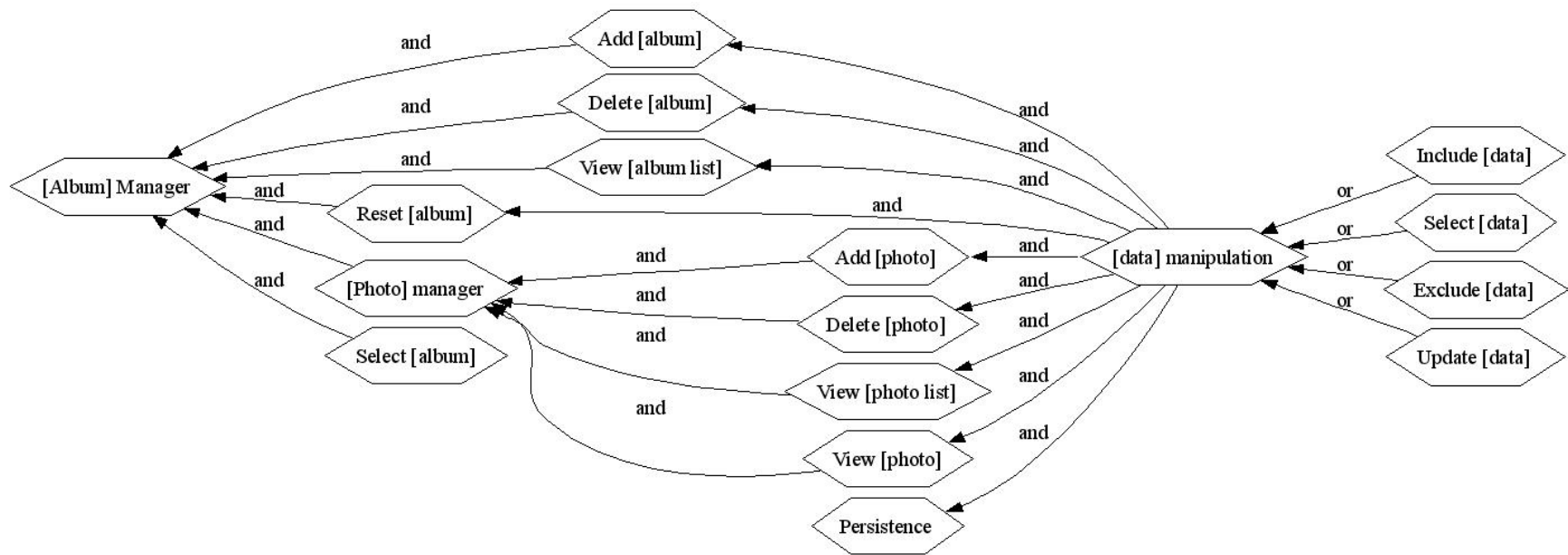
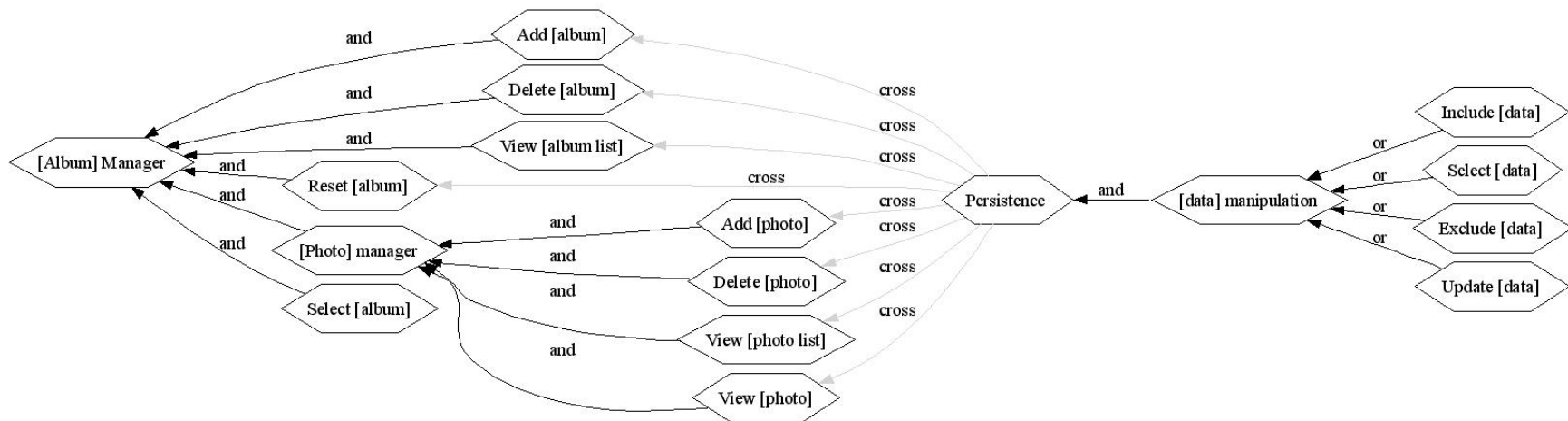


Expanded Goal Model (Release 0)



Shorten Goal Model (Release 0)



