BOOK 2

Build. Connect. Deliver.

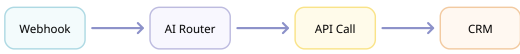
AI AUTOMATION BUILDER

Roman Urdu Intermediate Practical Guide to APIs, Webhooks, n8n, Make.com, CRM, WhatsApp Bots, aur Business Automation Systems

Intermediate Learners Ke Liye

Freelancers - Junior Developers - Automation Builders

Agencies & Small Business Teams



Map Karo. Connect Karo. Automate Karo.

- Real client-level workflows
- APIs aur webhooks practical use
- Make.com aur n8n projects
- CRM, WhatsApp, follow-up systems
- Exercises aur answer keys included

Hamza Ali Khalid

hamzaig.com

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Book ka simple learning flow

Workflow → Webhook → AI Router → API → CRM → Result

Hamza Ali Khalid

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Practical AI automation learning series

PRELIMINARY PAGES

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AI Automation Builder - Book 2: Intermediate Level

Disclaimer

AI tools, APIs, webhook platforms, CRM systems, WhatsApp APIs, aur automation tools time ke saath change ho sakte hain. Real client ya business use se pehle har workflow ko test, review, aur validate zaroor karein.

Author: Hamza Ali Khalid

Website: hamzaig.com

Book Level: Intermediate Practical Guide

DEDICATION

Un logon ke naam

jo AI automation ko sirf prompts tak limited nahin rakhna chahte, balkay real businesses ke liye practical systems build karna chahte hain.

Yeh book un learners ke liye hai jo Book 1 ke baad next step lena chahte hain: workflows ko APIs, webhooks, CRM, WhatsApp bots, aur client-ready automations ke saath connect karna.

About the Author

HK

Hamza Ali Khalid

Software Engineer - AI Automation Learner & Builder

Hamza Ali Khalid backend development, APIs, automation systems, chatbots, aur AI-based software solutions par kaam karte hain. Unka focus practical learning aur real-world implementation par hai, taake readers concepts ko client scenarios mein apply kar sakein.

Practical

Har concept ke saath workflows, examples, aur exercises.

Builder Focused

Simple idea ko working automation system mein convert karna.

Client Ready

Real business use cases ke liye planning, testing, aur delivery.

PRELIMINARY PAGES

About This Book

Book 1 mein aap ne prompts, classification, data extraction, lead capture, email assistant, support bot, aur basic WhatsApp planning seekhi. Book 2 unhi skills ko real client-level automation systems mein convert karegi.

Is book ka focus hai ke aap workflows ko APIs, webhooks, CRM, Make.com, n8n, WhatsApp bots, follow-up systems, aur human handoff ke saath connect karna seekhein.

Maqsad yeh hai ke aap sirf AI se response generate na karwain, balkay AI ko real business action ke saath connect karna seekhein.

Intermediate automation ka basic flow

Customer Message → Webhook → AI Router → API / CRM → Reply → Follow-up

Book ka promise: Is book se aap client-ready intermediate AI automation systems plan, build, test, aur explain karna seekhein ge.

How to Use This Book

Is book ko sirf read karne wali book na samjhein. Isay practical workbook ki tarah use karein. Har chapter mein pehle concept hoga, phir workflow, phir tool/API planning, phir exercise aur answer key.

Recommended learning method

Read → Map Flow → Build → Test → Fix → Deliver

Kya karna hai

- Har workflow ko paper par map karein
- Sample payload aur output define karein
- API response ko samajh kar next action plan karein
- Har automation ka error case bhi test karein

Kya avoid karna hai

- Workflow samjhe bina tool setup karna
- API keys ko insecure jagah rakhna
- Human handoff skip karna
- Testing ke bina client ko deliver karna

Aap Kya Seekhein Ge

Book 2 ke chapters is tarah design kiye gaye hain ke aap beginner prompt-based automation se real client-ready automation systems tak move kar sakein.

01

Workflow Mapping

Client ka manual process automation steps mein convert karna.

02

Webhooks & APIs

Webhook trigger, REST API, HTTP request, aur API response use karna.

03

Make.com & n8n

Intermediate workflows, routers, filters, nodes, aur error handling.

04

CRM & Follow-ups

Lead scoring, pipeline status, reminders, aur sales team notifications.

05

WhatsApp Bot Systems

Message receiving, routing, memory, handoff, aur reply flow planning.

06

Business Projects

Restaurant, e-commerce, clinic, real estate, aur ticketing automations.

Book Structure

Har chapter ki structure consistent rakhi gayi hai taake reader ek idea ko practical system mein convert karna seekhe. Theory short hogi, practical planning aur project work zyada hoga.

Har chapter ka practical pattern

Concept → Workflow → Tool Setup → API / Data → Testing → Answer Key

Is format ki wajah se har topic ko step-by-step samajhna, khud try karna, test karna, aur phir answer key ke saath improve karna asaan ho jata hai.

Target ratio: 10% simple concept + 90% practical workflows, API examples, tool steps, projects, exercises, and answers.

BOOK ROADMAP

Table of Contents

Neechay Book 2 ka intermediate roadmap diya gaya hai. Full chapters mein workflows, webhook examples, API planning, diagrams, exercises, aur answer keys include honge.

BOOK ROADMAP

Table of Contents Continued

BOOK ROADMAP

Table of Contents Continued

Note: Chapter pages final manuscript complete hone ke baad update honge. Abhi yeh preliminary pages A4 print-ready format mein design kiye gaye hain.

CHAPTER 1

Book 1 Se Book 2 Tak Ka Transition

Book 1 mein aap ne AI automation ki foundation seekhi: prompts, classification, data extraction, lead capture, email assistant, support bot, WhatsApp planning, aur basic client service ideas. Ab Book 2 mein hum in basic ideas ko real client-ready systems mein convert karna seekhein ge.

Book 2 ka learning direction

Prompt → Workflow → Webhook → API → CRM / Data → Delivery

Chapter ka goal: Aap samjhein ke beginner automation aur intermediate automation mein farq kya hai, aur client ke liye deliverable system banane ke liye kaun se extra parts zaroori hote hain.

CHAPTER 1

Book 1 Mein Hum Ne Kya Seekha?

Book 1 ka purpose yeh tha ke beginner ko AI automation ki practical foundation mil jaye. Us stage par focus zyada prompts, simple workflows, message classification, aur basic bot planning par tha.

Prompt Thinking

Aap ne seekha ke prompt ko role, task, context, rules, aur output format ke saath kaise design karna hai.

Classification

Customer message se intent, priority, sentiment, aur human handoff decision nikalna seekha.

Data Extraction

Message se name, phone, service, budget, date/time, aur missing fields extract karna seekha.

Beginner Projects

Lead capture assistant, mini support bot, email reply assistant, aur basic WhatsApp planning complete ki.

Important: Book 1 ne aapko AI se useful output lena sikhaya. Book 2 aapko us output ko real workflow action mein use karna sikhayegi.

CHAPTER 1

Book 2 Mein Kya Badalne Wala Hai?

Book 2 mein hum sirf prompt ya reply tak limited nahi rahen ge. Ab hum dekhein ge ke AI ka output business tools, APIs, webhooks, CRM, Google Sheets, WhatsApp bots, aur follow-up systems ke saath kaise connect hota hai.

Book 1 Approach	Book 2 Approach
AI se reply generate karna	AI reply ke saath data save, notification, aur next action run karna
Simple lead extraction	Lead score, CRM status, sales notification, aur follow-up reminder add karna
Basic WhatsApp bot planning	Webhook, AI router, database, human handoff, aur session memory plan karna
Manual testing	Payload testing, API response testing, error handling, aur delivery checklist use karna

Intermediate level par aapka kaam sirf AI se answer lena nahi hota. Aapko poora workflow design karna hota hai jo client ke business process ke saath fit ho.

CHAPTER 1

Simple Automation vs Client-Ready Automation

Simple automation demo ke liye achi hoti hai, lekin client-ready automation mein reliability, data structure, testing, fallback, aur handover zaroori hota hai.

Simple Automation

- Ek prompt se reply ban gaya
- Data manually copy hota hai
- Error case clear nahi hota
- Human handoff missing hota hai
- Client ko maintenance plan nahi milta

Client-Ready Automation

- Clear trigger aur workflow hota hai
- Data sheet/CRM/database mein save hota hai
- API/webhook response handle hota hai
- Human handoff rules defined hote hain
- Testing aur handover document hota hai

Client-ready automation ka core flow

Input → AI Router → Business Action → Save Data → Notify Team → Reply

CHAPTER 1

Intermediate Automation Ke Main Parts

Jab aap real client ke liye automation design karte hain, to system ke har part ka role clear hona chahiye.

1

Trigger

Automation kis event se start hogi? Form submit, WhatsApp message, email receive, ya webhook hit?

2

AI Decision

AI message classify karegi, data extract karegi, aur next action decide karegi.

3

Action Layer

Google Sheet update, CRM create, ticket create, email send, WhatsApp reply, ya API call.

4

Data Storage

Lead, customer, order, appointment, ticket, aur conversation data kahan save hoga?

5

Error Handling

Agar data missing ho, API fail ho, ya AI unsure ho to system kya karega?

CHAPTER 1

Practical Scenario: AC Service Business

Sochiye ek AC repair business ko daily WhatsApp aur website form se leads milti hain. Book 1 level par aap sirf customer ka message classify kar sakte thay. Book 2 level par aap poora lead management workflow design karein ge.

AC service lead workflow

Input Example

"Mera AC cooling nahi kar raha. Johar Town Lahore mein technician bhej sakte hain?"

Expected Output

Service: AC repair
Location: Johar Town
Urgency: medium
Next action: ask phone number

Is example mein AI sirf reply nahi de rahi. AI business action prepare kar rahi hai.

Beginner Mindset Se Builder Mindset Tak

Book 2 mein aapko har automation ko system ki tarah dekhna hai. Iska matlab yeh hai ke aap prompt ke saath business process, tools, data, testing, aur delivery bhi plan karein.

Beginner sochta hai	Builder sochta hai
Prompt kya likhna hai?	Input, output, workflow, aur next action kya honge?
AI ka reply acha hai ya nahi?	Reply ke saath data correctly save ho raha hai ya nahi?
Bot answer de raha hai?	Bot missing fields, angry customer, aur handoff handle kar raha hai?
Client ko demo dikha doon?	Client ko tested workflow, documentation, aur maintenance plan doon?

Builder rule: Har automation ka output measurable hona chahiye: lead saved, ticket created, order confirmed, appointment booked, ya team notified.

CHAPTER 1

Har Project Se Pehle 8 Sawal

Intermediate automation start karne se pehle client ya business process ke baare mein yeh sawal clear karna zaroori hai.

Workflow Questions

- Automation kis trigger se start hogi?
- Customer se pehle kya information milti hai?
- AI ko kya decide karna hai?
- Action kis tool mein perform hoga?

Delivery Questions

- Data kahan save hoga?
- Human handoff kab chahiye?
- Error ya missing data par kya reply hoga?
- Client success ko kaise measure karega?

Quick Practice

Apne kisi ek business idea ke liye upar wale 8 sawalon ke short answers likhein. Example: restaurant, clinic, real estate, online store, ya repair service.

CHAPTER 1

Book 2 Mein Structured Output Ka Role

Book 1 mein JSON output seekhna important tha. Book 2 mein wahi JSON automation tools aur APIs ke liye bridge banega.

Example: customer message ko AI classify aur extract kare, phir woh output CRM entry ya API request body mein use ho.

```
{
  "intent": "service_request",
  "customer_name": null,
  "phone": null,
  "service": "AC repair",
  "location": "Johar Town Lahore",
  "priority": "medium",
  "missing_fields": ["customer_name", "phone"],
  "next_action": "ask_missing_fields",
  "human_handoff": false
}
```

Key idea: JSON output human reading ke liye nahi, system action ke liye hota hai. Isi output se router, filter, API call, CRM field, aur reply generation control hoti hai.

Book 2 Tools Ka Practical Map

Book 2 mein hum tools ko theory ke liye nahi, real workflows ke liye use karein ge.

Make.com

Fast workflows, webhooks, routers, filters, Google Sheets, Gmail, HTTP module.

n8n

Webhook node, IF/Switch nodes, HTTP requests, code node, self-hosted workflow control.

APIs

External systems se data lena ya bhejna: CRM, order status, calendar, ticketing.

CRM / Database

Leads, customers, orders, tickets, appointments, aur conversations ko structured form mein store karna.

Tool connection flow

Webhook → n8n / Make → AI → API → CRM → Response

Exercise 1: Simple Automation Ko Upgrade Karein

Scenario

Ek online store ko customer ka message aata hai: "Mera order abhi tak deliver nahi hua." Book 1 level par bot sirf order number maangta tha.

Task: Is simple automation ko Book 2 level par upgrade karein. Neechay ke points define karein:

- Trigger kya hoga?
- AI ko kya classify karna hai?
- Kaunsa data extract ya ask karna hai?
- Kaunsa tool/API call hogi?
- Data kahan save hoga?
- Human handoff kab hoga?
- Customer ko reply kya milega?

Exercise 2: Missing Parts Identify Karein

Ek bot customer se lead data leta hai lekin Google Sheet update fail ho jati hai. System customer ko success message bhej deta hai. Is workflow mein 3 problems identify karein.

CHAPTER 1

Answer Key: Exercise 1

Possible Solution

- **Trigger:** WhatsApp message ya website chat message receive hona.
- **AI classification:** intent = order_status / delivery_delay.
- **Required data:** order_id, customer phone/email.
- **API call:** order management system se order status check karna.
- **Data storage:** conversation log aur issue status CRM/Sheet mein save karna.
- **Human handoff:** Agar order lost, payment issue, ya angry customer ho.
- **Customer reply:** Pehle order number maangna. Order number milne ke baad real status share karna.

```
Sample next action:
if order_id missing -> ask_order_id
if order_id found -> check_order_status_api
if status delayed -> send_apology_and_eta
if status unknown -> create_support_ticket
```

Answer Key: Exercise 2

Problems

- **False success reply:** Sheet update fail hui, lekin customer ko success message chala gaya. System ko pehle action result verify karna chahiye.
- **Error handling missing:** Google Sheet/API failure ke liye retry ya fallback plan nahi tha.
- **Internal alert missing:** Team ko notify nahi kiya gaya ke lead save nahi hui.

Better Workflow

- AI lead extract kare.
- Google Sheet update kare.
- Agar save successful ho to customer ko confirmation bheje.
- Agar save fail ho to internal alert bheje aur fallback message use kare.
- Failed lead ko retry queue ya manual review list mein add kare.

Professional rule: Customer ko success tabhi batayein jab actual action successfully complete ho chuka ho.

CHAPTER 1

Chapter Recap

Is Chapter Mein Aap Ne Seekha

- Book 1 ne AI output banana sikhaya; Book 2 us output ko real workflow action mein use karna sikhayegi.
- Client-ready automation mein trigger, AI decision, action layer, storage, error handling, aur handoff clear hota hai.
- Intermediate builder prompt ke saath workflow, API, data, testing, aur delivery bhi plan karta hai.
- JSON output Book 2 mein automation tools aur APIs ke liye bridge ka kaam karega.
- Success message tabhi send karna chahiye jab actual action complete ho.

Upgrade Challenge

Apne Book 1 ke kisi ek project ko choose karein: Lead Capture Assistant, Email Reply Assistant, ya Mini Customer Support Bot. Ab us ke liye Book 2 style workflow likhein jisme webhook, data storage, error handling, aur human handoff include ho.

Next Chapter: Real Business Workflow Mapping - ab hum client ke manual process ko automation diagram aur step-by-step workflow mein convert karna seekhein ge.

CHAPTER 2

Real Business Workflow Mapping

Automation build karne se pehle sab se important kaam workflow mapping hai. Agar aap client ka current process samjhe baghair automation bana dein, to system technically chal sakta hai lekin business problem solve nahi karega.

Workflow mapping ka simple flow

Current Process → Pain Points → Automation Steps → Tools & Data → Final Workflow

Chapter ka goal: Aap seekhein ge ke client ke manual process ko clear steps mein kaise todna hai, phir un steps ko automation workflow mein kaise convert karna hai.

CHAPTER 2

Workflow Mapping Kya Hoti Hai?

Workflow mapping ka matlab hai kisi business task ko step-by-step samajhna: kaam kahan se start hota hai, beech mein kaun se decisions hote hain, data kahan jata hai, aur final result kya nikalta hai.

Manual Workflow

Insaan message read karta hai, information note karta hai, reply bhejta hai, team ko batata hai, aur data sheet mein save karta hai.

Automated Workflow

System message receive karta hai, AI intent samajhti hai, data extract hota hai, CRM update hota hai, aur reply automatically draft ya send hota hai.

Simple definition

Workflow mapping yeh clear karti hai ke **input kya hai, process kya hai, decision kya hai, action kya hai, aur output kya hai**.

CHAPTER 2

Har Workflow Ke 5 Basic Parts

Har business workflow ko samajhne ke liye yeh 5 parts use karein. Yeh simple framework har project mein kaam ayega.

5-part workflow model

Input → Process → Decision → Action → Output

Input

Message, form, email, call, ya order. Automation ka starting point.

Process

Data read karna, classify karna, extract karna, ya validate karna.

Decision

AI ya rules decide karte hain: sales, support, complaint, order, appointment?

Action + Output

CRM update, ticket create, team notify, customer reply, ya follow-up schedule.

CHAPTER 2

As-Is aur To-Be Workflow

Client-ready automation mein hamesha do workflows banayein: pehla current manual process, doosra improved automated process.

As-Is Workflow	To-Be Workflow
Abhi client ka process kaise chal raha hai?	Automation ke baad process kaise chalega?
Manual replies, missed leads, late follow-ups	AI routing, saved data, instant reply, scheduled follow-up
Data scattered hota hai: WhatsApp, notebook, Excel	Data structured hota hai: CRM, Google Sheet, database
Owner ko manually team ko batana parta hai	System automatically team ko notification bhejta hai

As-Is workflow problem dikhata hai. To-Be workflow solution dikhata hai. Client ko yeh comparison samjhana bohot useful hota hai.

CHAPTER 2

Workflow Mapping Canvas

Har project ke liye neeche wala canvas fill karein. Is se aapka automation plan clear aur professional ban jata hai.

Field	Answer
Business type	Restaurant / clinic / online store / service business
Workflow name	Lead capture / order taking / support / appointment
Trigger	WhatsApp message, form submission, email, webhook
Required data	Name, phone, service, product, date, address, budget
AI task	Classify intent, extract data, assign priority, generate reply
Business action	Save record, notify team, create ticket, schedule follow-up
Success output	Lead saved, order confirmed, appointment requested, ticket created

CHAPTER 2

Workflow Ko Lanes Mein Sochna

Complex workflows ko easy banane ka best tareeqa yeh hai ke unhein lanes mein divide kar dein. Har lane ka role clear hota hai.

3-lane workflow map

Customer	Message / form / email / WhatsApp
AI Layer	Intent, data extraction, priority, next action
Business Tools	CRM, Google Sheet, calendar, ticket system, notification

Workflow mapping ka goal: har lane ka role clear karna

Customer Lane

Customer kya bhejta hai, kis channel se bhejta hai, aur kya expect karta hai.

System Lane

AI aur automation tools kya read, decide, save, aur send karte hain.

CHAPTER 2

Example 1: Restaurant Order Workflow

Restaurant ka manual workflow aksar WhatsApp messages par depend karta hai. Staff menu bhejta hai, order note karta hai, address leta hai, phir kitchen ko inform karta hai.

Restaurant automated workflow

Menu Request → AI Detects Intent → Collect Order → Ask Address → Notify Kitchen → Confirm Customer

Required Data

- Customer name
- Phone number
- Items and quantity
- Delivery address
- Payment method

Business Actions

- Order Google Sheet mein save
- Kitchen ko notification
- Customer ko confirmation
- Missing address par follow-up

CHAPTER 2

Example 2: Clinic Appointment Workflow

Clinic appointment workflow mein bot ko patient se complete information collect karni hoti hai. Agar data missing ho to appointment confirm nahi karni chahiye.

Clinic appointment flow

Appointment Request → Extract Service → Collect Patient Data → Check Slot → Create Request → Send Confirmation

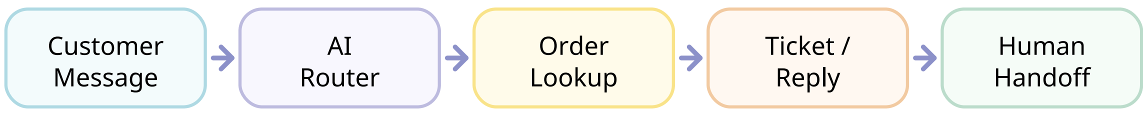
Required Data	Reason
Name and phone	Patient identification aur contact ke liye
Service or doctor	Correct appointment type ke liye
Preferred date/time	Availability check karne ke liye
Urgency	Emergency ya normal appointment decide karne ke liye

CHAPTER 2

Example 3: E-commerce Support Workflow

E-commerce store mein customer messages multiple categories mein aa sakte hain: product inquiry, order status, delivery delay, return/refund, complaint, ya human support.

E-commerce support router



Mapping rule

Agar customer order status poochta hai to order ID required hai. Agar complaint hai to priority assign hogi. Agar refund ya payment issue hai to human handoff likely required hai.

```
{
  "intent": "delivery_delay",
  "required_data": ["order_id"],
  "priority": "medium",
  "next_action": "ask_order_id",
  "human_handoff": false
}
```

CHAPTER 2

Manual Step Ko Automation Step Mein Convert Karna

Automation planning ka practical method yeh hai ke har manual step ke saamne automated replacement likhein.

Manual Step	Automation Step
Staff message read karta hai	Webhook message receive karta hai
Staff customer ka intent guess karta hai	AI intent classifier output generate karta hai
Staff name/phone note karta hai	AI extraction prompt structured JSON deta hai
Staff sheet update karta hai	n8n/Make.com Google Sheet/CRM update karta hai
Staff reply type karta hai	AI reply draft karta hai ya approved template send hota hai

Har manual step automate nahi hota. Kuch steps human approval ke saath rehne chahiye, especially payment issue, refund, complaint, ya sensitive data cases.

CHAPTER 2

Har Cheez Automate Karna Zaroori Nahi

Good automation builder woh nahi jo har task automate kar de. Good builder woh hai jo decide kare ke kaun sa task automate hona chahiye aur kaun sa human ke paas rehna chahiye.

Automate Kar Sakte Hain

- FAQ replies
- Lead data extraction
- Google Sheet/CRM update
- Simple follow-up messages
- Order/appointment data collection

Human Review Chahiye

- Refund approvals
- Angry complaints
- Payment disputes
- Legal/medical sensitive advice
- High-value sales negotiation

Professional rule: Automation ka goal human team ko replace karna nahi, unka repetitive kaam reduce karna hai.

CHAPTER 2

Client Ko Workflow Map Kaise Dikhana Hai?

Client ko technical explanation se zyada simple before/after flow samajh aata hai. Is liye workflow map ko short aur visual rakhein.

1

Problem Statement

Client ka current pain: late replies, missed leads, scattered data, manual follow-up.

2

Current Workflow

Abhi ka process 5-7 simple steps mein explain karein.

3

Proposed Workflow

Automation ke baad ka process visual flow mein dikhayein.

4

Expected Result

Fast response, saved data, fewer missed leads, clear reporting, better follow-up.

```
Client-friendly line:
"Is workflow ke baad har new lead automatically save hogi, team ko notification
milegi, aur customer ko instant reply chala jayega."
```

CHAPTER 2

Exercise 1: Workflow Mapping Canvas Fill Karein

Task

Ek real ya imaginary business choose karein. Neeche diye gaye fields fill karein:

- Business type
- Workflow name
- Trigger
- Required customer data
- AI ka role
- Business action
- Human handoff rule
- Success output

Sample Answer - Real Estate Lead

- **Business type:** Property dealer
- **Workflow:** Buyer lead qualification
- **Trigger:** WhatsApp message
- **Required data:** name, phone, location, property type, budget, buying/renting intent
- **AI role:** extract requirement and assign lead score
- **Business action:** save lead in sheet and notify agent
- **Human handoff:** high budget or urgent buyer
- **Success output:** qualified lead saved and agent notified

Exercise 2: Manual Process Ko Automation Mein Convert Karein

Task

Manual process:

Customer online store ko message karta hai: "Mera order abhi tak nahi aya." Staff order ID mangta hai, order status check karta hai, customer ko reply karta hai, aur delay complaint ko sheet mein note karta hai.

Isay automation workflow mein convert karein.

Answer Key

1. Customer message received through WhatsApp or website chat.
2. AI classifies intent as **order_status / delivery_delay**.
3. AI checks if order ID is present.
4. If missing, bot asks customer for order ID.
5. If order ID present, system calls order API or lookup sheet.
6. System generates reply based on order status.
7. If delayed, complaint row is saved in support sheet.
8. If customer is angry or refund demand exists, human handoff is triggered.

Exercise 3: Workflow JSON Design

Task

Customer message ke liye workflow JSON design karein:

Message: "Assalam o Alaikum, mujhe kal evening dentist appointment chahiye. Fees bhi bata dein."

JSON mein intent, required data, missing fields, next action, and human handoff include karein.

Answer Key

```
{
  "intent": "appointment_booking",
  "service": "dentist",
  "preferred_date": "tomorrow",
  "preferred_time": "evening",
  "pricing_question": true,
  "required_data": ["customer_name", "phone", "service", "preferred_date",
"preferred_time"],
  "missing_fields": ["customer_name", "phone"],
  "next_action": "ask_name_phone_and_share_fee_range",
  "human_handoff": false
}
```

Mini Project: Service Business Workflow Map

Ab aap ek service business ke liye workflow map banayein. Example: AC repair, cleaning service, salon, clinic, real estate, or online store.

Project Requirements

Workflow mein yeh parts zaroor include hon:

- Customer message trigger
- AI intent classification
- Data extraction
- Missing fields handling
- Google Sheet/CRM entry
- Team notification
- Customer reply
- Human handoff rule

Recommended project flow

Message → Classify → Extract → Save → Notify → Reply

Deliverable: Ek one-page workflow map banayein jise aap client ko explain kar sakein.

CHAPTER 2

Chapter Recap

Is chapter mein aap ne seekha:

- Workflow mapping automation se pehle sab se important planning step hai.
- Har workflow ke 5 parts hote hain: input, process, decision, action, output.
- As-Is workflow current problem dikhata hai, To-Be workflow solution dikhata hai.
- Manual steps ko automation steps mein convert karne se clear implementation plan banta hai.
- Har cheez automate nahi karni; risky ya sensitive cases human review mein jane chahiye.
- Client ko simple before/after workflow diagram dikhana professional approach hai.

Upgrade Challenge

Apne workflow map mein ek follow-up step add karein: agar customer 24 hours mein reply na kare to system automatic polite reminder bheje. Is step ka trigger, condition, message, aur data update define karein.

CHAPTER 3

Intent Router aur Multi-Step Automation

Book 1 mein aap ne message classification aur data extraction seekha. Book 2 mein ab hum us classification ko real workflow routing mein use karenge. Intent router automation ka traffic controller hota hai: har message ko correct path par bhejta hai.

