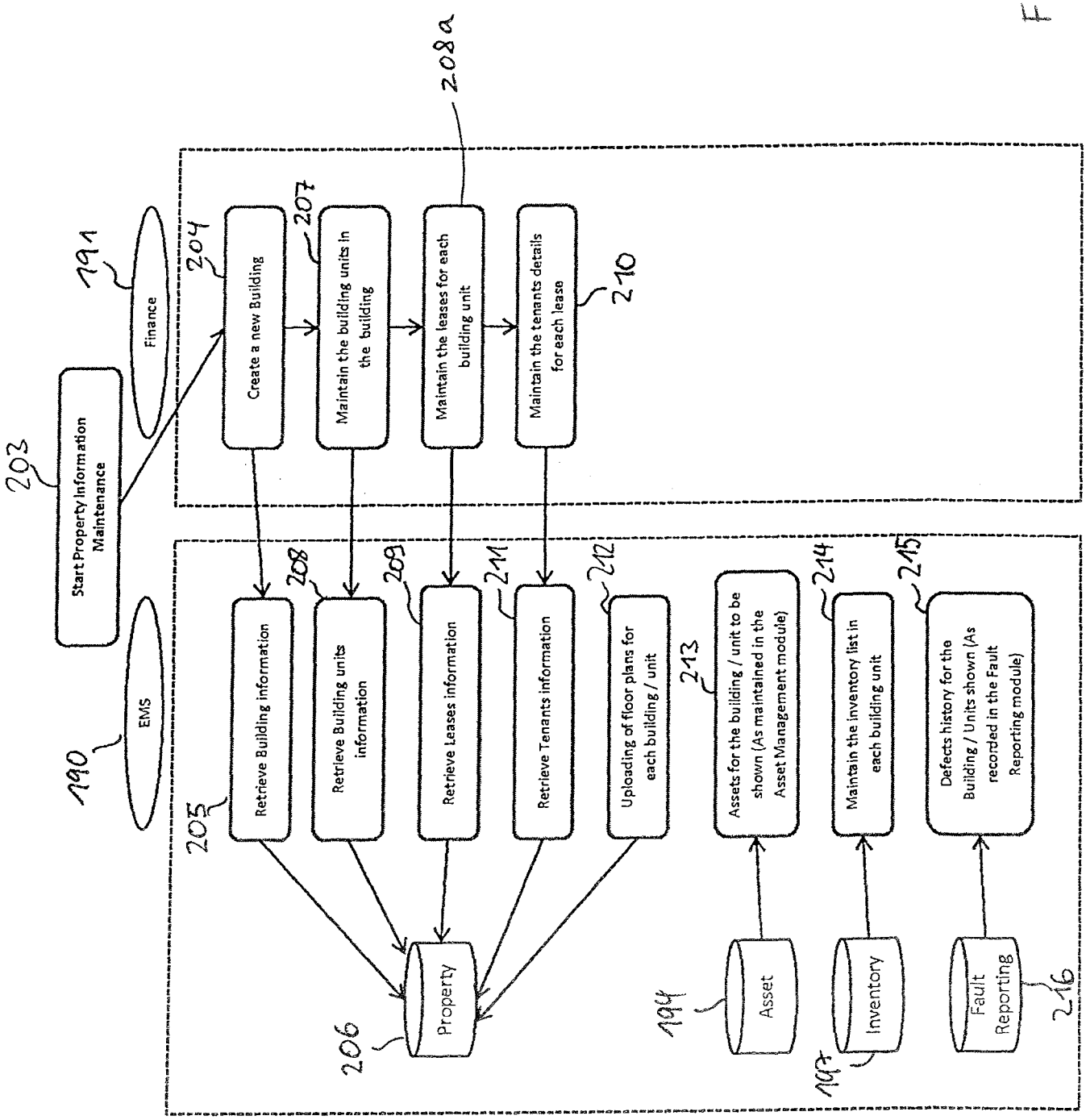
Start Property Information Maintenance
203
EMS
190
Finance
191
Create a new Building
204
Maintain the building units in the building
207
Maintain the leases for each building unit
208a
Maintain the tenants details for each lease
210
Retrieve Building information
205
Retrieve Building units information
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

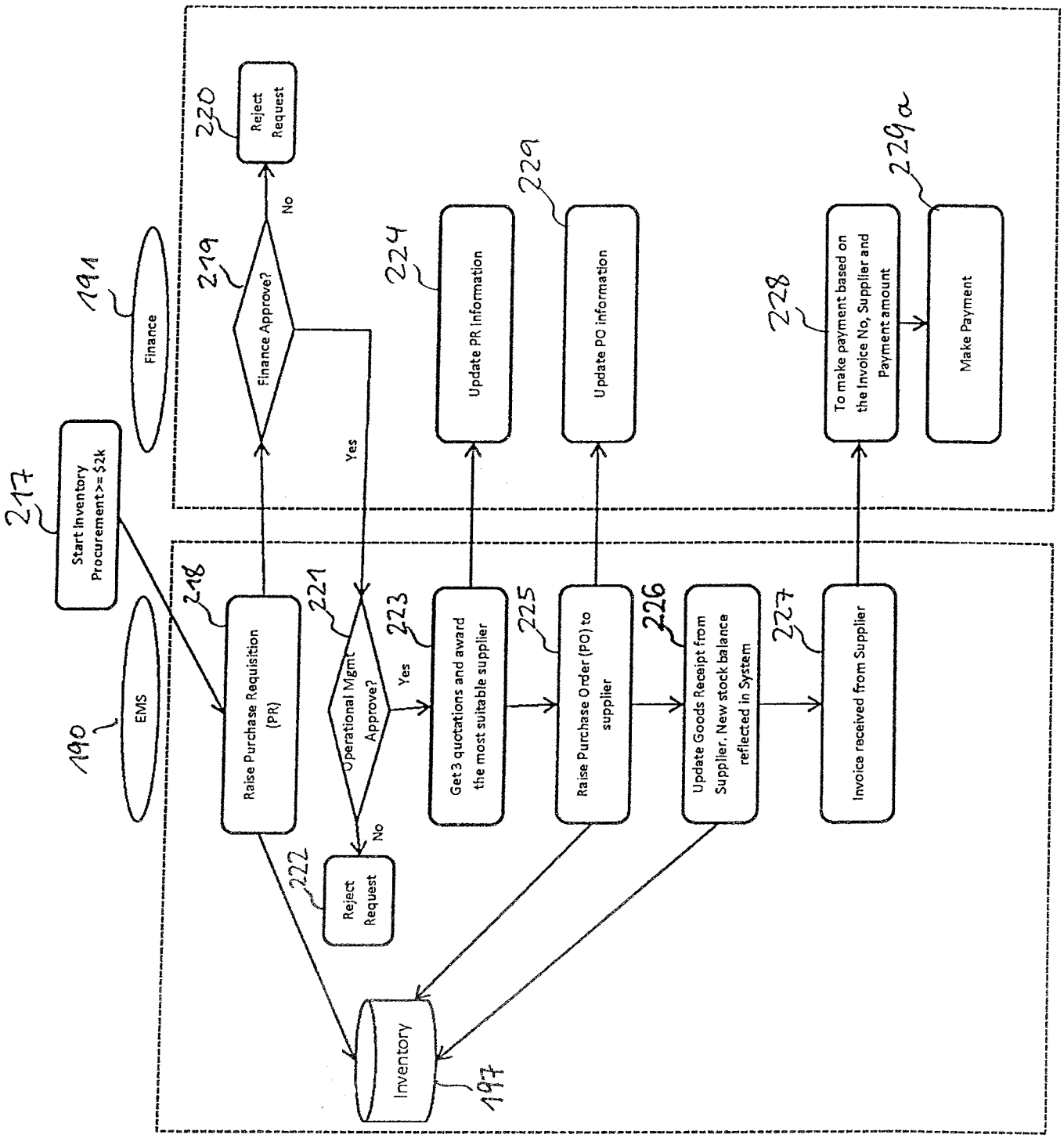
Start Inventory Procurement >= $2k
217
EMS
190
Finance
191
Raise Purchase Requisition (PR)
218
Finance Approve?
219
No
Yes
Reject Request
220
Operational Mgmt Approve?
221
No
Yes
Reject Request
222
Get 3 quotations and award the most suitable supplier
223
Update PR Information
224
Raise Purchase Order (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