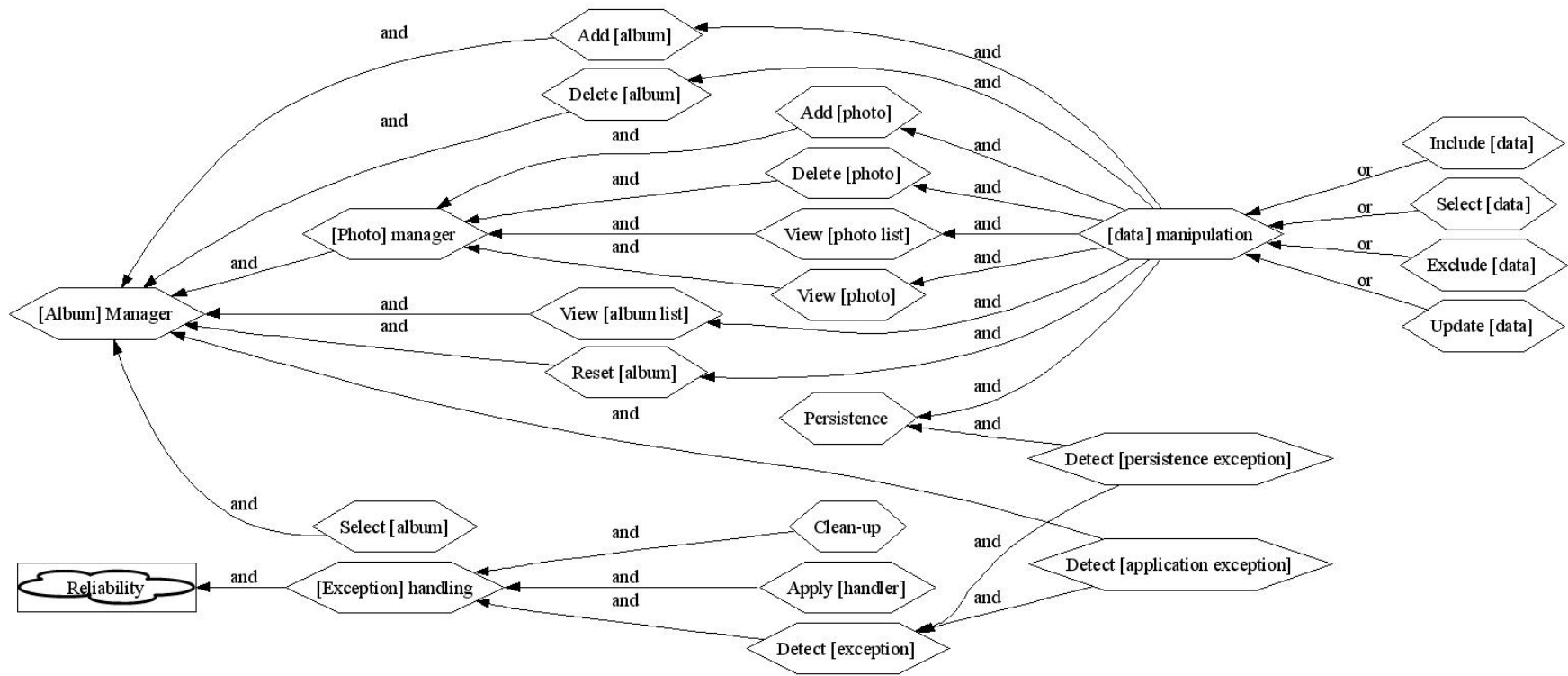
BNF (Release 0)

```
goal_model AlbumManagement (GM1) {
    task [Album] Manager (T1; and) {
        task Add [album] (T1.1; and) {}
        task Delete [album] (T1.6; and) {}
        task View [album list] (T1.2; and) {}
        task Select [album] (T1.3; and) {}
        task Reset [album] (T1.5; and) {}
        task_ref [Photo] manager (T1.4; and)
    }
}

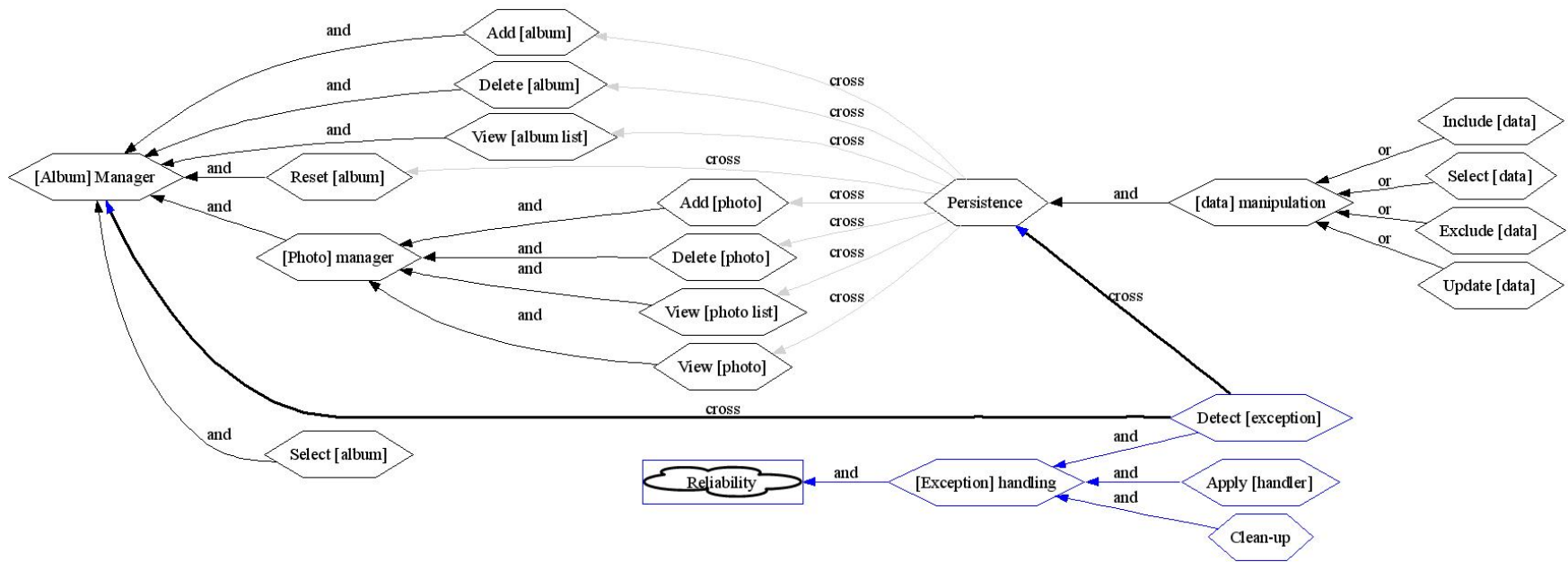
goal_model PhotoManagement (GM3) {
    task [Photo] manager (T1.4; and) {
        task Add [photo] (T1.4.5; and) {}
        task Delete [photo] (T1.4.6; and) {}
        task View [photo list] (T1.4.9; and) {}
        task View [photo] (T1.4.10; and) {} } }

goal_model Persistence (GM2) {
    task Persistence (T2; and) {
        task [data] manipulation (T2.1.2; and) {
            task Include [data] (T2.1.3.1; or) {}
            task Select [data] (T2.1.3.2; or) {}
            task Exclude [data] (T2.1.3.3; or) {}
            task Update [data] (T2.1.3.4; or) {} }
        crosscutting {
            source = (Persistence; T2)
            pointcut (make register operation; P2.1): include(Add.*; task; name) and
include(Delete.*; task; name) and
            include(Reset.*; task; name) and include(View.*; task; name)
            advice (around): P2.1 {
                task_ref [data] manipulation (T2.1.2; and)
            }
        }
    }
}
```

Expanded Goal Model (Release 1)



Shorten Goal Model (Release 1)



BNF (Release 1)

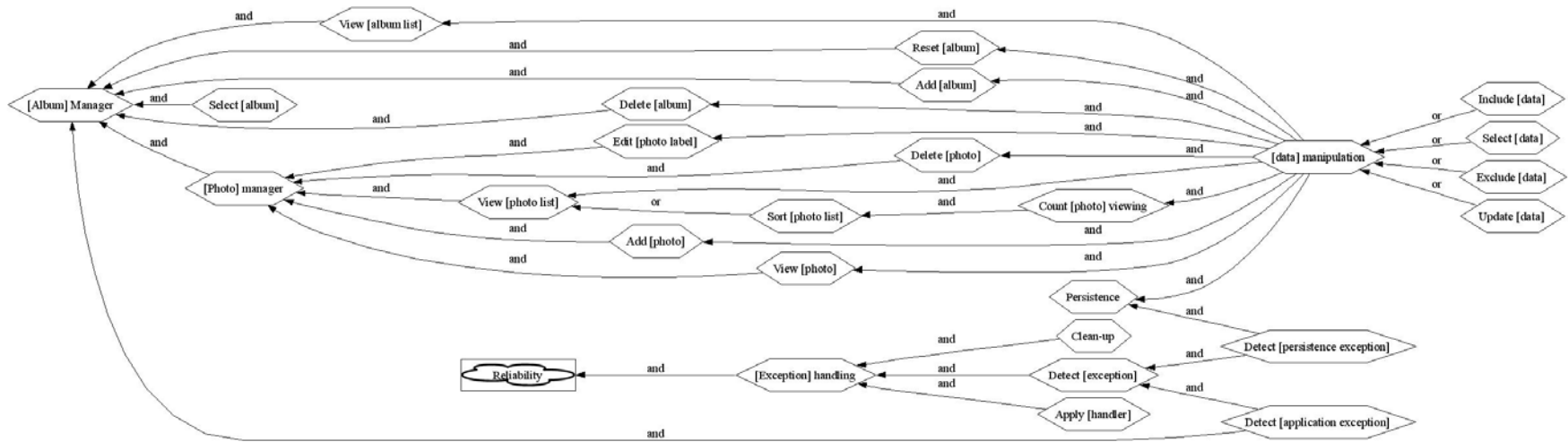
```
goal_model AlbumManagement (GM1) {
    task [Album] Manager (T1; and) {
        task Add [album] (T1.1; and) {}
        task Delete [album] (T1.6; and) {}
        task View [album list] (T1.2; and) {}
        task Select [album] (T1.3; and) {}
        task Reset [album] (T1.5; and) {}
        task_ref [Photo] manager (T1.4; and)
    }
}

goal_model PhotoManagement (GM3) {
    task [Photo] manager (T1.4; and) {
        task Add [photo] (T1.4.5; and) {}
        task Delete [photo] (T1.4.6; and) {}
        task View [photo list] (T1.4.9; and) {}
        task View [photo] (T1.4.10; and) {} } }

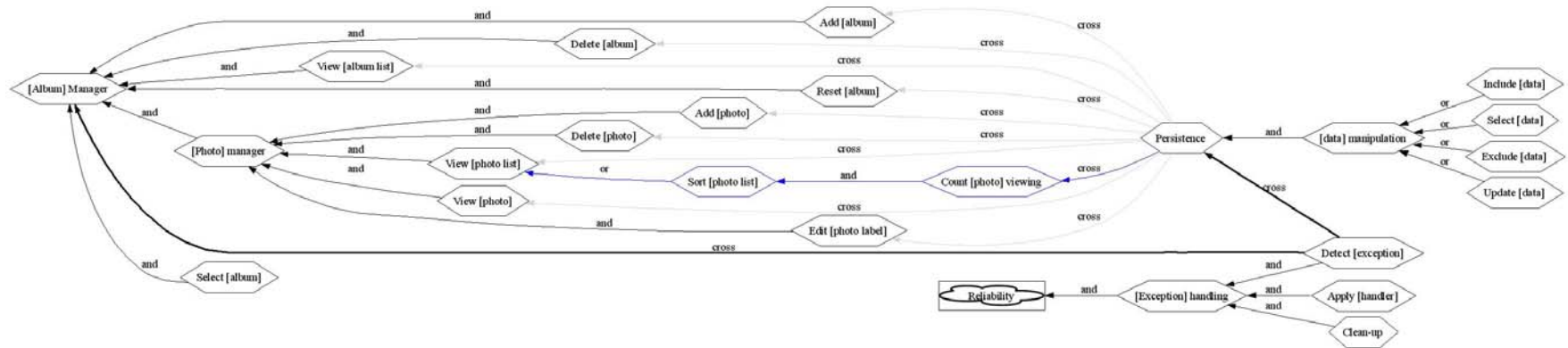
goal_model Persistence (GM2) {
    task Persistence (T2; and) {
        task [data] manipulation (T2.1.2; and) {
            task Include [data] (T2.1.3.1; or) {}
            task Select [data] (T2.1.3.2; or) {}
            task Exclude [data] (T2.1.3.3; or) {}
            task Update [data] (T2.1.3.4; or) {} }
        crosscutting {
            source = (Persistence; T2)
            pointcut (make register operation; P2.1): include(Add.*; task; name) and
include(Delete.*; task; name) and
            include(Reset.*; task; name) and include(View.*; task; name)
            advice (around): P2.1 {
                task_ref [data] manipulation (T2.1.2; and)
            }
        }
    }
}

goal_model Reliability (GM5) {
    softgoal Reliability (S5.1; and) {
        task [Exception] handling (G5.2; and) {
            task Detect [exception] (T5.2.1; and) {}
            task Apply [handler] (T5.2.4; and) {}
            task Clean-up (T5.2.2; and) {} } }
    crosscutting {
        source = (Detect [exception]; T5.2.1)
        pointcut (persistence; PC5.3): include(Persistence; T2)
        pointcut (application; PC5.2): include([Album] Manager; T1)
        intertype declaration (element): PC5.2 {
            task Detect [application exception] (T5.2.1.4; and) {} }
        intertype declaration (element): PC5.3 {
            task Detect [persistence exception] (T5.2.1.3; and) {} } } }
```