Intent router ka high-level flow

Message → Intent Router → Correct Path → Business Action → Reply / Handoff

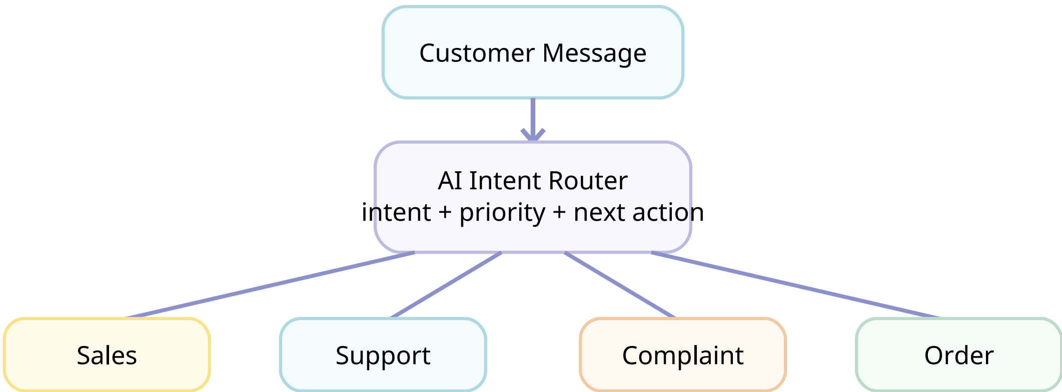
Chapter ka goal: Aap seekhein ge ke ek customer message ko sales, support, complaint, order, appointment ya human handoff flow mein kaise route karna hai.

CHAPTER 3

Intent Router Kya Hota Hai?

Intent router ek AI-based decision layer hoti hai jo customer ke message ko read karke decide karti hai ke is message ke saath system ko kya karna chahiye.

Router message ko correct bucket mein bhejta hai



Simple definition

Intent router ka kaam final answer dena nahi hota. Iska kaam message ko samajh kar correct automation path select karna hota hai.

CHAPTER 3

Router aur Normal Chatbot Mein Difference

Normal chatbot aksar direct reply generate karta hai. Router direct reply se pehle decision karta hai ke is query ko kis process mein bhejna hai.

Normal Chatbot	Intent Router
User ka message read karta hai aur reply likhta hai.	User ka message read karta hai aur next workflow select karta hai.
Mostly conversation-focused hota hai.	Mostly action-focused hota hai.
FAQ ya simple support ke liye useful.	Sales, support, order, CRM, ticket, handoff flows ke liye useful.
Structured output zaroori nahi.	Structured JSON output bohot important.

Important: Client-ready automation mein chatbot ke peeche router hona chahiye, warna har message ko same tareeqe se handle kiya jayega.

CHAPTER 3

Common Business Intents

Har business ke intents different ho sakte hain, lekin beginner/intermediate projects mein kuch common intents repeat hotay hain.

Sales Inquiry

Customer price, package, service details, demo, ya quote pooch raha ho.

Support Question

Customer existing product, service, account, ya general help ke bare mein pooch raha ho.

Complaint

Customer unhappy, angry, refund/payment issue, delay, ya problem report kar raha ho.

Order / Appointment

Customer order place karna, booking karna, ya slot reserve karna chahta ho.

```
Suggested beginner intents:
sales_inquiry, support_question, complaint, order_request, appointment_request,
human_support, unknown
```

CHAPTER 3

Router Output Mein Kya Hona Chahiye?

Intent router ka output clean JSON mein hona chahiye taake Make.com, n8n, ya backend easily next step execute kar sake.


```json
{
  "intent": "sales_inquiry",
  "confidence": "high",
  "priority": "medium",
  "sentiment": "neutral",
  "required_data": ["name", "phone", "service"],
  "missing_fields": ["phone"],
  "next_action": "ask_missing_phone",
  "human_handoff": false
}
```


Machine-friendly

JSON se automation tools ko clear hota hai ke agla module ya node kaun sa run karna hai.

Human-friendly

Priority, sentiment, aur summary human team ko situation quickly samjha dete hain.

CHAPTER 3

Multi-Step Automation Kya Hoti Hai?

Single-step automation mein ek trigger se ek action hota hai. Multi-step automation mein message receive hone ke baad multiple decisions aur actions hote hain.

Multi-step automation flow

Receive Message → Route Intent → Extract Data → Validate Fields → Execute Action → Send Reply

Example

Customer kehta hai: "AC service chahiye kal Model Town mein." System intent detect karega, service aur location extract karega, missing phone number ask karega, lead save karega, aur technician team ko notify karega.

Router Decision Rules

AI router powerful hota hai, lekin usay clear rules dena zaroori hai. Rules ke baghair router inconsistent output de sakta hai.

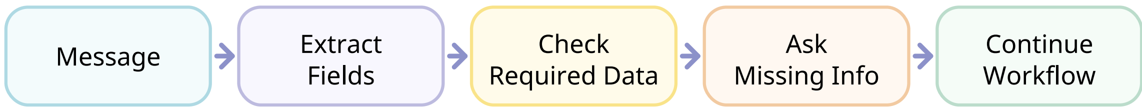
Condition	Router Decision
Customer price, package, demo ya quote poochay	intent = sales_inquiry
Customer existing order/service ka issue poochay	intent = support_question
Customer angry ho, refund/payment/delay complaint kare	intent = complaint, priority = high
Customer human se baat karna chahe	human_handoff = true
Message unclear ho	intent = unknown, next_action = ask_clarifying_question

CHAPTER 3

Missing Data Handling

Intermediate automation mein bot ko sirf intent detect nahi karna. Usay yeh bhi samajhna hai ke kaun si information missing hai.

Missing data flow



Lead Flow Missing Data

- Name missing
- Phone missing
- Service missing
- Location missing

Order Flow Missing Data

- Item missing
- Quantity missing
- Address missing
- Payment method missing

Acha bot incomplete data par fake confirmation nahi deta. Pehle missing information ask karta hai.

Example 1: Service Business Router

Scenario: AC repair business ko WhatsApp par customer messages receive hote hain. Router ko sales, service request, complaint, aur human support distinguish karna hai.

```
Customer Message:
"Bhai AC cooling nahi kar raha, kal technician bhej sakte hain? Model Town Lahore
mein hoon."
```

Router Output

```
{
  "intent": "service_request",
  "confidence": "high",
  "service": "AC repair",
  "location": "Model Town Lahore",
  "preferred_time": "tomorrow",
  "priority": "medium",
  "missing_fields": ["customer_name", "phone"],
  "next_action": "ask_name_and_phone",
  "human_handoff": false
}
```

CHAPTER 3

Example 2: E-commerce Router

E-commerce automation mein router ko order status, product inquiry, refund, return, complaint, aur human support paths clear rakhne chahiye.

```
Customer Message:
"Mera order 3 din se late hai, order ID 9211 hai. Agar nahi aa sakta to refund kar
dein."
```

Router Output

```
{
  "intent": "complaint",
  "sub_intent": "delivery_delay_refund_request",
  "confidence": "high",
  "order_id": "9211",
  "priority": "high",
  "sentiment": "negative",
  "next_action": "check_order_status_and_create_ticket",
  "human_handoff": true
}
```

Why handoff? Refund demand aur negative sentiment dono high-risk signals hain. Bot status check kar sakta hai, lekin refund decision human review mein jana chahiye.

Example 3: Clinic Appointment Router

Clinic appointment flow mein router appointment, fee question, emergency, cancellation, aur human support ko separate kar sakta hai.

```
Customer Message:
"Kal sham dentist ka appointment mil sakta hai? Fees bhi bata dein."
```

Router Output

```
{
  "intent": "appointment_request",
  "service": "dentist",
  "preferred_date": "tomorrow",
  "preferred_time": "evening",
  "pricing_question": true,
  "priority": "medium",
  "missing_fields": ["customer_name", "phone"],
  "next_action": "ask_name_phone_and_share_fee_range",
  "human_handoff": false
}
```

CHAPTER 3

Practical Router Prompt Template

Yeh prompt Make.com, n8n, ya backend mein AI router ke liye use kiya ja sakta hai. Business ke hisaab se intents aur required fields update kar sakte hain.

```
You are an AI intent router for a business automation system.

Your job is to classify the customer message and return ONLY valid JSON.
Do not write explanation outside JSON.

Allowed intents:
- sales_inquiry
- support_question
- service_request
- order_request
- appointment_request
- complaint
- human_support
- unknown

Return this JSON structure:
{
  "intent": "",
  "confidence": "low | medium | high",
  "priority": "low | medium | high",
  "sentiment": "positive | neutral | negative",
  "summary": "short summary",
  "extracted_data": {},
  "missing_fields": [],
  "next_action": "",
  "human_handoff": false
}

Customer message:
{{customer_message}}
```

CHAPTER 3

Router Output Se Workflow Kaise Chalta Hai?

Router ka output final result nahi hota. Yeh next module ya next node ko guide karta hai.

Router Output	Next Workflow Step
intent = sales_inquiry	Lead data extract karo, CRM/save sheet update karo, sales reply send karo.
intent = complaint	Priority assign karo, ticket create karo, team ko notify karo.
intent = appointment_request	Date/time/service collect karo, availability check planning karo.
human_handoff = true	Bot reply short rakhe aur human team ko alert bheje.
missing_fields not empty	Customer se sirf missing data ask karo, repeat questions na poochho.

CHAPTER 3

Multi-Step Workflow Example

Ab ek complete intermediate workflow dekhte hain jahan router, extraction, validation, storage, notification, aur reply sab connected hain.

Lead routing automation

Webhook → AI Router → Extract Lead → Validate Fields → Save CRM → Notify Team → Reply

1. **Webhook**
   Customer message system ko receive hota hai.

2. **AI Router**
   Intent, priority, sentiment, next action decide hota hai.

3. **Business Action**
   Lead save hoti hai, ticket banta hai, ya team notification jata hai.

CHAPTER 3

Common Mistakes

Intent router build karte waqt beginners usually yeh mistakes karte hain.

Too Many Intents

Start mein 30 intents banana confusion create karta hai. Pehle 6-8 strong intents rakhein.

No Unknown Intent

Agar unknown category nahi hogi to AI unclear messages ko wrong path par bhej sakti hai.

No Missing Fields

Router data incomplete hone par bhi action run kar deta hai.

No Handoff Rule

Angry complaints, refunds, payment issues bot ke paas atak jate hain.

Professional rule: Router ko confident na ho to clarify kare, guess na kare.

CHAPTER 3

Exercise 1: Message Intent Classify Karein

Task

In messages ke liye intent, priority, next_action, and human_handoff decide karein:

1. "Price bata dein website chatbot ka."
2. "Mera order abhi tak nahi aya."
3. "Payment kat gayi lekin order confirm nahi hua."
4. "Kal 4 baje appointment available hai?"
5. "Mujhe kisi human se baat karni hai."

Answer Key

Message	Intent / Action
Price bata dein website chatbot ka.	sales_inquiry, priority medium, share package/ask requirements, handoff false
Mera order abhi tak nahi aya.	support_question or delivery_delay, ask order ID, handoff false initially
Payment kat gayi lekin order confirm nahi hua.	complaint, priority high, create ticket, handoff true
Kal 4 baje appointment available hai?	appointment_request, ask name/phone/service, handoff false
Mujhe kisi human se baat karni hai.	human_support, priority medium, notify team, handoff true

CHAPTER 3

Exercise 2: Router JSON Likhein

Task

Customer message ke liye complete router JSON likhein:

"Mujhe DHA Lahore mein 5 marla house chahiye, budget 2 crore tak hai. Agar koi option ho to call kar lena."

Answer Key

```
{
  "intent": "sales_inquiry",
  "confidence": "high",
  "priority": "high",
  "sentiment": "neutral",
  "summary": "Customer is looking for a 5 marla house in DHA Lahore with
budget up to 2 crore.",
  "extracted_data": {
    "location": "DHA Lahore",
    "property_type": "house",
    "size": "5 marla",
    "budget": "2 crore",
    "request_callback": true
  },
  "missing_fields": ["customer_name", "phone"],
  "next_action": "ask_name_and_phone_then_notify_agent",
  "human_handoff": true
}
```

CHAPTER 3

Exercise 3: Multi-Step Flow Design

Task

Ek restaurant ke liye customer message aata hai: "2 zinger burger aur 1 fries chahiye, delivery Model Town." Is ke liye multi-step workflow design karein.

Answer Key

1. Webhook customer message receive kare.
2. AI Router intent = order_request detect kare.
3. Extraction step items, quantity, address extract kare.
4. Required data check kare: customer name, phone, payment method missing hain.
5. Bot missing fields ask kare.
6. Complete data milne ke baad order sheet mein save kare.
7. Restaurant owner/kitchen ko notification bheje.
8. Customer ko order confirmation bheje.

CHAPTER 3

Mini Project: Intent Router Design Karein

Apne selected business ke liye intent router design karein. Business restaurant, clinic, e-commerce, property dealer, salon, ya service company ho sakta hai.

Project Deliverables

- Business name/type
- Allowed intents list
- Required fields per intent
- Human handoff rules
- Router JSON format
- 3 sample customer messages with output

Project flow

Customer Message → AI Router → Intent Path → Required Fields → Action Plan

Goal: Router itna clear ho ke aap usay Make.com, n8n, ya backend mein use kar sakein.

CHAPTER 3

Chapter Recap

Is chapter mein aap ne seekha:

- Intent router automation ka traffic controller hota hai.
- Router direct reply dene ke bajaye correct workflow path select karta hai.
- Router output JSON mein hona chahiye taake automation tools agla step run kar saken.
- Multi-step automation mein routing, extraction, validation, storage, notification, reply, aur handoff steps ho sakte hain.
- Missing fields ko handle karna professional automation ka important part hai.
- High-risk cases jaise refund, payment dispute, angry complaint human handoff mein jane chahiye.

Upgrade Challenge

Apne router mein **confidence score** add karein. Rule banayein: agar confidence low ho to automation action na run ho; customer se clarifying question poocha jaye.

SECTION 2 - APIS AND WEBHOOKS

CHAPTER 4

Webhooks Practical Guide

Ab hum automation ka woh concept seekhenge jo real systems ko connect karta hai. Webhook ek bridge hota hai jo ek system ke event ko dusre system tak instantly pohanchata hai.

Webhook ka simple flow

Chapter ka goal: Aap samjhein ge ke webhook kya hota hai, payload kaise receive hota hai, Make.com/n8n mein webhook kaise use hota hai, aur test data ke saath workflow kaise verify hota hai.

CHAPTER 4

Webhook Kya Hota Hai?

Webhook ek URL hota hai jahan koi system event hone par data send karta hai. Jab bhi koi new message, form submission, payment, order, ya booking hoti hai, system webhook URL ko call kar sakta hai.

Simple example

Website form submit hota hai. Website webhook URL par customer ka naam, phone, email, aur message send karti hai. Automation system us data ko receive karke Google Sheet update karta hai aur customer ko reply bhejta hai.

Event se action tak

Event Happens → Webhook Receives Data → Automation Starts → Data Processed → Action Completed

CHAPTER 4

Webhook aur API Mein Difference

Beginners aksar webhook aur API ko same samajh lete hain. Dono connected concepts hain, lekin kaam alag hota hai.

API	Webhook
Aap request bhejte hain aur data mangte hain.	System khud event hone par data bhejta hai.
Example: order status check karna.	Example: new order create hote hi data receive hona.
Pull style: aap data pull karte hain.	Push style: system data push karta hai.
Usually app/backend call karta hai.	Usually external platform automation ko notify karta hai.

Yaad rakhein: API se aap system se baat karte hain. Webhook se system aapko event ke time inform karta hai.

CHAPTER 4

Webhook Kab Use Hota Hai?

Jab aap chahte hain ke automation instantly kisi event par start ho, to webhook best option hota hai.

New Lead

Website form submit hote hi lead automation start ho.

WhatsApp Message

Customer message aate hi AI router run ho.

Payment Success

Payment complete hote hi account activate ho.

Support Ticket

Complaint receive hote hi ticket create ho aur team ko alert jaye.

Webhook ka sab se bara benefit yeh hai ke automation real-time feel hoti hai.

CHAPTER 4

Webhook Payload Kya Hota Hai?

Webhook jab data send karta hai to us data ko payload kehte hain. Payload usually JSON format mein hota hai.

```
{
  "event": "new_lead",
  "source": "website_form",
  "lead": {
    "name": "Ali Khan",
    "phone": "03001234567",
    "email": "ali@example.com",
    "message": "Mujhe WhatsApp bot chahiye"
  },
  "created_at": "2026-07-01T10:30:00"
}
```

Payload mein kya hota hai?

- Event type
- Customer data
- Message details
- Order/payment/ticket details
- Timestamp
- Source platform

CHAPTER 4

Make.com Webhook Flow

Make.com mein webhook module automation ka trigger ban sakta hai. Jab webhook URL par data aata hai, scenario start ho jata hai.

Make.com webhook scenario

Custom Webhook → AI Router → Google Sheet → Email / WhatsApp → Team Alert

1 **Custom Webhook module add karein**
Make.com ek unique webhook URL generate karega.

2 **Sample data send karein**
Form, Postman, ya test tool se JSON payload bhejein.

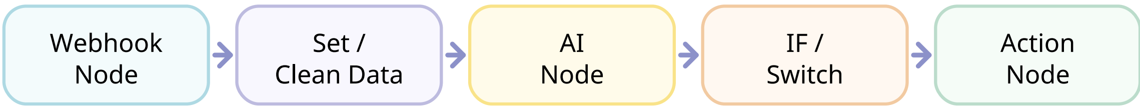
3 **Next modules map karein**
Payload fields ko AI, Sheets, CRM, ya notification module mein use karein.

CHAPTER 4

n8n Webhook Flow

n8n mein Webhook node ek endpoint create karta hai. Is endpoint par request aate hi workflow run hota hai.

n8n webhook workflow



Test URL

Workflow testing ke liye hota hai. Development mein use hota hai.

Production URL

Live automation ke liye hota hai. Workflow active hone ke baad use karein.

Important: n8n mein production webhook use karne se pehle workflow active hona chahiye.

CHAPTER 4

Webhook Request Ka Structure

Webhook request mein method, URL, headers, aur body hoti hai. Beginner ko in four parts ko clearly samajhna chahiye.

Part	Meaning
Method	Usually POST hota hai, kyun ke data send ho raha hota hai.
URL	Webhook endpoint jahan payload receive hoga.
Headers	Content type, secret token, authorization, etc.
Body	Actual JSON payload jo automation use karegi.

```
POST https://example.com/webhook/new-lead
Content-Type: application/json

{ "name": "Ali", "phone": "03001234567", "message": "Need website bot" }
```

CHAPTER 4

Webhook Test Kaise Karte Hain?

Webhook automation build karne ke baad testing bohot important hai. Test ke baghair aapko pata nahi chalega ke payload fields correct receive ho rahe hain ya nahi.

1

Webhook URL copy karein

Make.com ya n8n se generated URL copy karein.

2

Sample JSON ready karein

Real customer data jaisa sample payload create karein.

3

POST request send karein

Postman, Hoppscotch, curl, ya form tool se request bhejein.

4

Output verify karein

Check karein ke automation ne correct fields map ki hain aur expected action run hua hai.

CHAPTER 4

curl Se Webhook Test

Developers ke liye curl quick testing ka simple tareeqa hai. Non-technical readers Postman ya Hoppscotch use kar sakte hain.

```
curl -X POST "https://your-webhook-url.com"   -H "Content-Type: application/json"
-d '{
    "event": "new_lead",
    "name": "Ali Khan",
    "phone": "03001234567",
    "service": "WhatsApp bot",
    "message": "Mujhe restaurant ke liye bot chahiye"
  }'
```

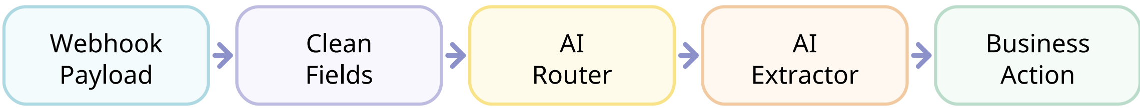
Testing rule: Pehle simple payload test karein. Jab basic flow chal jaye tab complex fields add karein.

CHAPTER 4

Webhook Data Ko AI Router Mein Use Karna

Webhook se data receive hone ke baad us data ko AI router ya extractor prompt mein pass kiya ja sakta hai.

Webhook se AI automation tak




```
Customer message from webhook:
{message}

AI router should return:
{
  "intent": "",
  "priority": "",
  "next_action": "",
  "missing_fields": []
}
```

Yahan webhook ka raw data directly customer reply mein use nahi karna. Pehle clean, validate, aur classify karna better hai.

CHAPTER 4

Common Webhook Mistakes

Webhook setup mein choti mistakes poori automation fail kar sakti hain.

Wrong Method

Webhook POST expect karta hai lekin request GET se bheji gayi.

Broken JSON

Payload valid JSON nahi hota, is liye automation data parse nahi kar pati.

Missing Header

Content-Type application/json missing hota hai.

No Validation

Automation empty ya fake data ko bhi process kar deti hai.

Professional habit: Webhook ke baad hamesha validation step add karein: required fields available hain ya nahi?

CHAPTER 4

Basic Webhook Validation Rules

Validation ka matlab hai data ko check karna before automation action. Agar required data missing hai to action run nahi karna chahiye.

Field	Validation Rule
name	Empty na ho, at least 2 characters.
phone	Phone number missing na ho; format later improve ho sakta hai.
message	Empty message ko AI router par send na karein.
event	Allowed event list mein hona chahiye.
source	Unknown source ho to log karein ya review mein bhejein.

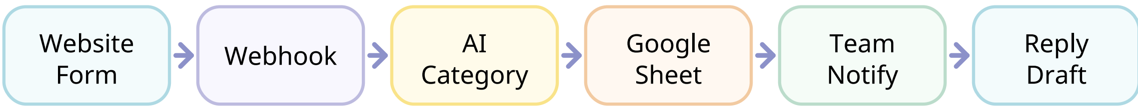
```
If phone is missing:
Do not create final lead.
Ask customer: "Please apna phone number share kar dein taake team aap se contact
kar sake."
```

CHAPTER 4

Real Example: Website Lead to Google Sheet

Scenario: Client ke website form se lead aati hai. Automation ko lead save karni hai, AI se category detect karni hai, aur team ko notify karna hai.

Lead webhook project



Required payload fields

- name
- phone
- email
- service_interest
- message
- source

CHAPTER 4

Webhook Security Basics

Book 2 mein hum security ko beginner/intermediate level par rakhenge. Advanced security Book 3 mein detail se cover hogi. Lekin basic protection abhi se zaroori hai.

Secret Token

Webhook URL ke saath ek secret token verify karein taake random requests process na hon.

Required Fields

Missing required data par workflow stop ya clarification step run karein.

Do Not Expose Secrets

API keys, access tokens, and private URLs public content mein share na karein.

Log Failures

Failed webhook payloads ko review ke liye log karein.

Exercise 1: Webhook Payload Samjhein

Task

Is payload ko read karein aur batayein: event kya hai, source kya hai, required data available hai ya nahi, aur next action kya hona chahiye.


```
{
  "event": "new_message",
  "source": "website_chat",
  "name": "Sara",
  "phone": "",
  "message": "Mujhe clinic appointment chahiye kal evening"
}
```


Answer Key

- Event: new_message
- Source: website_chat
- Name available hai: Sara
- Phone missing hai
- Intent likely appointment_request hai
- Next action: appointment details extract karein, phone number ask karein, final booking confirm na karein jab tak phone missing hai

CHAPTER 4

Exercise 2: Webhook Workflow Design Karein

Task

Ek AC repair business ke liye webhook workflow design karein. Website form se lead receive hogi, AI lead category detect karegi, data Google Sheet mein save hoga, aur team ko notification jayega.

Answer Key

1. Website form customer data collect kare: name, phone, service, location, message.
2. Form webhook URL par POST request bheje.
3. Webhook payload receive ho.
4. Validation step check kare: phone, service, message available hain.
5. AI category detect kare: AC repair, installation, maintenance, complaint.
6. Google Sheet mein row create ho.
7. Team ko WhatsApp/email/internal alert bheja jaye.
8. Customer ko confirmation reply draft/send ho.

CHAPTER 4

Exercise 3: Test Payload Likhein

Task

Restaurant order webhook ke liye ek sample JSON payload likhein. Fields include karein: event, source, customer_name, phone, items, address, payment_method.

Answer Key

```json
{
  "event": "new_order",
  "source": "whatsapp_bot",
  "customer_name": "Ahmed",
  "phone": "03001112223",
  "items": [
    { "name": "Zinger Burger", "quantity": 2 },
    { "name": "Fries", "quantity": 1 }
  ],
  "address": "Model Town Lahore",
  "payment_method": "cash_on_delivery"
}
```

CHAPTER 4

Mini Project: Webhook Lead Automation

Is chapter ka mini project hai ek complete webhook-based lead automation plan banana. Isay aap Make.com, n8n, ya custom backend mein implement kar sakte hain.

Project Deliverables

- Webhook event name
- Sample JSON payload
- Required fields list
- Validation rules
- AI router/extractor step
- Storage destination: Google Sheet, Airtable, CRM, ya database
- Customer reply message
- Team notification message

Mini project flow

Lead Form → Webhook → Validate → AI Process → Save → Notify → Reply

CHAPTER 4

Chapter Recap

Is chapter mein aap ne seekha:

- Webhook ek URL hota hai jo event data receive karta hai.
- Webhook push-style automation hoti hai: system event par data bhejta hai.
- Payload usually JSON format mein hota hai.
- Make.com aur n8n dono webhook trigger support karte hain.
- Webhook test karne ke liye sample JSON aur POST request use hoti hai.
- Webhook ke baad validation step zaroor add karna chahiye.
- Security ke liye secret token, required fields, and failure logs useful hain.

Upgrade Challenge

Apne mini project webhook mein ek **secret_token** field add karein. Rule banayein: agar token match na kare to workflow stop ho jaye aur data process na ho.

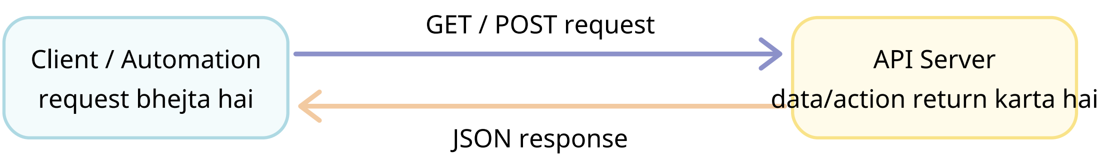
SECTION 2 - APIS AND WEBHOOKS

CHAPTER 5

REST API Basics for Automation

Webhook se automation start hoti hai, lekin API se automation real business systems ke saath kaam karti hai. Is chapter mein aap REST API ke basics practical automation angle se seekhein ge.

API ka simple request-response flow



Chapter ka goal: Aap endpoint, method, headers, body, authentication, status codes, request/response, aur API testing ko beginner-friendly practical style mein samajh kar automation workflows mein apply kar sakein.

CHAPTER 5

API Kya Hoti Hai?

API ka matlab hai Application Programming Interface. Simple words mein API ek tareeqa hota hai jiske zariye ek software dusre software se data le sakta hai ya action karwa sakta hai.

Daily life example

Restaurant mein waiter kitchen aur customer ke beech bridge hota hai. Customer order deta hai, waiter kitchen ko batata hai, kitchen result deta hai, waiter customer ko food serve karta hai. API bhi software systems ke beech waiter jaisa role play karti hai.

Automation mein API ka role

CHAPTER 5

REST API Kya Hoti Hai?

REST API web-based API ka common style hai. Is mein aap URL endpoints par HTTP methods ke through request bhejte hain aur mostly JSON response receive karte hain.

