

# Revising the Requirements: MSG (contd)

Slide 10..77

- (3) *Total estimated mortgage payments for the week and*
  
- (4) *Total estimated grant payments for the week:*
  - ▶ **Use case** `Compute Weekly Repayment Amount` models the computation of both the estimated mortgage payment and the estimated grant payment for each mortgage separately
  - ▶ Summing these separate quantities gives
    - The total estimated mortgage payments for the week, and
    - The total estimated grant payments for the week

# Revising the Requirements: MSG (contd)

Slide 10..78

- Now the use cases need to be reorganized
  - ▶ **Use case** `Compute Weekly Repayment Amount` also models borrowers updating their weekly income
- **Split** `Compute Weekly Repayment Amount` into two separate use cases
  - ▶ **Use case** `Estimate Payments and Grants for Week, and`
  - ▶ **Use case** `Update Borrowers' Weekly Income`

# Estimate Payments and Grants for Week

## Use Case

Slide 10..79

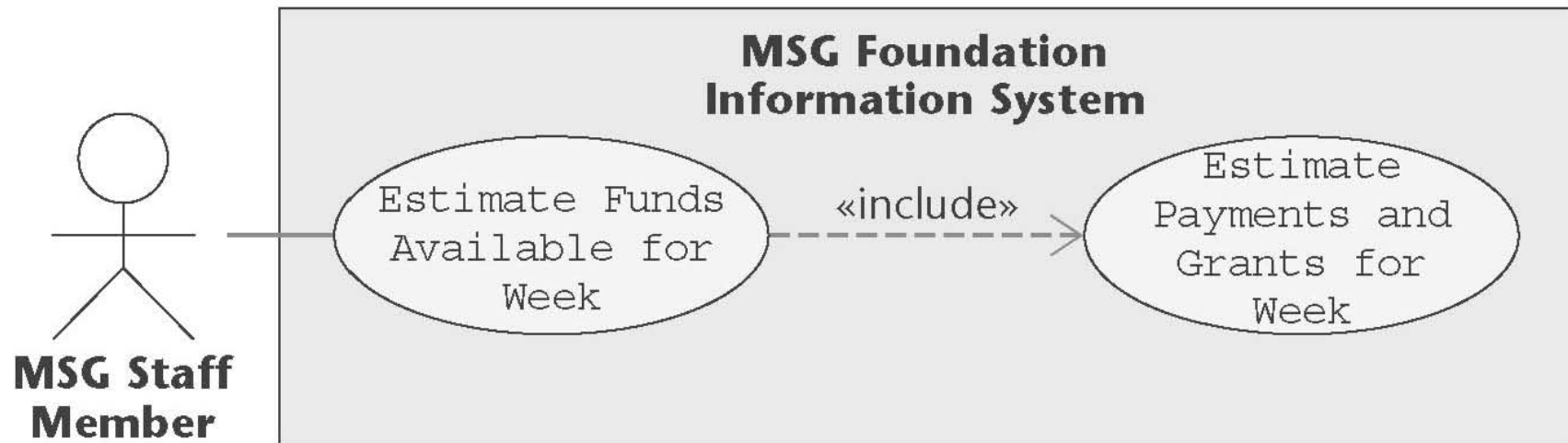


Figure 10.22

## Brief Description

The Estimate Payments and Grants for Week use case enables the Estimate Funds Available for Week use case to estimate the total estimated mortgage payments paid by borrowers to the MSG Foundation for this week and the total estimated grants paid by the MSG Foundation for this week.

## Step-by-Step Description

1. For each mortgage:
  - 1.1 The amount to be paid this week is the total of the principal and interest payment and  $\frac{1}{52}$ nd of the sum of the annual real-estate tax and the annual homeowner's insurance premium.
  - 1.2 Compute 28 percent of the couple's current gross weekly income.
  - 1.3 If the result of Step 1.1 is greater than the result of Step 1.2, then the mortgage payment for this week is the result of Step 1.2, and the amount of the grant for this week is the difference between the result of Step 1.1 and the result of Step 1.2.
  - 1.4 Otherwise, the mortgage payment for this week is the result of Step 1.1 and there is no grant this week.
2. Summing the mortgage payments of Steps 1.3 and 1.4 yields the estimated mortgage payments for the week.
3. Summing the grant payments of Step 1.3 yields the estimated grant payments for the week.