Expanded Goal Model (Release 2)



Shorten Goal Model (Release 2)



BNF (Release 2)

```
goal_model AlbumManagement (GM1) {
    task [Album] Manager (T1; and) {
        task Add [album] (T1.1; and) {}
        task Delete [album] (T1.6; and) {}
        task View [album list] (T1.2; and) {}
        task Select [album] (T1.3; and) {}
        task Reset [album] (T1.5; and) {}
        task_ref [Photo] manager (T1.4; and)
    }
}

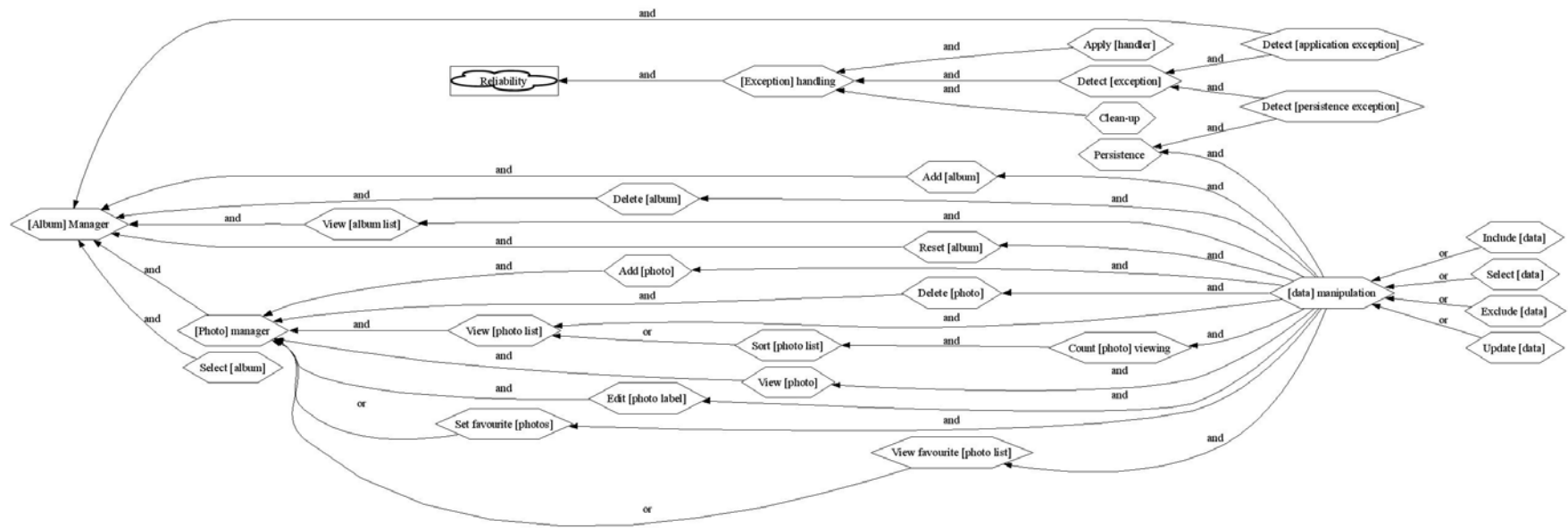
goal_model PhotoManagement (GM3) {
    task [Photo] manager (T1.4; and) {
        task Add [photo] (T1.4.5; and) {}
        task Delete [photo] (T1.4.6; and) {}
        task View [photo list] (T1.4.9; and) {
            task Sort [photo list] (T1.4.9.1; or) {}
            task Count [photo] viewing (T1.4.12; and) {} } }
        task View [photo] (T1.4.10; and) {}
        task Edit [photo label] (T1.4.11; and) {} } }

goal_model Persistence (GM2) {
    task Persistence (T2; and) {
        task [data] manipulation (T2.1.2; and) {
            task Include [data] (T2.1.3.1; or) {}
            task Select [data] (T2.1.3.2; or) {}
            task Exclude [data] (T2.1.3.3; or) {}
            task Update [data] (T2.1.3.4; or) {} }
        crosscutting {
            source = (Persistence; T2)
            pointcut (make register operation; P2.1): include(Add.*; task; name) and
include(Delete.*; task; name) and
            include(Reset.*; task; name) and include(View.*; task; name) and
include(Edit.*; task; name) and include(Count.*; task; name)
            advice (around): P2.1 {
                task_ref [data] manipulation (T2.1.2; and)
            } } } }

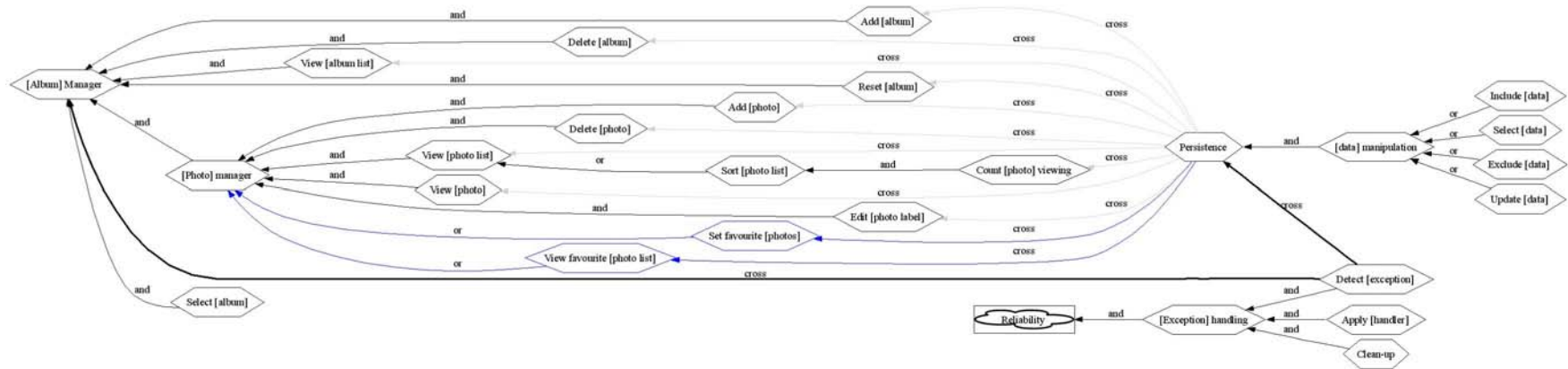
goal_model Reliability (GM5) {
    softgoal Reliability (S5.1; and) {
        task [Exception] handling (G5.2; and) {
            task Detect [exception] (T5.2.1; and) {}
            task Apply [handler] (T5.2.4; and) {}
            task Clean-up (T5.2.2; and) {} } }
        crosscutting {
            source = (Detect [exception]; T5.2.1)
            pointcut (persistence; PC5.3): include(Persistence; T2)
            pointcut (application; PC5.2): include([Album] Manager; T1)
            intertype declaration (element): PC5.2 {
```

```
task Detect [application exception] (T5.2.1.4; and) { } }  
    intertype declaration (element): PC5.3 {  
task Detect [persistence exception] (T5.2.1.3; and) { } } }
```

