



## 3. Detailed Process Analysis

### 3.1 Customer Process

The customer journey has been enhanced with specific operational details and user interface interactions.

#### Key Operational Elements:

- **Start Event:** Customer initiates the repair request process
- **User Task:** "Pay initial costs" - Interface for submitting payment information
- **User Task:** "Bring vehicle to repair shop" - Scheduling interface for drop-off
- **User Task:** "Approve or deny the repair quote" - Decision interface with cost breakdown
- **User Task:** "Receive and examine quote" - Detailed quote review interface
- **User Task:** "Receive and review invoice" - Final invoice review interface
- **User Task:** "Collect vehicle and process payment" - Checkout and final payment interface
- **End Event:** "Customer leaves with vehicle" - Process completion

#### User Form: Vehicle Issue Submission

The process begins with a customer form for submitting vehicle issue details:

This form captures essential information including:

- Vehicle make and model
- Description of the issue
- Customer contact information
- Preferred service date

The form incorporates input validation to ensure all required fields are completed properly before submission, enhancing data quality and process efficiency (Freund and Rücker, 2019).

### 3.2 Receptionist Process

The receptionist process has been enhanced with specific operational tasks and system integrations.

#### Key Operational Elements:

- **Service Task:** "Calculate membership discounts if applicable" - Automated calculation based on customer database
- **User Task:** "Gather info about customer and vehicle needs" - Customer intake interface
- **Service Task:** "Inform customer of initial cost" - Automated notification system
- **User Task:** "Ask customer if towing is needed to the shop" - Decision capture interface
- **Service Task:** "Send car details to the team" - Automated work order generation

- **User Task:** "Receive customer payment and finalize work" - Payment processing interface

### **User Form: Towing Request**

When towing is needed, the receptionist uses a specialized form

This form captures:

- Vehicle location details
- Customer availability for vehicle handover
- Special handling instructions
- Towing priority (standard/urgent)

The system automatically routes this information to the towing service through an integrated API, eliminating manual communication delays (Freund and Rücker, 2019).

## **3.3 Mechanics Process**

The mechanics' process has been enhanced with detailed operational tasks and quality control gates.

### **Key Operational Elements:**

- **User Task:** "Perform initial diagnostics" - Diagnostic findings capture interface
- **User Task:** "Identify exact cost of repairs" - Cost estimation interface with parts database integration
- **User Task:** "Perform repairs" - Repair documentation interface
- **Gateway:** "Tests passed?" - Quality control decision point
- **User Task:** "Apply quality assurance completed sticker" - Final approval interface

### **User Form: Diagnostic Findings**

The mechanics use a comprehensive diagnostics form

This form includes:

- Diagnostic test results (with attachable images)
- Parts needed for repair (with automated inventory checking)
- Estimated labor hours
- Repair priority classification

The system automatically calculates cost estimates based on parts prices from the inventory database and standard labor rates, ensuring accuracy and consistency (Camunda, 2021).

## **4. System Integration Points**

The operational model incorporates several system integration points that enable automation:

## **4.1 Customer Database Integration**

The receptionist's "Calculate membership discounts if applicable" service task queries the customer database to verify membership status and automatically applies relevant discounts. This integration eliminates manual lookup and calculation errors.

## **4.2 Inventory Management System**

The mechanics' "Identify exact cost of repairs" task integrates with the parts inventory system to:

- Check part availability
- Retrieve current pricing
- Reserve parts for the repair
- Trigger reordering for low-stock items

This integration ensures accurate quotations and prevents delays due to parts availability issues (Camunda, 2021).

## **4.3 Payment Processing System**

The customer's "Pay initial costs" and "Collect vehicle and process payment" tasks integrate with a secure payment processing system that:

- Validates payment methods
- Processes transactions
- Issues digital receipts
- Updates the accounting system

This integration streamlines the financial aspects of the repair process, reducing administrative overhead and improving cash flow management (von Rosing et al., 2014).