Figure 10.23

# Update Borrowers' Weekly Income Use Case

Slide 10..81

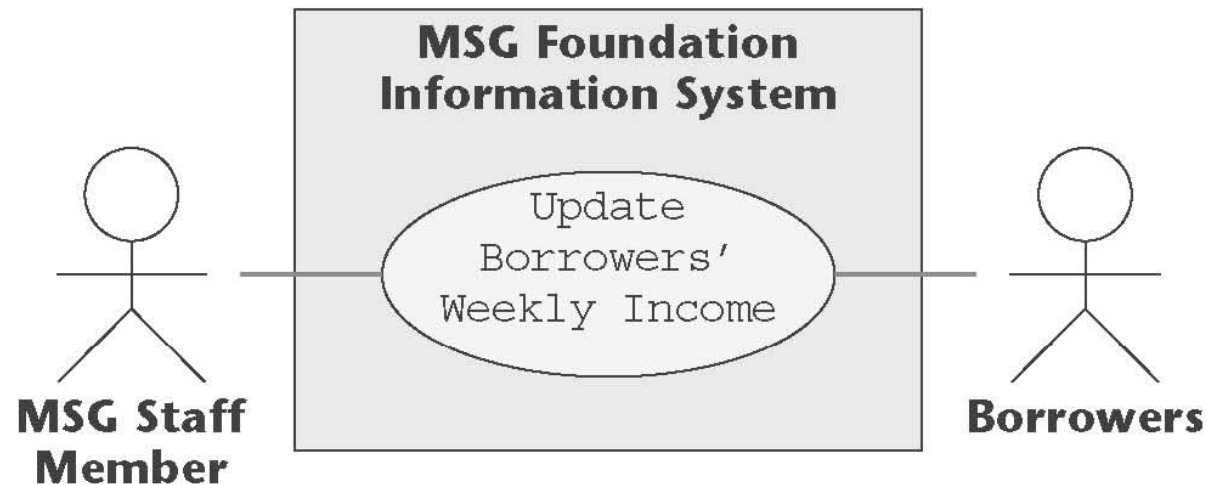


Figure 10.24

## Brief Description

The Update Borrowers' Weekly Income use case enables an MSG Foundation staff member to update the weekly income of a couple who have borrowed money from the Foundation.