Expanded Goal Model (Release 3)



Shorten Goal Model (Release 3)



BNF (Release 3)

```
goal_model AlbumManagement (GM1) {
    task [Album] Manager (T1; and) {
        task Add [album] (T1.1; and) {}
        task Delete [album] (T1.6; and) {}
        task View [album list] (T1.2; and) {}
        task Select [album] (T1.3; and) {}
        task Reset [album] (T1.5; and) {}
        task_ref [Photo] manager (T1.4; and)
    }
}

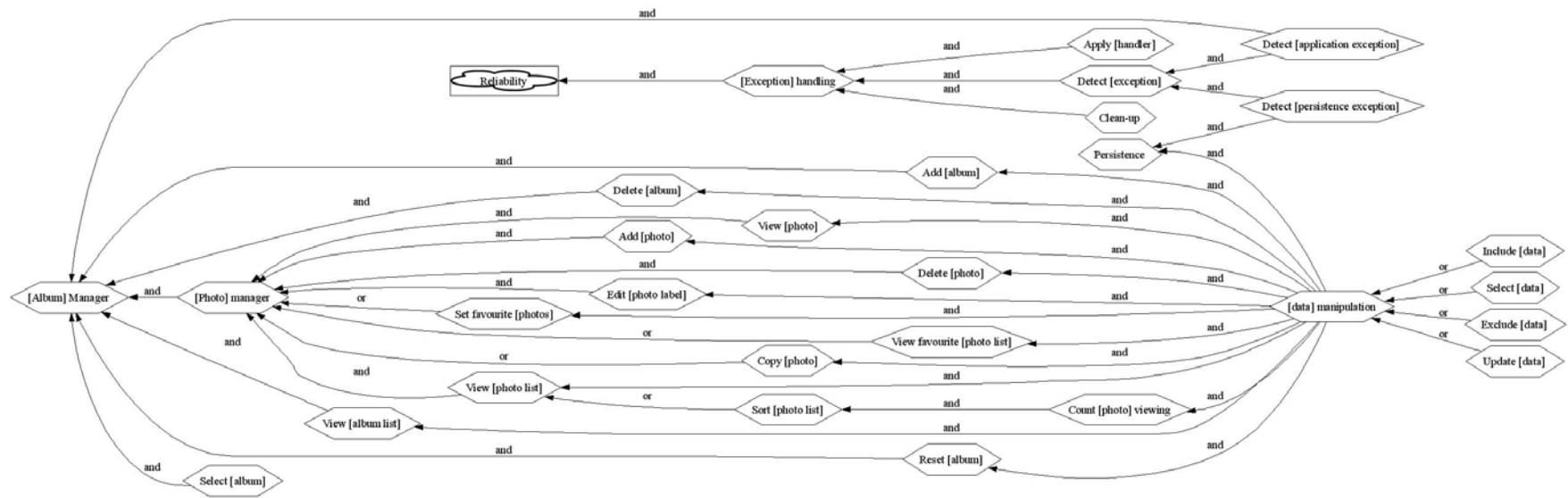
goal_model PhotoManagement (GM3) {
    task [Photo] manager (T1.4; and) {
        task Add [photo] (T1.4.5; and) {}
        task Delete [photo] (T1.4.6; and) {}
        task View [photo list] (T1.4.9; and) {
            task Sort [photo list] (T1.4.9.1; or) {
                task Count [photo] viewing (T1.4.12; and) {} } }
        task View [photo] (T1.4.10; and) {}
        task Edit [photo label] (T1.4.11; and) {}
        task Set favourite [photos] (T1.4.13; or) {}
        task View favourite [photo list] (T1.4.14; or) {} } }

goal_model Persistence (GM2) {
    task Persistence (T2; and) {
        task [data] manipulation (T2.1.2; and) {
            task Include [data] (T2.1.3.1; or) {}
            task Select [data] (T2.1.3.2; or) {}
            task Exclude [data] (T2.1.3.3; or) {}
            task Update [data] (T2.1.3.4; or) {} }
        crosscutting {
            source = (Persistence; T2)
            pointcut (make register operation; P2.1): include(Add.*; task; name) and
include(Delete.*; task; name) and
            include(Reset.*; task; name) and include(View.*; task; name) and
include(Edit.*; task; name) and include(Count.*; task; name)
            and include(Set.*; task; name)
            advice (around): P2.1 {
                task_ref [data] manipulation (T2.1.2; and)
            } } } }

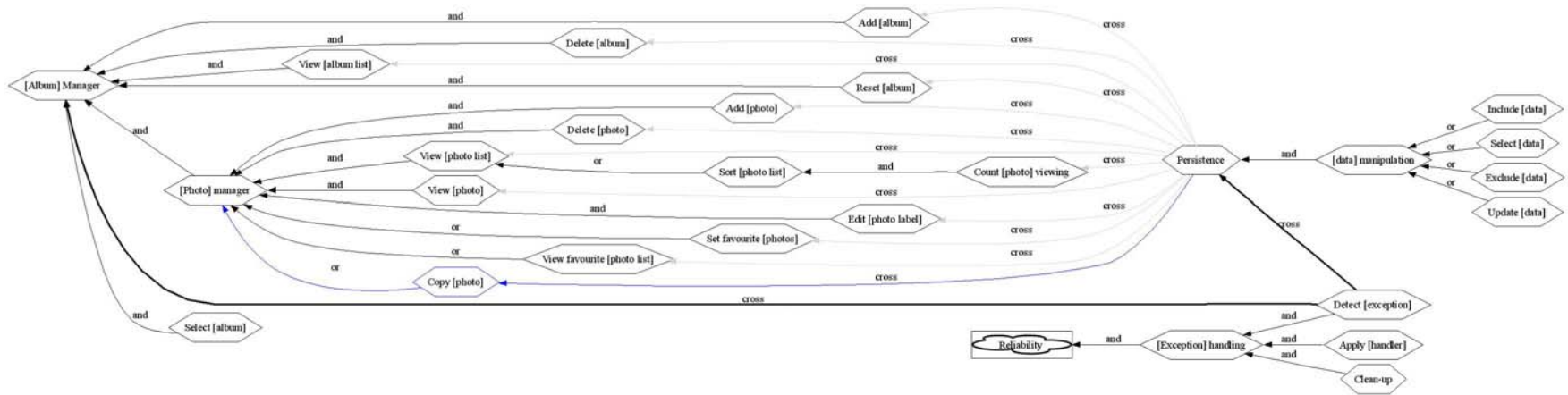
goal_model Reliability (GM5) {
    softgoal Reliability (S5.1; and) {
        task [Exception] handling (G5.2; and) {
            task Detect [exception] (T5.2.1; and) {}
            task Apply [handler] (T5.2.4; and) {}
            task Clean-up (T5.2.2; and) {} } }
    crosscutting {
        source = (Detect [exception]; T5.2.1)
```

```
pointcut (persistence; PC5.3): include(Persistence; T2)
pointcut (application; PC5.2): include([Album] Manager; T1)
intertype declaration (element): PC5.2 {
task Detect [application exception] (T5.2.1.4; and) { } }
intertype declaration (element): PC5.3 {
task Detect [persistence exception] (T5.2.1.3; and) { } } }
```