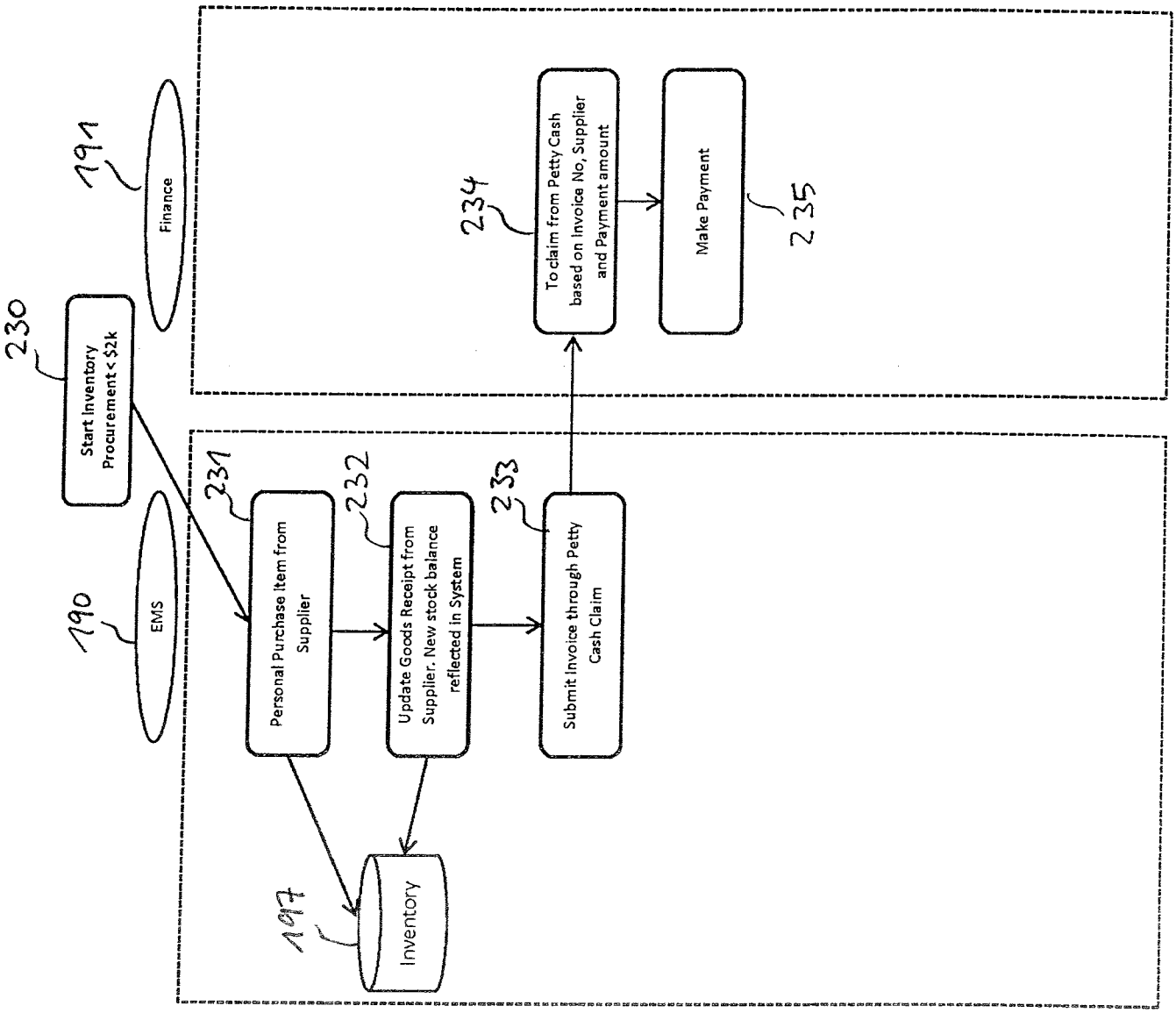
Finance
191
230
Start Inventory Procurement < $2k
234
To claim from Petty Cash based on Invoice No, Supplier and Payment amount
Make Payment
235
231
232
233
EMS
190
Personal Purchase Item from Supplier
Update Goods Receipt from Supplier. New stock balance reflected in System
Submit Invoice through Petty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