## Step-by-Step Description

1. Update the borrower's weekly income.

Figure 10.25

# Third Iteration of the Revised Use-Case Diagram

Slide 10..82

- The two new use cases are shaded

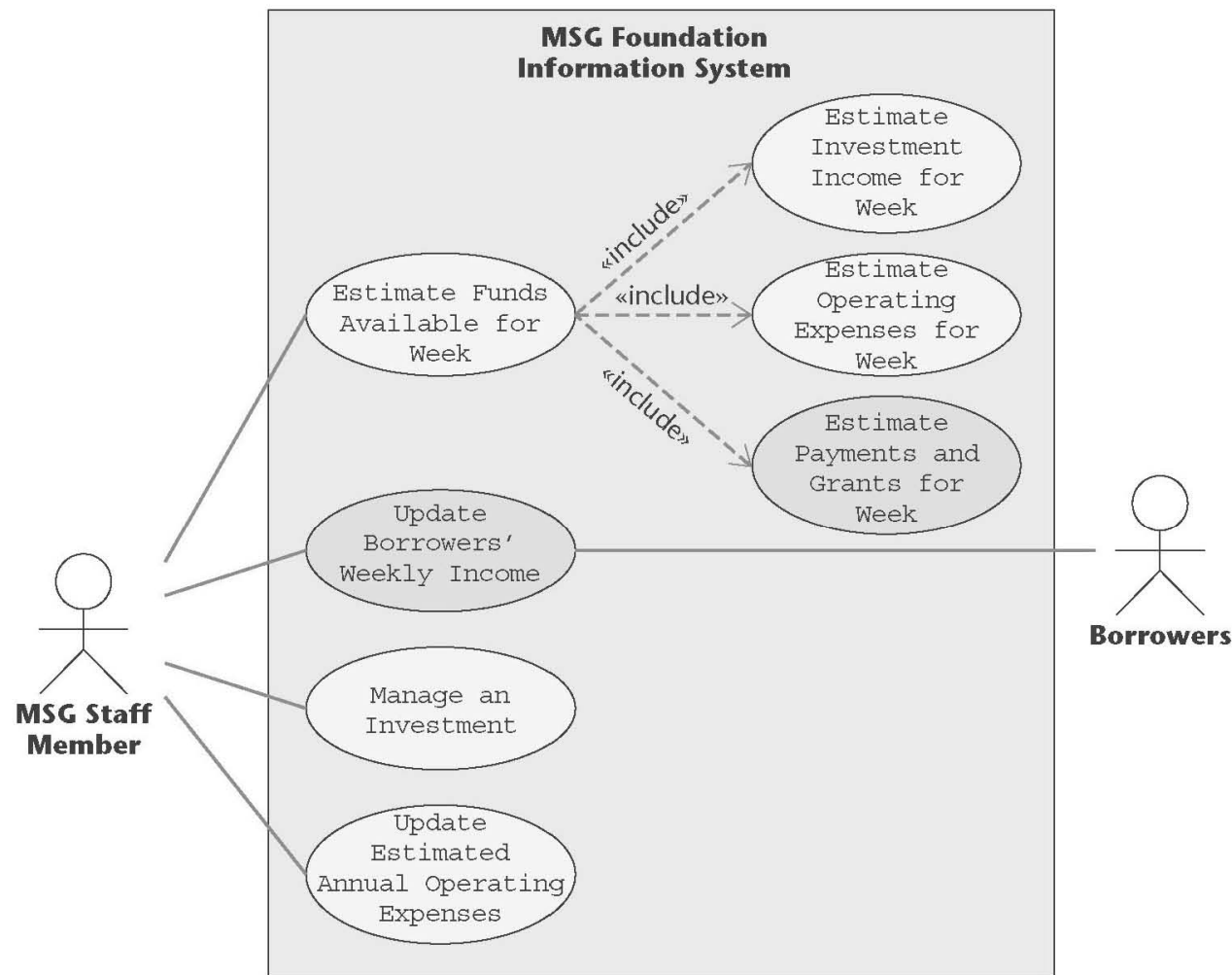


Figure 10.26

- **Use case** Estimate Funds Available for Week **models the computation that uses the data obtained from three other use cases**
  - ▶ Estimate Investment Income for Week
  - ▶ Estimate Operating Expenses for Week
  - ▶ Estimate Payments and Grants for Week