Expanded Goal Model (Release 4)



Shorten Goal Model (Release 4)



BNF (Release 4)

```
goal_model AlbumManagement (GM1) {
    task [Album] Manager (T1; and) {
        task Add [album] (T1.1; and) {}
        task Delete [album] (T1.6; and) {}
        task View [album list] (T1.2; and) {}
        task Select [album] (T1.3; and) {}
        task Reset [album] (T1.5; and) {}
        task_ref [Photo] manager (T1.4; and)
    }
}

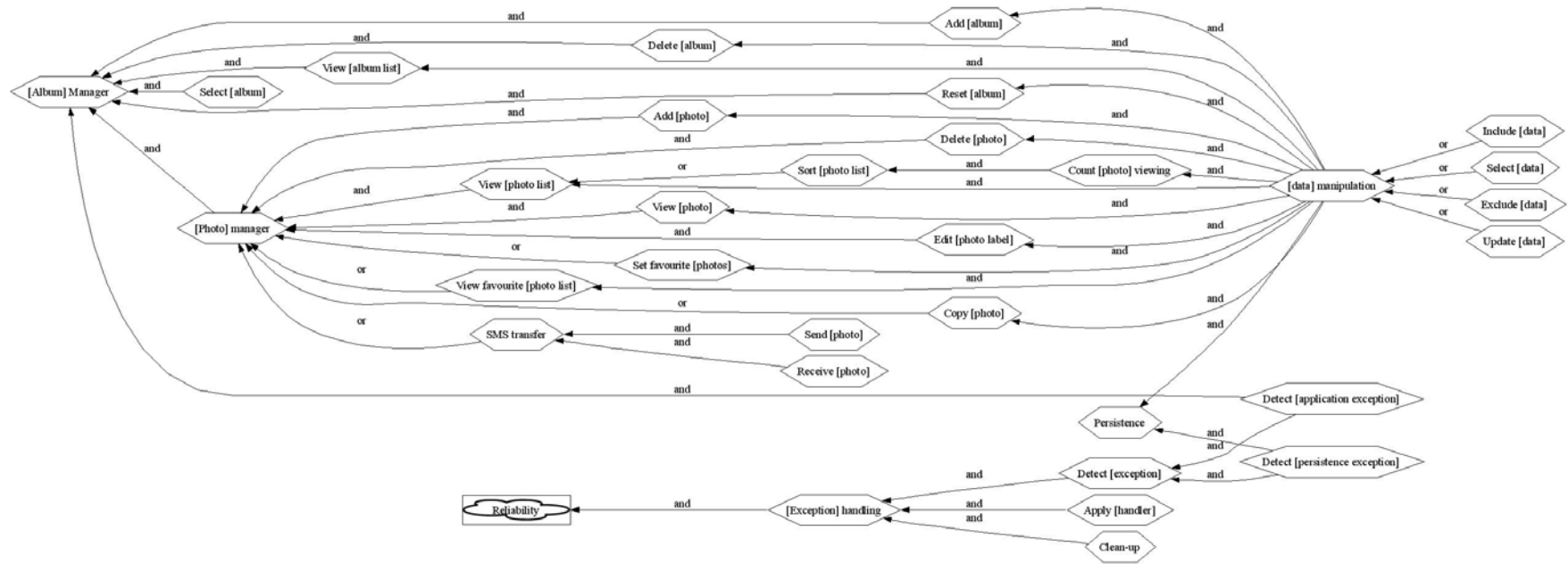
goal_model PhotoManagement (GM3) {
    task [Photo] manager (T1.4; and) {
        task Add [photo] (T1.4.5; and) {}
        task Delete [photo] (T1.4.6; and) {}
        task View [photo list] (T1.4.9; and) {
            task Sort [photo list] (T1.4.9.1; or) {
                task Count [photo] viewing (T1.4.12; and) {} } }
        task View [photo] (T1.4.10; and) {}
        task Edit [photo label] (T1.4.11; and) {}
        task Set favourite [photos] (T1.4.13; or) {}
        task View favourite [photo list] (T1.4.14; or) {}
        task Copy [photo] (T1.4.15; or) {} } }

goal_model Persistence (GM2) {
    task Persistence (T2; and) {
        task [data] manipulation (T2.1.2; and) {
            task Include [data] (T2.1.3.1; or) {}
            task Select [data] (T2.1.3.2; or) {}
            task Exclude [data] (T2.1.3.3; or) {}
            task Update [data] (T2.1.3.4; or) {} }
        crosscutting {
            source = (Persistence; T2)
            pointcut (make register operation; P2.1): include(Add.*; task; name) and
include(Delete.*; task; name) and
            include(Reset.*; task; name) and include(View.*; task; name) and
include(Edit.*; task; name) and include(Count.*; task; name)
            and include(Set.*; task; name) and include(Copy.*; task; name)
            advice (around): P2.1 {
                task_ref [data] manipulation (T2.1.2; and)
            } } } }

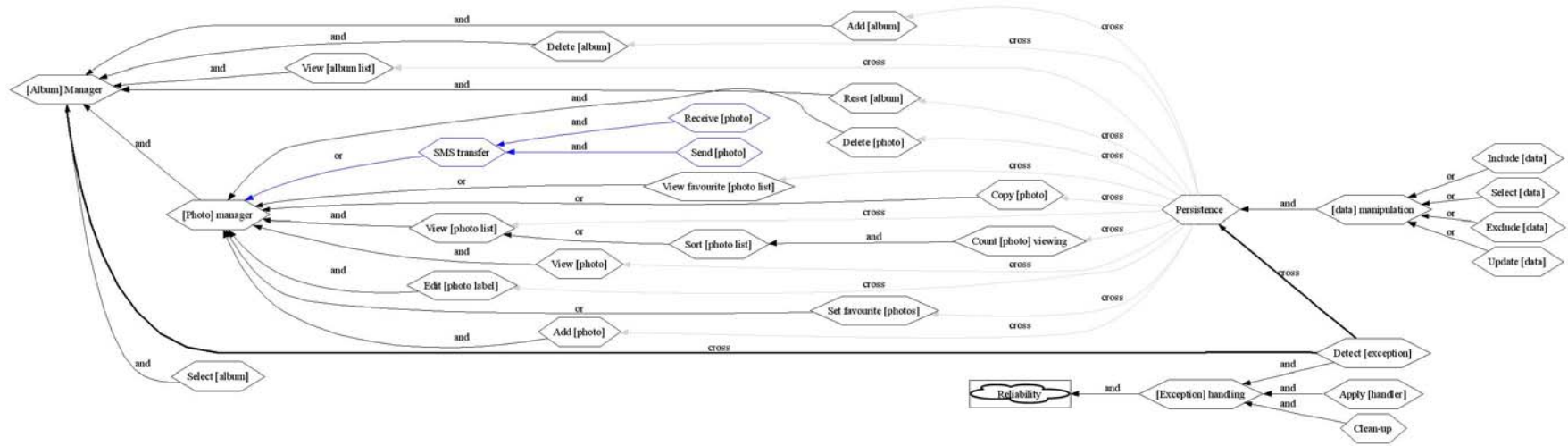
goal_model Reliability (GM5) {
    softgoal Reliability (S5.1; and) {
        task [Exception] handling (G5.2; and) {
            task Detect [exception] (T5.2.1; and) {}
            task Apply [handler] (T5.2.4; and) {}
            task Clean-up (T5.2.2; and) {} } }
    crosscutting {
```

```
source = (Detect [exception]; T5.2.1)
pointcut (persistence; PC5.3): include(Persistence; T2)
pointcut (application; PC5.2): include([Album] Manager; T1)
intertype declaration (element): PC5.2 {
task Detect [application exception] (T5.2.1.4; and) { } }
    intertype declaration (element): PC5.3 {
task Detect [persistence exception] (T5.2.1.3; and) { } } }
```

