

# TRAMP: Traveling Repair and Maintenance Platform

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## TRAMP

### RAD Presentation

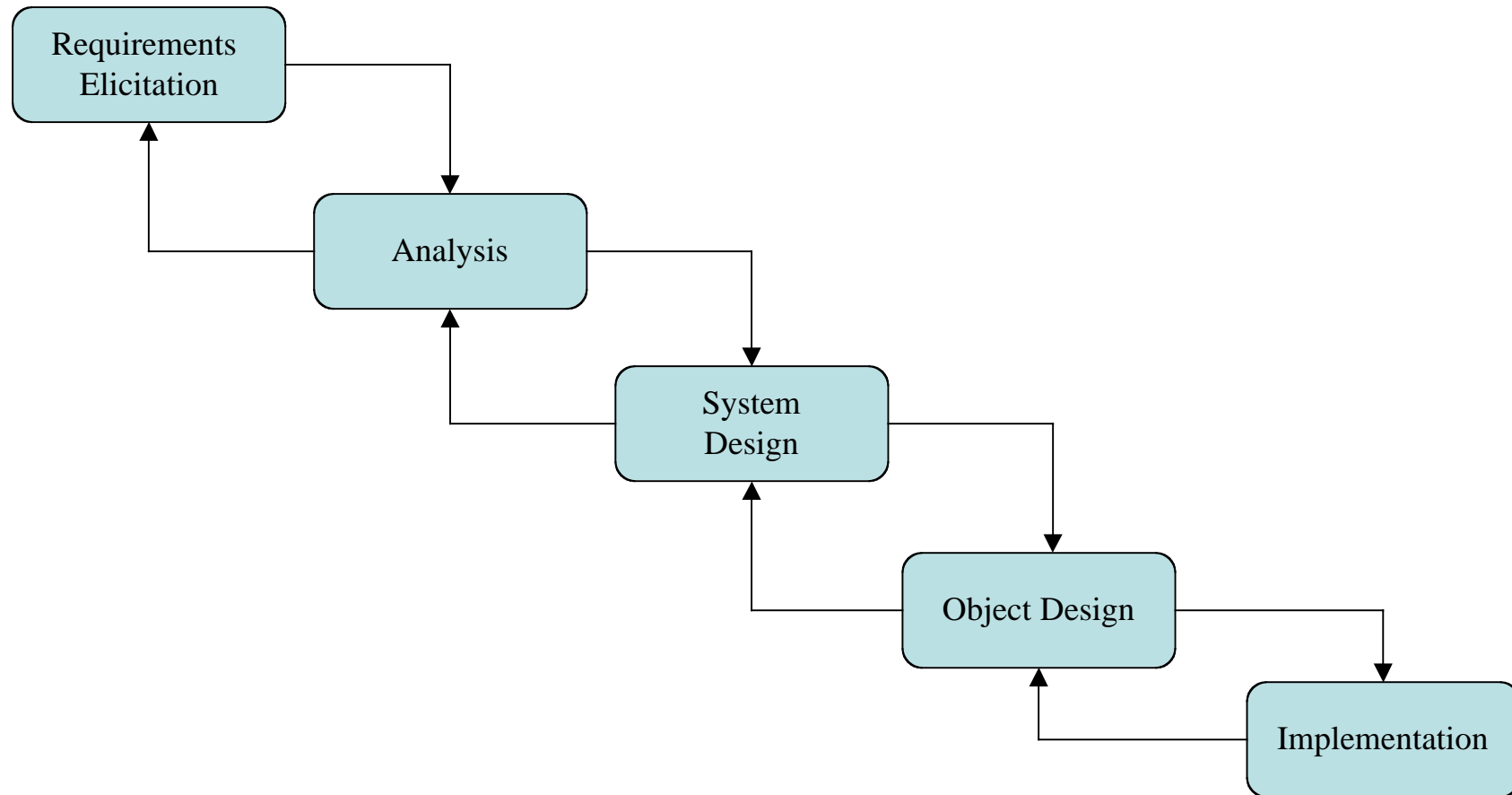
Martin Winter & Martin Groher

November 26th 2001

## Presentation Outline

- Introduction
- RAD in General
- Hardware Mock-Up
- RAD in Detail
- UI Mock-Up

## Software Life Cycle



# TRAMP: Traveling Repair and Maintenance Platform

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## What is a RAD?