Endpoint

Specific URL jahan request bheji jati hai.

Method

Request ka action: GET, POST, PUT, PATCH, DELETE.

Headers

Extra information: content type, authorization, API key.

Body

Data jo request ke saath send hota hai, mostly JSON.

Automation mindset: REST API ko coding concept nahi, business action connector samjhein.

CHAPTER 5

Endpoint Ka Concept

Endpoint API ka address hota hai. Har endpoint ka ek specific kaam hota hai. Ek endpoint leads create kar sakta hai, doosra order status la sakta hai, teesra ticket create kar sakta hai.

```
https://api.example.com/leads
https://api.example.com/orders/12345
https://api.example.com/tickets
https://api.example.com/customers/987
```

Endpoint	Purpose
/leads	New lead create karna ya leads list lena
/orders/12345	Specific order ka status lena
/tickets	Complaint/support ticket create karna
/customers/987	Customer ka record read/update karna

CHAPTER 5

HTTP Methods

HTTP method batata hai ke aap API se kya karwana chahte hain. Automation tools mein method select karna bohot important hota hai.

Method	Use	Automation Example
GET	Data read karna	Order status check karna
POST	New data create karna	New lead ya ticket create karna
PUT	Full record update karna	Customer profile replace/update karna
PATCH	Partial update karna	Lead status ko warm se hot karna
DELETE	Record delete karna	Test record remove karna

CHAPTER 5

GET Request Example

GET request data read karne ke liye use hoti hai. Is mein usually body nahi hoti. Data endpoint, path parameter, ya query parameter ke through identify hota hai.

```
GET https://api.store.com/orders/ORD-1001
Authorization: Bearer YOUR_ACCESS_TOKEN
```

Expected response

```
{
  "order_id": "ORD-1001",
  "status": "shipped",
  "delivery_date": "2026-07-04",
  "customer_name": "Ali Khan"
}
```

Automation mein AI customer se order ID extract karegi, phir API se status check hoga, phir customer ko friendly reply generate hoga.

POST Request Example

POST request new data create karne ke liye use hoti hai. Lead capture, ticket creation, appointment booking, aur order creation mein POST common hota hai.

```
POST https://api.crm.com/leads
Content-Type: application/json
Authorization: Bearer YOUR_ACCESS_TOKEN

{
  "name": "Sara Ahmed",
  "phone": "03001234567",
  "service": "WhatsApp automation",
  "source": "website_form"
}
```

Practical point: POST request ki body mein wahi fields send karein jo API documentation required batati hai.

CHAPTER 5

Headers, Body, Params

API request ke teen important parts headers, body, aur params hote hain. Automation tools mein in fields ko properly fill karna zaroori hota hai.

Part	Meaning	Example
Headers	Request ki extra information	Authorization, Content-Type
Body	Actual data jo create/update karna hai	Lead name, phone, service
Path Params	URL ke andar value	/orders/ORD-1001
Query Params	URL ke end par filter/search values	?status=open

```
GET /tickets?status=open&priority=high
```

CHAPTER 5

Authentication Basics

Most real APIs open nahi hoti. Unhein access karne ke liye API key ya token chahiye hota hai. Authentication ka purpose yeh hota hai ke API ko pata chale request authorized system se aa rahi hai.

API Key

Simple secret key jo header ya query mein send hoti hai.

Bearer Token

Common auth style jahan token Authorization header mein jata hai.

```
Authorization: Bearer YOUR_ACCESS_TOKEN
Content-Type: application/json
x-api-key: YOUR_API_KEY
```

Security rule: API keys ko kabhi public screenshots, frontend code, ya client demo recording mein expose na karein.

CHAPTER 5

Status Codes

API response ke saath status code aata hai. Status code se pata chalta hai request successful hui ya fail.

Status	Meaning	Automation Action
200 OK	Request successful	Result use kar ke reply send karein
201 Created	New record create ho gaya	Confirmation send karein
400 Bad Request	Required data missing/invalid	Missing field ask karein
401 Unauthorized	Token/API key issue	Admin alert ya token refresh
404 Not Found	Record nahi mila	Customer se correct ID ask karein
500 Server Error	API/server problem	Fallback reply + retry/log

CHAPTER 5

API Documentation Kaise Parhein?

Client ya platform API documentation provide karega. Beginner ko documentation mein kuch specific cheezen dekhni chahiye.

1. **Base URL identify karein**
   API ka main domain ya base path dekhein.

2. **Endpoint aur method dekhein**
   Required action ke liye correct endpoint choose karein.

3. **Required fields note karein**
   Body mein kaun se fields required hain, unki list banayein.

4. **Sample response samjhein**
   Response mein se automation ko kaun se fields chahiye honge, decide karein.

CHAPTER 5

AI Output Se API Body Banana

AI automation mein pehle AI customer message se data extract karti hai. Phir extracted data API body mein map hota hai.

Extraction se API call tak


```
AI extracted output:
{
  "name": "Bilal",
  "phone": "03001112222",
  "service": "restaurant WhatsApp bot",
  "budget": "not provided"
}

API body:
{
  "full_name": "Bilal",
  "mobile": "03001112222",
  "lead_interest": "restaurant WhatsApp bot",
  "source": "chatbot"
}
```

CHAPTER 5

Real Automation Example: Order Status

Customer message karta hai: **"Mera order ORD-1001 kahan tak pohancha?"**

1. **AI order ID extract karti hai**
   order_id = ORD-1001

2. **GET API call hoti hai**
   /orders/ORD-1001 endpoint se order status read hota hai.

3. **Response receive hota hai**
   Status shipped, delivery date available.

4. **Customer reply generate hota hai**
   Friendly Roman Urdu/English reply customer ko send hota hai.

```
Reply: Ji, aapka order shipped ho chuka hai aur expected delivery 4 July hai.
```

CHAPTER 5

Real Automation Example: Ticket Create

Customer complaint: **"Payment deduct ho gayi lekin order confirm nahi hua."**

```
POST https://api.support.com/tickets
Content-Type: application/json
Authorization: Bearer TOKEN

{
  "category": "payment_issue",
  "priority": "high",
  "summary": "Payment deducted but order not confirmed",
  "customer_message": "Payment deduct ho gayi lekin order confirm nahi hua"
}
```

Good automation: Ticket create karne ke baad customer ko ticket number aur expected response time bhi dena chahiye.

CHAPTER 5

Common API Mistakes

Intermediate learners ke liye API mistakes common hoti hain. Inhein pehle se samajhna project delivery mein help karta hai.

Wrong Method

GET ki jagah POST ya POST ki jagah GET use karna.

Missing Header

Authorization ya Content-Type header na bhejna.

Wrong Field Names

API full_name expect karti hai, aap name send kar dete hain.

No Error Handling

400/401/500 response par fallback ya alert na banana.

Rule: API request ko client ke real system par run karne se pehle test data ke saath verify karein.

CHAPTER 5

Mini Project: Lead Create API Plan

Is mini project mein aap ek service business ke liye API-based lead creation workflow plan karein ge.

Scenario

Ek digital agency chahti hai ke website chatbot se aane wali leads CRM mein automatically create ho jayen. Customer message mein name, phone, service interest, aur budget ho sakta hai.

Mini project workflow

Required output

- Lead create endpoint
- HTTP method
- Required fields
- Sample request body
- Success response handling
- Error fallback

Exercise 1

HTTP method choose karein

Neechay actions ke liye correct HTTP method likhein:

1. Order status check karna
2. New support ticket create karna
3. Lead status ko "contacted" karna
4. Customer ka full profile update karna
5. Test lead delete karna

Answer Key

1. GET
2. POST
3. PATCH
4. PUT
5. DELETE

Note: Real APIs mein naming aur allowed methods documentation ke mutabiq change ho sakte hain.

CHAPTER 5

Exercise 2

API request body banayein

Customer message:

"Mera naam Usman hai, mujhe clinic ke liye appointment bot chahiye. Phone 03005556666 hai. Budget abhi decide nahi."

Is message se CRM lead create karne ke liye JSON body banayein.

Answer Key

```
{
  "name": "Usman",
  "phone": "03005556666",
  "service_interest": "clinic appointment bot",
  "budget": null,
  "source": "chatbot",
  "lead_status": "new"
}
```

Exercise 3

Status code handling plan

Ek order status API call ke possible responses ke liye automation action likhein:

- 200 OK
- 404 Not Found
- 401 Unauthorized
- 500 Server Error

Answer Key

- **200:** Order status use kar ke customer ko reply send karein.
- **404:** Customer se order ID dobara confirm karne ko kahen.
- **401:** Admin/developer ko token issue alert karein; customer ko generic fallback reply dein.
- **500:** Retry/log karein aur customer ko temporary issue ka polite message dein.

CHAPTER 5

Chapter Recap

Is chapter mein aap ne seekha

- API software systems ke beech bridge hoti hai.
- REST API endpoint, method, headers, body, params, aur response par based hoti hai.
- GET data read karta hai, POST new record create karta hai.
- Bearer token/API key authentication common hoti hai.
- Status codes automation ke next action decide karne mein help karte hain.
- AI extracted JSON ko API body mein map karna intermediate automation ka core skill hai.

Upgrade Challenge

Ek e-commerce support workflow design karein jahan customer order ID send kare, API se status check ho, aur agar order delayed ho to support ticket automatically create ho.

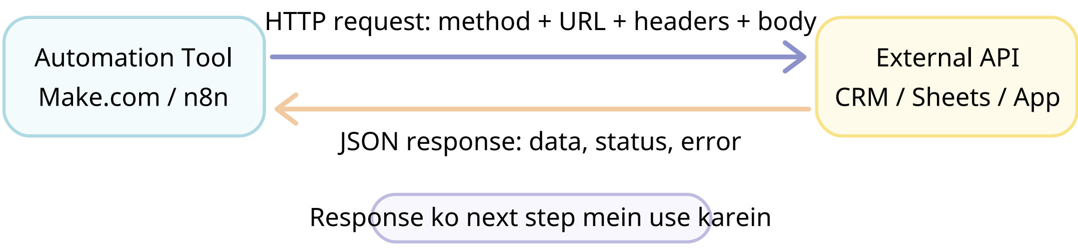
SECTION 2 - APIS AND WEBHOOKS

CHAPTER 6

HTTP Requests in Automation Tools

Pichlay chapter mein aap ne REST API basics samjhe. Ab hum unhi concepts ko Make.com, n8n, aur automation tools ke andar practical HTTP request workflow mein apply karein ge.

Automation tool se API tak request-response flow



Chapter ka goal: Aap HTTP request module/node ka use samajh kar API ko automation workflow se connect kar sakein, JSON body send kar sakein, response use kar sakein, aur errors handle kar sakein.

CHAPTER 6

HTTP Request Module/Node Kya Hota Hai?

Automation tools mein HTTP request module ya node ek universal connector hota hai. Iska kaam kisi bhi external API ko call karna hota hai.

Agar kisi platform ka direct integration available nahi hai, phir bhi aap uski API ko HTTP request ke zariye connect kar sakte hain.

Make.com

Make.com mein HTTP module use hota hai jahan aap method, URL, headers, query string, aur body configure karte hain.

n8n

n8n mein HTTP Request node use hota hai jahan API calls ko workflow ke andar visual step ki tarah add kiya jata hai.

Simple rule: Agar API documentation mein endpoint, method, headers, aur body given hain, to aap usay HTTP request module/node mein map kar sakte hain.

CHAPTER 6

HTTP Request Ka Basic Structure

Chahe aap Make.com use karein ya n8n, HTTP request ki basic structure almost same hoti hai.

Field	Meaning	Example
Method	API action type	GET, POST, PATCH
URL	Endpoint address	https://api.crm.com/leads
Headers	Auth aur content info	Authorization, Content-Type
Query Params	Search/filter data	?status=open
Body	Data jo send karna hai	Lead JSON, ticket JSON
Response	API ka result	lead_id, status, error

CHAPTER 6

Make.com Mein HTTP Request Flow

Make.com mein HTTP module ko usually webhook, OpenAI, Google Sheets, ya CRM module ke beech use kiya jata hai.

Make.com practical flow

Webhook Trigger → AI Extract → HTTP Request → API Response → Reply Send

1. **Trigger set karein**
   Webhook, form submission, ya message receive hone par scenario start hota hai.

2. **AI se data extract karein**
   Customer message se name, phone, service, budget ya order ID nikalein.

3. **HTTP module add karein**
   Method, URL, headers, aur JSON body configure karein.

4. **Response use karein**
   API response se ID/status le kar next step mein confirmation send karein.

CHAPTER 6

n8n Mein HTTP Request Flow

n8n mein HTTP Request node zyada flexible hota hai. Aap previous nodes ka data expressions ke through URL, headers, body, ya query params mein use kar sakte hain.

n8n practical flow

Webhook Node → Set Fields → HTTP Request → IF Check → Final Action

Webhook Node

External message ya form data receive karta hai.

Set / Edit Fields

Data ko clean fields mein arrange karta hai.

HTTP Request Node

External API ko call karta hai.

IF / Switch Node

Success, error, ya different routes handle karta hai.

CHAPTER 6

GET Request: Data Read Karna

GET request tab use hoti hai jab automation ko kisi system se data read karna ho. Example: order status, customer profile, ticket status, ya product detail.

Scenario

Customer kehta hai: "Mera order ORD-1200 kahan hai?" AI order ID extract karti hai, phir HTTP request node order API ko call karta hai.

```
Method: GET
URL: https://api.store.com/orders/ORD-1200
Headers:
  Authorization: Bearer YOUR_TOKEN
  Accept: application/json
```

Possible response

```
{
  "order_id": "ORD-1200",
  "status": "out_for_delivery",
  "expected_delivery": "Today"
}
```

CHAPTER 6

POST Request: New Record Create Karna

POST request tab use hoti hai jab automation ko external system mein new data create karna ho. Example: new lead, support ticket, appointment, order, ya contact.

```
Method: POST
URL: https://api.crm.com/leads
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "name": "Ayesha Khan",
  "phone": "03001234567",
  "service_interest": "WhatsApp automation",
  "source": "chatbot"
}
```

Important: POST body ka field name API documentation ke mutabiq hona chahiye. Agar API *full_name* expect karti hai aur aap *name* send karte hain, request fail ho sakti hai.

CHAPTER 6

Dynamic Data Mapping

Automation tools ki real power dynamic data mapping mein hoti hai. Aap previous step ke output ko HTTP request ke URL, headers, body, ya query params mein use karte hain.

Dynamic mapping flow

Previous Step Output	HTTP Request Mein Use
order_id	URL: /orders/{{order_id}}
customer_phone	Body: phone field
priority	Ticket body mein priority field
service_interest	CRM lead interest field

CHAPTER 6

Headers and Authentication

HTTP request mein headers bohot important hote hain. Headers API ko batate hain ke request kis format mein hai aur request authorized hai ya nahi.

Content-Type

Jab JSON body send karni ho to usually **application/json** use hota hai.

Authorization

Bearer token ya API key ko secure tareeqe se send karne ke liye use hota hai.

```
Headers:
{
  "Content-Type": "application/json",
  "Authorization": "Bearer YOUR_ACCESS_TOKEN"
}
```

Security rule: Tokens ko hard-code na karein. Make.com/n8n credentials, environment variables, ya secret fields use karein.

CHAPTER 6

Query Params and Path Params

GET requests mein data filter/search karne ke liye query params aur specific record access karne ke liye path params use hote hain.

Type	Example	Use
Path Param	/orders/ORD-1200	Specific order read karna
Query Param	/tickets?status=open	Open tickets filter karna
Multiple Query Params	/leads?status=new&source=chatbot	New chatbot leads list karna

```
Example:
GET https://api.crm.com/leads?status=new&priority=high
```

CHAPTER 6

Response Ko Next Step Mein Use Karna

HTTP request ka result sirf display ke liye nahi hota. Automation mein response ka data next step mein use hota hai.

API response example

```
{
  "success": true,
  "lead_id": "LEAD-7841",
  "status": "created"
}
```

1 **Lead ID save karein**
Response ka lead_id Google Sheet ya CRM log mein store karein.

2 **Customer ko confirm karein**
Reply mein reference ID ya confirmation message use karein.

3 **Team ko notify karein**
Sales/support team ko new lead notification send karein.

CHAPTER 6

Error Response Handle Karna

Real client workflows mein API kabhi kabhi fail hoti hai. Professional automation wahi hoti hai jo failure ke liye plan rakhti ho.

Error	Meaning	Automation Action
400	Invalid/missing data	Missing fields validate karein
401	Auth token issue	Admin alert + token check
404	Record not found	Customer se correct ID ask karein
429	Rate limit	Delay/retry schedule karein
500	Server issue	Retry + fallback message + log

Client-ready rule: Har HTTP request ke baad success aur failure dono paths design karein.

CHAPTER 6

Testing HTTP Requests

Automation workflow ko live client data par run karne se pehle test karna zaroori hai. Testing se field mapping, auth, status codes, aur response handling clear ho jati hai.

1 **Sample data prepare karein**
Fake customer/lead/order data se pehle test karein.

2 **Request manually run karein**
Make.com/n8n ke test execution se request run karein.

3 **Response inspect karein**
Check karein response mein required fields aa rahe hain ya nahi.

4 **Failure case test karein**
Wrong order ID, missing phone, ya wrong token ke saath bhi behavior test karein.

Common Mistakes

Wrong Body Format

JSON ke bajaye plain text send kar dena.

Header Missing

Content-Type ya Authorization header na bhejna.

Dynamic Field Wrong

Previous step ka wrong variable body mein map karna.

Error Path Missing

API fail hone par automation silent fail ho jati hai.

Professional habit: HTTP request ke saath request body, response body, status code, aur error message log karna seekhein - lekin secrets/tokens log na karein.

Mini Project: CRM Lead Create Workflow

Is project mein aap Make.com ya n8n ke through chatbot lead ko CRM API mein create karne ka complete HTTP request plan banayein ge.

Scenario

Customer website chatbot par service inquiry karta hai. AI customer data extract karti hai. HTTP request external CRM API ko POST request bhej kar lead create karti hai. Response se lead ID milti hai aur sales team ko notification jata hai.

Mini project workflow

Chatbot Lead → AI Extract → HTTP POST → CRM Lead ID → Sales Notify

Required deliverables

- HTTP method aur URL
- Headers
- Request body
- Response handling
- Error handling plan
- Customer confirmation message

CHAPTER 6

Exercise 1

HTTP request fields identify karein

Neechay API call ko read karein aur method, URL, headers, aur body identify karein:

```
POST https://api.examplecrm.com/leads
Content-Type: application/json
Authorization: Bearer abc123

{
  "name": "Ali",
  "phone": "03001234567",
  "service": "AI chatbot"
}
```

Answer Key

- **Method:** POST
- **URL:** https://api.examplecrm.com/leads
- **Headers:** Content-Type, Authorization
- **Body:** name, phone, service JSON object

CHAPTER 6

Exercise 2

Dynamic body create karein

AI output yeh hai:

```
{
  "customer_name": "Sara",
  "phone_number": "03009998888",
  "interest": "restaurant WhatsApp order bot",
  "priority": "high"
}
```

CRM API ke liye body banayein jahan fields hon: full_name, mobile, service_interest, lead_priority, source.

Answer Key

```
{
  "full_name": "Sara",
  "mobile": "03009998888",
  "service_interest": "restaurant WhatsApp order bot",
  "lead_priority": "high",
  "source": "chatbot"
}
```

CHAPTER 6

Exercise 3

Error handling plan likhein

Aapka HTTP request CRM lead create karta hai. Agar API 400, 401, ya 500 return kare to automation ka behavior kya hona chahiye?

Answer Key

- **400:** Required fields validate karein, missing data collect karein, aur request dobara try karein.
- **401:** Admin/developer ko auth issue alert karein; customer ko technical delay ka polite reply dein.
- **500:** Request log karein, retry schedule karein, aur human team ko notify karein.

CHAPTER 6

Chapter Recap

Is chapter mein aap ne seekha

- HTTP request module/node external APIs ko automation tools se connect karta hai.
- Make.com aur n8n dono mein method, URL, headers, body, aur response handling important hain.
- GET request data read karti hai, POST request new record create karti hai.
- Previous step ka data dynamically HTTP request mein map hota hai.
- Response ka data next automation step mein use hota hai.
- Error handling ke bina workflow client-ready nahi hota.

Upgrade Challenge

Ek workflow design karein jahan customer message se order ID extract ho, HTTP GET request order status check kare, aur agar status delayed ho to HTTP POST request support ticket create kare.

Chapter 7

Connecting AI with APIs

Book 1 mein aap ne AI se classify, extract, aur reply generate karwana seekha. Book 2 mein ab hum us AI output ko real business actions ke saath connect kar rahe hain. Is chapter ka focus yeh hai ke AI ka structured output API request mein kaise convert hota hai.

Chapter ka main idea

Customer Message → AI JSON Output → Validate Data → API Call → Business Action → Final Reply

Important: AI ka answer khud automation nahi hota. Jab AI ka output kisi API, CRM, database, calendar, ticketing system, ya WhatsApp sender ke saath connect hota hai, tab real automation banti hai.

CHAPTER 7

AI Output Se API Action Tak

Intermediate automation mein AI ka kaam usually decision aur structured data provide karna hota hai. API ka kaam us decision ko real system mein execute karna hota hai.

AI ka role

- Intent samajhna
- Required data extract karna
- Priority decide karna
- Next action suggest karna
- Reply draft banana

API ka role

- Lead create karna
- Order status read karna
- Ticket create karna
- Appointment save karna
- Message send karna

Agar AI sirf kehti hai ke customer high priority lead hai, to ye sirf analysis hai. Lekin agar system us lead ko CRM mein save kare, sales team ko notify kare, aur customer ko reply bheje, to ye complete automation hai.

Simple example

Customer kehta hai: "Mujhe website automation chahiye, budget 500 dollar hai." AI lead data extract karti hai. API CRM mein lead create karti hai. System sales team ko alert karta hai.

CHAPTER 7

Standard AI + API Pattern

Real projects mein aap baar baar ek hi pattern use karte hain. Pehle AI se clean JSON output lein, phir us output ko validate karein, phir API body mein map karein.

Reusable pattern

Input → AI Classifier → AI Extractor → Validation → HTTP Request → Response Handler → User Reply

1

Input receive karein

Customer message, form submission, email, ya WhatsApp message webhook se receive hota hai.

2

AI se structured output lein

AI message ko intent, fields, priority, aur next action mein convert karti hai.

3

Data validate karein

Required fields check karein. Missing information ho to API call na karein.

4

API call karein

Validated data ko API method, URL, headers, aur body mein map karein.

Example 1: Lead Create Karna

Is example mein customer ka message AI se parse hoga, phir CRM API mein lead create hoga.

Customer message

"Salam, mujhe apni academy ke liye WhatsApp bot chahiye. Students ki admission queries automate karni hain. Budget 800 dollar tak hai."

```
AI output:
{
  "intent": "lead_inquiry",
  "business_type": "academy",
  "requested_solution": "WhatsApp admission query bot",
  "budget": "800 USD",
  "lead_priority": "high",
  "next_action": "create_crm_lead"
}
```

Ab automation is JSON ko CRM API ke lead creation endpoint mein map karegi.

```
POST https://api.example-crm.com/leads
Headers:
  Authorization: Bearer YOUR_API_KEY
  Content-Type: application/json

Body:
{
  "source": "whatsapp",
  "business_type": "academy",
  "service_interest": "WhatsApp admission query bot",
  "budget": "800 USD",
  "priority": "high"
}
```

Example 2: Complaint Ticket Create Karna

Support automation mein AI customer complaint ko samajhti hai, phir API ticketing system mein ticket create karti hai.

Customer message

"Payment cut gayi hai lekin mera order confirm nahi hua. Please jaldi check karein."

AI detects

- Intent: complaint
- Category: payment issue
- Priority: high
- Needs human: true

API action

- Create ticket
- Attach customer message
- Set priority high
- Notify support team

```
POST https://api.supportdesk.com/tickets
{
  "title": "Payment deducted but order not confirmed",
  "category": "payment_issue",
  "priority": "high",
  "message": "Payment cut gayi hai lekin order confirm nahi hua.",
  "needs_human": true
}
```

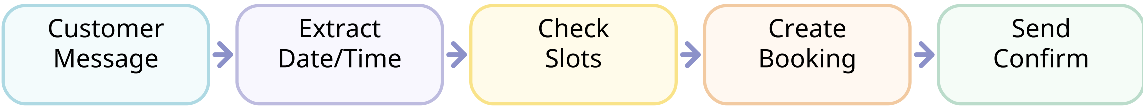
Ticket create hone ke baad user ko ticket ID ke saath confirmation dena chahiye. Agar API error aaye to fallback reply aur human alert zaroor hona chahiye.

CHAPTER 7

Example 3: Appointment Request

Clinic, salon, consultant, ya service business ke liye appointment automation common use case hai. AI customer se date/time/service extract karti hai, phir calendar ya booking API se slot check hota hai.

Appointment API flow




```
Customer: "Kal sham dentist appointment mil sakti hai?"

AI output:
{
  "intent": "appointment_request",
  "service": "dentist",
  "preferred_day": "tomorrow",
  "preferred_time": "evening",
  "missing_fields": ["customer_name", "phone_number"],
  "next_action": "ask_missing_info"
}
```

Yahan API call abhi nahi hogi, kyun ke customer name aur phone number missing hain. Pehle bot missing fields collect karega.

Rule: Jab tak required fields complete na hon, booking/ticket/order create karne wali API call avoid karein.

CHAPTER 7

Validation Layer Zaroori Hai

AI output ko directly API mein send karna risky hai. AI kabhi missing, wrong, ya uncertain fields de sakti hai. Is liye API call se pehle validation layer zaroor add karein.

Validation Check	Question	Action
Required fields	Kya name, phone, service complete hain?	Missing ho to ask user
Data format	Kya phone/email/date valid format mein hain?	Invalid ho to correction ask
Allowed intent	Kya intent known list mein hai?	Unknown ho to fallback
Permission	Kya action safe hai?	Risky ho to human approval
Confidence	Kya AI confident hai?	Low confidence ho to clarify

Best practice

Automation ka AI step decision suggest kare. Validation step decide kare ke action execute karna safe hai ya nahi.

CHAPTER 7

AI Output Ko API Body Mein Map Karna

AI output aur API body hamesha same format mein nahi hoti. Aapko mapping karni hoti hai.

AI Field	API Field	Example Value
customer_name	name	Ali Khan
phone_number	phone	03001234567
service_interest	service	WhatsApp bot
lead_priority	priority	high
original_message	notes	Customer full message

```
Mapping idea:
AI output customer_name  -> API body name
AI output phone_number   -> API body phone
AI output lead_priority  -> API body priority
AI output original_message -> API body notes
```

Make.com aur n8n dono mein aap previous step ke fields ko HTTP body ke andar map kar sakte hain.

CHAPTER 7

API Response Ko Use Karna

API call ke baad response ko ignore nahi karna chahiye. Response se aap confirmation message, next workflow, ya error handling decide karte hain.

Success response

```
{
  "success": true,
  "lead_id": "LD-2045",
  "status": "created"
}
```

Error response

```
{
  "success": false,
  "error":
"phone_required"
}
```

1

Success ho to

User ko confirmation dein, team ko notify karein, aur record ID save karein.

2

Error ho to

Fallback reply bhejein, internal alert create karein, aur retry/repair path use karein.

Professional automation sirf happy path nahi handle karti. Woh failed API calls ko bhi gracefully handle karti hai.