Expanded Goal Model (Release 5)



Shorten Goal Model (Release 5)



BNF (Release 5)

```
goal_model AlbumManagement (GM1) {  
    task [Album] Manager (T1; and) {  
        task Add [album] (T1.1; and) {}  
        task Delete [album] (T1.6; and) {}  
        task View [album list] (T1.2; and) {}  
        task Select [album] (T1.3; and) {}  
        task Reset [album] (T1.5; and) {}  
        task_ref [Photo] manager (T1.4; and)  
    }  
}
```

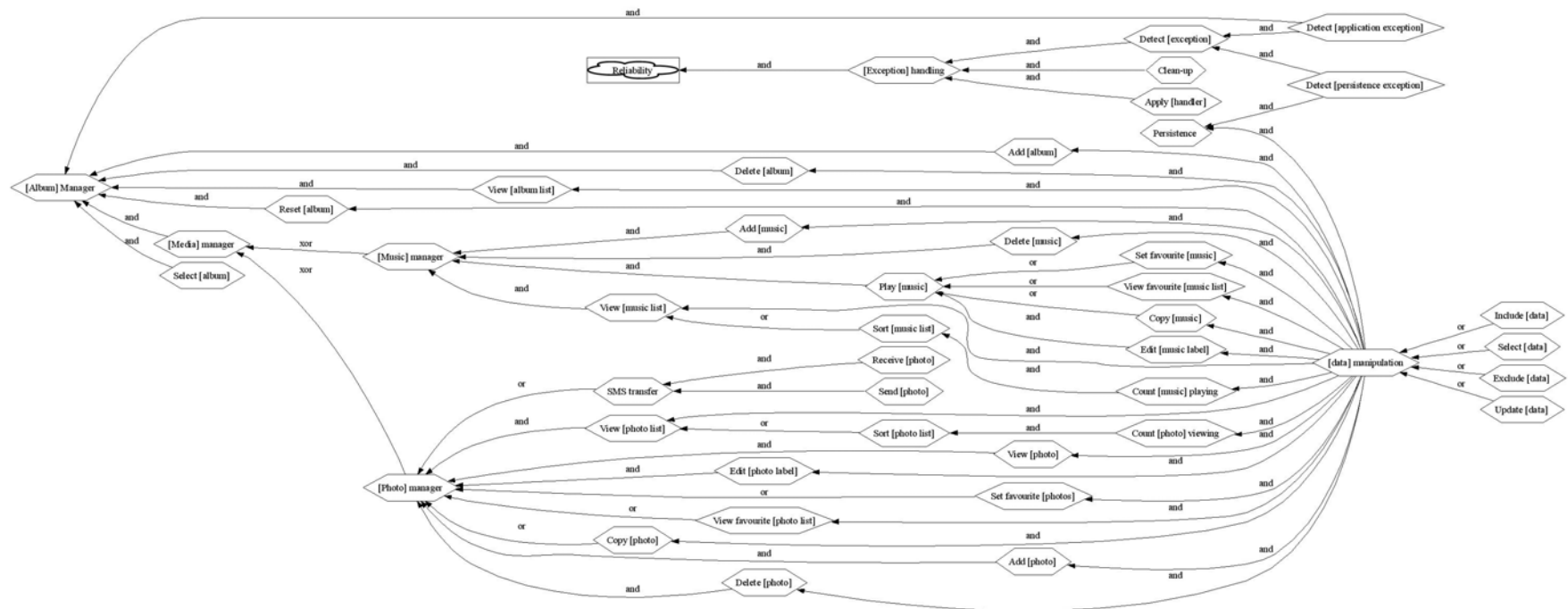
```
goal_model PhotoManagement (GM3) {  
    task [Photo] manager (T1.4; and) {  
        task Add [photo] (T1.4.5; and) {}  
        task Delete [photo] (T1.4.6; and) {}  
        task View [photo list] (T1.4.9; and) {  
            task Sort [photo list] (T1.4.9.1; or) {  
                task Count [photo] viewing (T1.4.12; and) {} } }  
            task View [photo] (T1.4.10; and) {}  
            task Edit [photo label] (T1.4.11; and) {}  
            task Set favourite [photos] (T1.4.13; or) {}  
            task View favourite [photo list] (T1.4.14; or) {}  
            task Copy [photo] (T1.4.15; or) {}  
            task SMS transfer (T1.4.16; or) {  
                task Send [photo] (T1.4.16.1; and) {}  
                task Receive [photo] (T1.4.16.2; and) {} } } }  
}
```

```
goal_model Persistence (GM2) {  
    task Persistence (T2; and) {  
        task [data] manipulation (T2.1.2; and) {  
            task Include [data] (T2.1.3.1; or) {}  
            task Select [data] (T2.1.3.2; or) {}  
            task Exclude [data] (T2.1.3.3; or) {}  
            task Update [data] (T2.1.3.4; or) {} }  
        crosscutting {  
            source = (Persistence; T2)  
            pointcut (make register operation; P2.1): include(Add.*; task; name) and  
include(Delete.*; task; name) and  
            include(Reset.*; task; name) and include(View.*; task; name) and  
include(Edit.*; task; name) and include(Count.*; task; name)  
            and include(Set.*; task; name) and include(Copy.*; task; name)  
            advice (around): P2.1 {  
                task_ref [data] manipulation (T2.1.2; and)  
            } } } }  
}
```

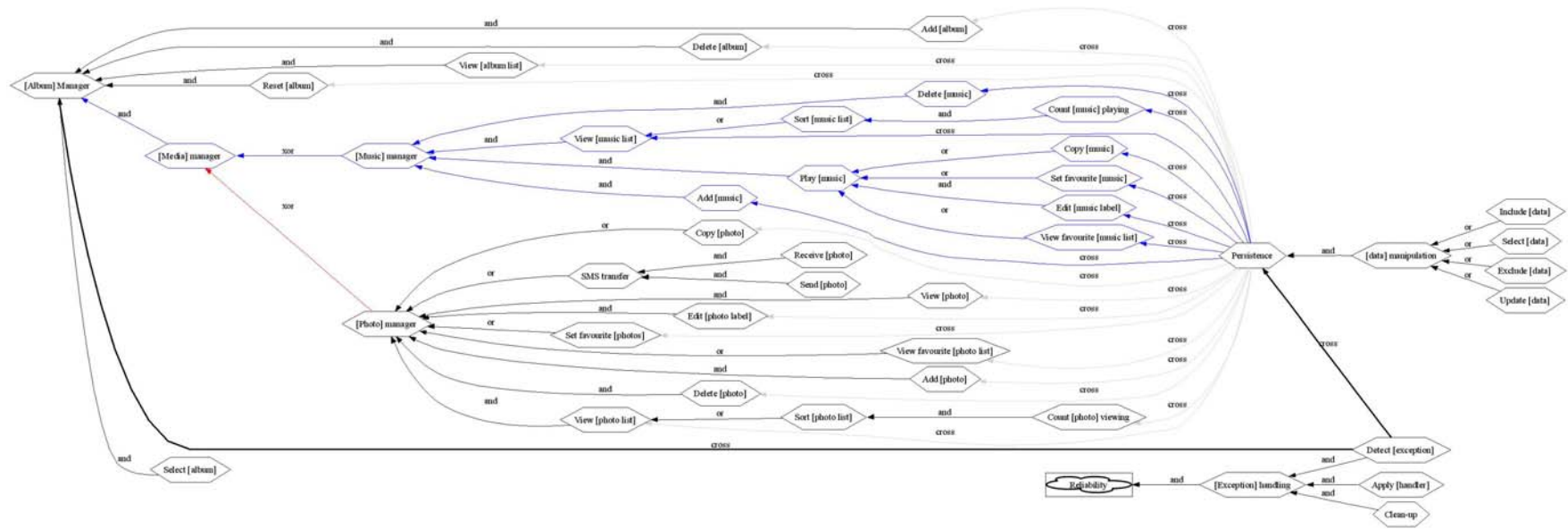
```
goal_model Reliability (GM5) {  
    softgoal Reliability (S5.1; and) {  
        task [Exception] handling (G5.2; and) {  
            task Detect [exception] (T5.2.1; and) {}  
        }  
    }  
}
```

```
task Apply [handler] (T5.2.4; and) {}
task Clean-up (T5.2.2; and) {} } }
crosscutting {
    source = (Detect [exception]; T5.2.1)
    pointcut (persistence; PC5.3): include(Persistence; T2)
    pointcut (application; PC5.2): include([Album] Manager; T1)
    intertype declaration (element): PC5.2 {
task Detect [application exception] (T5.2.1.4; and) {} }
    intertype declaration (element): PC5.3 {
task Detect [persistence exception] (T5.2.1.3; and) {} } } }
```