### Requirements elicitation:

finding features the system must provide and constraints it has to satisfy

### Requirements analysis:

formalization of system specification by developers

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=> Requirements Analysis Document

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## Introduction

### Purpose of the System:

TRAMP investigates the use of augmented reality, wearable and mobile computers for the maintenance of cars

### Goals:

- overall goals
- secondary goals

## Problem Statement

- Mass customization and new technologies evolve maintenance problems
- TRAMP solves these problems by using sophisticated hardware and software technologies

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# TRAMP: Traveling Repair and Maintenance Platform

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## User Tasks

- Perform maintenance at dealership:
  - Customer requests maintenance
  - Mechanic receives diagnostic information automatically
  - Mechanic performs maintenance with TRAMP's help
  
- Repair car on roadside



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## Actors

John the Customer

Toni the Customer Representative

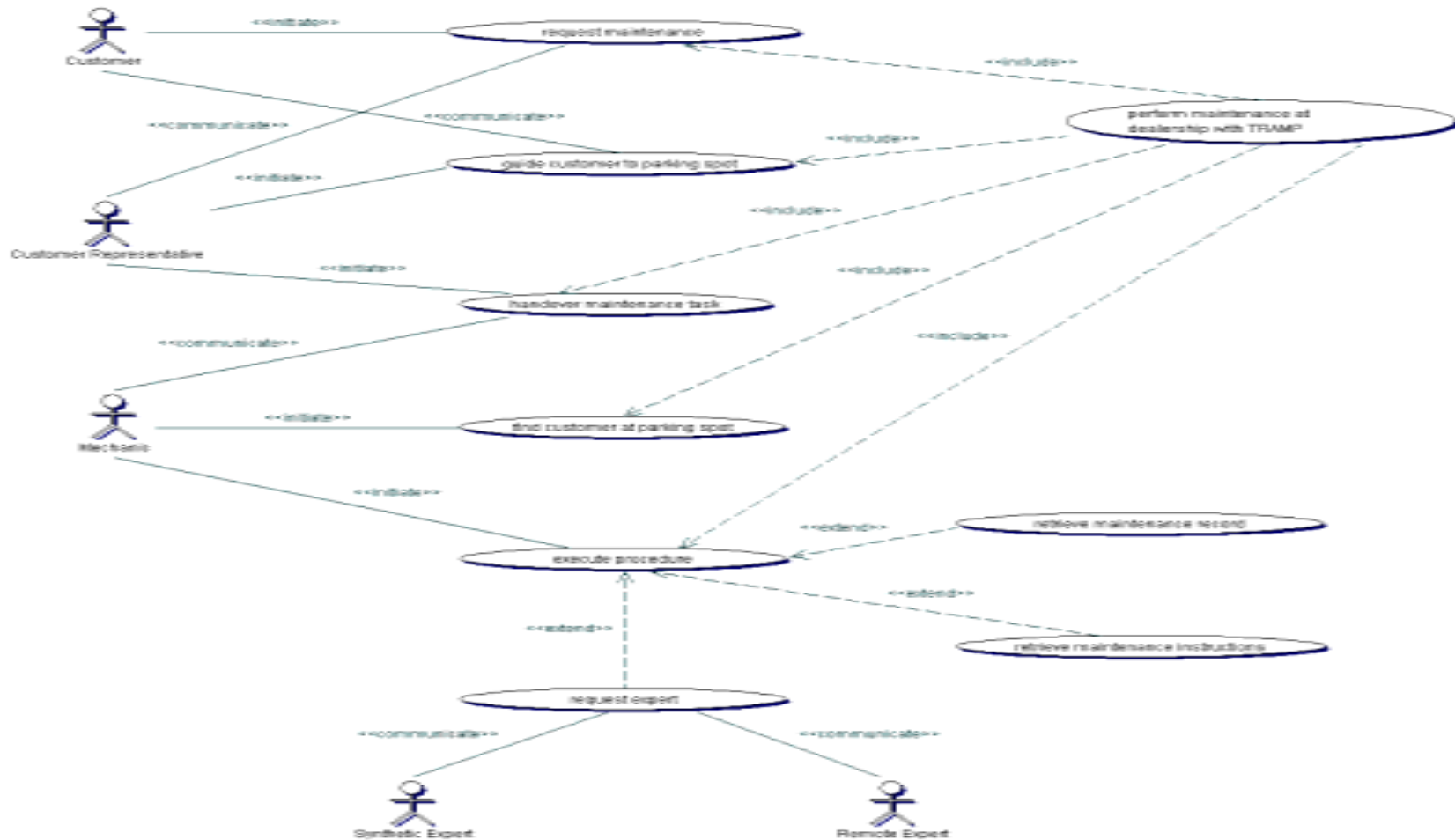
Magical Manfred – the Mechanic

Dr Best the Remote Expert

SPOT the Synthetic Expert

# TRAMP: Traveling Repair and Maintenance Platform

## Use Case Overview



# TRAMP: Traveling Repair and Maintenance Platform

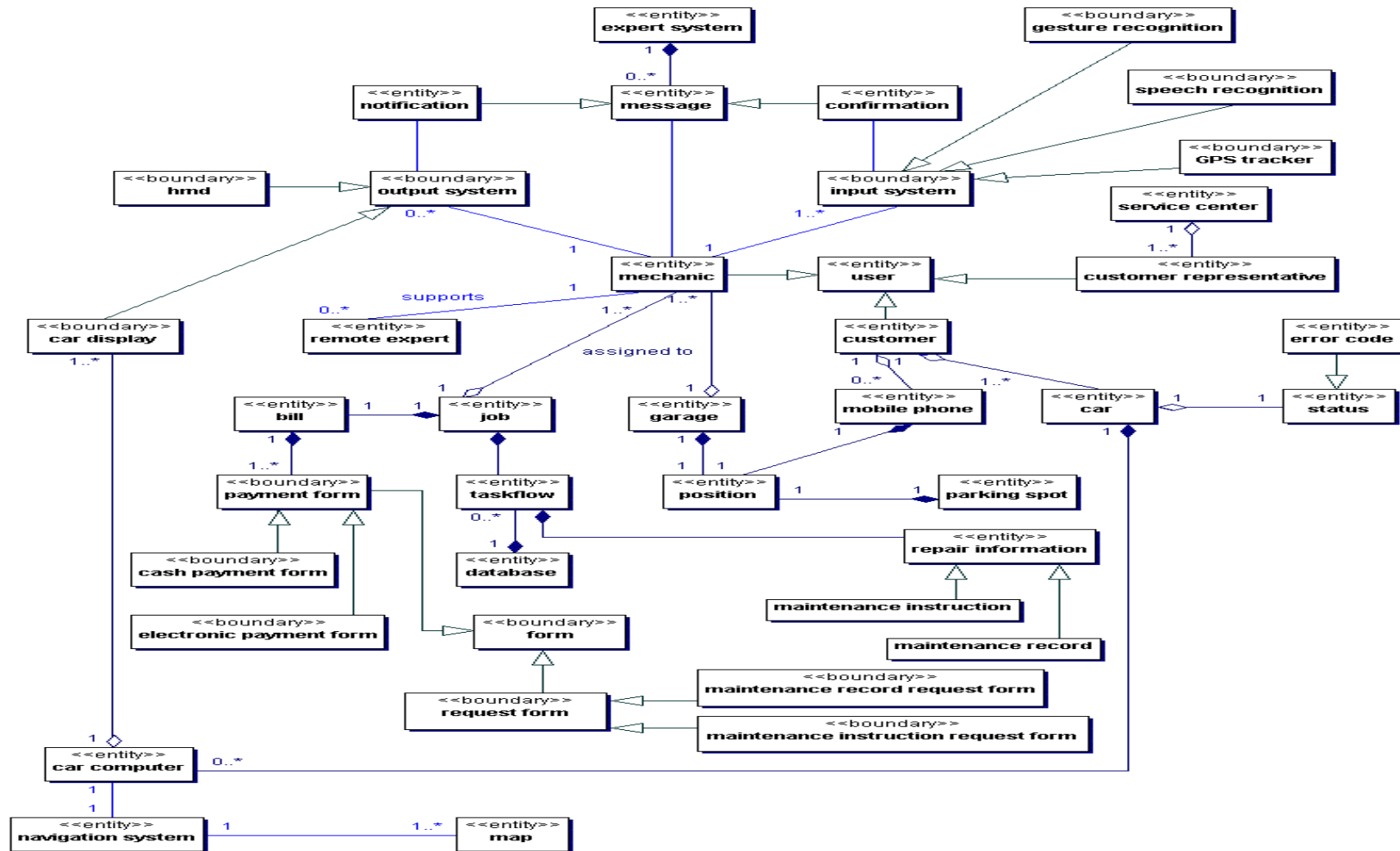
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## List of Services