CHAPTER 7

Prompt Template: AI to API Action Planner

Yeh prompt AI se aisa output leta hai jo direct automation workflow mein use ho sakta hai.

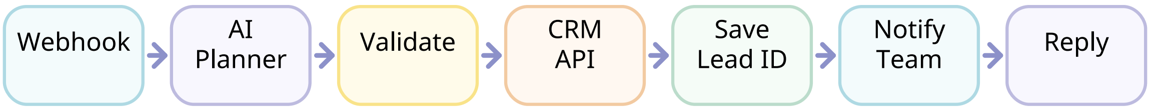
```
You are an AI automation action planner.
Your job is to read the customer message and decide whether an API action is ready.

Return only valid JSON with this structure:
{
  "intent": "lead_inquiry | complaint | order_status | appointment_request |
general_question | human_support",
  "api_action_ready": true,
  "api_action": "create_lead | create_ticket | check_order_status | create_booking |
none",
  "required_fields_complete": true,
  "missing_fields": [],
  "data": {
    "customer_name": null,
    "phone_number": null,
    "service_interest": null,
    "priority": "low | medium | high",
    "summary": null
  },
  "safe_to_execute": true,
  "customer_reply": "short reply for customer"
}

Rules:
- If required fields are missing, set api_action_ready to false.
- Never create booking/order/ticket if important fields are missing.
- If message is angry, payment-related, or sensitive, set priority to high.
```

CHAPTER 7

Practical Workflow: Lead to CRM

Ab hum ek complete workflow design karte hain jahan customer inquiry se CRM lead create hota hai.

Lead to CRM workflow



1. **Webhook message receive karta hai**
   WhatsApp, website form, ya email se customer inquiry aati hai.

2. **AI planner JSON banata hai**
   Intent, fields, priority, aur action decide hota hai.

3. **Validation step run hota hai**
   Name/phone/service missing ho to user se poocha jata hai.

4. **CRM API call hoti hai**
   Lead create hota hai aur lead_id response mein milta hai.

5. **Final reply send hota hai**
   Customer ko confirmation aur next step bataya jata hai.

CHAPTER 7

Make.com / n8n Implementation Plan

Is workflow ko aap Make.com ya n8n dono mein bana sakte hain. Structure almost same rahega.

Step	Make.com Module	n8n Node
Message receive	Webhook	Webhook Node
AI JSON output	OpenAI module / HTTP	OpenAI Node / HTTP Request
Validation	Filter / Router	IF / Switch Node
API action	HTTP module	HTTP Request Node
Save result	Google Sheets / Airtable	Google Sheets / DB Node
Reply	WhatsApp/Email module	HTTP/WhatsApp/Email Node

Book 2 mein aap ka goal coding se pehle architecture samajhna hai. Jab architecture clear hota hai, tool implementation easy ho jati hai.

CHAPTER 7

Common Mistakes

AI ko APIs ke saath connect karte waqt beginners kuch common mistakes karte hain. In se bachna zaroori hai.

AI output direct API mein bhejna

Validation ke baghair AI output send karna wrong records ya failed requests create kar sakta hai.

Required fields ignore karna

Phone, email, order ID, ya date missing ho to action execute nahi karna chahiye.

API response ignore karna

Response se success/error ka pata chalta hai. Isay ignore karna poor user experience create karta hai.

Fallback path na banana

API fail ho sakti hai. Fallback reply, retry, aur human alert hamesha plan karein.

Professional rule

AI decides. Validation protects. API executes. Response confirms.

CHAPTER 7

Mini Project: Service Lead to CRM API

Is mini project mein aap ek service business ke liye AI + API workflow design karenge.

Scenario

Ek digital agency chahti hai ke website form ya WhatsApp inquiry se lead automatically CRM mein create ho. Agar budget high ho to sales team ko immediate notification mile.

1. **Input define karein**
   Customer message, name, phone, service interest, budget, source.

2. **AI JSON output design karein**
   Intent, priority, missing fields, and API action ready flag.

3. **Validation rules likhein**
   Name/phone/service missing ho to CRM API call block karein.

4. **API body map karein**
   AI fields ko CRM API fields ke saath connect karein.

5. **Final reply likhein**
   Lead create hone ke baad customer ko confirmation mile.

CHAPTER 7

Exercises

Exercise 1

Customer message se AI JSON output banayein:

"Mujhe apne clinic ke liye appointment booking bot chahiye. Patients WhatsApp par message karte hain. Budget 1000 dollar hai."

Exercise 2

Upar wale AI output ko CRM API body mein map karein. Fields: name, business_type, service_interest, budget, priority, notes.

Exercise 3

Agar phone number missing ho to automation ka next action kya hona chahiye?

Exercise 4

Complaint ticket API ke liye required fields list karein.

Exercise 5

AI + API workflow ke liye 5 testing cases likhein.

CHAPTER 7

Answer Key

```
Exercise 1 sample answer:
{
  "intent": "lead_inquiry",
  "api_action_ready": false,
  "api_action": "create_lead",
  "required_fields_complete": false,
  "missing_fields": ["customer_name", "phone_number"],
  "data": {
    "business_type": "clinic",
    "service_interest": "WhatsApp appointment booking bot",
    "budget": "1000 USD",
    "priority": "high",
    "summary": "Clinic needs a WhatsApp bot for patient appointment booking."
  },
  "safe_to_execute": false,
  "customer_reply": "Ji, appointment booking bot ke liye details mil gayi hain. Please
apna naam aur phone number share kar dein."
}
```

```
Exercise 2 sample CRM body:
{
  "name": null,
  "business_type": "clinic",
  "service_interest": "WhatsApp appointment booking bot",
  "budget": "1000 USD",
  "priority": "high",
  "notes": "Clinic wants to automate patient appointment queries on WhatsApp."
}
```

CHAPTER 7

Answer Key Continued

Exercise 3

Phone number missing ho to API call block karein. Customer se politely phone number aur name ask karein. CRM lead incomplete data ke saath create na karein, jab tak business specifically partial leads allow na kare.

Exercise 4

- Customer name ya identifier
- Contact method
- Complaint summary
- Category
- Priority
- Original message
- Order/payment ID, agar available ho

Exercise 5 testing cases

- Complete lead data - CRM lead should be created
- Missing phone - bot should ask for phone
- Complaint message - ticket API should be selected
- API error - fallback reply and internal alert should run
- Low confidence intent - bot should ask clarification

Upgrade Challenge

Is chapter ke workflow mein ek extra step add karein: agar lead priority high ho to sales team ko WhatsApp ya email alert send ho. Agar priority medium/low ho to sirf CRM mein save ho.

CHAPTER 7

Chapter Recap

Is chapter mein aap ne seekha ke AI ko APIs ke saath connect karna intermediate automation ka key skill hai. AI structured output banati hai, validation layer us output ko check karti hai, phir API real business action perform karti hai.

Key lesson 1

AI ka output automation ka decision layer hai, final action layer nahi.

Key lesson 2

API call se pehle required fields aur safe action check karna zaroori hai.

Key lesson 3

AI fields ko API fields ke saath properly map karna hota hai.

Key lesson 4

API response se confirmation, fallback, retry, aur human alert decide hota hai.

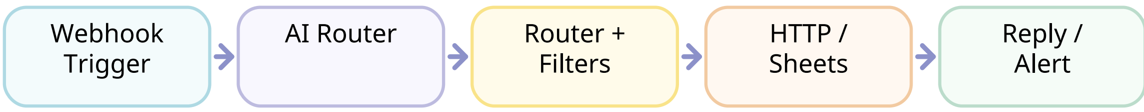
Next chapter: Ab hum Make.com intermediate workflows seekhein ge jahan webhook, router, filters, HTTP module, Google Sheets/CRM integration, aur error handling ko practical workflow mein combine kiya jaye ga.

Chapter 8

Make.com Intermediate Workflows

Book 2 ke pehle chapters mein aap ne workflow mapping, intent router, webhooks, REST APIs, HTTP requests, aur AI ko APIs ke saath connect karna seekha. Ab is chapter mein hum in concepts ko Make.com ke practical workflow style mein combine karenge.

Chapter ka main workflow



Goal: Is chapter ke end tak aap ek intermediate Make.com workflow plan kar sakenge jo incoming message receive kare, AI se classify kare, router se correct path select kare, data save kare, API call kare, aur response ya team alert generate kare.

CHAPTER 8

Make.com Intermediate Workflow Ka Matlab

Beginner level par Make.com ka use sirf simple trigger aur simple action ke liye hota hai. Example: form submit hua, Google Sheet mein row add ho gayi. Intermediate level par workflow sirf data move nahi karta, balkay decision bhi leta hai.

Beginner workflow

- One trigger
- One or two actions
- Fixed path
- Simple Google Sheet update
- Limited error handling

Intermediate workflow

- Webhook trigger
- AI classification
- Router paths
- Filters and conditions
- HTTP API calls
- Fallback and alerts

Intermediate workflow mein aap business logic ko modules aur routes mein divide karte hain. Har route ka apna purpose hota hai: lead create karna, support ticket banana, order save karna, appointment request handle karna, ya human team ko notify karna.

Simple rule

Make.com scenario ko ek digital worker samjhein: wo message receive karta hai, samajhta hai, decision leta hai, action perform karta hai, aur result save karta hai.

CHAPTER 8

Scenario Structure

Make.com mein complete workflow ko scenario kaha jata hai. Scenario ke andar multiple modules connected hote hain. Har module ek specific kaam karta hai.

Scenario ka practical structure

Trigger → Transform Data → AI Step → Router → Action → Log Result

Trigger

Workflow kis event se start hoga? Example: webhook, form, new row, email, scheduled time.

Processing

Data clean, format, classify, extract, ya validate hota hai.

Action

Lead save, ticket create, email send, API call, ya WhatsApp reply.

Best practice yeh hai ke scenario ka naam clear rakhein. Example: **WhatsApp Lead Router - Restaurant Demo** ya **Website Form to CRM - Clinic Leads**.

CHAPTER 8

Webhook Trigger Se Start Karna

Intermediate workflows mein webhook bohot common trigger hota hai. Webhook ka benefit yeh hai ke koi bhi external system Make.com ko data send kar sakta hai.

Example webhook payload

Website form, WhatsApp backend, chatbot widget, ya CRM system Make.com webhook ko customer message bhej sakta hai.

```
{
  "source": "website_chat",
  "customer_name": "Ali Khan",
  "phone": "03001234567",
  "message": "Mujhe apni clinic ke liye appointment bot chahiye",
  "created_at": "2026-07-01T12:30:00"
}
```

Webhook receive hone ke baad Make.com scenario ka next step usually data cleaning, AI classification, ya direct Google Sheet logging hota hai.

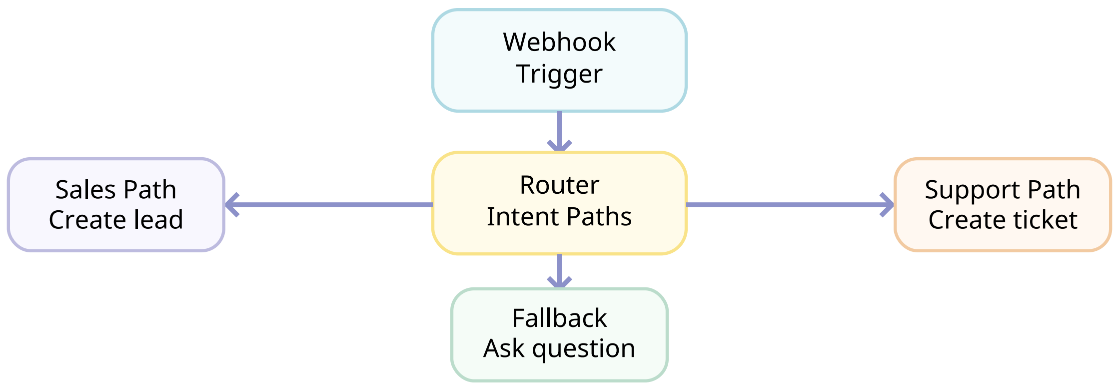
Important: Webhook payload ka sample save karna zaroori hai. Agar payload structure clear nahi hoga to baad mein field mapping confuse karegi.

CHAPTER 8

Router aur Filters

Router Make.com workflow ka decision point hota hai. Router ke baad multiple paths ban sakte hain. Filters decide karte hain ke incoming data kis path par jana chahiye.

Router-based automation



Agar AI output mein intent **lead_inquiry** ho to sales path chalega. Agar intent **complaint** ho to support path chalega. Agar data missing ho to clarification path chalega.

CHAPTER 8

Common Router Paths

Client-ready workflow mein har message ko same response nahi milta. Is liye router paths pehle plan karna important hai.

Path	Filter Condition	Action
Sales Lead	intent = lead_inquiry	Create lead, notify sales, send reply
Support	intent = support_question	Answer FAQ or create support record
Complaint	intent = complaint OR priority = high	Create ticket and alert human
Appointment	intent = appointment_request	Collect fields or call booking API
Fallback	intent = unknown OR confidence low	Ask clarification

Professional tip

Router ke har path ka naam business-friendly rakhein: Sales Lead Path, Complaint Path, Appointment Path, Missing Data Path.

CHAPTER 8

AI Module Ka Role

Make.com workflow mein AI step ka kaam message ko structured JSON mein convert karna hota hai. AI ko open-ended answer generate karne ke bajaye fixed fields dene chahiye.

```
Expected AI JSON:
{
  "intent": "lead_inquiry",
  "customer_name": "Ali Khan",
  "phone": "03001234567",
  "service_interest": "clinic appointment bot",
  "priority": "high",
  "missing_fields": [],
  "next_action": "create_lead"
}
```

Good AI output

- Clean JSON
- Fixed fields
- No extra paragraphs
- Clear next_action

Bad AI output

- Long explanation
- Unclear intent
- Missing required fields
- Broken JSON

Book 1 aur previous chapters mein jo prompt engineering seekhi gayi thi, usay yahan practical workflow ke andar use kiya jata hai.

CHAPTER 8

Google Sheets / CRM Integration

Make.com ka common use case extracted data ko Google Sheets, Airtable, CRM, ya database API mein save karna hai. Intermediate level par aap sirf row add nahi karte; aap lead status, priority, source, aur next follow-up bhi save karte hain.

Field	Example Value	Purpose
lead_id	auto-generated	Lead tracking
name	Ali Khan	Customer identity
phone	03001234567	Follow-up contact
source	website_chat	Lead source tracking
service_interest	Clinic bot	Sales context
priority	high	Sales urgency
status	new	Pipeline stage

Google Sheet ko CRM ki tarah use karte waqt columns clear aur consistent hone chahiye. Har workflow ko same column names follow karne chahiye.

CHAPTER 8

HTTP Module Ka Practical Use

HTTP module ka use tab hota hai jab aap Make.com se kisi external API ko call karna chahte hain. Example: CRM lead create karna, ticket create karna, order status check karna, ya WhatsApp message send karna.

```
POST https://api.example.com/leads
Headers:
  Authorization: Bearer YOUR_API_KEY
  Content-Type: application/json

Body:
{
  "name": "{{customer_name}}",
  "phone": "{{phone}}",
  "service": "{{service_interest}}",
  "priority": "{{priority}}",
  "source": "{{source}}"
}
```

Yahan double curly braces ka concept dynamic mapping ko show karta hai. Actual Make.com UI mein aap previous module ke fields select karte hain.

Rule

HTTP module se pehle required fields validate karein. Agar phone, service, ya customer name missing ho to API call se pehle customer se clarification poochhein.

CHAPTER 8

Intermediate Workflow Example

Ab ek practical scenario dekhte hain: website chatbot ya WhatsApp backend se customer message Make.com webhook par aata hai. AI message ko classify karti hai. Router correct path select karta hai. Lead ya ticket save hota hai.

Lead and support router workflow

Webhook → AI Classifier → Router → Lead / Ticket → Notify Team → Customer Reply

1

Webhook receive

Incoming message Make.com custom webhook par receive hota hai.

2

AI classify

AI message ko intent, priority, missing fields, aur next action mein convert karti hai.

3

Router apply

Intent ke basis par sales, support, complaint, appointment, ya fallback path run hota hai.

4

Action execute

Google Sheet, CRM, ticketing API, email, ya WhatsApp sender ko call kiya jata hai.

Example: AC Service Lead Router

Client scenario: AC service business ko WhatsApp aur website se inquiries aati hain. Owner chahta hai ke sales leads, urgent repair requests, aur general questions alag alag handle hon.

```
Customer message:
"Bhai AC cooling nahi kar raha. Aaj technician mil sakta hai? Main Johar Town Lahore mein
hoon."

AI output:
{
  "intent": "service_request",
  "service": "AC repair",
  "urgency": "high",
  "location": "Johar Town Lahore",
  "missing_fields": ["customer_name", "phone"],
  "next_action": "ask_missing_info"
}
```

Is case mein API ya technician assignment abhi execute nahi hoga, kyun ke name aur phone missing hain. Bot pehle missing fields collect karega.

Client-ready behavior: Incomplete data par fake confirmation na dein. Pehle required information collect karein, phir final action perform karein.

CHAPTER 8

Error Handling Basics

Intermediate Make.com workflow mein error handling ignore nahi karni chahiye. Real clients ke workflow mein API fail ho sakti hai, AI JSON broken aa sakta hai, Google Sheet unavailable ho sakti hai, ya message sender fail ho sakta hai.

Problem	Risk	Fallback
AI output broken	Router wrong path par chala jayega	Fallback path + human review
Missing data	Wrong/incomplete lead save hoga	Ask missing fields
API timeout	Lead/ticket create nahi hoga	Retry or alert team
Duplicate lead	CRM messy ho jayega	Phone/email based check
Message send failed	Customer reply miss ho jayega	Log error and notify admin

Minimum error plan

Har important workflow mein failed step ka log, admin notification, aur safe customer fallback message hona chahiye.

CHAPTER 8

Data Mapping Checklist

Make.com workflows mein sab se common mistake wrong field mapping hoti hai. Developer ya automation builder ko har module ke output fields carefully map karne chahiye.

Before mapping

- Webhook sample payload clear hai?
- AI output schema fixed hai?
- Required fields defined hain?
- Google Sheet/CRM columns ready hain?
- API body fields documented hain?

After mapping

- Test message run kiya?
- Empty fields check kiye?
- Wrong intent case test kiya?
- API response save kiya?
- Error path test kiya?

Professional workflow ka matlab sirf happy path chalana nahi. Wrong data, missing data, duplicate data, aur API failure bhi test karna zaroori hai.

CHAPTER 8

Mini Project: Lead Routing Workflow

Is mini project mein aap ek Make.com workflow plan karenge jo customer message ko receive kare, AI se classify kare, aur correct path par route kare.

1. **Webhook module**
   Input fields: source, name, phone, message, created_at.

2. **AI classification module**
   Output fields: intent, priority, category, missing_fields, next_action.

3. **Router**
   Paths: sales lead, support question, complaint, appointment, fallback.

4. **Action modules**
   Google Sheet row, CRM API call, team alert, customer reply.

```
Required routes:
1. lead_inquiry -> save lead + notify sales
2. complaint -> create ticket + alert support
3. appointment_request -> collect date/time or create booking
4. unknown -> ask clarification
```

CHAPTER 8

Exercise 1

Task: Neechay customer message diya gaya hai. Is ke liye Make.com workflow ke modules list karein.

Customer message

"Salam, mujhe apni clothing store ke liye WhatsApp order bot chahiye. Customers order bhi place kar saken aur delivery charges bhi pooch saken."

Aapka answer include kare

- Trigger module
- AI module
- Router paths
- Data save action
- Customer reply action

Answer Key

```
Recommended modules:
1. Webhook trigger
2. AI classifier / extractor
3. Router
   - lead_inquiry path
   - order_bot_request path
   - delivery_question path
   - fallback path
4. Google Sheet or CRM create lead
5. Team notification
6. Customer auto reply
```

Exercise 2

Task: Is AI output ke liye router filters define karein.


```
{
  "intent": "complaint",
  "priority": "high",
  "category": "payment_issue",
  "needs_human": true,
  "missing_fields": ["order_id"]
}
```


Answer Key

Route	Filter	Action
Complaint path	intent = complaint	Create complaint record
High priority alert	priority = high	Notify support team
Human handoff	needs_human = true	Assign human agent
Missing data	missing_fields contains order_id	Ask customer for order ID

Order ID missing hai, is liye final ticket mein order lookup ya refund action tab tak execute nahi karna chahiye jab tak customer order ID share na kare.

Exercise 3

Task: Ek restaurant ke liye Make.com workflow design karein jo menu request, order request, aur complaint ko alag route kare.

Answer Key

```
Workflow:
1. Webhook receives WhatsApp message
2. AI classifier returns intent
3. Router paths:
   - menu_request -> send menu message
   - order_request -> extract items + ask address
   - complaint -> save complaint + alert owner
   - unknown -> ask clarification
4. Google Sheet tables:
   - Leads
   - Orders
   - Complaints
5. Final reply sent to customer
```

Order path fields

- customer_name
- phone
- items
- quantity
- address
- payment_method

Complaint path fields

- customer_message
- category
- priority
- needs_human
- status
- created_at

CHAPTER 8

Chapter Recap

Is chapter mein aap ne Make.com intermediate workflows ka practical structure seekha. Ab aap scenario ko trigger, AI step, router, filters, actions, error handling, aur final response mein divide kar sakte hain.

Aap ne seekha

- Scenario structure
- Webhook trigger
- Router and filters
- AI JSON output mapping
- Google Sheets/CRM integration
- HTTP module usage

Professional mindset

- Happy path ke saath error path bhi design karein
- Required fields validate karein
- Clear route names use karein
- Every action ka log maintain karein

Upgrade Challenge

Apne Make.com lead routing workflow mein duplicate lead detection add karein. Rule: agar phone number already Google Sheet/CRM mein exist karta hai to new lead create na karein, balkay existing lead update karein aur team ko notify karein.

Chapter 9

n8n Intermediate Workflows

Is chapter mein hum n8n ko practical automation builder ke taur par use karna seekhein ge. Book 2 ke previous chapters mein aap webhooks, APIs, HTTP requests, aur Make.com workflows samajh chuke hain. Ab hum same ideas ko n8n ke nodes, conditions, routing, data mapping, aur API calls ke saath apply karenge.

Chapter ka main workflow

Webhook Node → Set / Edit Fields → AI / HTTP Node → IF / Switch Node → Action + Response

Goal: Is chapter ke end tak aap n8n mein ek intermediate workflow plan kar sakenge jo data receive kare, clean kare, AI/API call kare, condition check kare, Google Sheet ya CRM update kare, aur error/fallback path handle kare.

CHAPTER 9

n8n Kya Hai?

n8n ek workflow automation tool hai jahan aap different nodes ko connect kar ke automation banate hain. Har node ek kaam karta hai: webhook receive karna, data set karna, condition check karna, API call karna, AI se output lena, database update karna, ya response send karna.

n8n ka strong point

- Technical control zyada hota hai
- Self-hosting possible hai
- HTTP/API workflows powerful hain
- Code node se custom logic add hota hai

Beginner ko kya samajhna hai

- Node ka input/output
- Data mapping
- Conditions
- Error handling
- Credentials safe rakhna

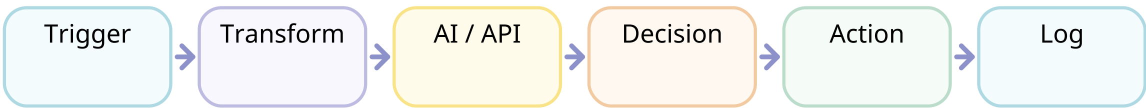
Make.com ka interface visual aur simple feel hota hai. n8n thora developer-friendly hai. Agar aap APIs, webhooks, JSON, aur backend logic samajhte hain to n8n aapko more control deta hai.

CHAPTER 9

n8n Workflow Ka Structure

n8n workflow nodes ka chain hota hai. Pehla node usually trigger hota hai. Uske baad processing, decision, action, aur response nodes aate hain.

n8n workflow structure



Part	n8n Node Example	Purpose
Trigger	Webhook, Schedule, Gmail	Workflow start karta hai
Transform	Set, Edit Fields, Code	Data clean aur format karta hai
Decision	IF, Switch	Correct path select karta hai
Action	HTTP Request, Google Sheets, Email	Business action perform karta hai

CHAPTER 9

Webhook Node

Webhook node n8n mein external data receive karne ka common tareeqa hai. Website form, WhatsApp backend, chatbot widget, CRM, ya custom app n8n webhook URL par data send kar sakte hain.

```
Incoming payload example:
{
  "source": "website_form",
  "name": "Ali Khan",
  "phone": "03001234567",
  "message": "Mujhe restaurant ke liye WhatsApp order bot chahiye",
  "budget": "50000 PKR"
}
```

1

Webhook node add karein

HTTP method usually POST rakhein taake external system JSON body send kar sake.

2

Test URL use karein

Development ke time test URL par sample payload bhej kar output inspect karein.

3

Production URL use karein

Workflow test hone ke baad production URL connect karein.

Set / Edit Fields Node

Webhook se aane wala data hamesha clean nahi hota. Kabhi field names inconsistent hote hain, kabhi extra data hota hai, aur kabhi required fields missing hoti hain. Set ya Edit Fields node se aap data ko clean structure mein convert karte hain.

Raw input

- name
- phone
- msg
- service
- random fields

Clean output

- customer_name
- phone_number
- message_text
- service_interest
- source

```
Clean object example:
{
  "customer_name": "Ali Khan",
  "phone_number": "03001234567",
  "message_text": "Mujhe restaurant ke liye WhatsApp order bot chahiye",
  "source": "website_form"
}
```

Professional workflows mein clean data layer bohot important hoti hai, kyun ke baad ke AI, API, aur database steps isi structure par depend karte hain.

CHAPTER 9

IF Node

IF node simple condition ke liye use hota hai. Example: agar phone number missing hai to clarification path chalao. Agar priority high hai to team ko alert karo.

Condition	True Path	False Path
phone_number is empty	Ask for phone number	Continue lead creation
priority = high	Notify sales team	Save as normal lead
intent = complaint	Create support ticket	Continue router

IF node ka best use

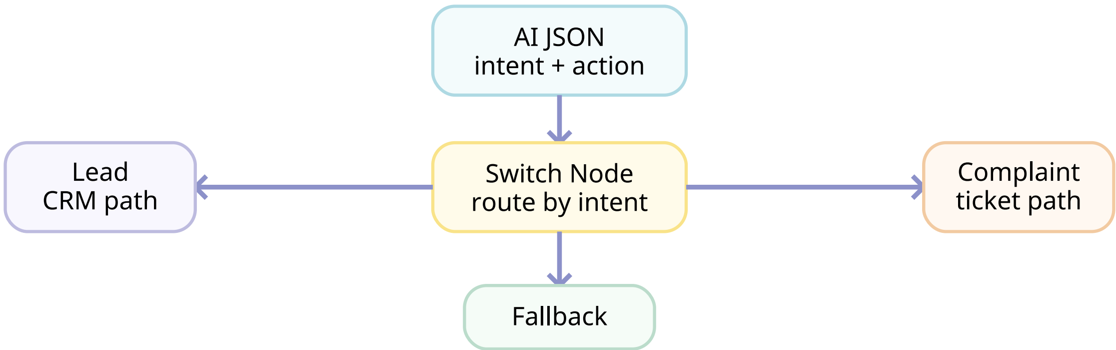
IF node ko simple yes/no decisions ke liye use karein. Agar multiple categories hain to Switch node zyada clean hota hai.