Fig. 8

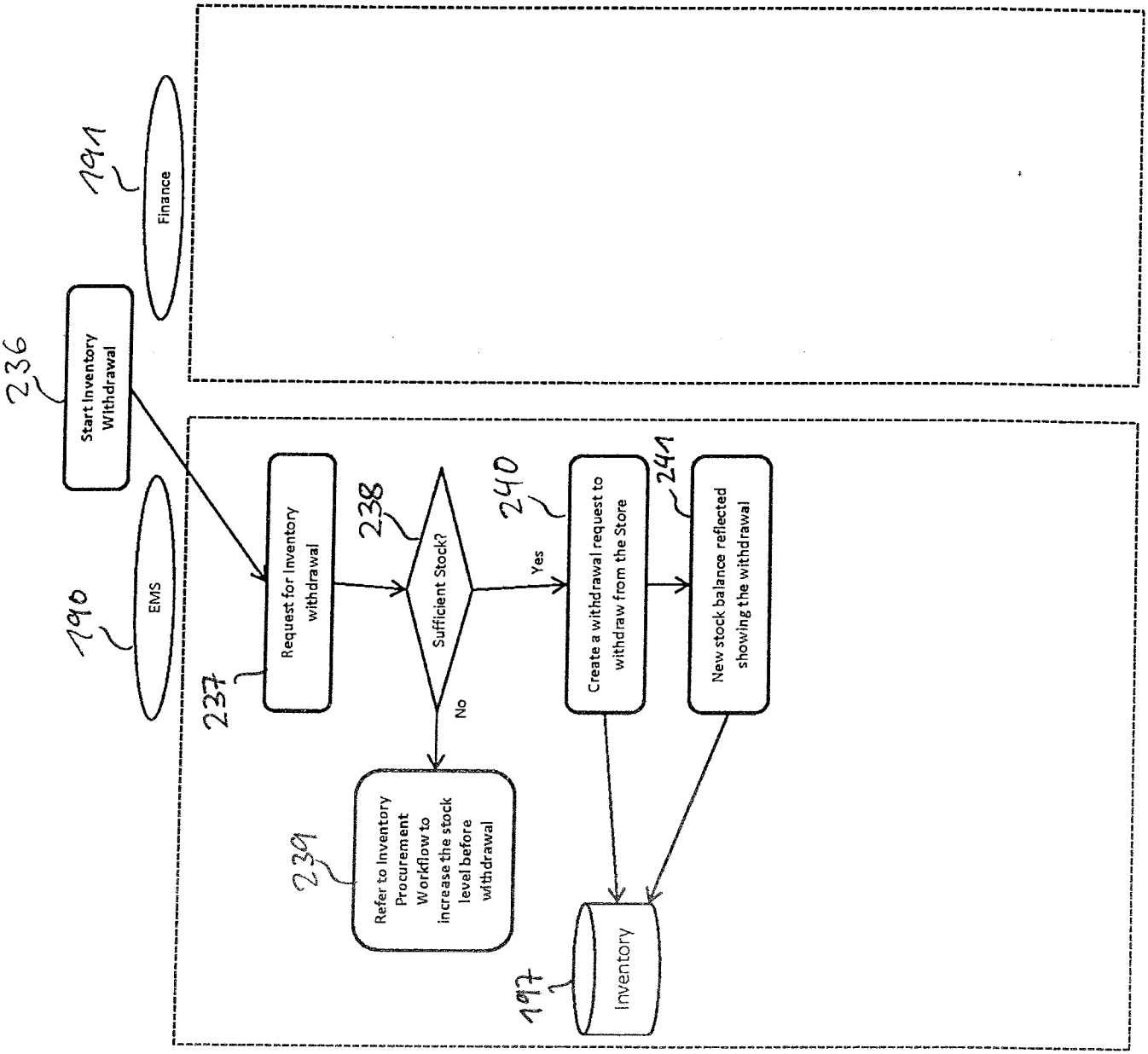
Finance
191
Start Inventory Withdrawal
236
EMS
190
Request for Inventory withdrawal
237
Sufficient Stock?
238
Yes
No
Create a withdrawal request to withdraw from the Store
240
New stock balance reflected showing the withdrawal
241
Refer to Inventory Procurement Workflow to increase the stock level before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

Fig. 9

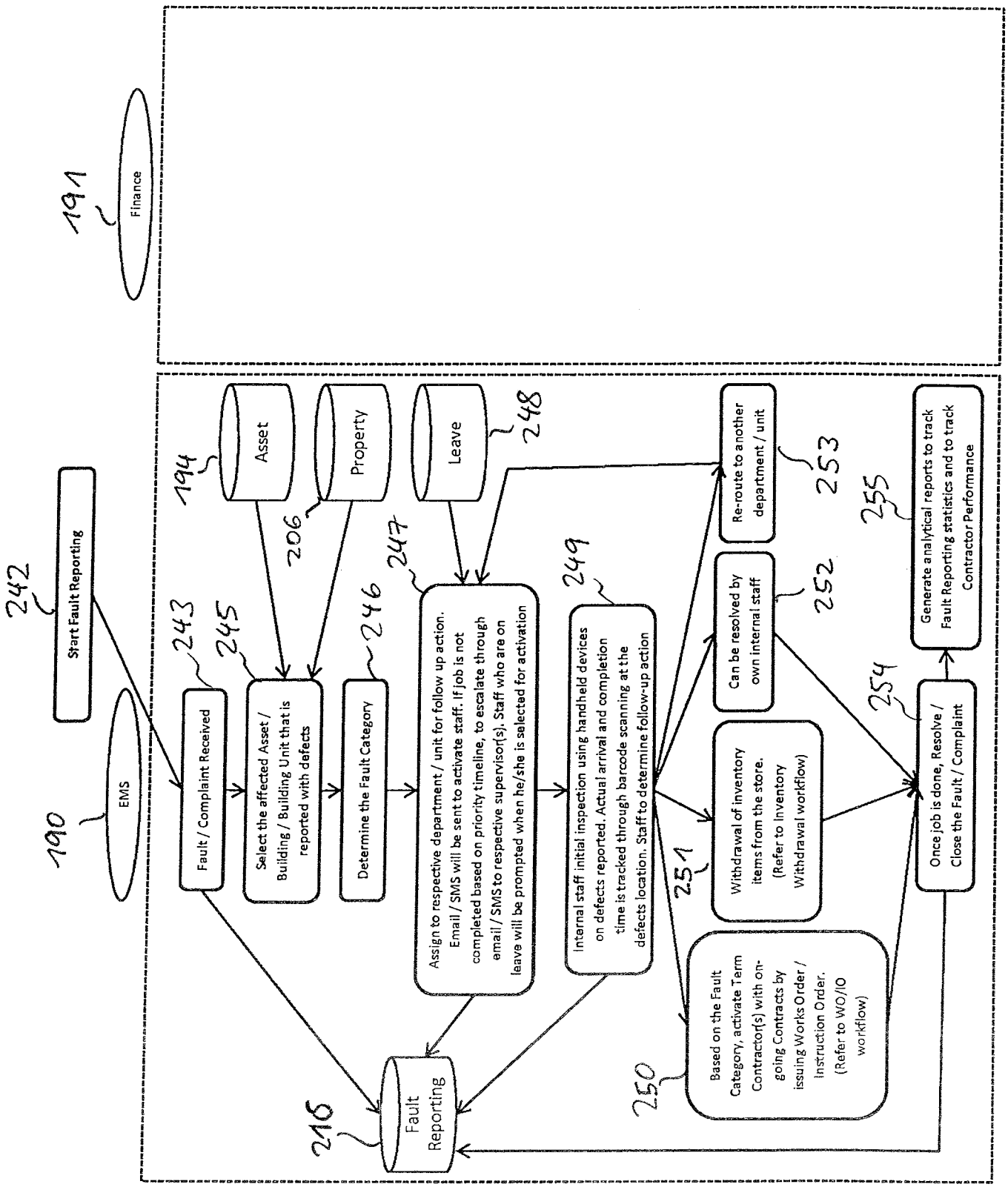
191
Finance
190
EMS
242
Start Fault Reporting
243
Fault / Complaint Received
245
Select the affected Asset / Building / Building Unit that is reported with defects
246
Determine the Fault Category
247
Assign to respective department / unit for follow up action. Email / SMS will be sent to activate staff. 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
249
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
194
Asset
206
Property
Leave
248
216
Fault Reporting
250
Based on the Fault Category, activate Term Contractor(s) with on-going Contracts by issuing Works Order / Instruction Order. (Refer to WO/IO workflow)
251
Withdrawal of inventory items from the store. (Refer to Inventory Withdrawal workflow)
252
Can be resolved by own internal staff
253
Re-route to another department / unit
254
Once job is done, Resolve / Close the Fault / Complaint
255
Generate analytical reports to track Fault Reporting statistics and to track Contractor Performance