- Second iteration of use case

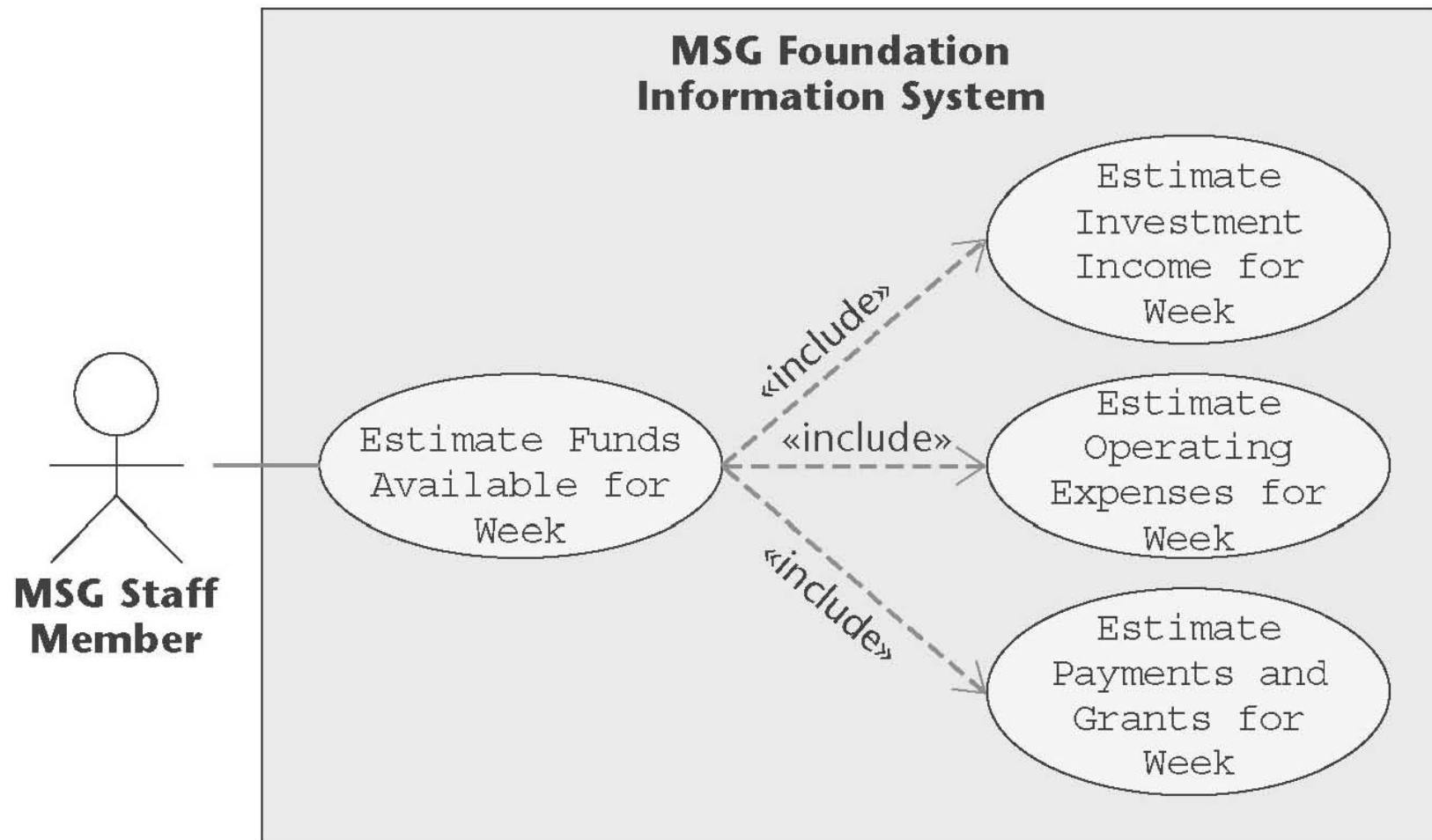


Figure 10.27



- Second iteration of description of use case

#### **Brief Description**

The Estimate Funds Available for Week use case enables an MSG Foundation staff member to estimate how much money the Foundation has available that week to fund mortgages.

#### **Step-by-Step Description**

1. Determine the estimated income from investments for the week utilizing use case Estimate Investment Income for Week.
2. Determine the operating expenses for the week utilizing use case Estimate Operating Expenses for Week.
3. Determine the total estimated mortgage payments for the week utilizing use case Estimate Payments and Grants for Week.
4. Determine the total estimated grants for the week utilizing use case Estimate Payments and Grants for Week.
5. Add the results of Steps 1 and 3 and subtract the results of Steps 2 and 4. This is the total amount available for mortgages for the current week.

Figure 10.28

# The Test Workflow: MSG Case Study (contd)

Slide 10..90

- Details of use case `Manage an Investment` have been overlooked, and
- Use case `Manage a Mortgage` to model
  - ▶ The addition of a new mortgage
  - ▶ The modification of an existing mortgage, or
  - ▶ The removal of an existing mortgagehas been totally forgotten  
(Analogous to use case `Manage an Investment`)

