8

Advanced Interaction Modeling

8.1 Here are answers for an electronic gasoline pump.

a. Figure A8.1 shows a use case diagram.

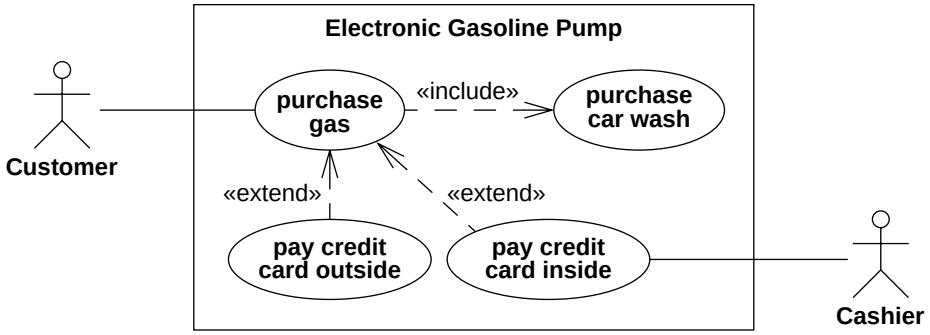

Figure A8.1 Use case diagram for an electronic gasoline pump

b. There are two actors:

- **Customer**. A person who initiates the purchase of gas.
- **Cashier**. A person who handles manual credit card payments and monitors the sale of gas.

c. There are four use cases:

- **Purchase gas**. Obtain gas from the electronic gas pump and pay for it with cash.
- **Purchase car wash**. A customer also decides to purchase a car wash and pays for it with cash.
- **Pay credit card outside**. Instead of cash, pay for the gas and optional car wash with a credit card that is directly handled by the gas system.
- **Pay credit card inside**. Instead of cash, pay for the gas and optional car wash with a credit card that is manually handled by the cashier.

8.2 Figure A8.2 shows a use case diagram for an online travel agent.

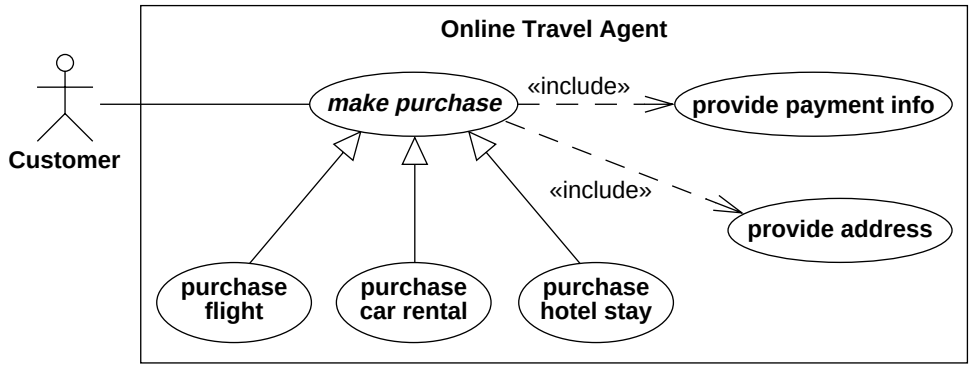

Figure A8.2 Use case diagram for an online travel agent

8.3 Figure A8.3 shows a use case diagram for the online frequent flyer program. Finding a free flight is the same as finding a paid flight, except seats are limited for free flights (hence the *extend* relationship). When submitting a claim for missing credits, a user must first view their existing credits (hence the *include* relationship).

8.4 Figure A8.4 shows a use case diagram for the electronic music management software. We chose to make the CD an actor, because it is an external entity apart from the electronic music software.