Fig. 10

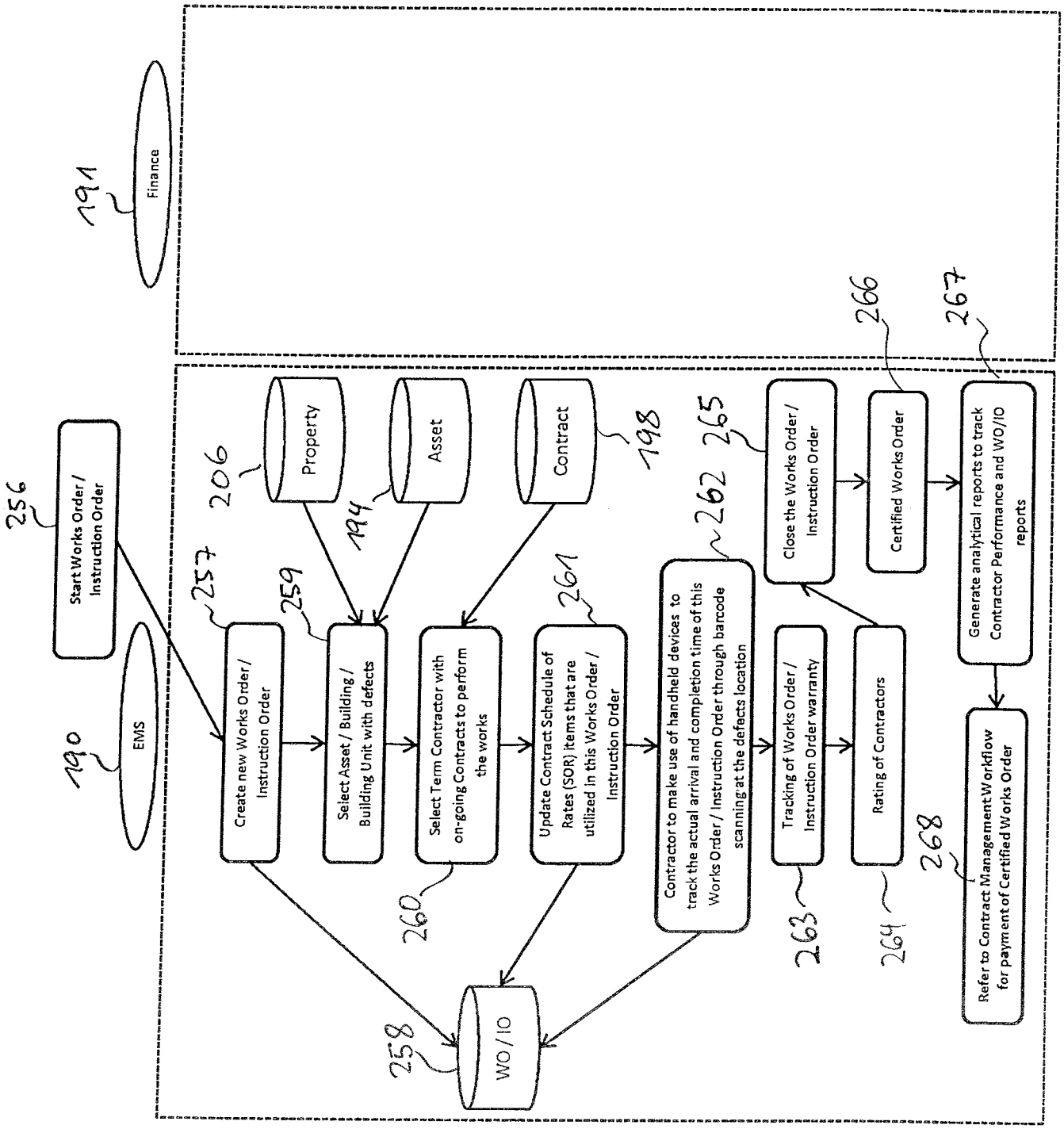
Finance
191
Start Works Order / Instruction Order
256
EMS
190
Create new Works Order / Instruction Order
257
Property
206
Asset
194
Contract
198
Select Asset / Building / Building Unit with defects
259
Select Term Contractor with on-going Contracts to perform the works
260
Update Contract Schedule of 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
Tracking of Works Order / Instruction Order warranty
263
Rating of Contractors
264
Close the Works Order / Instruction Order
265
Certified Works Order
266
Generate analytical reports to track Contractor Performance and WO/IO reports
267
Refer to Contract Management Workflow for payment of Certified Works Order
268
WO / IO
258