# Manage an Investment Use Case

Slide 10..91

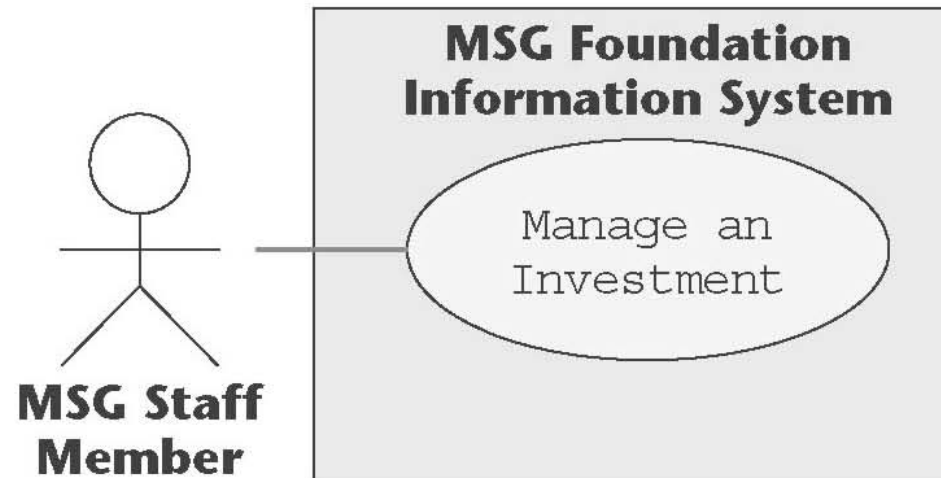


Figure 10.30

## Brief Description

The `Manage an Investment` use case enables an MSG Foundation staff member to add and delete investments and manage the investment portfolio.

## Step-by-Step Description

1. Add, modify, or delete an investment.

Figure 10.31

# Manage a Mortgage Use Case

Slide 10..92

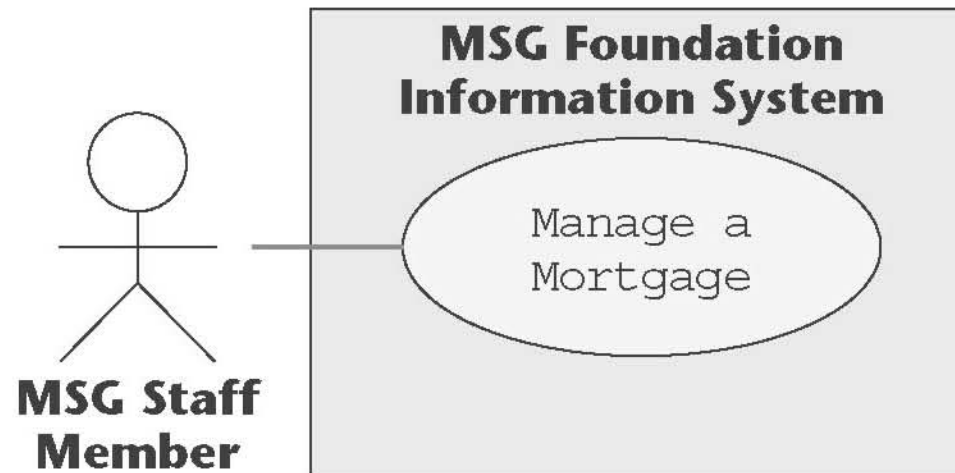


Figure 10.32

## Brief Description

The `Manage a Mortgage` use case enables an MSG Foundation staff member to add and delete mortgages and manage the mortgage portfolio.