Expanded Goal Model (Release 6)



Shorten Goal Model (Release 6)



BNF (Release 6)

```
goal_model AlbumManagement (GM1) {
    task [Album] Manager (T1; and) {
        task Add [album] (T1.1; and) {}
        task Delete [album] (T1.6; and) {}
        task View [album list] (T1.2; and) {}
        task Select [album] (T1.3; and) {}
        task Reset [album] (T1.5; and) {}
        task [Media] manager (T1.7; and) {
            task_ref [Photo] manager (T1.4; xor)

            task_ref [Music] manager (T4.5; xor)
        }
    }
}

goal_model PhotoManagement (GM3) {
    task [Photo] manager (T1.4; and) {
        task Add [photo] (T1.4.5; and) {}
        task Delete [photo] (T1.4.6; and) {}
        task View [photo list] (T1.4.9; and) {
            task Sort [photo list] (T1.4.9.1; or) {
                task Count [photo] viewing (T1.4.12; and) {} } }
            task View [photo] (T1.4.10; and) {}
            task Edit [photo label] (T1.4.11; and) {}
            task Set favourite [photos] (T1.4.13; or) {}
            task View favourite [photo list] (T1.4.14; or) {}
            task Copy [photo] (T1.4.15; or) {}
            task SMS transfer (T1.4.16; or) {
                task Send [photo] (T1.4.16.1; and) {}
                task Receive [photo] (T1.4.16.2; and) {} } } }

goal_model MusicManagement (GM4) {
    task [Music] manager (T4.5; and) {
        task Add [music] (T4.5.5; and) {}
        task Delete [music] (T4.5.6; and) {}
        task View [music list] (T4.5.9; and) {
            task Sort [music list] (T4.5.9.1; or) {
                task Count [music] playing (T4.5.12; and) {} } }
            task Play [music] (T4.5.10; and) {}
            task Edit [music label] (T4.5.11; and) {}
            task Set favourite [music] (T4.5.13; or) {}
            task View favourite [music list] (T4.5.14; or) {}
            task Copy [music] (T4.5.15; or) {} } } }

goal_model Persistence (GM2) {
    task Persistence (T2; and) {
        task [data] manipulation (T2.1.2; and) {
            task Include [data] (T2.1.3.1; or) {}
            task Select [data] (T2.1.3.2; or) {}
            task Exclude [data] (T2.1.3.3; or) {}
        }
    }
}
```

```

task Update [data] (T2.1.3.4; or) {} }
crosscutting {
    source = (Persistence; T2)
    pointcut (make register operation; P2.1): include(Add.*; task; name) and
include(Delete.*; task; name) and
    include(Reset.*; task; name) and include(View.*; task; name) and
include(Edit.*; task; name) and include(Count.*; task; name)
    and include(Set.*; task; name) and include(Copy.*; task; name)
    advice (around): P2.1 {
        task_ref [data] manipulation (T2.1.2; and)
    } } } }

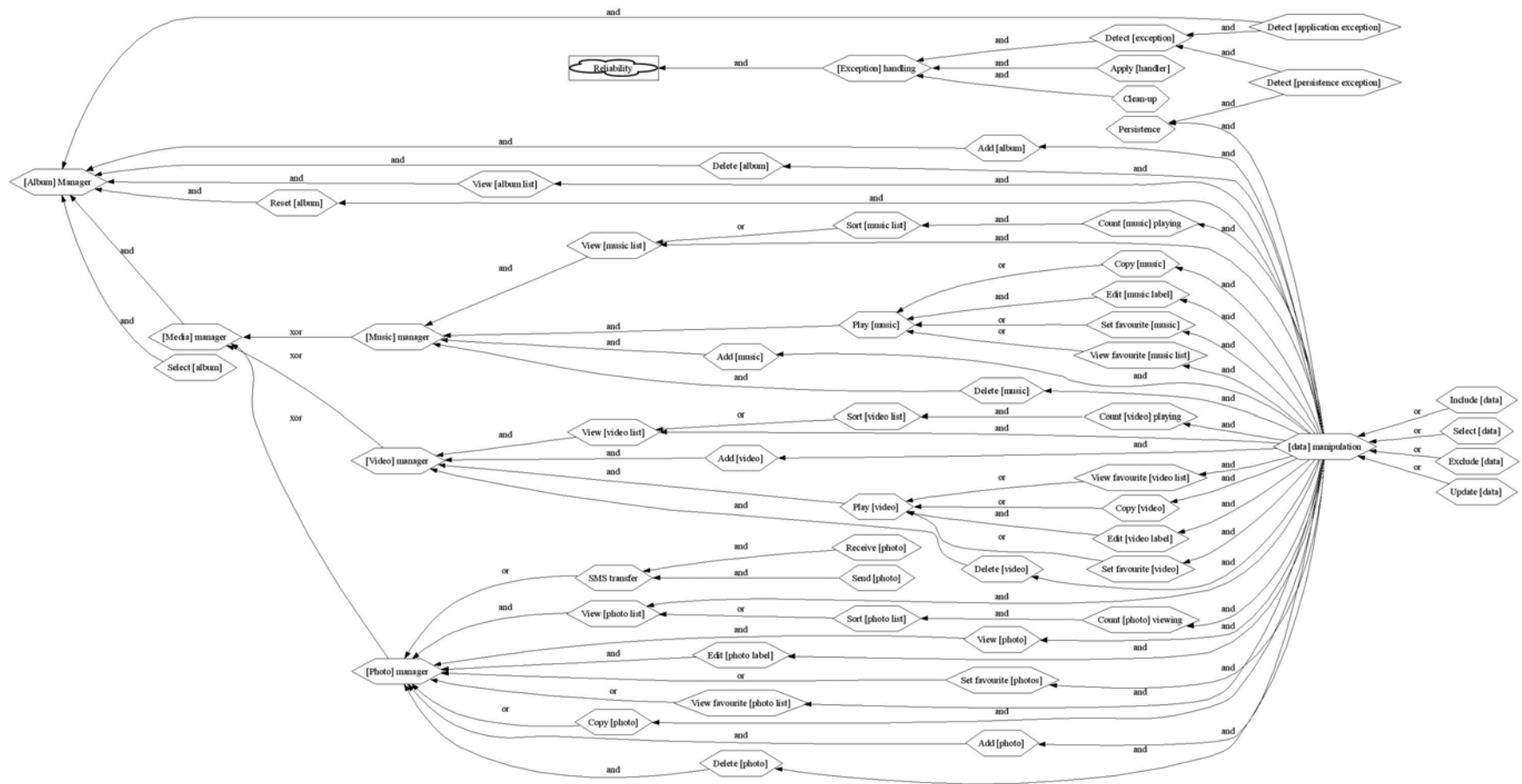
```

```

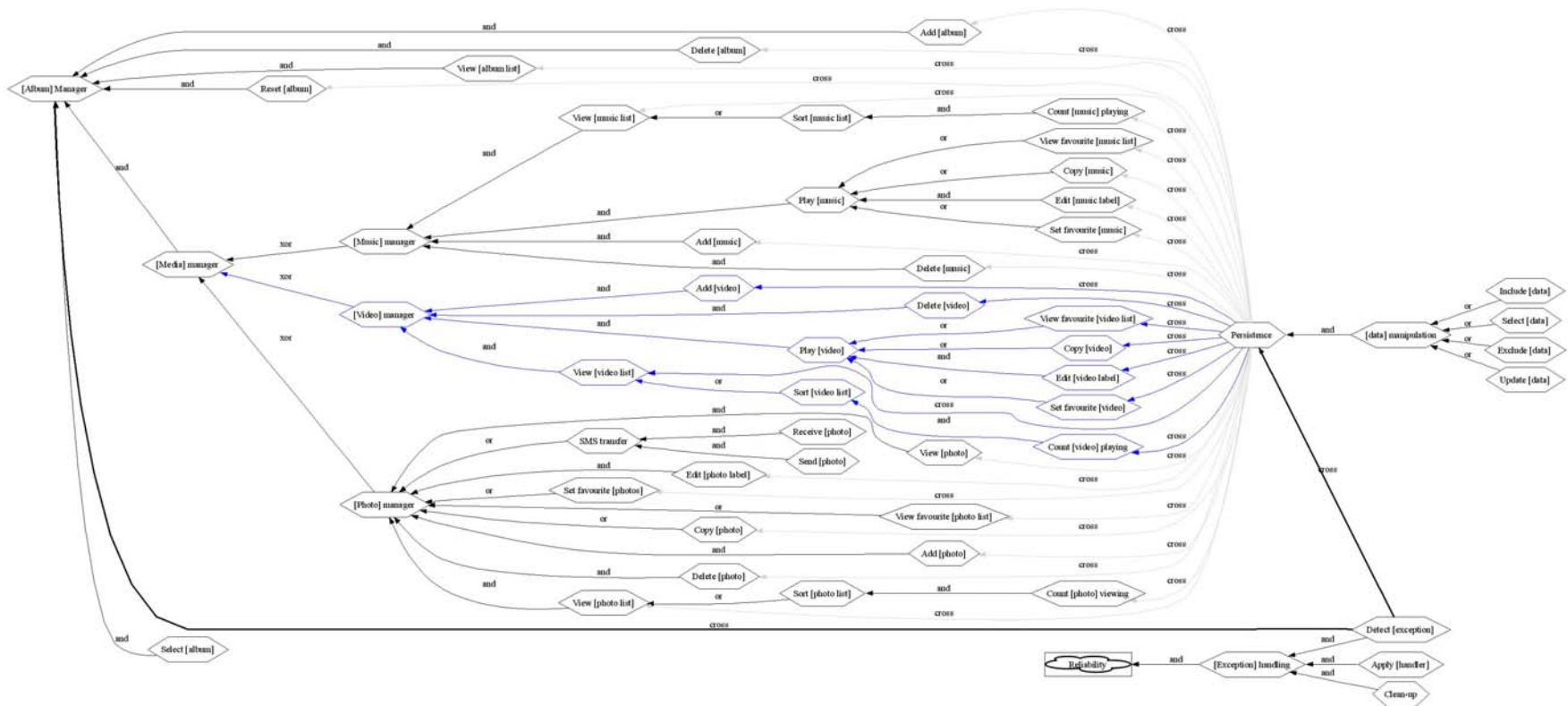
goal_model Reliability (GM5) {
    softgoal Reliability (S5.1; and) {
        task [Exception] handling (G5.2; and) {
            task Detect [exception] (T5.2.1; and) {}
            task Apply [handler] (T5.2.4; and) {}
            task Clean-up (T5.2.2; and) {} } }
        crosscutting {
            source = (Detect [exception]; T5.2.1)
            pointcut (persistence; PC5.3): include(Persistence; T2)
            pointcut (application; PC5.2): include([Album] Manager; T1)
            intertype declaration (element): PC5.2 {
                task Detect [application exception] (T5.2.1.4; and) {} }
            intertype declaration (element): PC5.3 {
                task Detect [persistence exception] (T5.2.1.3; and) {} } } }