Fig. 11

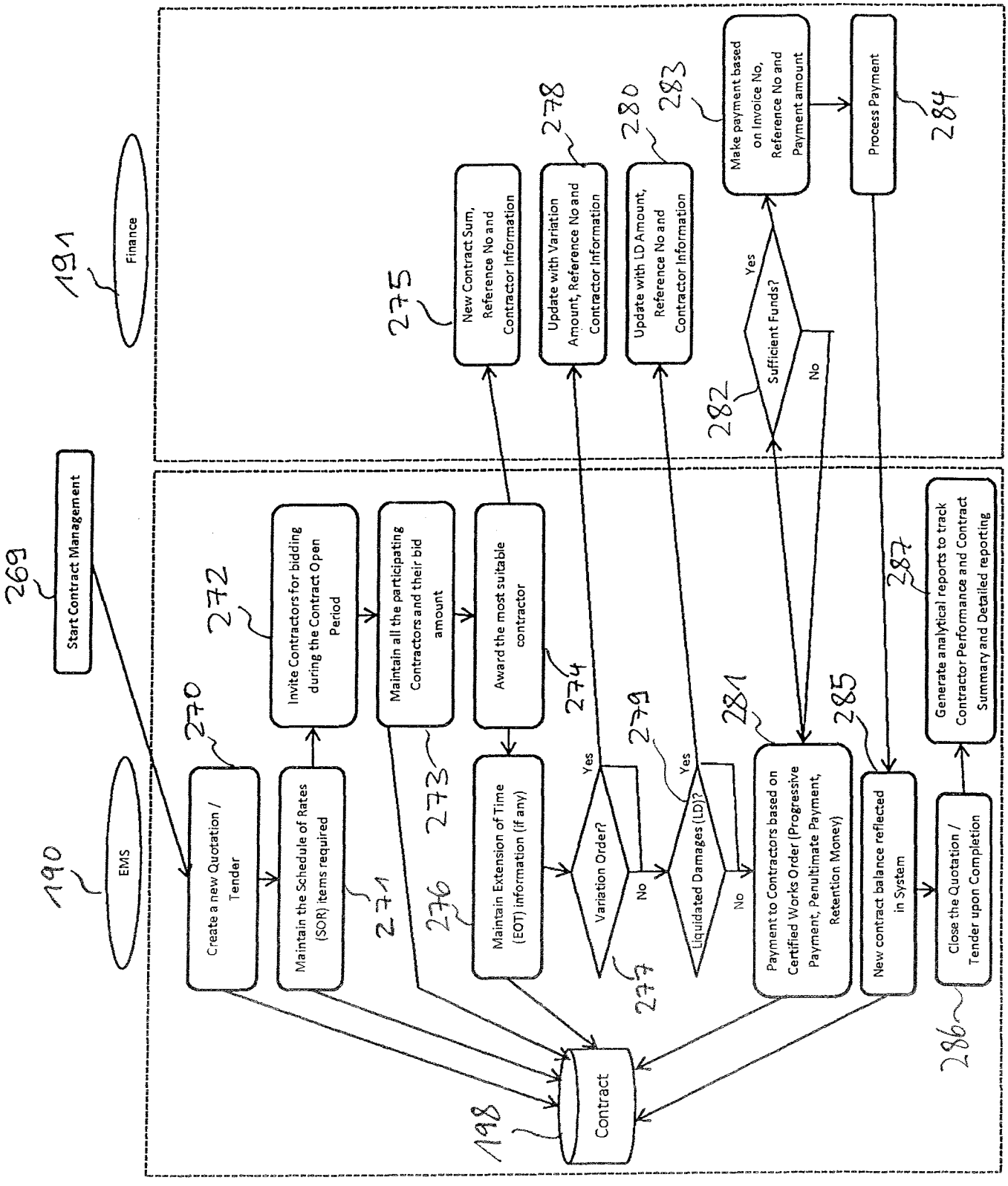
Start Contract Management
269
EMS
190
Finance
191
Create a new Quotation / Tender
270
Maintain the Schedule of Rates (SOR) items required
271
Invite Contractors for bidding during the Contract Open Period
272
Maintain all the participating Contractors and their bid amount
273
Award the most suitable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

Fig. 12

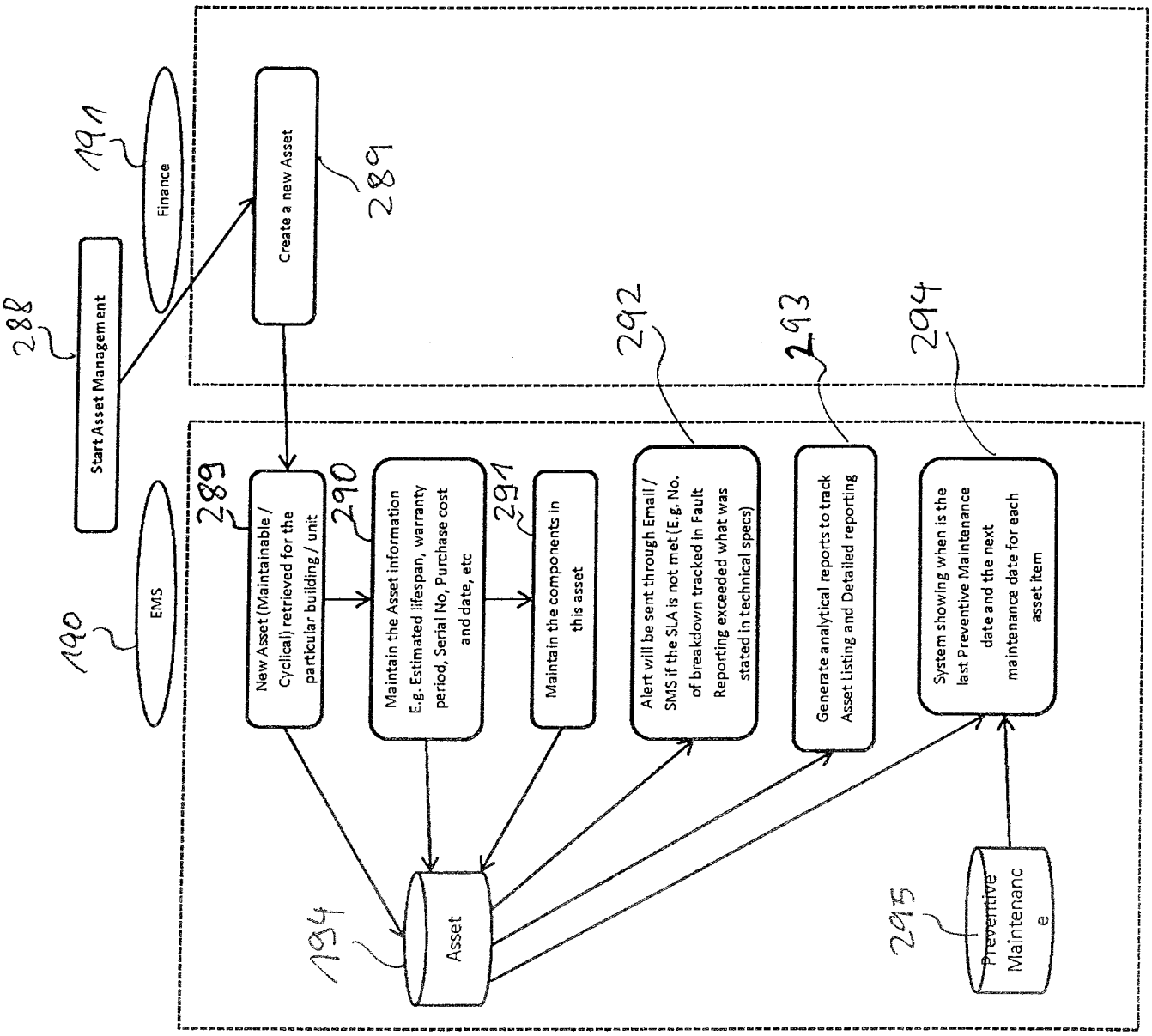
Start Asset Management
288
EMS
190
Finance
191
Create a new Asset
289
New Asset (Maintainable / Cyclical) retrieved for the particular building / unit
289
Maintain the Asset information E.g. Estimated lifespan, warranty period, Serial No, Purchase cost and date, etc
290
Maintain the components in this 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