## **4.4 Notification System**

Automated notifications are triggered at key points in the process:

- When the initial quote is ready for customer review
- When repair work begins
- When repairs are completed
- When the vehicle is ready for collection

These notifications can be delivered via email, SMS, or mobile app notifications based on customer preferences, enhancing the customer experience through proactive communication (Freund and Rücker, 2019).

# **5. Data Validation and Reusability Features**

## **5.1 Data Validation**

All user input forms incorporate comprehensive validation to ensure data integrity:

- Required field validation prevents form submission with missing information
- Format validation ensures phone numbers, email addresses, and vehicle identification numbers conform to expected patterns
- Logical validation checks for inconsistencies (e.g., appointment dates in the past)
- Regular Expressions

These validation mechanisms prevent process errors and exceptions due to bad data, improving overall process reliability (Silver, 2011).

## **5.2 Reusability Features**

Several components of the process have been designed for reusability:

### **5.2.1 Form Templates**

Standardized form templates are used for common data capture scenarios, ensuring consistent user experience and data collection. These templates can be reused across different service types while maintaining branding and usability standards.

### **5.2.2 Sub-processes**

Common recurrent activities can be encapsulated as reusable sub-processes. We demonstrated this functionality with our Calendly booking link send message and service task. Sub-processes can be maintained centrally and reused across multiple business processes, ensuring consistency and reducing maintenance overhead (Camunda, 2021).

## **6. Process Efficiency Improvements**

The operational model introduces several efficiency improvements over the strategic model:

### **6.1 Automated Decision Points**

Several decision points have been automated based on business rules:

- Discount application based on membership status
- Towing requirement assessment based on vehicle condition
- Quality assurance routing based on test results

These automated decisions reduce manual intervention, speed up processing, and ensure consistent application of business policies (von Rosing et al., 2014).

## **7. Conclusion**

The operational BPMN model provides a detailed, implementation-ready representation of the car repair shop process. By incorporating user interface designs, system integration points, and automated components, the model bridges the gap between business process design and technical implementation.

## References

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Freund, J. and Rücker, B. (2019) *Real-Life BPMN: Using BPMN 2.0 to Analyze, Improve, and Automate Processes in Your Company*. 4th edn. Self-published.

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APPENDIX A – FORMS Pt I

1\_CustomerOnboarding

Group 4's Repair Center

☐ Please tick this box if the vehicle has broken down, and requires towing.

Full Name\*

Email\*

Please enter the vehicle make\*

Please enter the vehicle model\*

Please enter the location of the vehicle.\*

Please provide a description of the fault/error or work requested.\*

Please enter any other information you think our tow team might need to know.

Membership:

☐ Please check this box if the customer is already signed up to our membership programme.

Membership ID

☐ Please check this box if the customer would like to sign up for membership today.

Submit

2\_ApproveQuote

Customer Quote Approval Form

By checking the box below, you accept that the quote given is our best estimate of the cost of repair, that you understand the final cost to yourself may be different and that you are happy to go ahead with the repair.

Do you wish to receive services for the service rate quoted to you?\*

☐ I give consent for the repair shop to proceed with the repair.

☐ I do NOT give consent for the repair shop to proceed with the repair.

If for whatever reason you would not like to go ahead with our service, we will allow for you to book a vehicle collection appointment.  
Please note your deposit and towing costs are non-refundable.

Submit

3\_RepairCost

Repair Costs Form

Please calculate all labour and parts cost and input them below:

Total costs to customer

£

^  
v

Confirm

## APPENDIX A – FORMS Pt II

### 4\_TestPassing

#### Repair Shop Test Passing Form

☐ I confirm that the vehicle passes all necessary tests

Signed\*

### 5\_VerifySatisfaction

#### Your repair has been completed!

We are confident that you are satisfied with the works we have completed, and ask you to confirm this below:

Are you satisfied with the service you received today?\*

- ☐ I am satisfied with the repair of my vehicle
- ☐ I am not satisfied with the repair and would like a warranty repair performed.

In the unlikely event you are not satisfied with your repair we offer to take the vehicle back in for a follow-up warranty service free-of-charge, as well as waiving our fee on this occasion. Please note your deposit and towing costs are non-refundable.

Submit