8.5 Figure A8.5 shows a use case diagram for a simple payroll system.

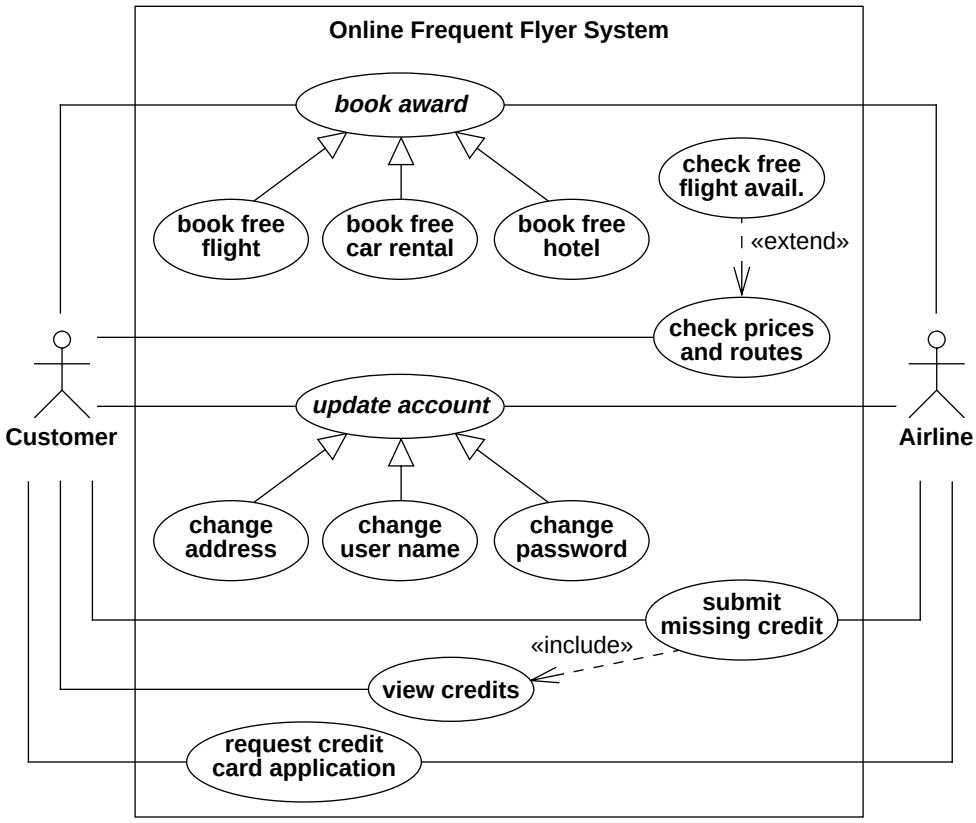

Figure A8.3 Use case diagram for an online frequent flyer program

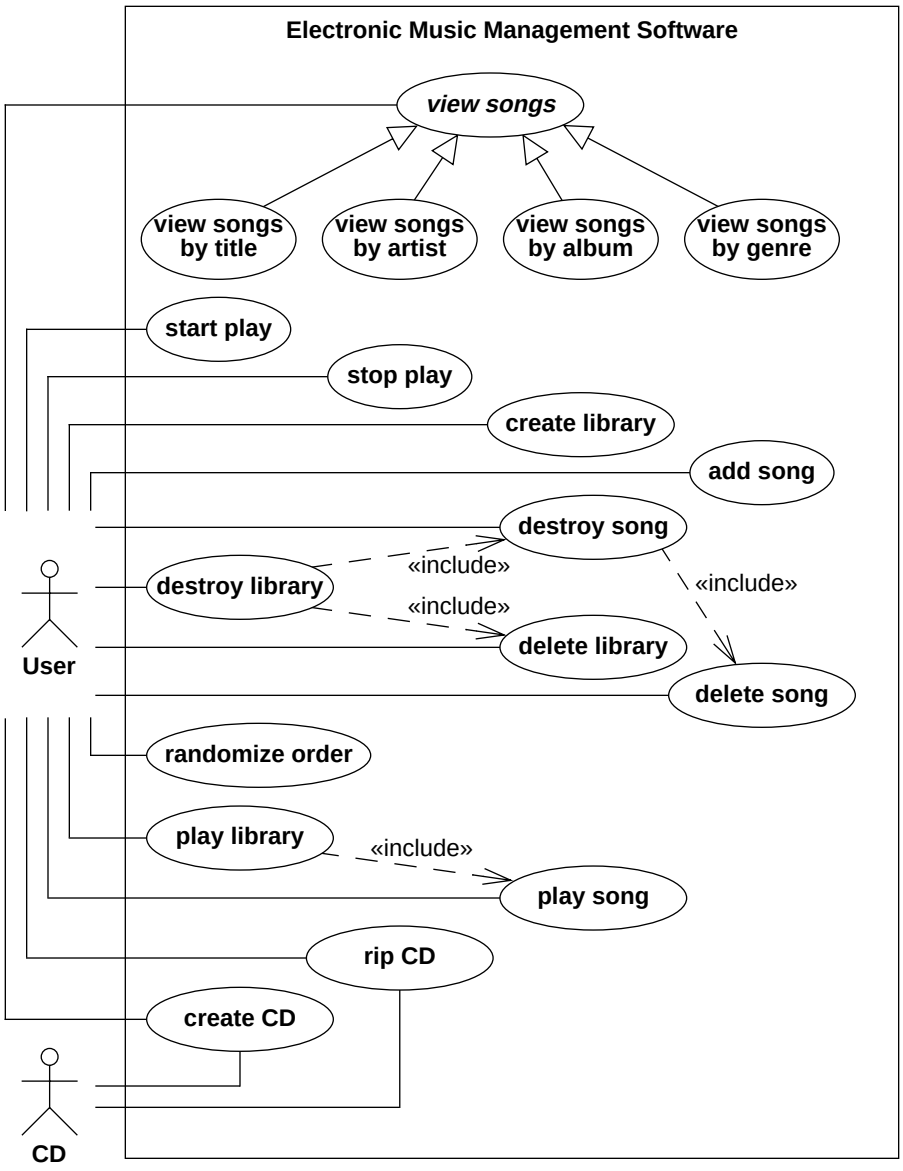

Figure A8.4 Use case diagram for electronic music management software