CHAPTER 9

Switch Node

Switch node multiple paths ke liye use hota hai. Jab AI output mein intent field ho aur us ke basis par different actions perform karne hon, tab Switch node ideal hai.

Switch node routing




```
AI output:
{
  "intent": "lead_inquiry",
  "priority": "high",
  "next_action": "create_lead"
}
```

Switch node mein aap intent ke values define kar sakte hain: lead_inquiry, support_question, complaint, appointment_request, order_status, unknown.

CHAPTER 9

Code Node Ka Basic Use

n8n ka Code node tab useful hota hai jab built-in nodes se simple transformation possible na ho. Beginner level par Code node ko limited use karein, lekin intermediate workflows mein kabhi kabhi yeh bohot helpful hota hai.

```
// Example: lead score calculate karna
const item = $input.first().json;
let score = 0;

if (item.phone_number) score += 20;
if (item.budget) score += 30;
if (item.intent === 'lead_inquiry') score += 20;
if (item.priority === 'high') score += 30;

item.lead_score = score;
item.lead_quality = score >= 70 ? 'high' : score >= 40 ? 'medium' : 'low';

return [{ json: item }];
```

Important: Code node ka use sirf tab karein jab zaroori ho. Har cheez code mein daal dena workflow ko difficult aur hard-to-maintain bana deta hai.

CHAPTER 9

HTTP Request Node

HTTP Request node n8n ka most important node hai jab aap external APIs se connect karna chahte hain. Is node se aap GET, POST, PUT, DELETE requests send kar sakte hain.

```
POST https://api.example.com/leads
Headers:
  Authorization: Bearer YOUR_API_KEY
  Content-Type: application/json

Body:
{
  "name": "{{$json.customer_name}}",
  "phone": "{{$json.phone_number}}",
  "service": "{{$json.service_interest}}",
  "priority": "{{$json.priority}}"
}
```

Use cases

- Create CRM lead
- Create ticket
- Send WhatsApp reply
- Check order status

Check points

- Method correct hai?
- Headers correct hain?
- Body JSON valid hai?
- Response handle ho raha hai?

CHAPTER 9

OpenAI / AI Node Ka Role

n8n mein AI node ka role incoming message ko structured output mein convert karna hai. Is chapter ka focus generic chat response par nahi, balkay automation-ready output par hai.

```
Prompt instruction:
Customer message ko classify karo aur sirf valid JSON return karo.

Required fields:
- intent
- priority
- missing_fields
- extracted_data
- next_action

No explanation. No markdown. Sirf JSON.
```

```
Expected JSON:
{
  "intent": "lead_inquiry",
  "priority": "high",
  "missing_fields": [],
  "extracted_data": {
    "service_interest": "restaurant WhatsApp order bot",
    "budget": "50000 PKR"
  },
  "next_action": "create_lead"
}
```

CHAPTER 9

Google Sheets Aur Database Nodes

n8n mein Google Sheets, Airtable, Postgres, MySQL, MongoDB, aur many other nodes available hote hain. Beginner/intermediate projects mein Google Sheets easy option hai, lekin client-ready system ke liye database ya CRM better ho sakta hai.

Storage Option	Best For	Limitation
Google Sheets	Small demos, lead lists, simple tracking	Large scale ke liye weak
Airtable	Small CRM, business records	Cost and limits
PostgreSQL	Production apps, structured data	Setup knowledge chahiye
MongoDB	Flexible records, chat logs	Schema discipline required

Practical recommendation

Demo aur beginner client ke liye Google Sheets use karein. Serious client ke liye CRM ya database recommend karein.

CHAPTER 9

Example 1: Lead Router Workflow

Is example mein website form se lead n8n webhook par aati hai. AI lead ko classify karta hai. Switch node next action decide karta hai. High priority lead sales team ko alert hoti hai.

Lead router flow

Webhook → Clean Fields → AI Classifier → Switch → Save Lead → Notify Team

1

Webhook receives message

Customer ka form data ya chat message n8n mein receive hota hai.

2

Set node cleans fields

Raw data ko customer_name, phone_number, message_text mein convert kiya jata hai.

3

AI classifier runs

Intent, priority, service interest, aur missing fields extract hotay hain.

4

Action path selected

Lead Google Sheet/CRM mein save hoti hai aur sales team ko notification jata hai.

CHAPTER 9

Example 2: Support Ticket Workflow

Is example mein customer complaint aati hai. AI complaint category aur priority detect karta hai. Agar payment issue ya angry message ho to human team ko alert kiya jata hai.

Support ticket flow


```
Example AI output:
{
  "intent": "complaint",
  "category": "payment_issue",
  "priority": "high",
  "summary": "Customer paid but order was not confirmed",
  "next_action": "create_ticket"
}
```

Support workflows mein bot ko blindly reply nahi karna chahiye. Sensitive complaints, payment issues, refund issues, aur angry customers ko human handoff path par bhejna safer hota hai.

CHAPTER 9

Credentials Aur Security

n8n workflows mein API keys, tokens, email credentials, CRM credentials, aur database passwords use hotay hain. In credentials ko direct prompt, code, ya plain text fields mein expose nahi karna chahiye.

Safe practice

- n8n credentials manager use karein
- API keys logs mein na dikhayen
- Webhook secret token use karein
- Production aur test credentials separate rakhein

Avoid karein

- API key prompt mein daalna
- Password spreadsheet mein rakhna
- Public webhook without validation
- Secrets ko screenshots mein share karna

Client project mein security ka basic discipline zaroori hai. Beginner mistake yeh hoti hai ke workflow to chal jata hai, lekin API keys aur customer data unsafe ho jata hai.

CHAPTER 9

Error Handling Aur Execution Logs

n8n ka strong feature execution logs hain. Jab workflow fail hota hai to aap dekh sakte hain ke kis node par error aya, input kya tha, output kya tha, aur response kya mila.

Error	Possible Reason	Fix
400 Bad Request	API body invalid hai	JSON fields check karein
401 Unauthorized	Token/API key wrong hai	Credentials update karein
Missing field	Input data incomplete hai	IF node se missing data path banayein
AI JSON broken	Prompt strict nahi hai	JSON-only prompt improve karein

Professional habit

Har important workflow mein failed execution ke liye alert path rakhein: Slack, email, WhatsApp, ya internal sheet log.

CHAPTER 9

Mini Project: n8n Lead + Support Router

Is mini project mein aap ek workflow design karein ge jo customer message receive kare, AI se classify kare, aur intent ke basis par lead, support, complaint, ya fallback path chalayega.

Mini project architecture

Webhook → Set Fields → AI JSON → Switch → Lead / Support → Response

1. **Webhook node**
   Incoming customer message receive karein.

2. **Set node**
   Fields ko clean format mein convert karein.

3. **AI node**
   Intent, priority, missing fields, extracted data aur next action return karwayein.

4. **Switch node**
   lead_inquiry, support_question, complaint, unknown ke separate paths banayein.

5. **Actions**
   Lead save, ticket create, human alert, ya clarification reply send karein.

CHAPTER 9

Exercises

Exercise 1: Node selection

Ek customer message website form se aata hai. Aapko message classify karna hai, lead save karni hai, aur high priority lead par sales team ko alert karna hai. Is workflow ke liye required n8n nodes list karein.

Exercise 2: Switch conditions

AI output mein intent field aa rahi hai: lead_inquiry, complaint, appointment_request, unknown. Har intent ke liye Switch node ka action define karein.

Exercise 3: Missing data handling

Agar customer ne service mention ki hai lekin phone number nahi diya, to workflow ka safe next step kya hona chahiye?

Exercise 4: Security check

n8n workflow mein API key use ho rahi hai. Aap kaise ensure karein ge ke API key safe rahe?

CHAPTER 9

Answer Keys

Answer 1: Required nodes

Webhook node, Set/Edit Fields node, AI/OpenAI node, Switch node, Google Sheets/CRM node, IF node for priority, notification node, and response node.

Answer 2: Switch actions

lead_inquiry -> create lead. complaint -> create ticket and alert human. appointment_request -> collect date/time or call booking API. unknown -> ask clarification.

Answer 3: Missing phone

Workflow ko lead create karne se pehle clarification reply bhejna chahiye: "Please apna phone number share kar dein taake team aap se contact kar sake." Saath hi partial lead log bhi save kar sakte hain.

Answer 4: API key safety

API key ko n8n credentials manager mein store karein, prompt ya Code node mein hard-code na karein, logs/screenshots mein expose na karein, aur production/test keys separate rakhein.

CHAPTER 9

Chapter Recap

Aap ne seekha

- n8n workflow structure
- Webhook node ka use
- Set/Edit Fields node
- IF aur Switch node
- HTTP Request node
- AI JSON output routing

Key lesson

n8n mein strong automation tab banti hai jab data clean ho, AI output structured ho, decision nodes clear hon, aur har path ka action defined ho.

Upgrade Challenge

Mini project workflow mein ek extra feature add karein: agar lead priority high ho to sales team ko instant notification bhejein, lekin low priority lead ko sirf Google Sheet mein save karein.

Next Chapter: Ab hum workflow error handling par focus karein ge: missing data, failed APIs, retry logic, fallback replies, aur human alerts.

Chapter 10

Workflow Error Handling

Automation tab professional banti hai jab woh sirf success case handle na kare, balkay failure case bhi safely handle kare. Is chapter mein hum missing data, API failure, timeout, retry, fallback reply, human alert, aur logging ko practical tareeqe se samjhein ge.

Chapter ka error handling flow

Input → Validate → Try Action → If Failed → Fallback → Log

Goal: Is chapter ke end tak aap har automation ke liye safe failure path design kar sakenge, taake client ka workflow silently break na ho.

CHAPTER 10

Error Handling Kyon Zaroori Hai?

Beginner workflow aksar sirf happy path ke liye banaya jata hai. Happy path ka matlab: customer message complete hai, AI correct output deta hai, API success response deti hai, aur reply send ho jata hai. Lekin real business mein har dafa aisa nahi hota.

Without error handling

- Workflow quietly fail ho jata hai
- Customer ko reply nahi milta
- Lead miss ho sakti hai
- Client ka trust kam hota hai

With error handling

- Fallback reply chala jata hai
- Team ko alert milta hai
- Issue log ho jata hai
- Retry se temporary failure recover hota hai

Professional automation ka rule simple hai: agar system ka main path fail ho, to fallback path zaroor hona chahiye.

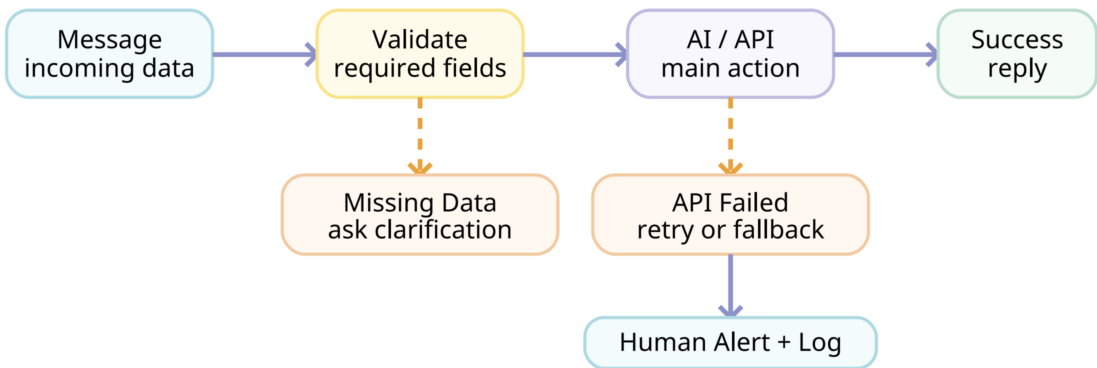
CHAPTER 10

Automation Fail Kyon Hoti Hai?

Workflow fail hone ki sab se common wajah missing data, wrong data format, API issue, AI output issue, credentials problem, ya rate limit hoti hai. In causes ko pehle samajhna zaroori hai.

Failure Type	Example	Safe Response
Missing data	Phone number nahi mila	Customer se phone number ask karein
Wrong format	JSON broken hai	Validation fail karein aur reformat karein
API failure	CRM API 500 return kar rahi hai	Retry + internal alert
Auth issue	API key expired hai	Admin alert + safe fallback
Rate limit	Too many requests	Wait + retry later

Failure paths



CHAPTER 10

Missing Data Handling

Missing data ka matlab required field available nahi hai. Example: appointment booking ke liye customer ka naam, phone number, service, date, aur time required ho sakte hain. Agar date missing hai to workflow ko appointment create nahi karni chahiye.

```
Required fields example:
{
  "customer_name": "required",
  "phone_number": "required",
  "service_type": "required",
  "preferred_date": "required",
  "preferred_time": "optional"
}
```

Safe missing data rule

Agar required field missing ho to API call na karein. Pehle customer se missing field politely ask karein.

```
Fallback reply:
Ji, appointment book karne ke liye please apni preferred date share kar dein. Date milte hi
main booking request proceed kar dunga.
```

CHAPTER 10

Validation Layer

Validation layer workflow ka safety gate hota hai. Yeh check karta hai ke AI output ya user input business action ke liye ready hai ya nahi. Validation layer ke baghair automation wrong API calls kar sakti hai.

Validate before action

- Required fields present hain?
- Phone format valid hai?
- Intent allowed list mein hai?
- Priority valid value hai?

Do not trust blindly

- AI output ko directly API mein na bhejein
- Customer data ko normalize karein
- Unknown values ko fallback mein bhejein
- Dangerous actions mein human approval rakhein

```
Allowed intents:
["lead_inquiry", "support_question", "complaint", "appointment_request", "order_status",
"unknown"]
```

Agar AI output mein intent allowed list se bahar ho to usay unknown treat karein.

CHAPTER 10

API Failure Handling

API failure ka matlab external service expected response nahi de rahi. Example: CRM down hai, Google Sheets API limit hit ho gayi, WhatsApp message send nahi hua, ya ticketing system response nahi de raha.

Status	Meaning	Action
400	Bad request	Payload/data mapping check karein
401	Unauthorized	Token/API key check karein
403	Forbidden	Permission/scope check karein
404	Not found	Endpoint ya ID verify karein
429	Rate limited	Wait and retry
500	Server error	Retry + alert

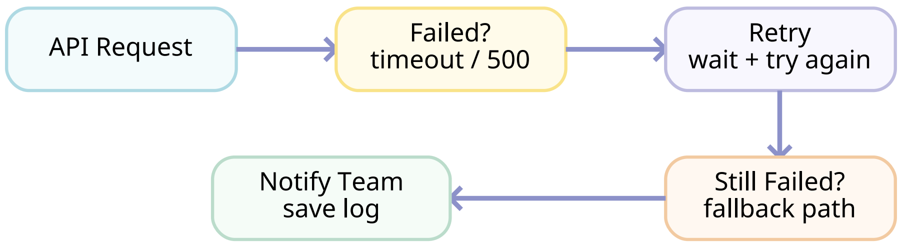
Professional workflow mein 400 aur 401 ko blindly retry nahi karna chahiye. Usually yeh configuration ya payload issue hota hai.

CHAPTER 10

Retry Logic

Retry logic temporary failures ke liye useful hoti hai. Agar API temporarily down hai ya timeout aa raha hai to workflow kuch seconds/minutes wait karke dobara try kar sakta hai.

Retry pattern



Important: Har error par retry na karein. 500, timeout, 429 jaise temporary errors retry ho sakte hain. 400 ya 401 par pehle payload/auth fix karein.

CHAPTER 10

Fallback Reply

Fallback reply customer ko silence se bachata hai. Agar automation fail ho jaye aur customer ko kuch na mile to experience poor hota hai. Safe fallback reply clear, polite, aur honest hona chahiye.

Bad fallback

Error occurred. Try again.

Yeh reply robotic aur unclear lagta hai.

Good fallback

Sorry, is waqt system aapki request process nahi kar pa raha. Main aapki request team ko forward kar raha hoon.

```
Fallback template:
Sorry, is waqt request automatically process nahi ho pa rahi. Aapki details team ko forward
kar di gayi hain. Hamari team jald aap se contact karegi.
```

Fallback mein kabhi technical error details customer ko na bhejein.

CHAPTER 10

Human Alert

Human alert ka purpose team ko batana hai ke automation mein koi important issue ya customer case manual attention require karta hai. Alert Slack, email, WhatsApp, dashboard, ya CRM note ke through ja sakta hai.

```
Internal alert example:
Automation Alert
Type: API Failure
Workflow: Lead Capture
Customer: Ali Khan
Phone: 03001234567
Error: CRM API returned 500
Action Needed: Manually save lead and check CRM integration
```

Alert kab bhejna hai?

- High priority lead
- Payment issue
- Complaint
- API failure after retries
- Missing critical config

Alert mein kya include ho?

- Customer data
- Workflow name
- Error reason
- Time
- Recommended action

CHAPTER 10

Logging

Logging ka matlab workflow ke important events save karna. Logs se aap baad mein dekh sakte hain ke workflow kaun se step par fail hua, payload kya tha, response kya mila, aur next action kya hua.

Log Field	Example	Why Needed
workflow_name	lead_capture	Issue source identify hota hai
customer_id	cust_123	Case trace hota hai
step	crm_api_call	Failure step clear hota hai
status	failed	Success/failure tracking
error_message	HTTP 500	Debugging help

Security note: Logs mein API keys, passwords, access tokens, ya sensitive private data save na karein.

CHAPTER 10

Make.com Mein Error Handling

Make.com mein aap error handlers use kar sakte hain. Agar koi module fail ho jaye to aap alternate route chala sakte hain: retry, ignore, resume, ya custom notification.

1

Error handler route add karein

Jo module fail ho sakta hai, us ke saath error handler route attach karein.

2

Failure data capture karein

Error message, customer data, aur failed module ka name save karein.

3

Fallback action run karein

Customer ko safe reply bhejein ya team ko email/Slack alert send karein.

Example

Google Sheets row add fail ho jaye to workflow team ko email bheje: “Lead save nahi hui, please manually add karein.”

CHAPTER 10

n8n Mein Error Handling

n8n mein aap node-level options, IF checks, Error Trigger workflow, aur execution logs se error handling improve kar sakte hain. n8n ka advantage yeh hai ke aap errors ko detailed level par inspect kar sakte hain.

Node-level safety

- Continue On Fail option
- IF node after API call
- Status code check
- Output validation

Error workflow

- Error Trigger node
- Admin email
- Failed execution link
- Customer fallback path

```
n8n error decision example:
If statusCode >= 500:
  retry or notify team
If statusCode == 400:
  log payload issue
If statusCode == 401:
  alert admin about credentials
```

CHAPTER 10

Error Handling Checklist

Before action

- Required fields validate karein
- Allowed intent check karein
- Data type verify karein
- Empty values handle karein
- Duplicate request check karein

After action

- API status check karein
- Success response save karein
- Failure log karein
- Customer fallback bhejein
- Team ko alert karein

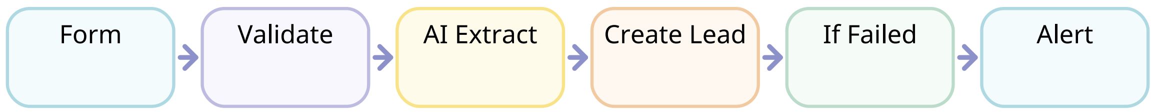
Har workflow design karte waqt yeh question zaroor poochein: “Agar yeh step fail ho gaya to customer aur team ko kya pata chalega?”

CHAPTER 10

Mini Project: Safe Lead Capture Workflow

Is mini project mein aap lead capture workflow ke liye error handling design karenge. Scenario: website form se lead aati hai, AI lead details extract karta hai, CRM API mein lead create hoti hai, phir customer ko confirmation reply jata hai.

Safe lead workflow



1. **Required fields define karein**
   name, phone, message, service_interest.

2. **Missing field fallback likhein**
   Agar phone missing hai to phone number ask karein.

3. **CRM API failure plan karein**
   Retry once, phir admin alert and fallback reply.

CHAPTER 10

Practical Error Handling Prompt

Yeh prompt AI ko workflow output validate karne aur safe next action decide karne ke liye use kiya ja sakta hai.

```
You are an automation safety checker.

Task:
Check whether the extracted data is ready for the next API action.

Required fields:
- customer_name
- phone_number
- service_interest
- message_summary

Rules:
- If any required field is missing, return ready_for_api=false.
- If phone_number is missing, ask for phone number.
- If service_interest is unclear, ask a clarification question.
- Do not invent missing data.

Output JSON:
{
  "ready_for_api": true/false,
  "missing_fields": [],
  "next_action": "create_lead | ask_clarification | human_handoff",
  "customer_reply": "...",
  "internal_note": "..."
}
```

CHAPTER 10

Exercise 1

Scenario: Customer message: “Mujhe website chatbot chahiye. Price bata dein.”

Lead capture API ke required fields hain: customer_name, phone_number, service_interest, message_summary.

Task: Missing fields identify karein aur safe next action JSON likhein.

Answer Key

```
{
  "ready_for_api": false,
  "missing_fields": ["customer_name", "phone_number"],
  "next_action": "ask_clarification",
  "customer_reply": "Ji, website chatbot ke liye details share kar sakta hoon. Please apna
naam aur phone number share kar dein taake main aapki inquiry proper note kar sakoon.",
  "internal_note": "Service interest clear hai, lekin customer name aur phone missing hain."
}
```

CHAPTER 10

Exercise 2

Scenario: CRM API lead create karte waqt HTTP 500 return kar rahi hai. Customer high-priority lead hai.

Task: Is case ka error handling plan likhein.

Answer Key

1

Retry

HTTP 500 temporary server issue ho sakta hai, is liye 1-2 retries add karein.

2

Fallback reply

Customer ko safe confirmation bhejein ke request team ko forward kar di gayi hai.

3

Human alert

Sales/admin team ko customer data aur CRM error ke saath alert bhejein.

4

Log

Workflow name, failed step, status code, timestamp, aur customer reference save karein.

CHAPTER 10

Chapter Recap

Aap ne seekha

- Workflow failure causes
- Missing data handling
- Validation layer
- API failure handling
- Retry and fallback logic

Professional rule

Har automation mein success path ke saath failure path bhi design karein. Agar system fail ho to customer ko clear reply, team ko alert, aur system ko log milna chahiye.

Upgrade Challenge

Apne Chapter 8 Make.com ya Chapter 9 n8n workflow mein error handling add karein. Required fields validation, API failure retry, customer fallback reply, aur human alert ka complete plan banayein.

Chapter 11

Database and CRM Basics for Automation

Automation sirf reply dene ka naam nahi. Real business automation tab useful hoti hai jab lead, customer, conversation, order, ticket, aur follow-up data properly save ho. Is chapter mein hum database aur CRM ka beginner-friendly practical structure samjhein ge.

Chapter ka data flow

Message → Extract Data → Save in CRM → Track Status → Follow-up

Goal: Is chapter ke end tak aap simple business ke liye lead table, customer table, conversation table, order/ticket table, aur CRM pipeline plan kar sakenge.

CHAPTER 11

Data Storage Kyon Zaroori Hai?

Agar automation customer ko reply de kar data save nahi karti, to business ko long-term value nahi milti. Business owner ko yeh pata hona chahiye ke kitni leads aayi, kis customer ne kya poocha, kaunsi lead hot hai, kis complaint ko follow-up chahiye, aur sales team ne kis customer se contact kiya.

Without data storage

- Customer history lost ho jati hai
- Leads track nahi hoti
- Team ko follow-up yaad nahi rehta
- Reporting possible nahi hoti

With data storage

- Har lead record hoti hai
- Customer history available hoti hai
- Follow-up easy hota hai
- Reports and pipeline clear hoti hai

Intermediate automation ka real upgrade yeh hai ke aap AI output ko proper data system ke saath connect karte hain.

CHAPTER 11

CRM aur Database Mein Difference

CRM aur database dono data store karte hain, lekin unka purpose different hota hai. Beginner level par aap Google Sheets ya Airtable se start kar sakte hain. Intermediate level par CRM ya proper database use hoti hai.

Tool	Best For	Example Use
Google Sheets	Simple lead tracking	Website/WhatsApp leads save karna
Airtable	Visual database + simple CRM	Leads, customers, orders, follow-ups
CRM	Sales process and pipeline	Lead stage, owner, follow-up, deal value
Database	Custom production system	Customers, conversations, orders, tickets

Data storage options

Google Sheets vs Airtable vs CRM vs Database

Har client ke liye direct database banana zaroori nahi hota. Tool selection client ke budget, complexity, team size, aur reporting need par depend karti hai.

Start simple

Small business ke liye Google Sheets ya Airtable enough ho sakta hai. Is se setup fast hota hai aur client easily data dekh sakta hai.

Move advanced later

Jab data grow ho, multiple users hon, permissions chahiye hon, ya dashboard chahiye ho, tab CRM ya database better option hai.

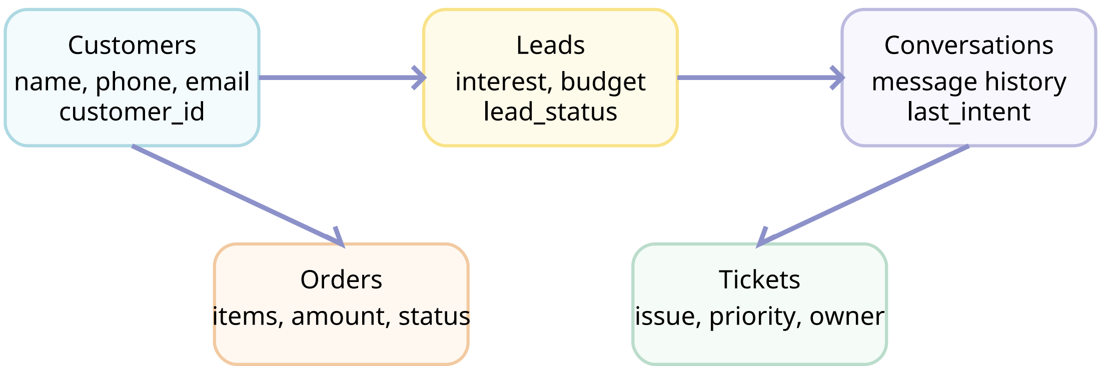
Situation	Recommended Storage
Daily 10-30 leads	Google Sheets
Leads + follow-up + status	Airtable / CRM
Orders, tickets, users, roles	Database
Multi-business SaaS	Database + dashboard

CHAPTER 11

Core Data Tables

Most AI automation systems mein kuch common tables ya collections hoti hain. Table ka matlab structured data list. Google Sheet mein yeh tabs ho sakte hain, database mein yeh tables/collections ho sakti hain.

Common data model



Customers

Person ya business jo aap se contact karta hai.

Leads

Potential buyer ya interested customer.

Conversations

Messages aur AI/ customer interaction history.

CHAPTER 11

Lead Table Structure

Lead table automation ka sab se common data structure hai. Jab bhi customer inquiry karta hai, AI uska data extract karke lead table mein save kar sakti hai.

```
Lead table fields:
lead_id
customer_name
phone_number
email
source
interest
budget
city
lead_score
lead_status
assigned_to
last_message
created_at
next_follow_up_at
```

Lead status examples

new, contacted, interested, qualified, proposal_sent, won, lost

Lead status ka purpose yeh hai ke sales team ko pata rahe ke lead kis stage par hai.