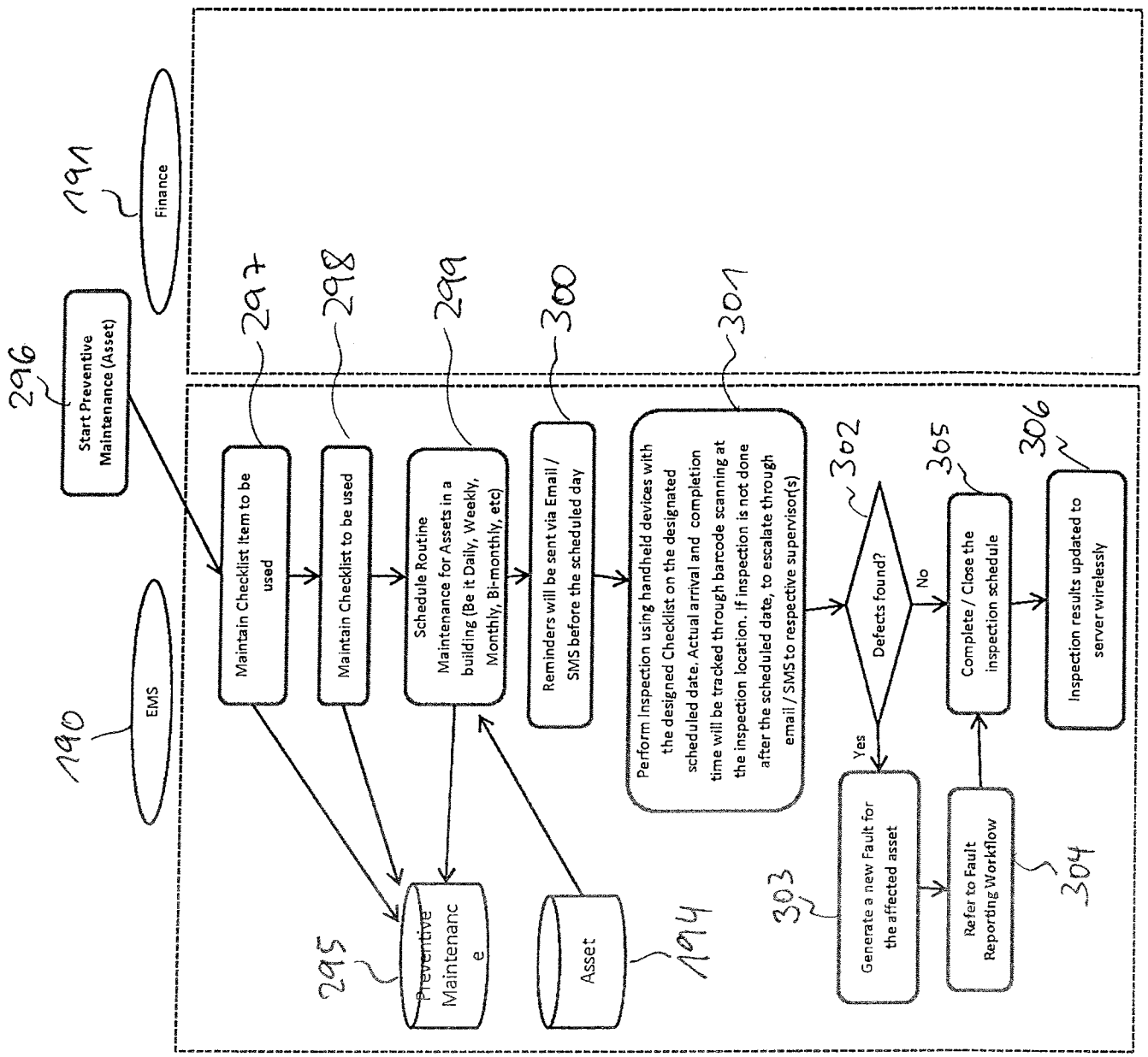
Finance
191
Start Preventive Maintenance (Asset)
296
EMS
190
Maintain Checklist Item to be used
297
Maintain Checklist to be used
298
Schedule Routine Maintenance for Assets in a building (Be it Daily, Weekly, Monthly, Bi-monthly, etc)
299
Reminders will be sent via Email / SMS before the scheduled day
300
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)
301
Defects found?
302
Yes
No
Generate a new Fault for the affected asset
303
Refer to Fault Reporting Workflow
304
Complete / Close the inspection schedule
305
Inspection results updated to server wirelessly
306
Preventive Maintenanc e
295
Asset
194

Fig. 14

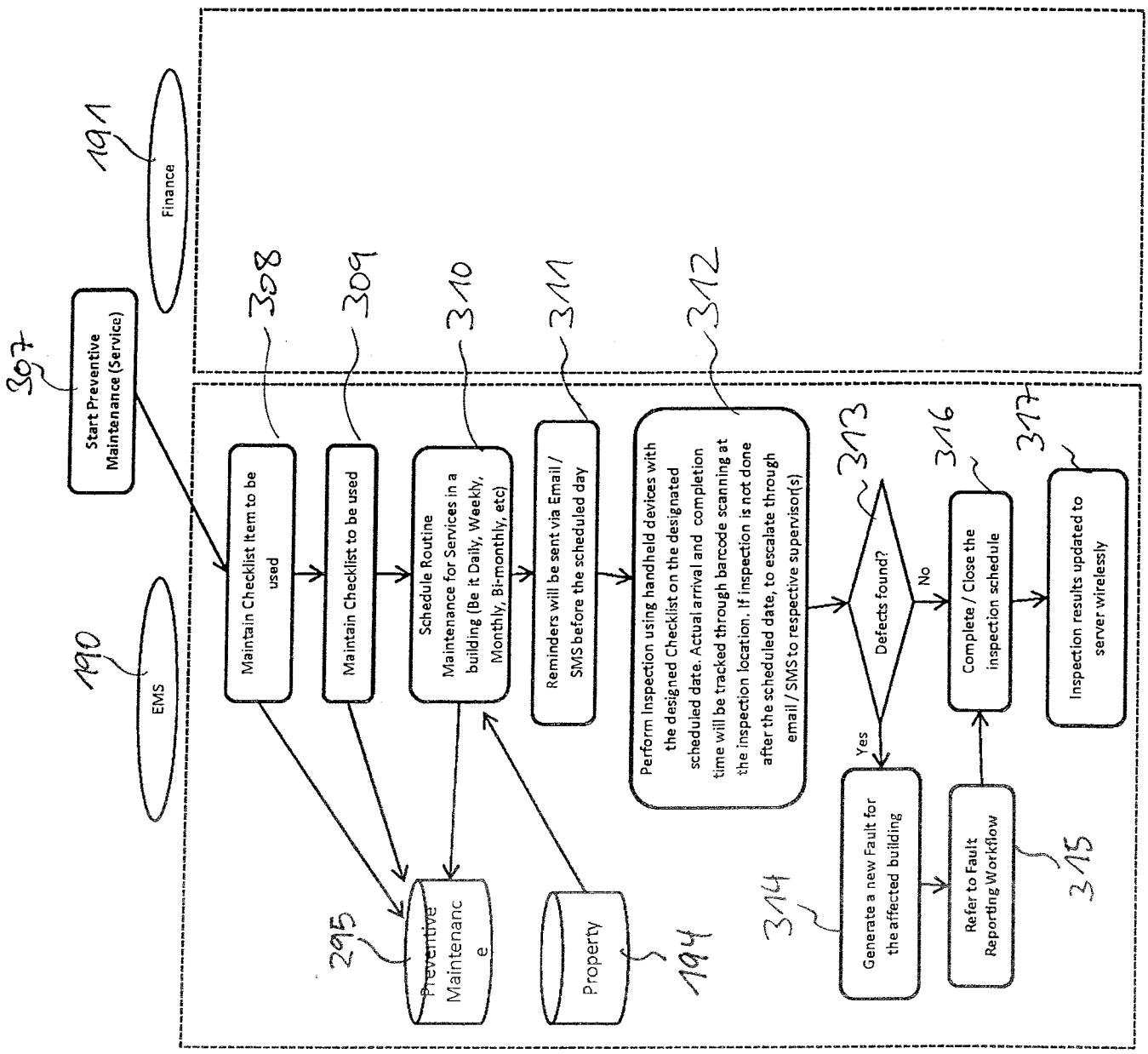
Start Preventive Maintenance (Service)
307
EMS
190
Finance
191
Maintain Checklist Item to be used
308
Maintain Checklist to be used
309
Schedule Routine Maintenance for Services in a building (Be it Daily, Weekly, Monthly, Bi-monthly, etc)
310
Reminders will be sent via Email / SMS before the scheduled 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