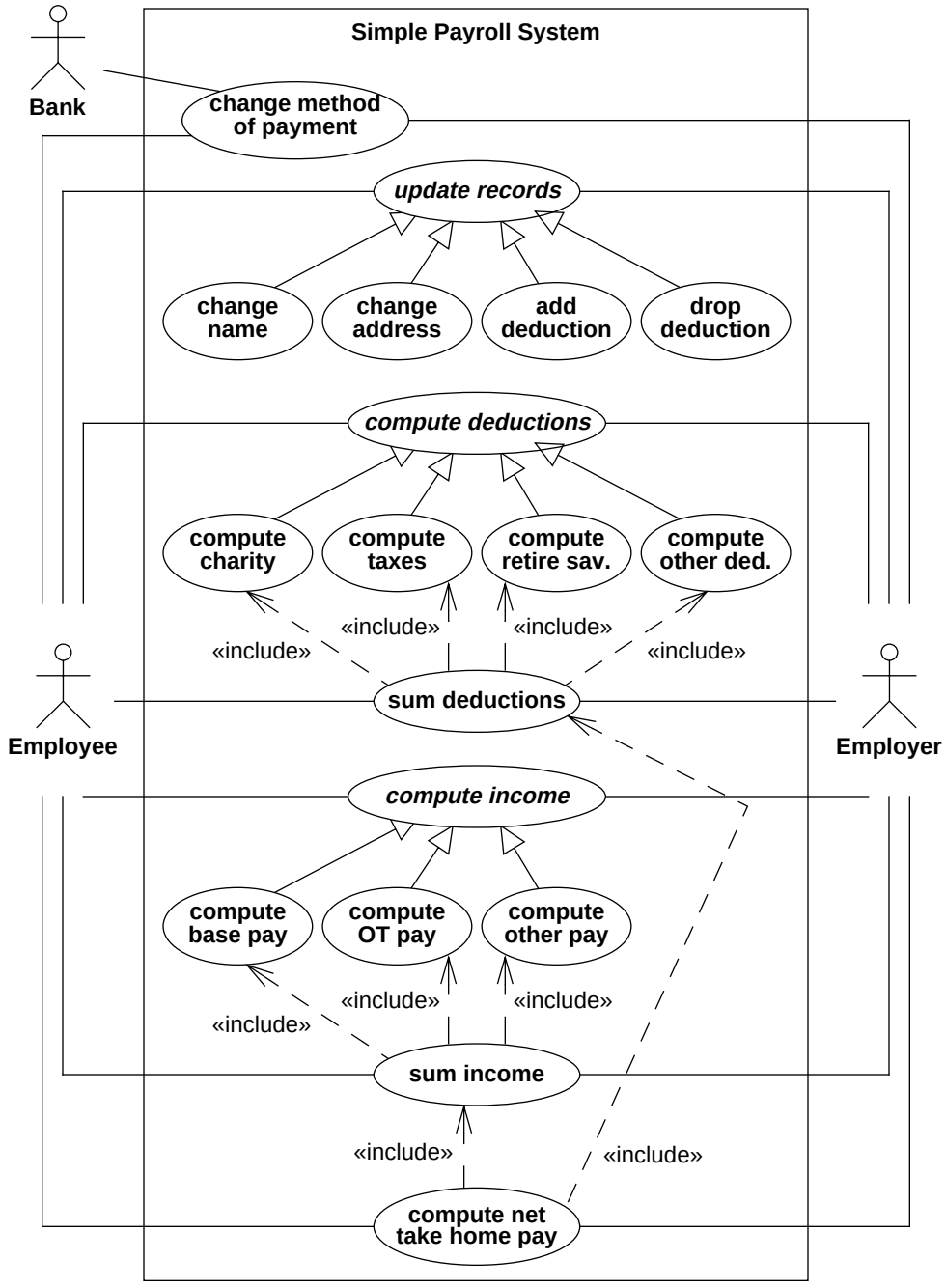

Figure A8.5 Use case diagram for a simple payroll system

8.6 Figure A8.6 computes the contents of a portfolio of stocks.

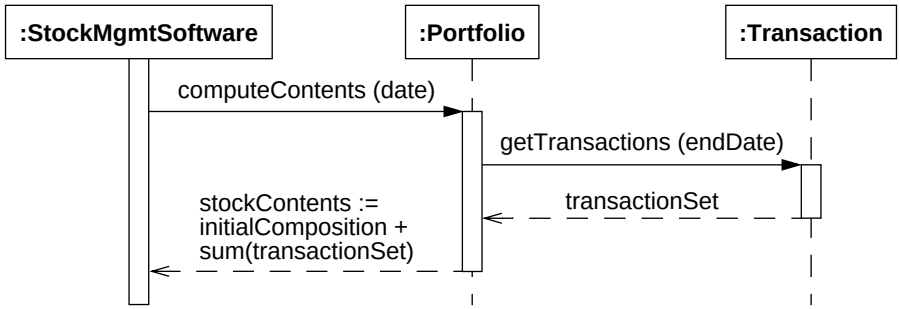

Figure A8.6 Sequence diagram for computing the contents of a portfolio of stocks