CHAPTER 11

Customer Table Structure

Customer table mein customer ki stable information save hoti hai. Lead table ek sales opportunity ko represent karti hai, jabke customer table actual person/business ko represent karti hai.

```
Customer table fields:
customer_id
full_name
phone_number
email
city
customer_type
first_seen_at
last_contact_at
tags
notes
```

Lead

Interest ya sales opportunity. Ek customer ke multiple leads ho sakte hain.

Customer

Actual person/business record. Ismein permanent profile information hoti hai.

CHAPTER 11

Conversation Table Structure

Conversation table automation ko context deti hai. Agar customer dobara message kare to system ko pata hona chahiye ke pehle kya baat hui thi, last intent kya tha, aur missing fields kaun si thi.

```
Conversation table fields:
conversation_id
customer_id
channel
last_intent
last_user_message
last_bot_reply
missing_fields
human_handoff_required
status
updated_at
```

Important: Beginner systems mein full conversation history store karna zaroori nahi. Lekin last intent, missing fields, aur status save karna bohot useful hota hai.

CHAPTER 11

Orders aur Tickets Tables

Har business lead-based nahi hota. E-commerce, restaurant, service business, aur support system mein orders aur tickets bhi important hote hain.

Order table

- order_id
- customer_id
- items
- total_amount
- delivery_address
- order_status

Ticket table

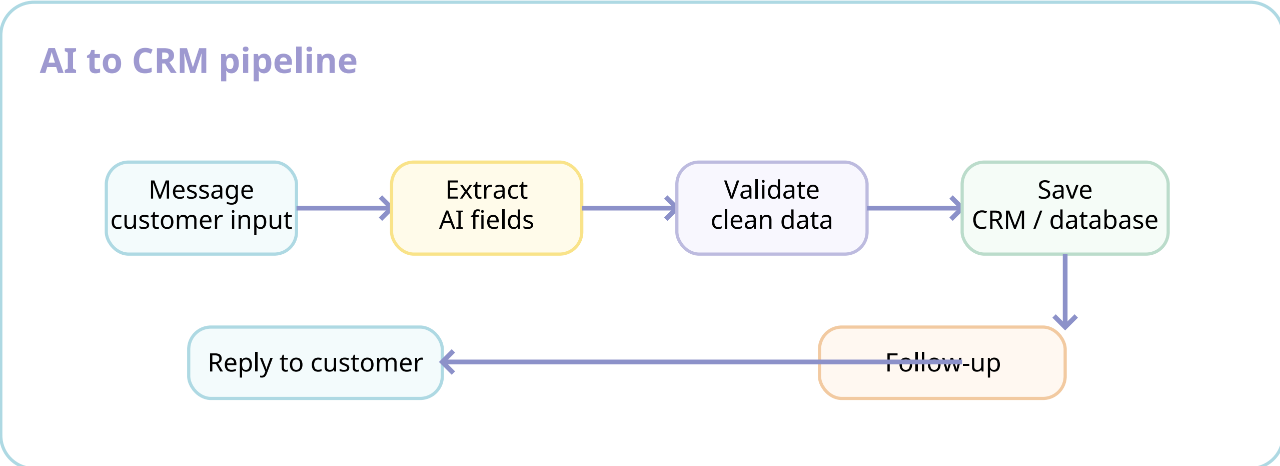
- ticket_id
- customer_id
- issue_category
- priority
- summary
- ticket_status

Order table transaction ko track karti hai. Ticket table problem ya complaint ko track karti hai.

CHAPTER 11

AI Output Se Data Save Karna

AI ka kaam message samajhna aur structured output dena hai. Automation ka kaam is output ko validate karke storage system mein save karna hai.




```
Example AI output:
{
  "intent": "lead_inquiry",
  "customer_name": "Ali",
  "phone_number": "03001234567",
  "interest": "AC service",
  "city": "Lahore",
  "lead_score": "high",
  "next_action": "save_lead_and_notify_team"
}
```

Is output ko directly save karne se pehle validation layer zaroor apply karein.

CHAPTER 11

Data Quality Rules

Automation ki quality uske data ki quality par depend karti hai. Agar duplicate leads, wrong phone numbers, incomplete fields, aur inconsistent statuses hon to CRM useless ho jata hai.

Validation rules

- Phone number required
- Lead status allowed list se ho
- Priority allowed values se ho
- Duplicate phone check ho
- Missing fields clearly store hon

Normalization rules

- City spelling consistent rakhein
- Phone format standard rakhein
- Dates ISO format mein save karein
- Tags short and clear rakhein
- Unknown values blank ya null rakhein

CRM mein messy data ka matlab messy sales process hota hai.

CHAPTER 11

CRM Pipeline Stages

CRM pipeline sales journey ko stages mein divide karti hai. Is se team ko pata chalta hai ke har lead kis stage par hai aur next action kya hona chahiye.

Stage	Meaning	Next Action
New	Lead just received	Auto reply + notify team
Contacted	Team ne contact kiya	Requirement confirm karein
Qualified	Budget/need clear hai	Proposal ya quote send karein
Proposal Sent	Offer share ho chuki hai	Follow-up schedule karein
Won/Lost	Deal close ya reject ho gayi	Record update karein

Basic CRM pipeline

Example 1: AC Service Business

Scenario: Customer WhatsApp par message karta hai: "AC cooling nahi kar raha, Model Town Lahore mein service chahiye." AI is message se required lead data extract karegi.

```
CRM record:
{
  "customer_name": null,
  "phone_number": "from_whatsapp_profile",
  "service_interest": "AC service",
  "issue": "AC cooling problem",
  "city": "Lahore",
  "area": "Model Town",
  "lead_score": "high",
  "lead_status": "new",
  "next_action": "ask_customer_name_and_preferred_time"
}
```

Automation action

Lead save karein, customer se naam aur preferred time ask karein, aur owner ko high-priority lead alert bhejein.

Example 2: E-commerce Store

E-commerce mein order status, refund, return, product inquiry, aur complaint data alag alag tables mein ja sakta hai. Is se support team quickly decide kar sakti hai ke case sales ka hai ya support ka.

Customer Message	Record Type	Fields
Price kya hai?	Lead	product_interest, source, status
Order late hai	Support ticket	order_id, issue, priority
Return karna hai	Ticket	reason, order_id, return_status
2 items order karne hain	Order	items, quantity, address

Same chatbot multiple data tables update kar sakta hai, lekin har path ke liye validation rules alag honge.

Example 3: Clinic Appointment System

Clinic automation mein customer, appointment, aur follow-up records important hote hain. Patient data sensitive hota hai, is liye privacy aur access control ka khayal zaroor rakhein.

```
Appointment table fields:
appointment_id
customer_id
patient_name
phone_number
service_type
preferred_date
preferred_time
appointment_status
notes
created_at
```

Safe rule: Agar medical case sensitive ho ya emergency mention ho, bot ko appointment book karne ke bajaye human staff ko alert karna chahiye.

CHAPTER 11

Mini Project: CRM Data Model Banana

Ab aap ek service business ke liye simple CRM data model design karein. Scenario: Business AC repair, fridge repair, aur washing machine repair services provide karta hai.

1

Business entities identify karein

Customer, lead, conversation, service request, aur follow-up record define karein.

2

Required fields likhein

Har table ke 8-12 important fields select karein.

3

Status values define karein

new, contacted, scheduled, completed, cancelled jaise status define karein.

4

Automation actions plan karein

Lead save, team alert, customer reply, follow-up reminder ka flow banayein.

Deliverable

Ek simple Google Sheet ya Airtable structure design karein jisme tabs hon: Customers, Leads, Service Requests, Conversations, Follow-ups.

CHAPTER 11

Exercise 1: Storage Tool Choose Karein

Neechay scenarios ke liye best storage option choose karein: Google Sheets, Airtable, CRM, ya Database.

Scenario	Your Answer
Small restaurant daily 20 WhatsApp orders receive karta hai	
Real estate agency lead pipeline and follow-up track karna chahti hai	
SaaS platform multiple businesses ka data manage karega	
Freelancer simple lead capture service sell kar raha hai	

Answer Key

Scenario	Suggested Option
Small restaurant	Google Sheets or Airtable
Real estate pipeline	CRM or Airtable
SaaS platform	Database
Freelancer simple lead capture	Google Sheets

CHAPTER 11

Exercise 2: Lead Table Design

Ek online course seller ke liye lead table fields design karein. Business WhatsApp par course inquiries receive karta hai.

Answer Key

```
Suggested lead table:
lead_id
student_name
phone_number
course_interest
education_level
city
budget_range
preferred_language
lead_score
lead_status
last_message
next_follow_up_at
created_at
```

Is structure se course seller ko pata chalega ke kaunsa student kis course mein interested hai, kis language mein learning chah raha hai, aur follow-up kab karna hai.

Upgrade

Ek aur field add karein: source. Is se pata chalega lead TikTok ad, Facebook ad, website, ya referral se aayi.

Exercise 3: CRM Pipeline Status

AC service business ke liye lead status values define karein. Status values practical aur team-friendly honi chahiye.

Answer Key

```
Recommended statuses:
new
contacted
waiting_for_location
waiting_for_time
scheduled
technician_assigned
completed
cancelled
follow_up_required
```

Yeh statuses sales aur operations dono ke liye useful hain. Is se team ko pata chalega ke lead sirf inquiry hai ya actual service request ban chuki hai.

Rule: Status list short rakhein. Bohot zyada statuses team ko confuse karte hain.

CHAPTER 11

Chapter Recap

Aap ne seekha

- Data storage automation ka important part hai
- Google Sheets, Airtable, CRM, aur database ka use case different hai
- Lead, customer, conversation, order, aur ticket tables common hain
- CRM pipeline sales process ko track karti hai
- AI output ko validate karke save karna chahiye

Key rule

Automation ka goal sirf reply dena nahi. Goal yeh hai ke business data structured form mein save ho, track ho, aur follow-up action create ho.

Upgrade Challenge

Apne kisi real ya imaginary client ke liye complete CRM data model banayein. Kam az kam 4 tables define karein, har table ke fields likhein, aur har table ke liye automation action plan karein.

Chapter 12

CRM Lead Automation

Lead capture se next step CRM lead automation hai. Is chapter mein hum seekhein ge ke AI lead ko classify, score, assign, save, notify, aur follow-up ke liye ready kaise karti hai.

Chapter ka main flow

Lead Received → AI Scores → Save in CRM → Notify Team → Follow-up

Goal: Is chapter ke end tak aap ek practical CRM lead automation design kar sakenge jo business team ko sirf lead list nahi, balkay next action bhi de.

CHAPTER 12

CRM Lead Automation Kya Hoti Hai?

CRM lead automation ka matlab hai ke jab koi new lead aaye, system us lead ko manually copy-paste karne ke bajaye automatically process kare. AI lead ka message samajhti hai, important fields nikalti hai, quality score deti hai, CRM ya sheet mein save karti hai, aur sales team ko batati hai ke next step kya hona chahiye.

Manual process

- Message read karo
- Data copy karo
- Sheet update karo
- Team ko message karo
- Follow-up yaad rakho

Automated process

- AI message read karti hai
- Data extract hota hai
- Lead score banta hai
- CRM update hota hai
- Follow-up reminder set hota hai

Client ke liye iska benefit simple hai: koi important lead miss nahi hoti.

CHAPTER 12

Lead Automation ke Core Parts

Ek useful CRM lead automation mein sirf form submission save karna enough nahi hota. System ko lead ke business value ke hisaab se action bhi decide karna chahiye.

CRM lead automation building blocks

Input → Extraction → Scoring → CRM Save → Action

Input

WhatsApp, website form, email, ad lead, chatbot.

AI Logic

Intent, fields, score, missing info, next action.

Business Action

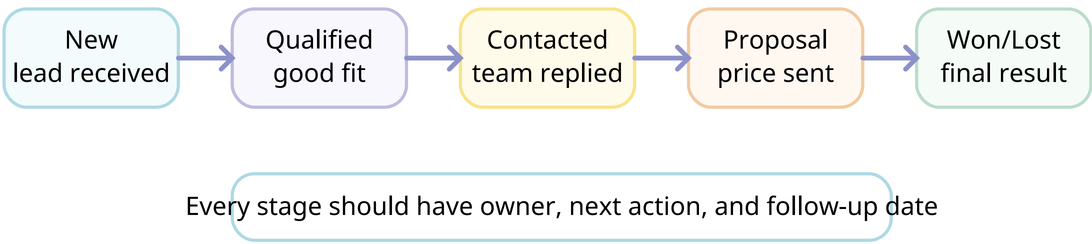
CRM record, notification, follow-up, assignment.

CHAPTER 12

CRM Pipeline Stages

Pipeline stages lead ka journey show karte hain. Har lead ko ek status milna chahiye, taake team ko pata rahe ke lead kis stage par hai.

Simple CRM pipeline



Important rule

Pipeline stages simple rakhein. Agar stages bohot zyada hon, team CRM update karna chor deti hai.

CHAPTER 12

Recommended Lead Statuses

Beginner/intermediate CRM automation ke liye status list practical honi chahiye. Neechay ek general-purpose list hai jo most service businesses ke liye kaam kar sakti hai.

```
new
qualified
not_qualified
contacted
waiting_for_customer
proposal_sent
follow_up_required
won
lost
```

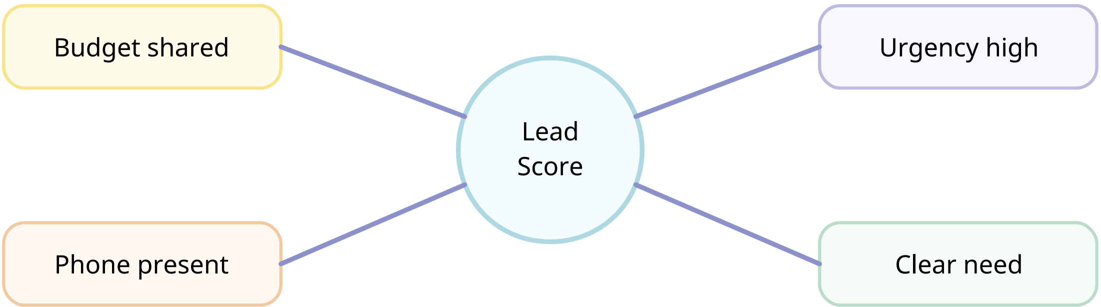
Status	Meaning
new	Lead just received, no action taken yet.
qualified	Lead has clear need and contact info.
proposal_sent	Price, quotation, or offer has been shared.
follow_up_required	Customer needs reminder or team callback.

CHAPTER 12

Lead Scoring Basics

Lead scoring ka matlab hai lead ko quality ke hisaab se score dena. Score se sales team decide karti hai ke kis lead ko pehle call karna hai.

Lead score factors



Simple formula: Jis lead mein clear need, phone number, budget, urgency, aur location ho, uska score zyada hona chahiye.

CHAPTER 12

Practical Lead Score Rules

Lead score complicated nahi hona chahiye. Start mein 0 se 100 score ka simple system enough hota hai.

Condition	Points	Reason
Phone number available	+20	Team contact kar sakti hai
Clear service/product need	+25	Lead serious lagti hai
Budget shared	+20	Buying intent strong hota hai
Urgent timeline	+20	Fast action required hai
Location/service area match	+15	Business serve kar sakta hai

Score labels

80-100 = hot, 50-79 = warm, 0-49 = cold.

CHAPTER 12

AI Lead Scoring Output

AI ko sirf score generate nahi karna chahiye. Usay score ka reason bhi dena chahiye taake sales team samajh sake ke lead hot kyon hai.

```
{
  "lead_type": "service_inquiry",
  "lead_score": 85,
  "lead_quality": "hot",
  "score_reasons": [
    "Customer shared phone number",
    "Customer needs urgent AC repair",
    "Location is available",
    "Service requirement is clear"
  ],
  "recommended_action": "Call customer within 15 minutes"
}
```

Is tarah ka output CRM mein save bhi ho sakta hai aur team notification mein bhi use ho sakta hai.

CHAPTER 12

CRM Record Ka Structure

Jab lead CRM mein save ho, to record complete hona chahiye. Missing data ko blank chorne ke bajaye clearly null ya missing mark karna better hota hai.

```
{
  "customer_name": "Ali Khan",
  "phone_number": "03001234567",
  "source": "WhatsApp",
  "interest": "AC repair",
  "city": "Lahore",
  "budget": null,
  "urgency": "high",
  "lead_score": 85,
  "lead_status": "qualified",
  "assigned_to": "sales_team",
  "next_follow_up_at": "today_15_minutes"
}
```

Rule: CRM mein wohi data save karein jo team action ke liye use kar sakti hai.

CHAPTER 12

Sales Team Notification

CRM mein lead save karna zaroori hai, lekin hot lead ke liye team notification bhi zaroori hai. Notification short, clear, aur action-oriented honi chahiye.

Weak notification

New lead received.

Strong notification

Hot lead: AC repair, Lahore, urgent, phone available. Call within 15 minutes.

```
New Hot Lead
Name: Ali Khan
Phone: 03001234567
Need: AC repair
Location: Lahore
Score: 85/100
Recommended Action: Call within 15 minutes
```

CHAPTER 12

Follow-up Automation

Follow-up automation ka role yeh hai ke team ya customer ko right time par reminder mil jaye. Bohot businesses lead is liye lose karte hain kyun ke unhone follow-up nahi kiya.

Follow-up flow

Lead Type	Follow-up Timing
Hot lead	15 minutes to 1 hour
Warm lead	Same day or next day
Cold lead	2-3 days later

CHAPTER 12

Follow-up Message Templates

Follow-up message polite, short, aur context-aware honi chahiye. Har lead ko same generic message bhejna weak automation lagta hai.

Customer follow-up

Assalam-o-Alaikum, aap ne AC repair ke liye inquiry ki thi. Kya aap technician visit schedule karna chahenge?

Team reminder

Reminder: Ali Khan ki AC repair lead abhi tak contacted status mein nahi gayi. Please call and update CRM.

Best practice

Follow-up message mein previous conversation ka context zaroor include karein.

CHAPTER 12

Lead Assignment Rules

Agar business mein multiple sales persons hain, to lead ko assign karna zaroori hota hai. Assignment simple rules se ho sakti hai.

Rule	Example
Location based	Lahore leads Lahore sales person ko
Service based	AC repair leads technical team ko
Lead score based	Hot leads senior sales person ko
Round robin	Leads team members mein rotate hoti hain

```
if lead_score >= 80:
  assign_to = "senior_sales"
elif city == "Lahore":
  assign_to = "lahore_team"
else:
  assign_to = "general_sales"
```

CHAPTER 12

CRM Reporting

Lead automation ka ek strong benefit reporting hai. Jab data clean save hota hai, business owner ko clear picture milti hai.

Basic reports

- Total leads
- Hot leads
- Won leads
- Lost leads
- Pending follow-ups

Useful questions

- Best lead source kaunsa hai?
- Team response time kaisa hai?
- Kitni leads convert hui?
- Kis service ki demand zyada hai?

Client value: Automation report business owner ko decision making mein help karti hai.

CHAPTER 12

Project: AC Service CRM Lead Automation

Is mini project mein hum AC service business ke liye CRM lead automation design karte hain. Customer WhatsApp ya website form se inquiry karta hai.

Project workflow

Required fields

name, phone, city, area, service_type, urgency, preferred_time, message, lead_score, lead_status, next_follow_up_at.

CHAPTER 12

AI Prompt for CRM Lead Automation

Is prompt ka kaam customer message se CRM-ready lead record banana hai.

```
You are a CRM lead automation assistant.
Read the customer message and create a clean CRM lead record.

Return only valid JSON with these fields:
customer_name, phone_number, city, area, service_type,
urgency, lead_score, lead_quality, lead_status,
missing_fields, recommended_action, follow_up_timing,
team_notification.

Scoring rules:
- Clear service need: +25
- Phone number present: +20
- Location present: +15
- Urgency high: +20
- Preferred time/date present: +10
- Budget or price discussion: +10

Customer message:
{{customer_message}}
```

CHAPTER 12

Make.com Implementation Plan

Make.com mein is CRM lead automation ko scenario ki form mein build kiya ja sakta hai.

1

Webhook trigger

Website form ya WhatsApp backend se lead message receive karein.

2

AI extraction

OpenAI/AI module se CRM-ready JSON output generate karein.

3

Router

Hot, warm, cold lead ke hisaab se path select karein.

4

Save + notify

Google Sheet/CRM update karein aur team ko notification bhejein.

CHAPTER 12

n8n Implementation Plan

n8n mein same workflow zyada controlled form mein build hota hai, especially jab API calls aur error handling strong chahiye ho.

1

Webhook Node

Incoming message receive karein.

2

AI Node

Lead score aur CRM JSON generate karein.

3

IF / Switch Node

Lead quality ke hisaab se route karein.

4

CRM / Sheet Node

Lead save karein, notification send karein, follow-up schedule karein.

Tip: n8n mein execution logs se aap easily debug kar sakte hain ke lead kis step par fail hui.

Exercise 1: Lead Score Calculate Karein

Customer message: "Mera AC cooling nahi kar raha. Main Johar Town Lahore mein hoon. Aaj technician bhej sakte hain? 03001234567"

Is lead ka score, quality, status, aur recommended action likhein.

Answer Key

```
{
  "lead_score": 80,
  "lead_quality": "hot",
  "lead_status": "qualified",
  "recommended_action": "Call customer within 15 minutes and schedule technician visit",
  "score_reasons": [
    "Clear AC repair need",
    "Phone number is present",
    "Location is present",
    "Urgency is high"
  ]
}
```

CHAPTER 12

Exercise 2: CRM Fields Design Karein

Ek real estate agency ke liye CRM lead fields design karein. Leads WhatsApp aur Facebook ads se aati hain.

Answer Key

```
lead_id
customer_name
phone_number
source
property_type
buy_or_rent
location_preference
budget_range
timeline
lead_score
lead_quality
lead_status
assigned_agent
last_message
next_follow_up_at
created_at
```

Is structure se agency ko pata chalega ke lead buying ke liye hai ya renting ke liye, kis location mein interested hai, aur kis agent ko assign karni hai.

CHAPTER 12

Exercise 3: Follow-up Rules Banayein

Ek course-selling business ke liye hot, warm, aur cold leads ke follow-up rules banayein.

Answer Key

Lead Quality	Follow-up Rule
Hot	Call or WhatsApp within 30 minutes
Warm	Send course details same day, follow-up next day
Cold	Send helpful info, follow-up after 3 days

Important: Follow-up rules business type ke hisaab se customize karein. Urgent services mein fast follow-up required hota hai.

CHAPTER 12

Chapter Recap

Aap ne seekha

- CRM lead automation ka purpose
- Lead pipeline stages
- Lead scoring rules
- CRM-ready JSON structure
- Team notification and follow-up
- Make.com and n8n implementation plan

Key rule

Lead automation ka goal sirf lead save karna nahi. Goal yeh hai ke right lead, right person tak, right time par, right action ke saath pohanch jaye.

Upgrade Challenge

Apne kisi real ya imaginary client ke liye CRM lead automation design karein. Lead fields, score rules, status stages, assignment rules, aur follow-up timings define karein.

Chapter 13

Follow-up Automation

Lead save karna pehla step hai. Real business result tab aata hai jab system timely follow-up kare, CRM status update kare, aur sales/support team ko next action clear bataye.

Chapter ka main flow

Lead Saved → Wait Rule → Send Message → Update CRM → Stop or Repeat

Goal: Is chapter ke end tak aap follow-up rules, timing, messages, CRM fields, and automation workflow design kar sakenge.

CHAPTER 13

Follow-up Automation Kya Hoti Hai?

Follow-up automation ka matlab hai ke jab customer pehle message ke baad reply na kare, ya sales process mein next step pending ho, system automatically reminder, helpful message, ya team notification send kare.

Iska goal customer ko spam karna nahi hota. Goal yeh hota hai ke interested customer ko timely help mile aur business ki potential sale miss na ho.

Without follow-up

- Lead sheet mein save ho jati hai
- Team bhool sakti hai
- Customer competitor ke paas chala jata hai
- No clear next action

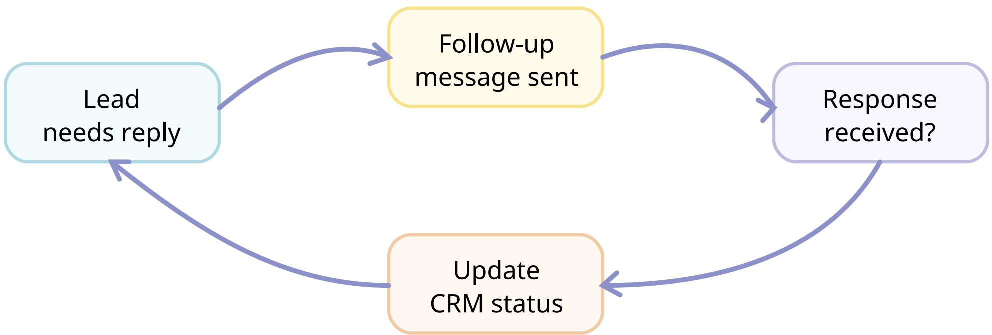
With follow-up

- Lead status track hota hai
- Reminder time par jata hai
- Team ko alert milta hai
- Conversion chance improve hota hai

Follow-up Loop

Follow-up ek controlled loop hai. Har reminder ke baad system ko check karna chahiye ke customer ne reply kiya ya nahi. Agar reply aa jaye to follow-up stop ya next stage mein shift ho jata hai.

Follow-up loop



Follow-up is a controlled loop, not random repeated messaging.

Important rule

Har follow-up ka reason hona chahiye. Random repeated messages customer ko irritate kar sakte hain.

CHAPTER 13

Follow-up Kab Trigger Hona Chahiye?

Automation mein trigger wo condition hoti hai jiske baad follow-up start hota hai. Follow-up trigger clearly define hona chahiye, warna system unnecessary messages send karega.

Common triggers

- Lead created but no team response
- Customer ne price poocha but order confirm nahi kiya
- Proposal sent but no reply
- Appointment details pending
- Payment confirmation pending

Stop conditions

- Customer replied
- Lead marked won/lost
- Human took over
- Customer asked to stop
- Maximum follow-ups reached

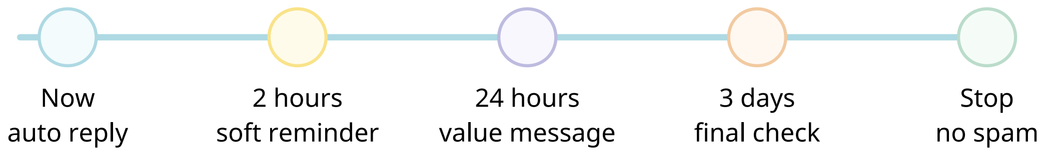
CHAPTER 13

Follow-up Timing Strategy

Timing business type ke hisaab se change hoti hai. Emergency service mein 10 minutes important ho sakte hain, jabke course ya software service mein 24 hours acceptable ho sakte hain.

Example timing sequence

Example follow-up timing for warm leads



Student note: Timing hamesha business type, customer urgency, aur communication channel ke hisaab se decide karein.

CHAPTER 13

Lead Quality ke Hisab se Follow-up

Har lead ko same follow-up nahi milna chahiye. Hot lead ko fast personal response chahiye, warm lead ko helpful reminder, aur cold lead ko soft value-based message.