- |                              |  |   |
|------------------------------|--|---|
| 1. Assign Parking Spot       | 18. Get User Position                          | 31. Receive Maintenance Instruction Form  |
| 2. Close Taskflow            | 19. Initiate Calibration                       | 32. Receive Maintenance Record Form       |
| 3. Deliver Remote Expert     | 20. Initiate Job                               | 33. Receive Remote Expert Request         |
| 4. Detect Marker             | 21. Initiate Job Assignment                    | 34. Register a customer                   |
| 5. Display Calibration       | 22. Initiate Taskflow                          | 35. Send Cash Payment Form                |
| 6. Display Taskflow          | 23. Log-in SPOT for repair-process by mechanic | 36. Send Maintenance Instruction Form     |
| 7. Enlarge Map               | 24. Navigate Mechanic                          | 37. Send Payment Confirmation             |
| 8. Find Shortest Path        | 25. Notify Mechanic                            | 38. Send Retrieve Maintenance Record Form |
| 9. Generate Bill             | 26. Notify Mechanic (to be renamed...)         | 39. Transfer Information Package          |
| 10. Get Calibration Input    | 27. Query Backend Database                     | 40. Transfer Navigation Information       |
| 11. Get Car History          | 28. Receive Car Status                         | 41. Transfer Requested Technical Data     |
| 12. Get Job Confirmation     | 29. Receive Cash Payment Notification          |   |
| 13. Get Payment Confirmation | 30. Receive Credit Card Data                   |   |
| 14. Get Repair Information   |  |   |
| 15. Update Car History       |  |   |
| 16. Validate Payment Data    |  |   |
| 17. send E-payment form      |  |   |

# TRAMP: Traveling Repair and Maintenance Platform

## Object Model



## Domain Constraints

- User interfaces and human factors
- Extreme conditions
- Physical environment
- Security issues
- Resource issues