```

Expanded Goal Model (Release 7)



Shorten Goal Model (Release 7)



BNF (Release 7)

```
goal_model AlbumManagement (GM1) {
    task [Album] Manager (T1; and) {
        task Add [album] (T1.1; and) {}
        task Delete [album] (T1.6; and) {}
        task View [album list] (T1.2; and) {}
        task Select [album] (T1.3; and) {}
        task Reset [album] (T1.5; and) {}
        task [Media] manager (T1.7; and) {
            task_ref [Photo] manager (T1.4; xor)

            task_ref [Music] manager (T4.5; xor)

            task_ref [Video] manager (T6.6; xor)
        }
    }
}

goal_model PhotoManagement (GM3) {
    task [Photo] manager (T1.4; and) {
        task Add [photo] (T1.4.5; and) {}
        task Delete [photo] (T1.4.6; and) {}
        task View [photo list] (T1.4.9; and) {
            task Sort [photo list] (T1.4.9.1; or) {}
            task Count [photo] viewing (T1.4.12; and) {} } }
        task View [photo] (T1.4.10; and) {}
        task Edit [photo label] (T1.4.11; and) {}
        task Set favourite [photos] (T1.4.13; or) {}
        task View favourite [photo list] (T1.4.14; or) {}
        task Copy [photo] (T1.4.15; or) {}
        task SMS transfer (T1.4.16; or) {
            task Send [photo] (T1.4.16.1; and) {}
            task Receive [photo] (T1.4.16.2; and) {} } } }

goal_model MusicManagement (GM4) {
    task [Music] manager (T4.5; and) {
        task Add [music] (T4.5.5; and) {}
        task Delete [music] (T4.5.6; and) {}
        task View [music list] (T4.5.9; and) {
            task Sort [music list] (T4.5.9.1; or) {}
            task Count [music] playing (T4.5.12; and) {} } }
        task Play [music] (T4.5.10; and) {}
        task Edit [music label] (T4.5.11; and) {}
        task Set favourite [music] (T4.5.13; or) {}
        task View favourite [music list] (T4.5.14; or) {}
        task Copy [music] (T4.5.15; or) {} } } }

goal_model VideoManagement (GM6) {
    task [Video] manager (T6.6; and) {
        task Add [video] (T6.6.5; and) {}
        task Delete [video] (T6.6.6; and) {}
    }
}
```

```

task View [video list] (T6.6.9; and) {
task Sort [video list] (T6.6.9.1; or) {
task Count [video] playing (T6.6.12; and) {} } }
task Play [video] (T6.6.10; and) {
task Edit [video label] (T6.6.11; and) {}
task Set favourite [video] (T6.6.13; or) {}
task View favourite [video list] (T6.6.14; or) {}
task Copy [video] (T6.6.15; or) {} } } }

```

```

goal_model Persistence (GM2) {
  task Persistence (T2; and) {
    task [data] manipulation (T2.1.2; and) {
      task Include [data] (T2.1.3.1; or) {}
      task Select [data] (T2.1.3.2; or) {}
      task Exclude [data] (T2.1.3.3; or) {}
      task Update [data] (T2.1.3.4; or) {} }
    crosscutting {
      source = (Persistence; T2)
      pointcut (make register operation; P2.1): include(Add.*; task; name) and
include(Delete.*; task; name) and
      include(Reset.*; task; name) and include(View.*; task; name) and
include(Edit.*; task; name) and include(Count.*; task; name)
      and include(Set.*; task; name) and include(Copy.*; task; name)
      advice (around): P2.1 {
        task_ref [data] manipulation (T2.1.2; and)
      } } } }
} } } }

```

```

goal_model Reliability (GM5) {
  softgoal Reliability (S5.1; and) {
    task [Exception] handling (G5.2; and) {
      task Detect [exception] (T5.2.1; and) {}
      task Apply [handler] (T5.2.4; and) {}
      task Clean-up (T5.2.2; and) {} } } }
    crosscutting {
      source = (Detect [exception]; T5.2.1)
      pointcut (persistence; PC5.3): include(Persistence; T2)
      pointcut (application; PC5.2): include([Album] Manager; T1)
      intertype declaration (element): PC5.2 {
        task Detect [application exception] (T5.2.1.4; and) {} }
      intertype declaration (element): PC5.3 {
        task Detect [persistence exception] (T5.2.1.3; and) {} } } } }
} } } }

```