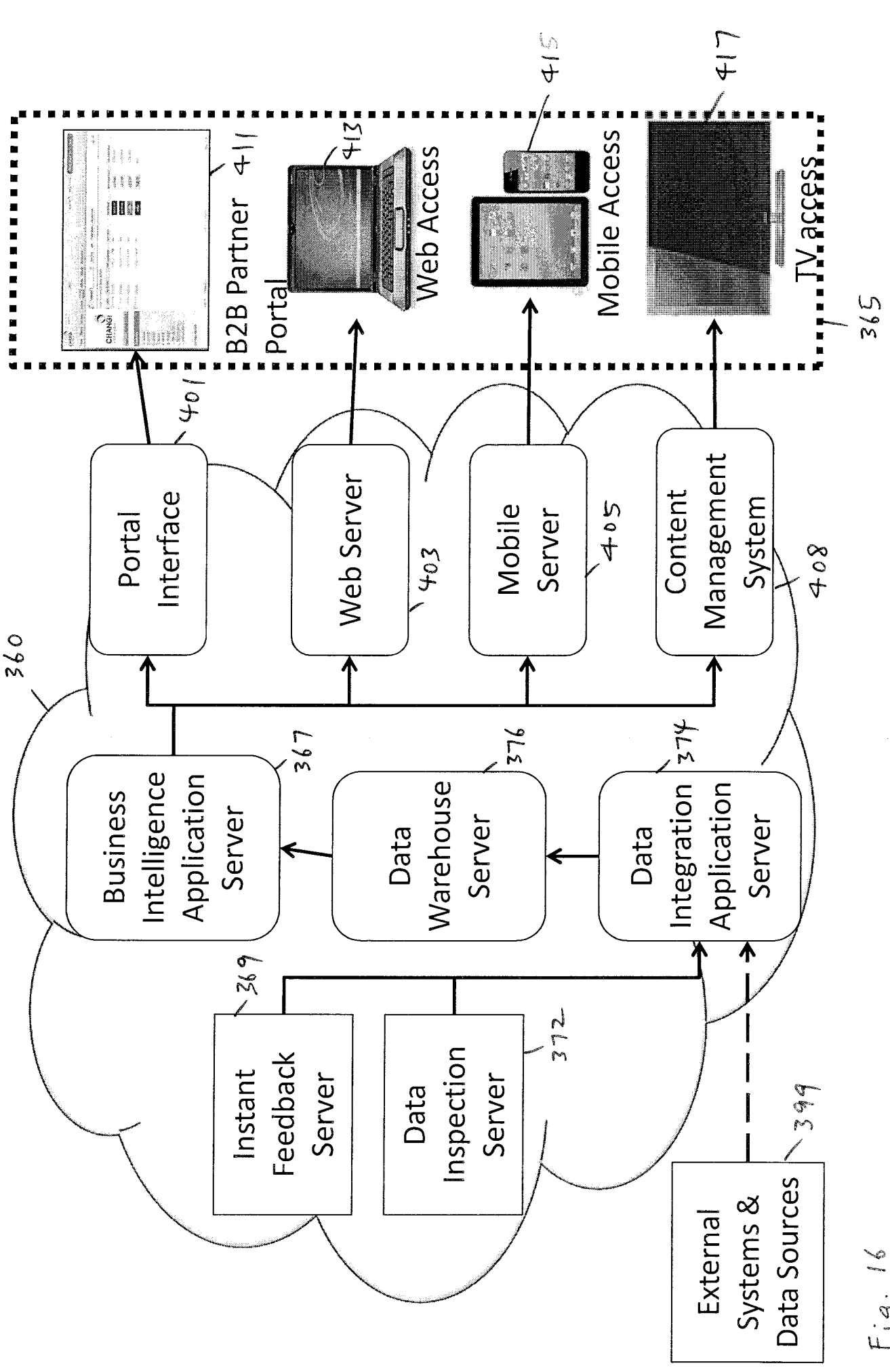
360
B2B Partner Portal
411
Web Access
413
Mobile Access
415
TV access
417
365
Portal Interface
401
Web Server
403
Mobile Server
405
Content Management System
408
360
Business Intelligence Application Server
367
Data Warehouse Server
376
Data Integration Application Server
374
Instant Feedback Server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