Lead Type	Follow-up Style	Timing
Hot	Direct call/WhatsApp, urgent action	5-30 minutes
Warm	Helpful reminder + next step	2-24 hours
Cold	Soft information, no pressure	2-3 days

Hot = fast **Warm = helpful** **Cold = soft**

CHAPTER 13

Follow-up Channels

Follow-up channel ka selection client ke business aur customer behavior par depend karta hai. Pakistan aur local service businesses mein WhatsApp usually strong channel hota hai, lekin email, SMS, and internal team alerts bhi important ho sakte hain.

Customer-facing

- WhatsApp message
- Email reminder
- SMS reminder
- Website chat notification

Internal team

- Slack/Teams alert
- Email to sales team
- CRM task
- Google Sheet status update

Best automation usually customer reminder + internal team alert dono combine karti hai.

CHAPTER 13

CRM Fields for Follow-up

Follow-up automation ke liye CRM mein kuch extra fields required hoti hain. In fields ke bina system ko pata nahi chalega ke next reminder kab send karna hai.

```
lead_id
customer_name
phone_number
lead_status
lead_quality
last_customer_message
last_team_reply
last_follow_up_at
next_follow_up_at
follow_up_count
follow_up_stage
assigned_to
stop_follow_up
follow_up_reason
```

Important field

stop_follow_up field zaroor rakhein. Agar customer ne mana kar diya ya human agent ne takeover kar liya, automation stop ho jani chahiye.

CHAPTER 13

Follow-up Rule JSON

Automation tools mein follow-up rules ko structured JSON format mein plan karna easy hota hai. Is se Make.com, n8n, ya backend system ko clear instructions milti hain.

```json
{
  "lead_quality": "warm",
  "lead_status": "proposal_sent",
  "follow_up_stage": 1,
  "wait_time_hours": 24,
  "channel": "whatsapp",
  "message_type": "value_reminder",
  "stop_if_customer_replied": true,
  "max_follow_ups": 3,
  "next_action": "send_follow_up_message"
}
```

Is structure ka faida yeh hai ke business rules readable aur testable rehte hain.

CHAPTER 13

Follow-up Message Templates

Follow-up message short, polite, aur helpful hona chahiye. Message mein pressure ya spam wali feeling nahi honi chahiye.

Service reminder

Assalam-o-Alaikum, aap ne AC service ke bare mein poocha tha. Agar aap chahein to hum aaj technician availability check kar sakte hain.

Proposal reminder

Hi, kal jo estimate share kiya tha us par agar koi question ho to bata dein. Main aapko next step guide kar dunga.

Soft final follow-up

Just checking in - agar abhi service required nahi hai to koi issue nahi. Jab zaroorat ho, aap message kar sakte hain.

CHAPTER 13

AI Follow-up Message Prompt

AI ko follow-up message generate karne ke liye customer context aur business rules chahiye hotay hain. Prompt mein tone, length, channel, aur goal clear hona chahiye.

```
You are a helpful sales follow-up assistant.
Write a short follow-up message in Roman Urdu.

Business: {business_name}
Customer interest: {customer_interest}
Last customer message: {last_customer_message}
Lead quality: {lead_quality}
Follow-up stage: {follow_up_stage}
Goal: {goal}
Channel: WhatsApp

Rules:
- Keep it polite and natural.
- Do not sound pushy.
- Do not invent price or availability.
- Ask only one clear next-step question.
- Keep the message under 3 sentences.
```

Best practice: AI message generate kare, lekin system rules decide karein ke message kab send hoga.

CHAPTER 13

Make.com Implementation Plan

Make.com mein follow-up workflow usually scheduled scenario se banta hai. Scenario fixed interval par CRM/Google Sheet check karta hai aur due follow-ups send karta hai.

1

1. Scheduler

Every 15 minutes ya hourly scenario run karein.

2

2. Search leads

CRM ya Google Sheet se due follow-ups find karein.

3

3. Filter

stop_follow_up false aur next_follow_up_at due hona chahiye.

4

4. Generate message

AI se polite follow-up message banwayein.

5

5. Send and update

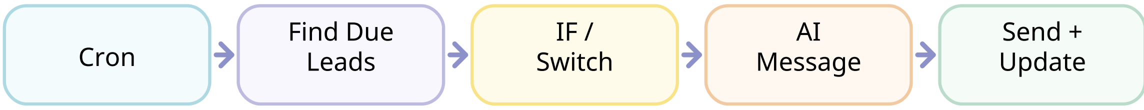
Message send karein, count aur next time update karein.

CHAPTER 13

n8n Implementation Plan

n8n mein follow-up workflow Cron node, database/Google Sheet node, IF/Switch node, AI node, and HTTP Request node se ban sakta hai.

n8n follow-up workflow



n8n tip

Follow-up workflow ke execution logs zaroor check karein. Is se pata chalega kaun se leads message receive kar rahe hain aur kaun se fail ho rahe hain.

CHAPTER 13

Follow-up Safety Rules

Follow-up automation useful hai, lekin agar rules weak hon to customer experience kharab ho sakta hai. Is liye safety rules zaroor include karein.

Kya karna hai

- Message short rakhein
- Customer context use karein
- Max follow-up limit set karein
- Stop condition define karein
- Human takeover support karein

Kya avoid karna hai

- Har ghante message bhejna
- Generic spam text
- Wrong customer ko wrong message
- Unverified offers
- Customer opt-out ignore karna

CHAPTER 13

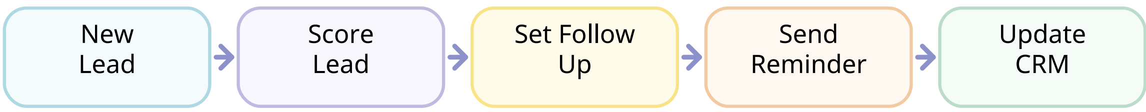
Mini Project: Course Lead Follow-up System

Scenario: Ek training institute ko WhatsApp aur website se course leads milti hain. Kuch students fees pooch kar reply nahi karte. Institute chahta hai ke system automatically follow-up kare.

Requirements

- Lead CRM/sheet mein save ho
- Lead quality hot/warm/cold assign ho
- Warm leads ko 24 hours baad follow-up jaye
- Hot leads ke liye team ko immediate alert jaye
- 3 follow-ups ke baad automation stop ho

Mini project flow



CHAPTER 13

Mini Project: Suggested Solution

```
{
  "workflow_name": "Course Lead Follow-up Automation",
  "trigger": "new_lead_created",
  "lead_quality_rules": {
    "hot": "phone present + asks about admission/payment/timing",
    "warm": "asks about course details or fees",
    "cold": "only says details or interested"
  },
  "follow_up_rules": [
    {"quality": "hot", "action": "notify_team_immediately"},
    {"quality": "warm", "wait_hours": 24, "action": "send_whatsapp_follow_up"},
    {"quality": "cold", "wait_hours": 72, "action": "send_soft_info_message"}
  ],
  "max_follow_ups": 3,
  "stop_conditions": ["customer_replied", "lead_won", "lead_lost", "human_takeover",
"opt_out"]
}
```

Is solution mein customer ko repeatedly spam nahi kiya ja raha. Lead quality ke hisaab se timing aur message change ho raha hai.

Exercise 1: Follow-up Timing Design Karein

Scenario: Ek AC repair business ko customer message karta hai: "AC cooling nahi kar raha, rate bata dein." Customer ko price reply mil gaya, lekin us ne 2 ghante tak reply nahi kiya.

Follow-up timing, message, aur stop condition define karein.

Answer Key

```
{
  "lead_type": "warm",
  "first_follow_up_after": "2 hours",
  "message": "Ji, agar aap chahen to hum aapke area ke hisaab se technician availability
check kar sakte hain. Please apna area share kar dein.",
  "stop_conditions": ["customer_replied", "human_agent_assigned", "lead_marked_lost"],
  "max_follow_ups": 2
}
```

CHAPTER 13

Exercise 2: CRM Fields Select Karein

Ek real estate business ke liye follow-up automation fields define karein. Leads WhatsApp aur Facebook ads se aati hain.

Answer Key

```
lead_id
customer_name
phone_number
source
property_type
location_preference
budget_range
lead_quality
lead_status
assigned_agent
last_contact_at
last_follow_up_at
next_follow_up_at
follow_up_count
stop_follow_up
follow_up_notes
```

Real estate mein budget, location, and assigned agent important fields hain. Follow-up date ke bina agent lead miss kar sakta hai.

CHAPTER 13

Exercise 3: Follow-up Message Improve Karein

Bad message: "Aap ne reply kyun nahi kiya? Jaldi order confirm karein."

Isay polite, professional, aur customer-friendly Roman Urdu follow-up message mein convert karein.

Answer Key

Improved message

Assalam-o-Alaikum, bas follow-up kar raha hoon ke kya aapko service ke bare mein koi aur detail chahiye? Agar aap chahein to main next step guide kar sakta hoon.

Reason: Message polite hai, pressure nahi daal raha, aur customer ko clear next step de raha hai.

CHAPTER 13

Chapter Recap

Aap ne seekha

- Follow-up automation ka purpose
- Follow-up triggers and stop conditions
- Lead quality based timing
- CRM fields for follow-up
- AI follow-up prompt
- Make.com and n8n implementation plan

Key rule

Follow-up automation ka goal customer ko force karna nahi. Goal timely help, clear next step, aur lost leads ko reduce karna hai.

Upgrade Challenge

Apne kisi real ya imaginary client ke liye follow-up automation design karein. Trigger, timing, message templates, stop conditions, CRM fields, aur team alerts define karein.

SECTION 5: WHATSAPP AND CHATBOT SYSTEMS

Chapter 14

WhatsApp Bot Architecture

WhatsApp bot sirf auto-reply tool nahi hota. Client-ready WhatsApp system mein message channel, webhook, backend, AI router, database, business action, and human handoff sab connected hote hain.

Chapter ka main architecture

Customer Message → Webhook Event → AI Router Decision → Business Action → WhatsApp Reply

Goal: Is chapter ke end tak aap WhatsApp bot ka proper architecture design kar sakenge, chahe implementation Make.com, n8n, ya custom backend se ho.

CHAPTER 14

WhatsApp Bot Architecture Kya Hoti Hai?

Architecture ka matlab hai system ke parts aur un parts ke beech connection. WhatsApp bot architecture batati hai ke customer ka message kahan receive hoga, AI usay kaise samjhega, data kahan save hoga, action kaise execute hoga, aur reply customer tak kaise wapas jaye ga.

Beginner level par log bot ko sirf auto-reply samajhte hain. Intermediate level par aapko bot ko complete business workflow ke taur par dekhna hai.

Simple auto-reply

- Fixed response
- No memory
- No CRM update
- No business action

Client-ready bot

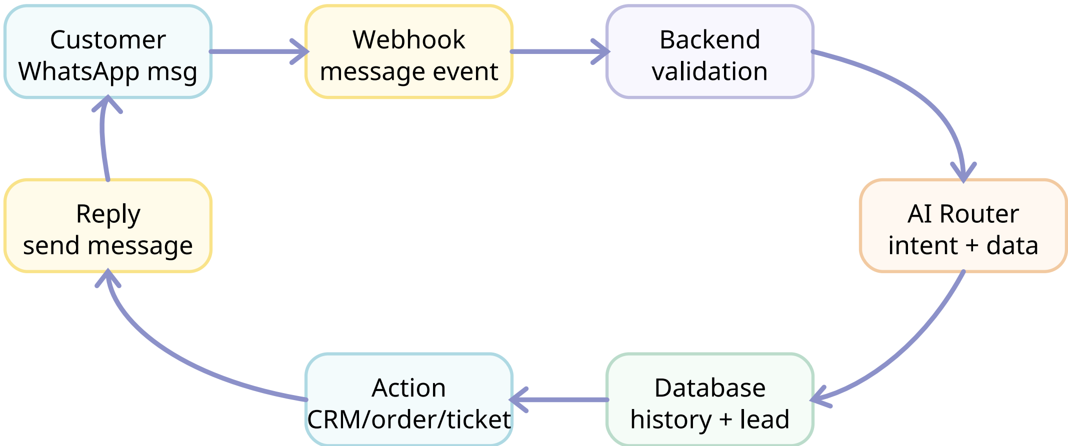
- Intent detection
- Data extraction
- CRM/database update
- Human handoff

CHAPTER 14

Complete WhatsApp Bot System

Professional WhatsApp bot mein har message ek flow follow karta hai. Yeh flow channel se start hota hai aur reply/send action par end hota hai.

WhatsApp bot system architecture



A WhatsApp bot is a system: channel + webhook + backend + AI + database + action + reply.

Is diagram ka purpose yeh samjhana hai ke AI sirf system ka ek part hai. Database, validation, action, and handoff equally important hain.

CHAPTER 14

WhatsApp Options: App, Cloud API, ya Web Automation?

Client ke liye WhatsApp automation plan karte waqt pehle yeh clear karein ke kis approach ka use hoga. Har option ka use case, control, risk, aur scalability different hoti hai.

Option	Best For	Limitations
WhatsApp Business App	Manual replies, small business, quick setup	Deep automation limited hoti hai
WhatsApp Cloud API	Official business messaging, scalable bots	Setup, verification, templates, and policies samajhni hoti hain
WhatsApp Web Automation	Testing, experiments, unofficial workflows	Reliability aur policy risk high ho sakta hai

Best practice: Real clients ke liye official API approach prefer karein. Agar koi tool ya policy change ho, current official documentation zaroor check karein.

CHAPTER 14

Core Components

WhatsApp bot ko design karte waqt system ke components clear likhein. Agar components clear nahi honge to workflow confusing ho jaye ga.

1. Channel

Customer WhatsApp par message send karta hai. Yeh message API ya automation tool tak event ki form mein aata hai.

2. Webhook

New message event ko receive karta hai aur backend ya workflow tool ko data forward karta hai.

3. AI Router

Message ka intent, required data, priority, and next action decide karta hai.

4. Action Layer

CRM update, order create, appointment plan, ticket create, ya team notification execute karta hai.

CHAPTER 14

Message Receiving Flow

Jab customer WhatsApp message bhejta hai, system ko sirf message text nahi milta. Usually sender number, timestamp, message id, and sometimes media/file information bhi mil sakti hai.


```
{
  "message_id": "msg_1001",
  "from": "923001234567",
  "customer_name": "Ali",
  "message_text": "Menu bhej dein aur delivery charges bhi bata dein",
  "timestamp": "2026-07-01T14:25:00Z",
  "channel": "whatsapp"
}
```


Automation ka pehla kaam is payload ko clean format mein convert karna hai taake AI aur business workflow usay easily use kar sake.

CHAPTER 14

AI Router ka Role

WhatsApp bot mein AI router incoming message ko samajhta hai. Iska output natural language reply nahi, balkay structured decision hona chahiye.

```
{
  "intent": "menu_request",
  "customer_type": "new",
  "required_data_missing": [],
  "priority": "low",
  "next_action": "send_menu",
  "needs_human": false,
  "reply_type": "menu_response"
}
```

Router ka faida

Router se bot har message par same response nahi deta. Yeh message ke intent ke hisaab se correct path choose karta hai.

CHAPTER 14

Required Data Planning

Har intent ke liye required fields define karna zaroori hai. Jab data missing ho to bot direct action execute nahi karega, pehle missing information collect karega.

Intent	Required Data	Next Action
place_order	items, quantity, address, phone	collect missing fields or confirm order
appointment_booking	name, phone, service, date, time	check availability or ask missing data
complaint	name, issue, order_id if available	create ticket or handoff
price_inquiry	service/product name	send pricing or ask service details

CHAPTER 14

Database aur Conversation History

Professional WhatsApp bot ko customer history save karni chahiye. Is se bot ko pata hota hai ke customer new hai ya returning, last conversation kya thi, aur kaunsa field missing tha.

Customer table

- phone_number
- customer_name
- source
- last_contact_at

Conversation table

- message_text
- intent
- bot_reply
- created_at

Lead/order table

- status
- assigned_to
- next_action
- notes

Handoff table

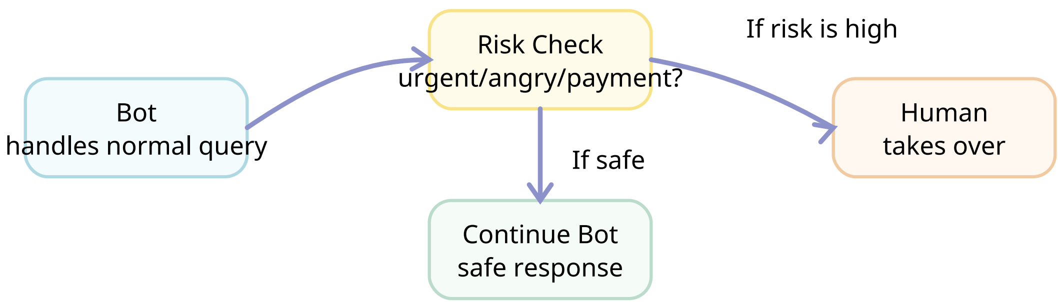
- reason
- priority
- agent_name
- resolved_at

CHAPTER 14

Human Handoff Architecture

Bot ko har cheez khud handle nahi karni chahiye. Payment issue, angry customer, urgent complaint, ya high-value lead ko human team tak route karna zaroori hai.

Bot to human handoff



Rule: Agar message risky, emotional, legal, payment-related, ya high-value ho to bot safe reply de aur human ko notify kare.

CHAPTER 14

Human Handoff Rules

Handoff rules ko clearly define karna chahiye taake bot unnecessary cases human ko forward na kare aur risky cases miss bhi na kare.

```
{
  "handoff_rules": [
    "customer_is_angry",
    "payment_issue_detected",
    "refund_request_detected",
    "high_value_lead",
    "bot_confidence_low",
    "customer_asks_for_human",
    "medical_or_legal_advice_requested"
  ],
  "handoff_message_to_customer": "Main aapki request team ko forward kar raha hoon. Hamara
representative jald aap se contact karega.",
  "internal_alert_channel": "sales_team_whatsapp_group"
}
```

CHAPTER 14

Restaurant Bot Architecture Example

Restaurant WhatsApp bot mein main intents menu request, order placement, address collection, order confirmation, and complaint ho sakte hain.

Restaurant order flow

Example order JSON

```
{
  "intent": "place_order",
  "items": [
    { "name": "Zinger Burger", "quantity": 2 },
    { "name": "Fries", "quantity": 1 }
  ],
  "missing_fields": ["delivery_address"],
  "next_action": "ask_delivery_address"
}
```

CHAPTER 14

Service Business Bot Architecture Example

Service business jaise AC repair, plumbing, electrician, salon, or clinic ke liye bot ka goal lead capture aur appointment/service request route karna hota hai.

Service request flow

Service Inquiry → Extract Details → Ask Missing Fields → Save Lead → Assign Team

Required fields

- customer_name
- phone_number
- service_type
- area/location
- preferred_time

Team action

- Lead assign karein
- Technician availability check karein
- Follow-up time set karein
- Customer ko confirmation bhejein

CHAPTER 14

WhatsApp Bot Prompt Template

Neechay intermediate level WhatsApp router prompt ka reusable template diya gaya hai. Is prompt ko Make.com, n8n, ya backend AI step mein use kiya ja sakta hai.

```
You are a WhatsApp automation router for a business.
Your job is to analyze the customer message and return ONLY valid JSON.

Business type: {business_type}
Available intents: {intent_list}
Required fields by intent: {required_fields}

Rules:
- Detect the main intent.
- Extract all available customer details.
- Identify missing required fields.
- Decide the next action.
- Set needs_human=true for angry customer, payment issue, refund, urgent complaint, or low
confidence.
- Do not create final customer reply unless reply_text is requested.

Return JSON:
{
  "intent": "",
  "confidence": "high|medium|low",
  "extracted_data": {},
  "missing_fields": [],
  "priority": "low|medium|high",
  "needs_human": false,
  "next_action": "",
  "reply_text": ""
}
```

CHAPTER 14

Make.com Implementation Plan

Agar aap WhatsApp bot Make.com mein plan kar rahe hain to flow ko modules mein break karein.

1. **Webhook**

   WhatsApp message payload receive karein.

2. **AI Router**

   Message ko classify aur extract karein.

3. **Router**

   Intent ke hisaab se path select karein.

4. **Google Sheet/CRM**

   Lead, order, complaint, ya conversation save karein.

5. **HTTP Send Message**

   WhatsApp provider API ke through reply send karein.

CHAPTER 14

n8n Implementation Plan

n8n mein WhatsApp bot zyada flexible ho sakta hai kyun ke aap IF/Switch, Code node, HTTP Request, database, aur error workflows use kar sakte hain.

1

Webhook Node

Incoming WhatsApp message receive karein.

2

Set Node

Payload ko clean fields mein convert karein.

3

AI Node

Intent, fields, priority, and next action generate karein.

4

Switch Node

Intent ke hisaab se branch select karein.

5

HTTP/DB Nodes

Message send, CRM update, ya ticket creation execute karein.

Testing Checklist

WhatsApp bot ko live client par deploy karne se pehle testing zaroor karein.

Functional tests

- Menu request
- Price inquiry
- Order placement
- Missing address
- Complaint

Safety tests

- Angry customer
- Payment issue
- Human request
- Unknown message
- Repeated message

Important: Bot ko test phone numbers se run karein. Live customers par direct untested automation apply na karein.

CHAPTER 14

Mini Project: Service Business WhatsApp Bot

Scenario: Ek AC repair business chahta hai ke WhatsApp par incoming messages automatically classify hon, required details collect hon, lead Google Sheet mein save ho, aur high-priority lead team ko notify ho.

Required output

- Intent list
- Required fields
- AI router JSON
- Human handoff rules
- Workflow diagram

Sample Answer

```
{
  "intents": ["price_inquiry", "service_request", "complaint", "availability_query",
"human_support"],
  "required_fields": ["customer_name", "phone_number", "service_type", "area",
"preferred_time"],
  "handoff_rules": ["angry_customer", "urgent_service", "payment_issue",
"customer_asks_human"],
  "workflow": "WhatsApp -> Webhook -> AI Router -> Google Sheet/CRM -> Team Alert ->
WhatsApp Reply"
}
```

Exercise 1: Intent List Banayein

Scenario: Ek restaurant WhatsApp bot ke liye intents define karein.

Answer Key

```
menu_request
place_order
modify_order
delivery_address
order_confirmation
delivery_status
complaint
human_support
```

Restaurant bot mein order flow ke saath complaint and human support intents zaroor include karein.

Exercise 2: Missing Fields Handle Karein

Customer message: "2 zinger burger bhej dein." Required fields: items, quantity, address, phone number.

Answer Key

```
{
  "intent": "place_order",
  "extracted_data": {
    "items": [
      { "name": "Zinger Burger", "quantity": 2 }
    ]
  },
  "missing_fields": ["delivery_address", "phone_number"],
  "next_action": "ask_missing_fields",
  "reply_text": "Ji, 2 zinger burger note kar liye hain. Please delivery address aur phone
number share kar dein."
}
```

Exercise 3: Handoff Decision

Customer message: "Payment deduct ho gayi hai lekin order confirm nahi hua. Mujhe abhi kisi insan se baat karni hai."

Answer Key

```
{
  "intent": "payment_complaint",
  "priority": "high",
  "needs_human": true,
  "handoff_reason": "payment_issue_and_customer_requested_human",
  "next_action": "notify_support_team",
  "reply_text": "Sorry for the inconvenience. Main aapki payment issue request support team ko forward kar raha hoon. Hamara representative jald aap se contact karega."
}
```

CHAPTER 14

Chapter Recap

Aap ne seekha

- WhatsApp bot architecture
- Channel, webhook, backend, AI router, database
- Required data planning
- Conversation history
- Human handoff rules
- Make.com and n8n implementation plan

Key rule

WhatsApp bot ko auto-reply machine na banayein. Isay business system banayein jo data save kare, correct action le, aur risky cases human ko forward kare.

Upgrade Challenge

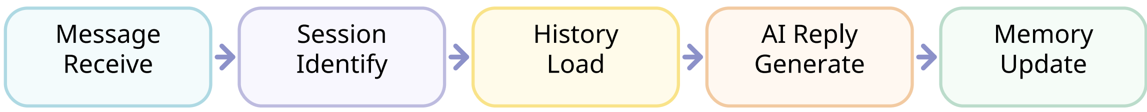
Apne kisi real client ke liye WhatsApp bot architecture design karein. Intent list, required fields, CRM tables, handoff rules, and testing checklist include karein.

Chapter 15

Conversation Memory

Conversation memory ka matlab hai bot ko yeh yaad rehna ke customer ne pehle kya kaha, kaunsa data already collect ho chuka hai, aur next step kya hona chahiye.

Memory ka basic flow



Goal: Is chapter ke end tak aap WhatsApp ya website chatbot ke liye session, customer history, missing fields, and conversation state ka practical design bana sakenge.

CHAPTER 15

Conversation Memory Kya Hoti Hai?

Simple bot har message ko new message samajhta hai. Memory-based bot previous conversation ko context ke taur par use karta hai. Is se bot customer se bar bar same information nahi maangta.

Without memory

Customer ne address pehle de diya, lekin bot aglay message par phir address pooch leta hai. Conversation robotic aur annoying lagti hai.

With memory

Bot samajhta hai ke address already collect ho chuka hai. Ab woh next missing field, confirmation, ya business action par move karta hai.

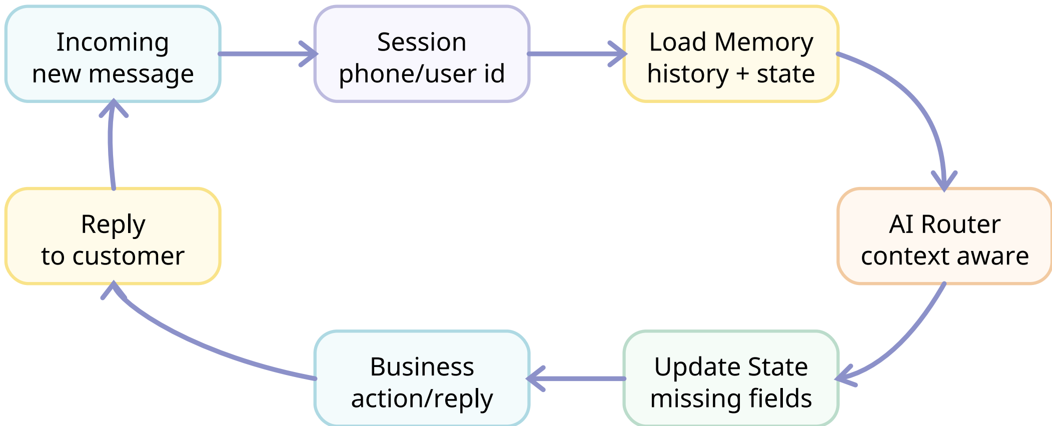
Simple definition: Memory is the saved context of a conversation that helps the bot continue from the right point.

CHAPTER 15

Memory Architecture

Conversation memory ka architecture WhatsApp, website chatbot, email assistant, ya CRM automation mein almost same hota hai. Pehle session identify hota hai, phir history load hoti hai, phir AI context-aware decision leta hai.

Memory-based bot architecture



Memory makes the bot continue a conversation instead of starting from zero every time.

CHAPTER 15

Memory Ki Types

Har bot ko unlimited memory ki zaroorat nahi hoti. Business use case ke hisaab se memory ko types mein divide karein.

Short-term memory

Current conversation ka context. Example: customer order place kar raha hai aur bot required fields collect kar raha hai.

Long-term memory

Customer profile ya history. Example: repeat customer ka naam, phone, last order, preferred service.

State memory

Current workflow ka stage. Example: waiting_for_address, waiting_for_date, awaiting_confirmation.