8.7 Figure A8.7 computes the value of a stock portfolio on a specified date.

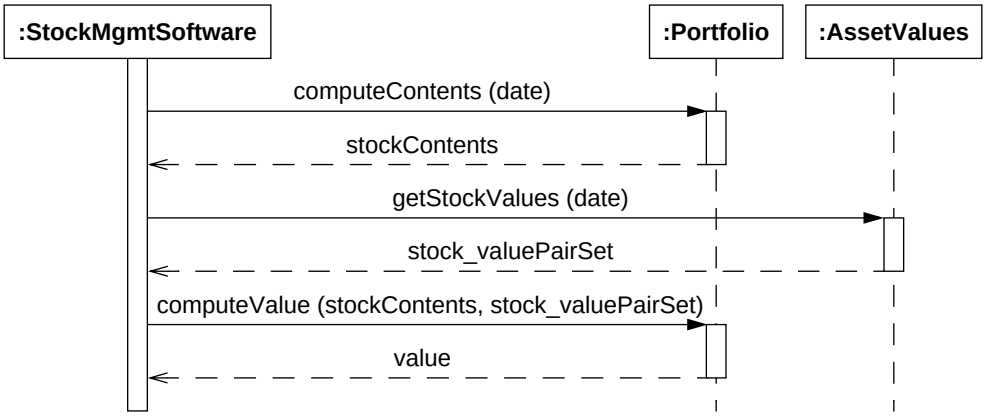

Figure A8.7 Sequence diagram for computing the value of a portfolio of stocks