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## Hardware Mock-Up

### ✓ Mounted on Helmet:

- HMD
- GPS- / UMTS – Receiver
- Camera
- Microphone
- Inertial Tracker



### ✓ The Wearable Computer:

- Billing System
- Wearable
- Wheelmouse



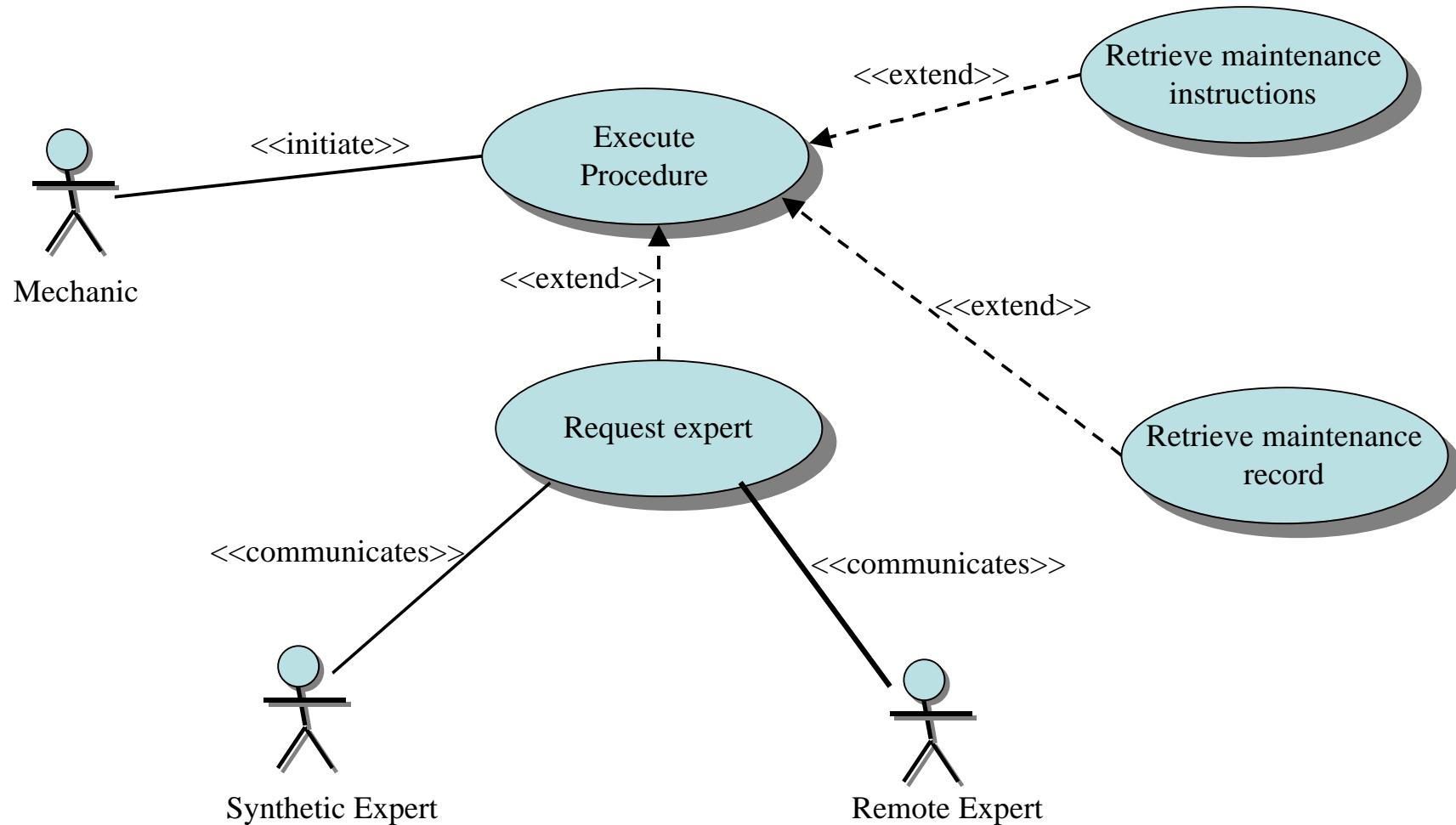
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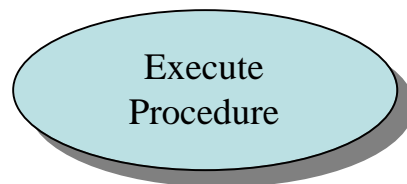