Fig. 16

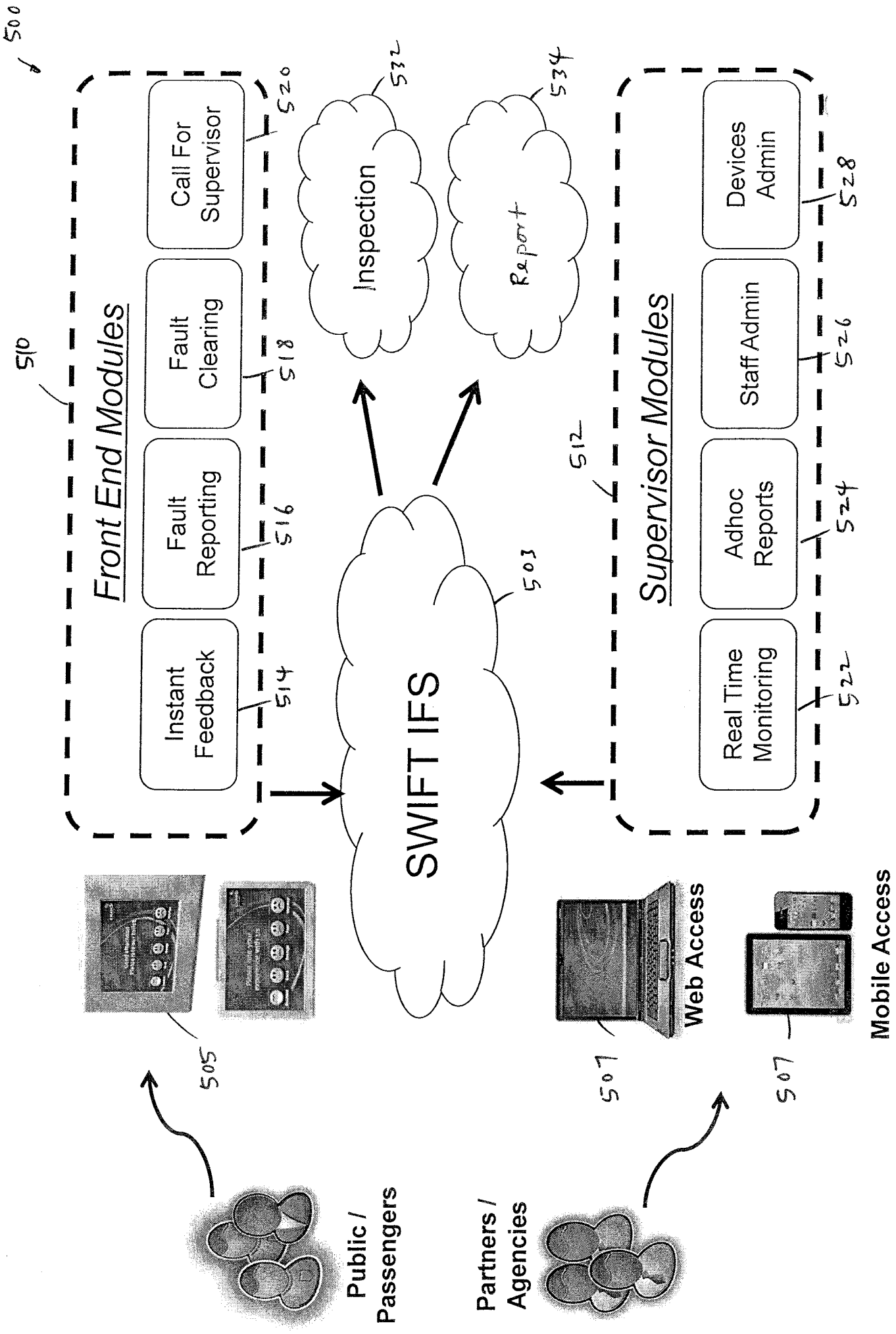
500
510
Front End Modules
Instant Feedback
514
Fault Reporting
516
Fault Clearing
518
Call For Supervisor
520
SWIFT IFS
503
Inspection
532
Report
534
512
Supervisor Modules
Real Time Monitoring
522
Adhoc Reports
524
Staff Admin
526
Devices Admin
528
505
507
Web Access
507
Mobile Access
Public / Passengers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

Fig. 17

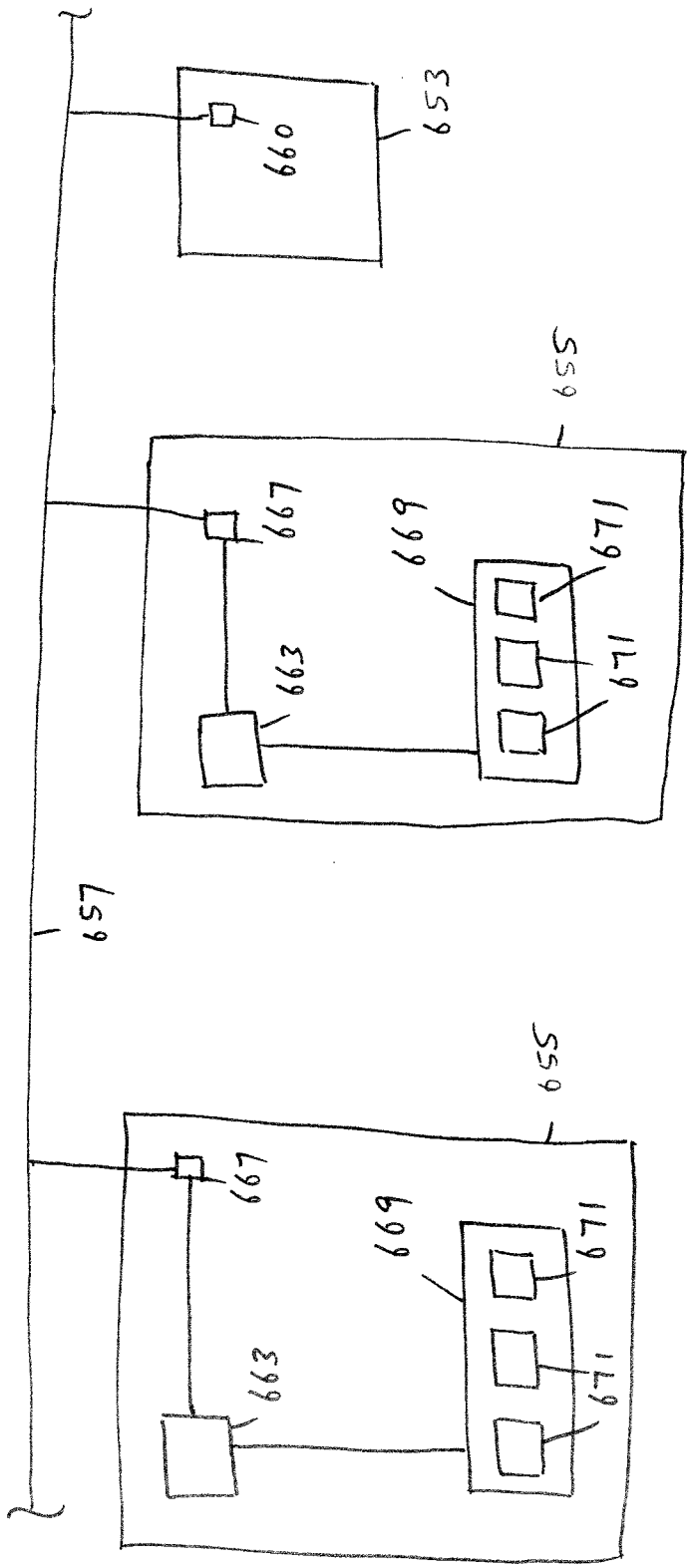


FIG. 18