8.8 Figure A8.8 compute the values of a recursive stock portfolio that is limited to three levels deep.

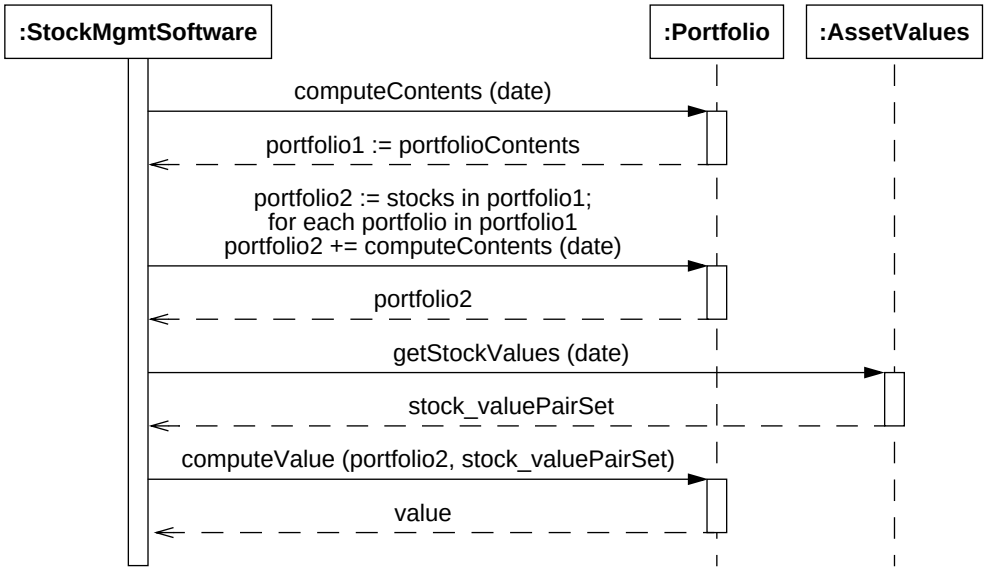

Figure A8.8 Sequence diagram for computing the value of a recursive portfolio

8.9 Figure A8.9 shows the various activities and interactions for a DVD purchase.