## Step-by-Step Description

1. Add, modify, or delete a mortgage.

Figure 10.33

# Fourth Iteration of the Revised Use-Case Diagram

Slide 10..93

- The new use case is shaded

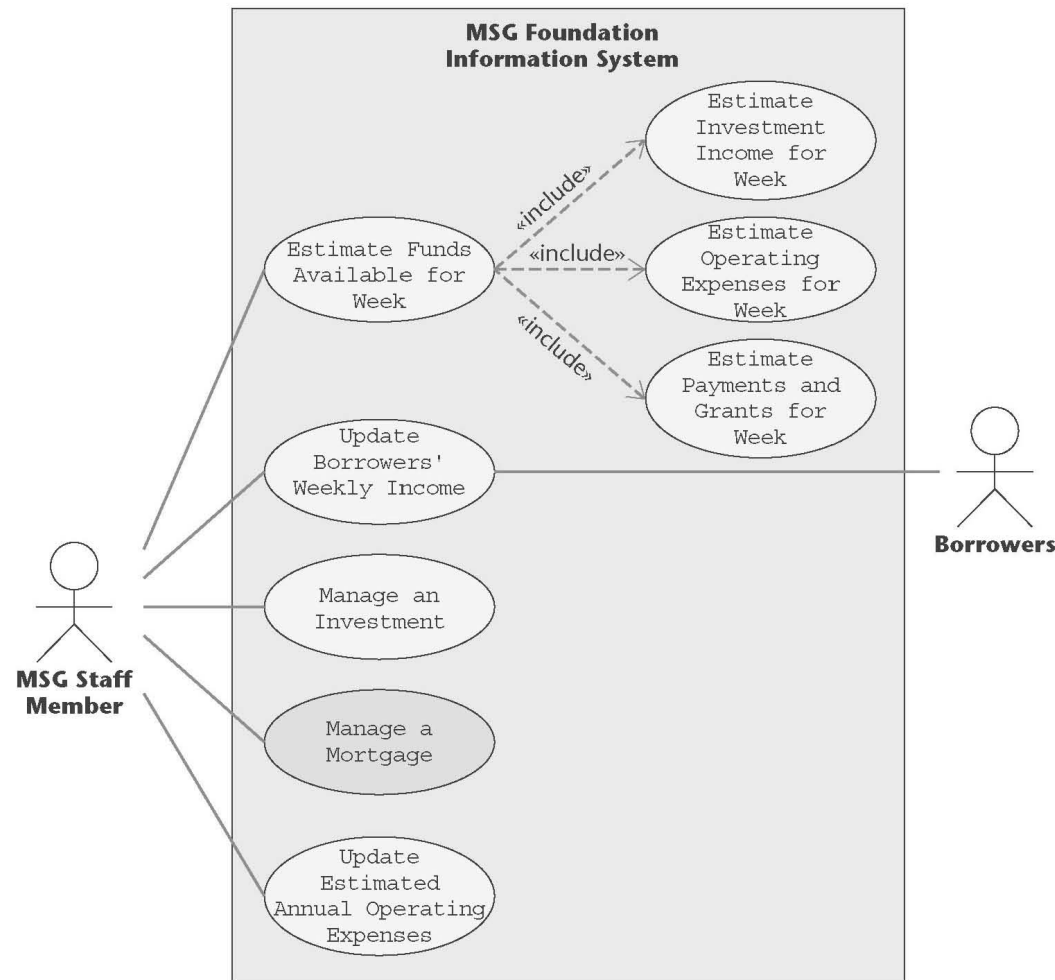


Figure 10.34

# The Test Workflow: MSG Case Study (contd)

Slide 10..94

- There is a further omission
    - ▶ Use case `Produce a Report` to print the three reports
      - Investments report
      - Mortgages report
      - Results of weekly computation
- has also been totally forgotten

# Produce a Report Use Case

Slide 10..95

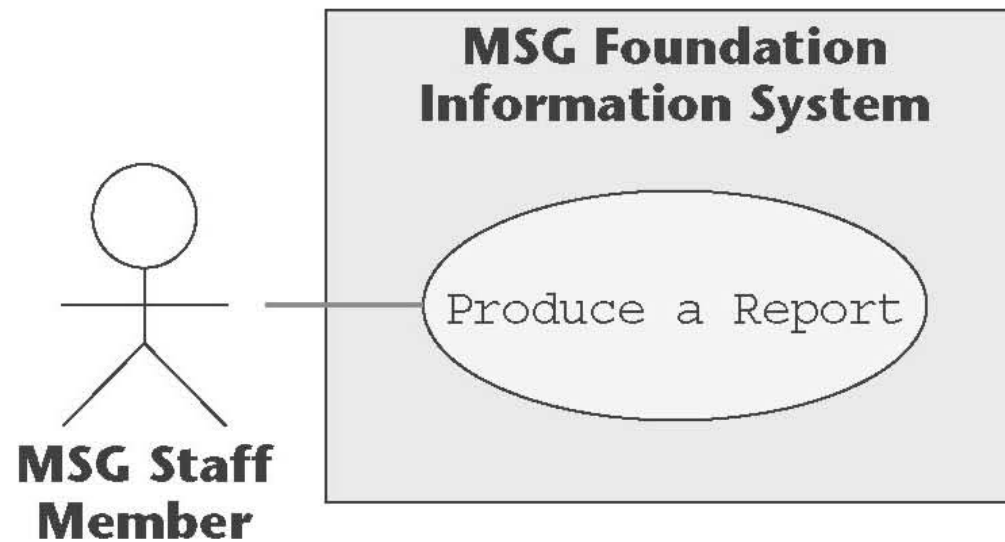


Figure 10.35

# Produce a Report Use Case (contd)

Slide 10..96

## Brief Description

The `Produce a Report` use case enables an MSG Foundation staff member to print the results of the weekly computation of funds available for new mortgages or to print a listing of all investments or all mortgages.