# TRAMP: Traveling Repair and Maintenance Platform

## A Use Case in Detail



## The associated Services



Initiate Taskflow

Receive Remote Expert Request

Retrieve Requested Technical Data

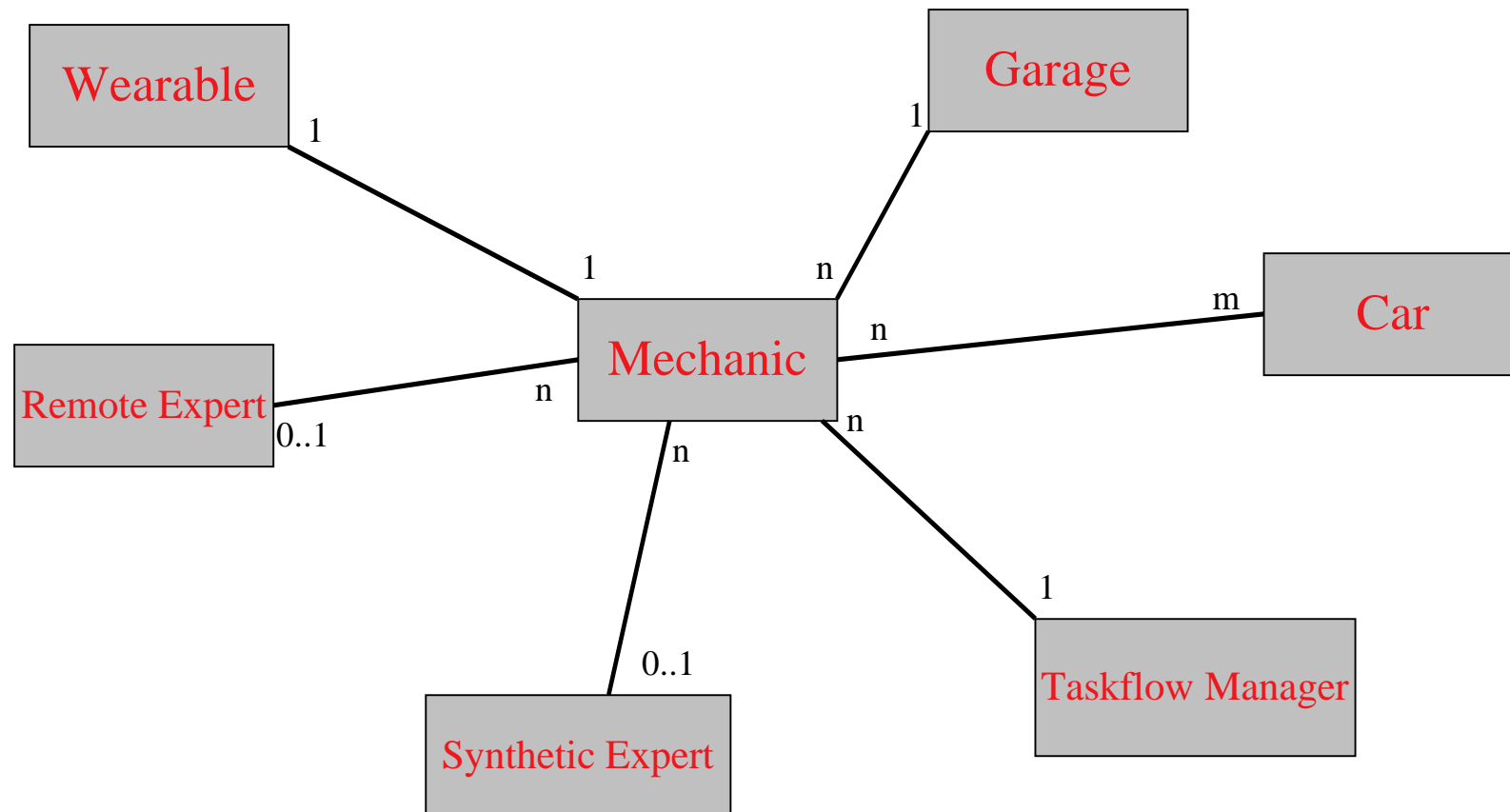
Deliver Remote Expert

Close Taskflow

