```python
class Product:
    def __init__(self, name, price, stock):
        self.name = name
        self.price = price
        self.stock = stock

    def update_stock(self, quantity):
        self.stock += quantity

    def __str__(self):
        return f"Product: {self.name}, Price: ${self.price:.2f}, Stock: {self.stock}"


def main():
    products = {}

    while True:
        print("\nProduct Management System")
        print("1. Add Product")
        print("2. Update Stock")
        print("3. View Product Details")
        print("4. Exit")
        choice = input("Enter your choice: ")

        if choice == "1":
            name = input("Enter product name: ")
            price = float(input("Enter product price: "))
            stock = int(input("Enter stock quantity: "))
            products[name] = Product(name, price, stock)
            print("Product added successfully!")

        elif choice == "2":
            name = input("Enter product name: ")
            if name in products:
                quantity = int(input("Enter quantity to add/remove (negative to remove): "))
                products[name].update_stock(quantity)
                print("Stock updated successfully!")
            else:
                print("Product not found!")

        elif choice == "3":
            name = input("Enter product name: ")
            if name in products:
                print(products[name])
            else:
                print("Product not found!")

        elif choice == "4":
            print("Exiting the system.  Goodbye!")
            break
        else:
            print("Invalid choice. Please try again.")


if __name__ == "__main__":
    main()
```

```
Product Management System
1. Add Product
2. Update Stock
3. View Product Details
4. Exit
Enter your choice: 1
Enter product name: potato
Enter product price: 20
Enter stock quantity: 4
Product added successfully!

Product Management System
1. Add Product
2. Update Stock
3. View Product Details
4. Exit
Enter your choice: 3
Enter product name: potato
```

```
Product: potato, Price: $20.00, Stock: 4

Product Management System
1. Add Product
2. Update Stock
3. View Product Details
4. Exit
Enter your choice: 2
Enter product name: potato
Enter quantity to add/remove (negative to remove): -1
Stock updated successfully!

Product Management System
1. Add Product
2. Update Stock
3. View Product Details
4. Exit
Enter your choice: 3
Enter product name: potato
Product: potato, Price: $20.00, Stock: 3

Product Management System
1. Add Product
2. Update Stock
3. View Product Details
4. Exit
Enter your choice: 4
Exiting the system.  Goodbye!
```