## Step-by-Step Description

1. The following reports must be generated:
  - 1.1 Investments report—printed on demand:

The information system prints a list of all investments. For each investment, the following attributes are printed:

    - Item number
    - Item name
    - Estimated annual return
    - Date estimated annual return was last updated
  - 1.2 Mortgages report—printed on demand:

The information system prints a list of all mortgages. For each mortgage, the following attributes are printed:

    - Account number
    - Name of mortgagee
    - Original price of home
    - Date mortgage was issued
    - Principal and interest payment
    - Current combined gross weekly income
    - Date current combined gross weekly income was last updated
    - Annual real-estate tax
    - Date annual real-estate tax was last updated
    - Annual homeowner's insurance premium
    - Date annual homeowner's insurance premium was last updated
  - 1.3 Results of the weekly computation—printed each week:

The information system prints the total amount available for new mortgages during the current week

Figure 10.36



# Fifth Iteration of the Revised Use-Case Diagram

Slide 10..97

- The new use case, Produce a Report, is shaded

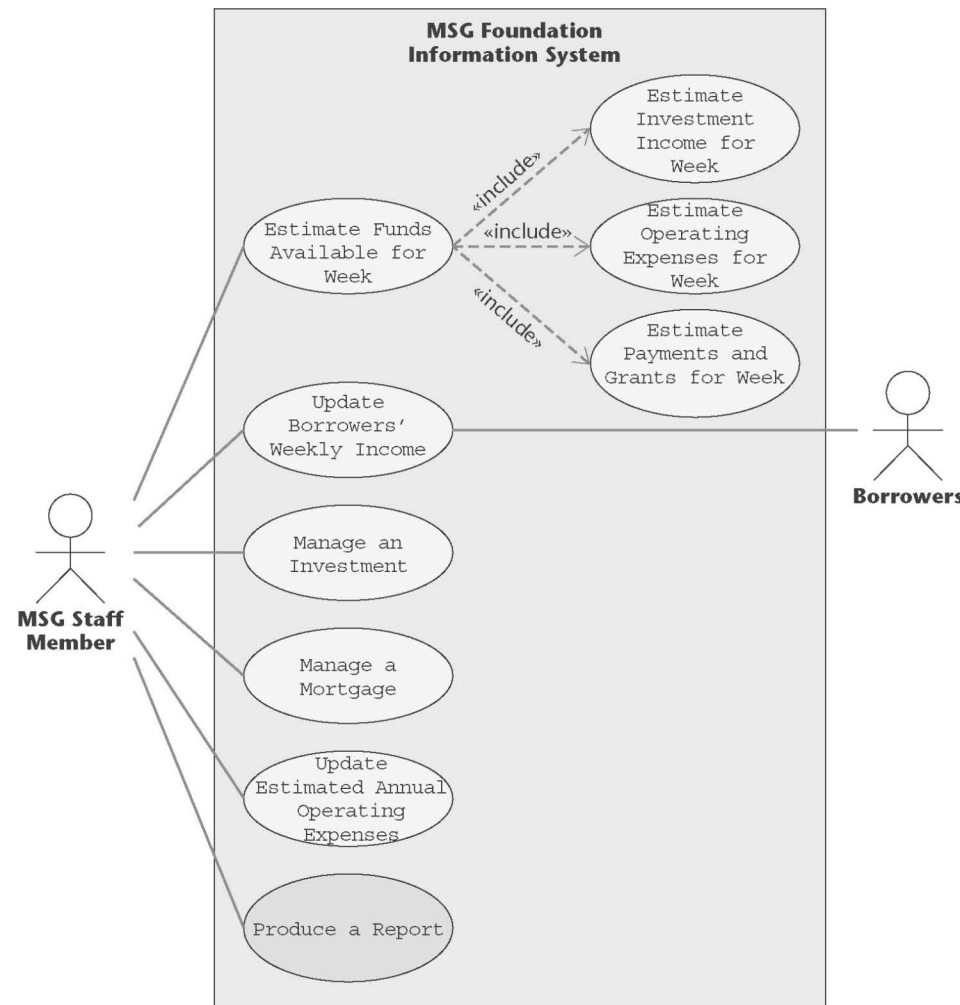


Figure 10.37