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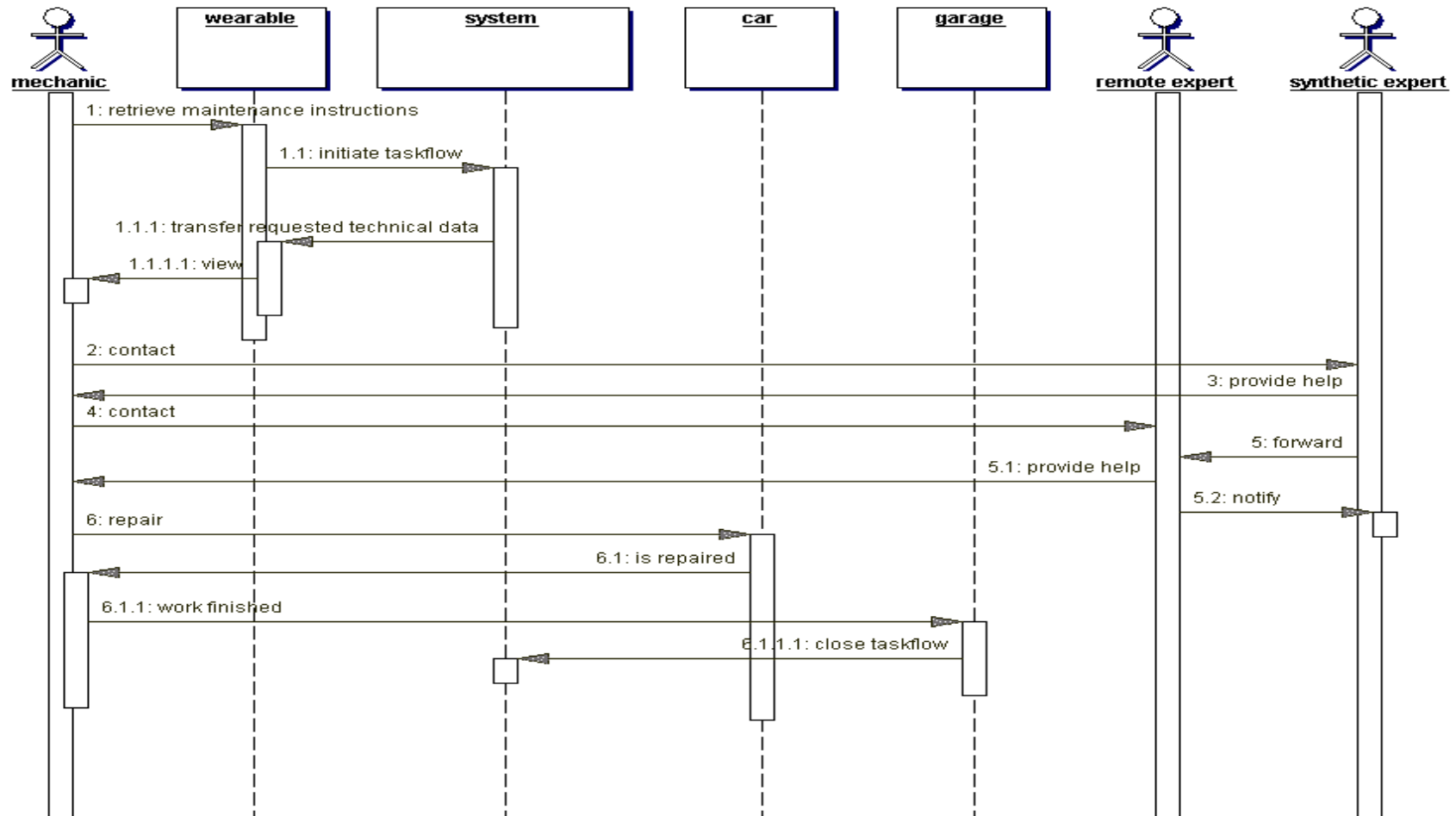
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## The corresponding Object Model



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## The Sequence Diagram



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## UI Mock-Up