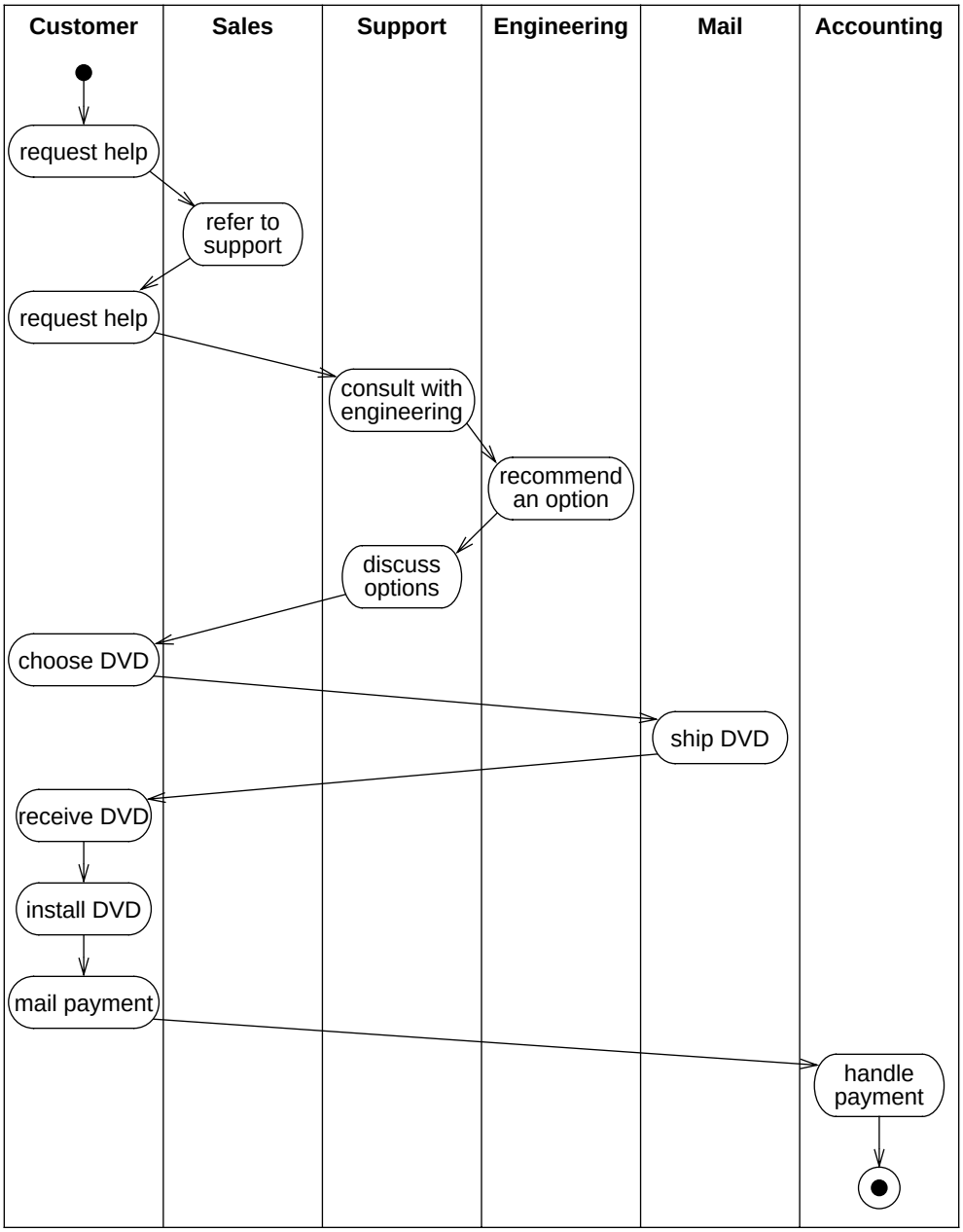

Figure A8.9 Activity diagram for a DVD purchase

8.10 Figure A8.10 shows an activity diagram for the creation of a product.

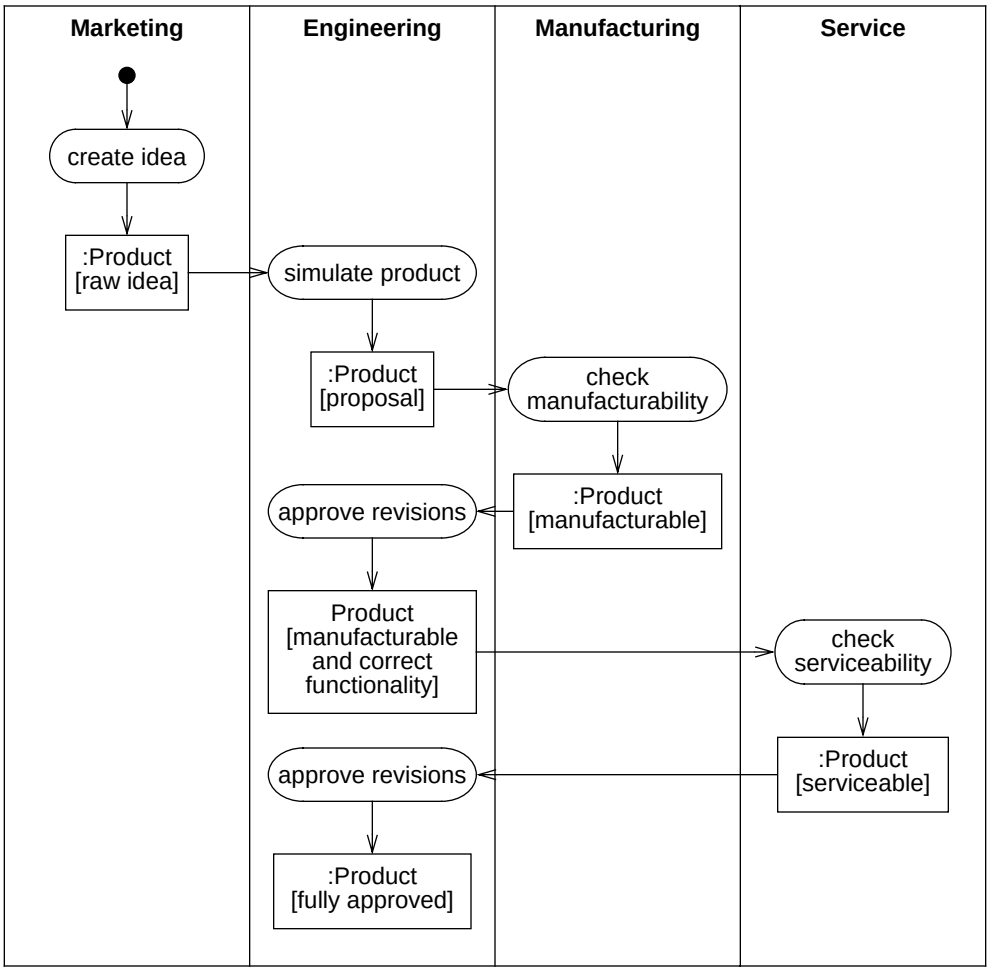

Figure A8.10 Activity diagram for the creation of a product