Business memory

Business rules, menu, services, prices, policies, and FAQs. Yeh usually knowledge base se aati hai.

CHAPTER 15

Session ID Ka Role

Session ID woh identifier hai jis se system ko pata chalta hai ke yeh message kis conversation se belong karta hai. WhatsApp mein commonly phone number session key ban sakta hai. Website chatbot mein browser/session id use ho sakti hai.

Channel	Possible Session ID	Example
WhatsApp	phone_number	923001234567
Website Chat	visitor_id or session_id	web_session_12345
Email	email_thread_id	thread_7788
CRM	customer_id or lead_id	lead_1001

Session ID ke baghair bot ko pata nahi chalega ke previous message aur new message same customer se aaye hain ya different customers se.

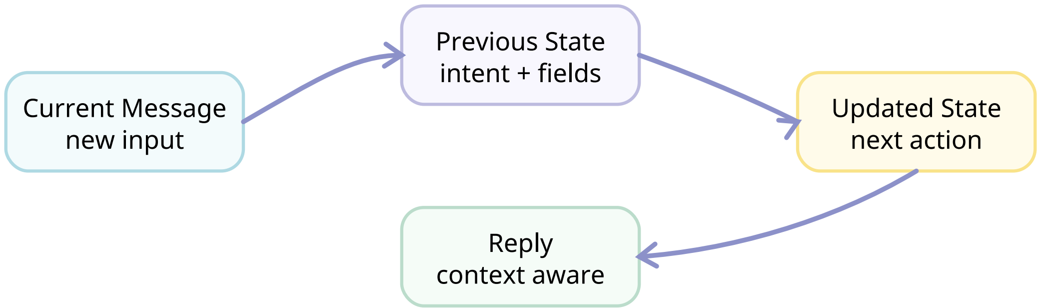
CHAPTER 15

Conversation State

Conversation state bot ko yeh batati hai ke customer current workflow mein kis point par hai. State ke baghair bot ka flow toot sakta hai.

State update flow

State tells the bot what is already known and what is still missing.



State ko simple text value ki form mein save kiya ja sakta hai, jaise **collecting_address**, **waiting_for_confirmation**, ya **handoff_to_human**.

CHAPTER 15

Common State Values

Business bot ke liye common states pehle se define karne chahiye. Yeh automation ko predictable banata hai.

State	Meaning	Bot ka Next Step
new_conversation	Customer ka pehla message	Intent detect karein
collecting_details	Required fields missing hain	Missing field ask karein
waiting_for_confirmation	Data complete hai, confirmation pending hai	Confirm/cancel ask karein
action_completed	Lead/order/ticket save ho chuka hai	Confirmation reply bhejein
handoff_to_human	Human support required hai	Team ko notify karein

CHAPTER 15

Memory Data Structure

Conversation memory ko clean JSON ya database table mein save kiya ja sakta hai. Important yeh hai ke memory structured ho, taake bot easily use kar sake.

```
{
  "session_id": "923001234567",
  "customer_name": "Ali",
  "current_intent": "service_request",
  "current_state": "collecting_details",
  "collected_fields": {
    "service_type": "AC repair",
    "area": "Johar Town"
  },
  "missing_fields": ["preferred_time"],
  "last_bot_message": "Please preferred time share kar dein.",
  "updated_at": "2026-07-01T15:30:00Z"
}
```

Yeh structure bot ko batata hai ke service type aur area already available hain, sirf preferred time missing hai.

CHAPTER 15

Customer History vs Conversation History

Customer history aur conversation history same cheez nahi hain. Dono ko separate sochna chahiye.

Customer History

- Name
- Phone
- Previous orders
- Preferred service
- Customer status

Conversation History

- Messages
- Bot replies
- Detected intents
- Missing fields
- Last state

Customer history long-term business relationship ke liye useful hoti hai. Conversation history current workflow ko continue karne ke liye useful hoti hai.

Example: AC Repair Lead

Customer pehla message bhejta hai: "AC cooling nahi kar raha, Johar Town mein service chahiye." Bot service type aur area extract kar leta hai, lekin time missing hai.

```
Step 1 Memory:
{
  "current_intent": "service_request",
  "current_state": "collecting_details",
  "collected_fields": {
    "service_type": "AC repair",
    "area": "Johar Town"
  },
  "missing_fields": ["preferred_time"]
}
```

Customer next message bhejta hai: "Kal sham ko." Memory ke baghair AI confuse ho sakta hai. Memory ke saath bot samajhta hai ke yeh preferred_time hai.

```
Step 2 Updated Memory:
{
  "current_intent": "service_request",
  "current_state": "waiting_for_confirmation",
  "collected_fields": {
    "service_type": "AC repair",
    "area": "Johar Town",
    "preferred_time": "tomorrow evening"
  },
  "missing_fields": []
}
```

CHAPTER 15

Example: Restaurant Order

Restaurant order bot ke liye memory bohot important hai kyun ke customer multiple short messages mein order details deta hai.

Msg 1	Msg 2	Msg 3	Msg 4
2 zinger burger	1 large fries bhi add kar dein	Model Town delivery	Confirm kar dein

Bot ko har message ko alag order nahi samajhna. Memory se bot items, address, and confirmation ko same order flow mein connect karta hai.

```
{
  "order_items": [
    { "name": "Zinger Burger", "quantity": 2 },
    { "name": "Large Fries", "quantity": 1 }
  ],
  "delivery_address": "Model Town",
  "current_state": "ready_to_confirm"
}
```

CHAPTER 15

Memory Prompt Template

AI ko current message ke saath previous state bhi deni chahiye. Is se AI accurate output generate karta hai.

```
You are a conversation memory manager for a business automation bot.
Analyze the current customer message using the previous conversation state.
Return ONLY valid JSON.

Previous state:
{previous_state}

Current customer message:
{current_message}

Rules:
- Do not ask again for fields already collected.
- If the current message answers a missing field, update that field.
- Keep the same intent if the user is continuing the same task.
- Change intent only if the user clearly starts a new request.
- If all required fields are complete, set current_state="waiting_for_confirmation" or
"ready_for_action".
- If the customer is angry or asks for human, set needs_human=true.

Return JSON:
{
  "current_intent": "",
  "current_state": "",
  "collected_fields": {},
  "missing_fields": [],
  "needs_human": false,
  "next_action": "",
  "reply_text": ""
}
```

CHAPTER 15

Memory Save Karne Ka Practical Plan

Beginner to intermediate projects mein memory save karne ke liye Google Sheets, Airtable, Supabase, PostgreSQL, MongoDB, ya CRM notes use ho sakte hain.

Storage	Use Case	Good For
Google Sheets	Simple lead/session tracking	Beginner projects
Airtable	Structured CRM-like records	Small business workflows
MongoDB	Flexible conversation state JSON	Chatbot systems
PostgreSQL	Relational customer/conversation tables	Production systems
CRM Notes	Sales/support context	Client-facing workflows

CHAPTER 15

Make.com Memory Plan

Make.com mein simple memory Google Sheets ya Airtable ke through maintain ki ja sakti hai.

1. **Webhook**

   Customer message receive karein.

2. **Search Row**

   Phone number/session id se previous state find karein.

3. **AI Memory Step**

   Previous state + current message AI ko send karein.

4. **Update Row**

   New state, missing fields, and last reply save karein.

5. **Send Reply**

   Customer ko context-aware reply send karein.

Tip: Make.com mein phone number ko unique key bana kar customer/session row update karna easiest approach hai.

CHAPTER 15

n8n Memory Plan

n8n mein memory workflow zyada flexible ho sakta hai. Aap database node, Set node, Code node, and AI node ko combine kar sakte hain.

1. **Webhook Node**

   Incoming message receive karein.

2. **DB Lookup**

   Session id ke through state record load karein.

3. **Set/Code Node**

   Previous state and current message ko AI input mein format karein.

4. **AI Node**

   Updated state and reply generate karein.

5. **DB Update**

   State save karein aur reply send karein.

CHAPTER 15

Memory Safety Rules

Memory powerful hai, lekin privacy aur quality ka dhyan rakhna zaroori hai. Har cheez save karna best practice nahi hota.

Save karein

- Business-related fields
- Lead/order/appointment state
- Last intent
- Missing fields
- Human handoff reason

Avoid karein

- Unnecessary personal data
- Payment secrets
- Sensitive documents without need
- Passwords or tokens
- Private notes in customer reply

Rule: Memory mein sirf woh information save karein jo business workflow complete karne ke liye required ho.

CHAPTER 15

Mini Project: Memory-Based Service Bot

Scenario: Ek home service business ka WhatsApp bot customer se service type, area, preferred time, and phone number collect karta hai. Customer details multiple messages mein deta hai.

Required output

- Session id strategy
- Memory JSON structure
- State values
- Missing fields rule
- AI memory prompt

Sample Answer

```
{
  "session_id_strategy": "use customer phone number",
  "states": ["new_conversation", "collecting_details", "waiting_for_confirmation",
"action_completed", "handoff_to_human"],
  "required_fields": ["service_type", "area", "preferred_time", "phone_number"],
  "memory_store": "Google Sheets or database session table",
  "missing_field_rule": "ask only one or two missing fields at a time"
}
```

CHAPTER 15

Exercise 1: Session ID Choose Karein

Neechay channels ke liye best session id choose karein: WhatsApp bot, website chat, email assistant.

Answer Key

Channel	Session ID	Reason
WhatsApp	phone_number	Usually stable customer identifier hota hai
Website Chat	visitor_id/session_id	Anonymous visitor ko track karne ke liye
Email	email_thread_id	Same email conversation continue karne ke liye

CHAPTER 15

Exercise 2: Memory Update Karein

Previous state mein service_type missing hai. Customer message: "Mujhe AC repair chahiye." Updated memory JSON likhein.

Answer Key

```
{
  "current_intent": "service_request",
  "current_state": "collecting_details",
  "collected_fields": {
    "service_type": "AC repair"
  },
  "missing_fields": ["area", "preferred_time", "phone_number"],
  "next_action": "ask_area_and_preferred_time",
  "reply_text": "Ji, AC repair ke liye please apna area aur preferred time share kar dein."
}
```

CHAPTER 15

Exercise 3: Bot Reply Improve Karein

Previous memory: customer ne area "DHA Lahore" aur service "AC repair" share kar di hai. Missing field: preferred_time. Customer message: "Kal ho sakta hai?"

Answer Key

```
{
  "current_intent": "service_request",
  "current_state": "waiting_for_confirmation",
  "collected_fields": {
    "service_type": "AC repair",
    "area": "DHA Lahore",
    "preferred_time": "tomorrow"
  },
  "missing_fields": [],
  "next_action": "confirm_service_request",
  "reply_text": "Ji, AC repair ke liye DHA Lahore mein kal ka request note kar liya hai. Kya main is request ko confirm kar doon?"
}
```

CHAPTER 15

Chapter Recap

Aap ne seekha

- Conversation memory ka concept
- Session ID ka role
- Conversation state
- Customer history vs conversation history
- Memory JSON structure
- Make.com and n8n memory plan
- Memory safety rules

Key rule

Memory bot ko smart banati hai, lekin memory ko controlled, structured, and privacy-safe rakhna zaroori hai.

Upgrade Challenge

Ek restaurant ya service business ke liye memory table design karein. Session id, current state, collected fields, missing fields, last message, and next action fields include karein.

Chapter 16

Human Handoff System

Human handoff ka matlab hai bot ka sahi waqt par conversation ko human team ke paas transfer karna, taake customer ko safe, clear, aur professional support mil sake.

Handoff ka simple flow

Customer Message → AI Router Checks Risk → Handoff Decision → Team Notify → Human Takes Over

Goal: Is chapter ke end tak aap bot ke liye handoff rules, escalation triggers, team notification, and handoff summary design kar sakenge.

CHAPTER 16

Human Handoff Kya Hota Hai?

AI bot har problem solve nahi kar sakta. Kuch situations mein customer ko human support chahiye hoti hai, jaise angry complaint, payment issue, legal question, urgent request, ya complex order change.

Bot ka role

Routine questions answer karna, details collect karna, lead qualify karna, order/status samajhna, aur simple response dena.

Human ka role

Complex decisions lena, exceptions handle karna, angry customers ko calm karna, refunds/payment issues aur sensitive cases solve karna.

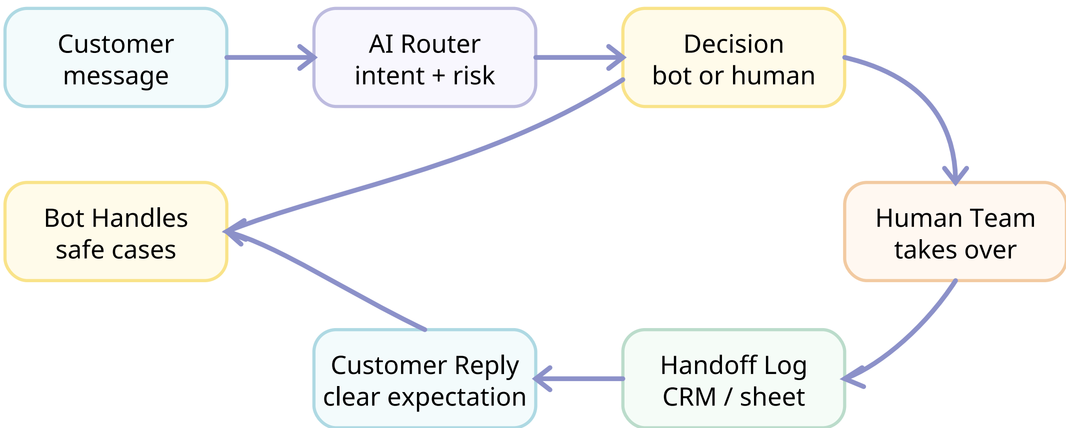
Important: Good automation ka matlab yeh nahi ke human completely remove ho jaye. Good automation ka matlab hai human sirf important cases par focus kare.

CHAPTER 16

Human Handoff Architecture

Professional handoff system mein sirf team ko message forward nahi kiya jata. Bot conversation ka summary, customer details, intent, priority, aur required action bhi send karta hai.

Bot se human tak complete route



Good handoff means the bot knows when to stop and the human knows what happened.

CHAPTER 16

Kab Human Handoff Zaroori Hai?

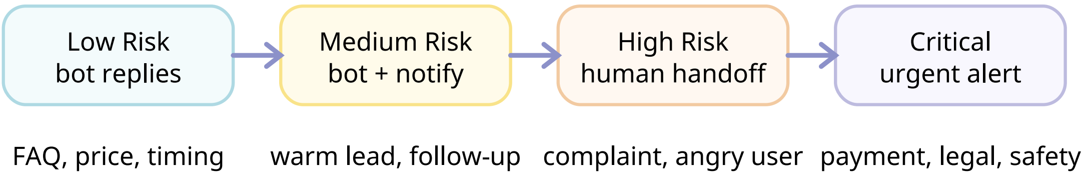
Handoff rules pehle se define honi chahiye. Agar rules clear nahi honge to bot ya to bohot jaldi human ko involve karega, ya bohot late.

Situation	Example	Action
Angry customer	"Aap logon ne mera order kharab kar diya"	Human handoff
Payment issue	"Payment deduct ho gayi lekin order confirm nahi hua"	Urgent handoff
Refund request	"Mujhe refund chahiye"	Human review
High-value lead	"Mujhe full automation setup chahiye"	Sales team notify
Unknown question	Bot ko answer nahi pata	Collect contact + handoff

Escalation Levels

Har message same priority ka nahi hota. Handoff system mein risk level define karna zaroori hai. Is se team ko pata hota hai ke kis case ko pehle handle karna hai.

Risk based escalation



Rule: jitna zyada risk ho, utni jaldi human involve hona chahiye.
Bot ka kaam har situation solve karna nahi, safe route choose karna hai.

CHAPTER 16

Handoff Trigger Rules

Trigger rules woh conditions hoti hain jinke basis par bot decide karta hai ke conversation human ko transfer karni hai ya nahi.

Trigger	Condition	Reason
Negative sentiment	Customer angry/frustrated ho	Brand reputation protect karni hoti hai
High priority intent	payment_issue, refund_request, complaint	Bot ko risky decision nahi lena chahiye
Missing confidence	AI confidence low ho	Wrong answer se bachna hota hai
Repeated failure	Bot 2 dafa same field ask kar chuka ho	Customer frustration avoid karni hoti hai
Human requested	Customer says "agent se baat karni hai"	User preference respect karni hoti hai

CHAPTER 16

Handoff Data Packet

Human team ko sirf customer ka last message send kar dena enough nahi hota. Team ko complete context chahiye hota hai.

Handoff packet mein kya hona chahiye?

Customer	Name, phone, email, city, source
Intent	Sales inquiry, complaint, refund, appointment, order issue
Summary	Conversation ka 2-3 line summary
Priority	Low, medium, high, urgent
Required Action	Call customer, check payment, confirm booking, create quote

CHAPTER 16

Handoff JSON Example

Automation tools ke liye handoff data structured format mein hona chahiye. JSON is ka best format hai.

```json
{
  "handoff_required": true,
  "priority": "high",
  "reason": "payment_issue",
  "customer": {
    "name": "Ali",
    "phone": "03001234567"
  },
  "conversation_summary": "Customer says payment was deducted but order was not confirmed.",
  "last_customer_message": "Payment cut gayi lekin order confirm nahi hua.",
  "recommended_action": "Check payment record and contact customer urgently.",
  "assigned_team": "support"
}
```

Yeh JSON Make.com, n8n, CRM, Slack, email, ya WhatsApp internal notification mein use ho sakta hai.

CHAPTER 16

Customer Ko Kya Reply Dena Hai?

Handoff ke waqt customer ko clear expectation deni chahiye. Customer ko yeh feel nahi hona chahiye ke bot ne bas conversation end kar di.

Good handoff reply

"Aapka issue support team ko forward kar diya gaya hai. Hamari team isay check karke aap se jald contact karegi."

Weak handoff reply

"Human se baat karein." Yeh reply incomplete hai, customer ko next step clear nahi hota.

Rule: Customer reply mein acknowledgement, next step, and expected response method clear hona chahiye.

CHAPTER 16

Team Notification Template

Internal team ko short, clear, and actionable notification milni chahiye.

```
New Human Handoff Required

Priority: High
Reason: Payment issue
Customer: Ali - 03001234567
Channel: WhatsApp

Summary:
Customer says payment was deducted but order was not confirmed.

Last Message:
"Payment cut gayi lekin order confirm nahi hua."

Recommended Action:
Check payment record and contact customer urgently.
```

Is format ko email, Slack, WhatsApp group, CRM note, ya ticket comment mein use kiya ja sakta hai.

CHAPTER 16

Human Handoff Channels

Business ke size aur workflow ke hisaab se different handoff channels use ho sakte hain.

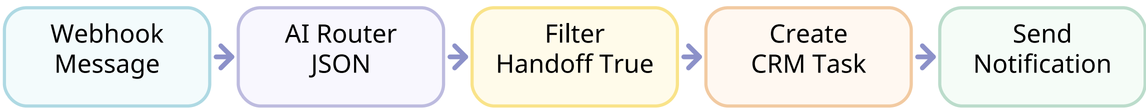
Channel	Best For	Example
WhatsApp group	Small local businesses	Restaurant/order support
Email	Formal business communication	Service request or complaint
CRM task	Sales teams	Lead follow-up assignment
Ticketing system	Support teams	Complaint or refund case
Slack/Teams	Remote teams	Internal alert and discussion

CHAPTER 16

Make.com Implementation Plan

Make.com mein human handoff ka workflow simple router aur notification modules ke through build kiya ja sakta hai.

Make.com handoff flow



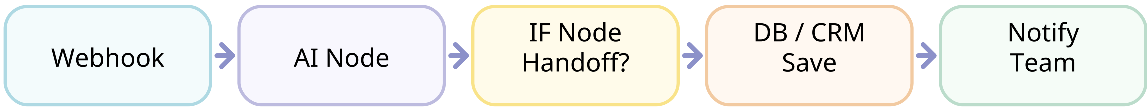
1. Webhook se customer message receive karein.
2. AI module se intent, priority, and handoff_required output lein.
3. Router/filter lagayein: handoff_required = true.
4. CRM task, Google Sheet row, ya ticket create karein.
5. Team ko WhatsApp/email/Slack notification bhejein.

CHAPTER 16

n8n Implementation Plan

n8n mein handoff workflow zyada controlled hota hai. Aap IF node, Switch node, HTTP Request node, and database node use kar sakte hain.

n8n handoff flow



1. Webhook node se payload receive karein.
2. AI node se structured classification lein.
3. IF node: handoff_required true/false check karein.
4. True branch mein database/CRM/ticket create karein.
5. Notification node se team ko summary bhejein.

CHAPTER 16

Handoff Prompt Template

AI ko clearly batayein ke kab handoff karna hai aur output hamesha JSON mein dena hai.

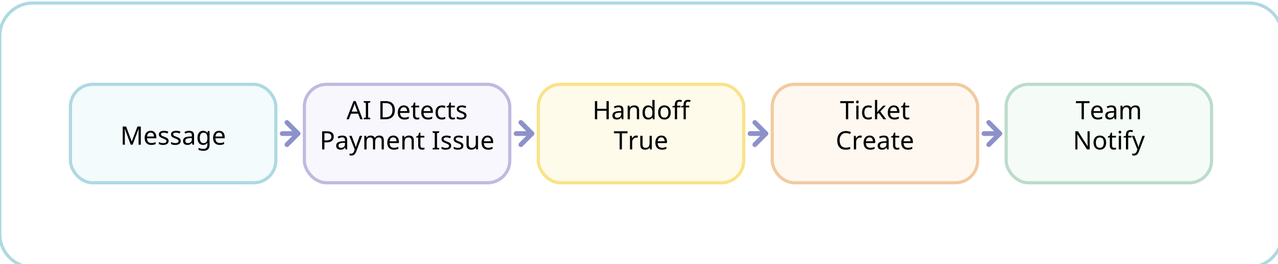
```
You are an AI support router for a business automation system.

Analyze the customer message and decide whether a human handoff is required.

Handoff is required when:
- Customer is angry or frustrated
- Customer asks for refund or cancellation
- Payment issue exists
- Legal/sensitive question exists
- AI confidence is low
- Customer explicitly asks for a human

Return only valid JSON:
{
  "intent": "",
  "sentiment": "positive | neutral | negative",
  "priority": "low | medium | high | urgent",
  "handoff_required": true,
  "handoff_reason": "",
  "summary": "",
  "recommended_action": "",
  "customer_reply": ""
}
```

Mini Project: Payment Issue Handoff

Scenario: E-commerce customer message karta hai: "Meri payment cut gayi hai lekin order confirm nahi hua. Mujhe abhi support chahiye."

Task: Aap ne AI router output, customer reply, and internal team notification design karni hai.

Expected workflow



Is mini project ka purpose yeh samajhna hai ke handoff system automation ko safe aur professional kaise banata hai.

Exercises

Exercise 1

Neechay messages ko classify karein: bot handle kare ya human handoff?

- "Price kya hai?"
- "Payment deduct ho gayi lekin order nahi bana"
- "Mujhe agent se baat karni hai"
- "Delivery charges kya hain?"
- "Aap log fraud hain, refund karo"

Exercise 2

Ek handoff JSON design karein for customer: "Mera appointment cancel ho gaya aur mujhe urgently doctor se baat karni hai."

Exercise 3

Restaurant business ke liye 5 handoff triggers likhein.

CHAPTER 16

Answer Key

Exercise 1 Answer

Message	Decision	Reason
Price kya hai?	Bot handle	Simple FAQ / sales query
Payment deduct ho gayi...	Human handoff	Payment issue high risk hai
Agent se baat karni hai	Human handoff	Customer explicitly human demand kar raha hai
Delivery charges?	Bot handle	Simple policy question
Aap log fraud hain...	Urgent handoff	Negative sentiment + refund issue

Answer Key Continued

Exercise 2 Sample JSON


```
{
  "intent": "appointment_issue",
  "sentiment": "negative",
  "priority": "urgent",
  "handoff_required": true,
  "handoff_reason": "urgent appointment cancellation issue",
  "summary": "Customer says appointment was cancelled and they urgently need to speak with
the doctor.",
  "recommended_action": "Clinic staff should contact the customer immediately and check
doctor availability.",
  "customer_reply": "Sorry for the inconvenience. Aapka case clinic team ko urgent basis par
forward kar diya gaya hai. Hamari team aap se jald contact karegi."
}
```


Exercise 3 Sample Triggers

- Wrong order received
- Payment issue
- Angry customer
- Large catering order inquiry
- Refund or cancellation request

Chapter Recap

- Human handoff bot ko safer aur more professional banata hai.
- Handoff ka goal human ko complete context dena hai, sirf last message nahi.
- Handoff triggers pehle se define hone chahiye.
- Risk level ke basis par escalation fast ya slow ho sakti hai.
- Customer ko handoff ke waqt clear next step batana zaroori hai.
- Make.com aur n8n dono mein handoff workflow easily build ho sakta hai.

Upgrade Challenge: Apne previous WhatsApp bot architecture mein human handoff branch add karein: AI router output, CRM task, team notification, and customer reply.

CHAPTER 17

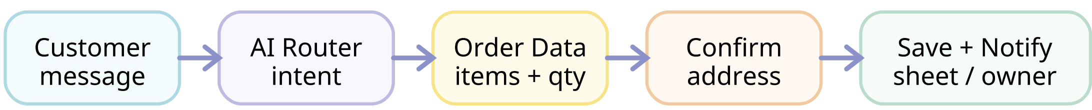
Restaurant WhatsApp Order Bot

Is chapter mein hum ek practical restaurant WhatsApp order bot design karenge. Goal yeh hai ke customer ka message aaye, bot intent samjhe, menu dikhaye, order items extract kare, address collect kare, order confirm kare, restaurant owner ko notify kare, aur order record save ho jaye.

Menu request | **Order taking** | **Address collection** | **Owner notification** | **Order sheet**

Learning outcome: Chapter ke end tak aap restaurant ke liye ek complete WhatsApp order workflow plan kar sakenge jo Make.com, n8n, ya custom backend ke saath implement ho sakta hai.

Restaurant bot ka simple end-to-end flow



Professional bot ka kaam sirf jawab dena nahi, order ko complete business record banana hai.
Message - Intent - Data - Confirmation - Save - Notify - Follow-up

CHAPTER 17

Restaurant Bot Kya Problem Solve Karta Hai?

Restaurants ko WhatsApp par aksar same type ke messages aate hain: menu bhej dein, price kya hai, delivery available hai, order note kar dein, address yeh hai, payment kaise karni hai, order kab tak aayega. Agar staff har message manually handle kare to time bhi zaya hota hai aur mistakes bhi hoti hain.

Manual process ki problems

- Messages miss ho jate hain
- Order items galat note ho sakte hain
- Address incomplete hota hai
- Owner ko late notification milti hai
- Order history properly save nahi hoti

Automation ka value

- Instant menu response
- Order details structured form mein
- Address aur phone collect
- Owner ko clean order summary
- Google Sheet/CRM mein order record

Important: Restaurant bot ka goal full cashier replace karna nahi. Beginner/intermediate level par goal yeh hai ke routine orders aur repeated questions fast handle ho jayein.

CHAPTER 17

Bot Ke Main Intents

Restaurant bot ka pehla kaam customer intent samajhna hai. Intent se bot decide karta hai ke customer ko menu bhejna hai, order extract karna hai, address ask karna hai, ya human ko involve karna hai.

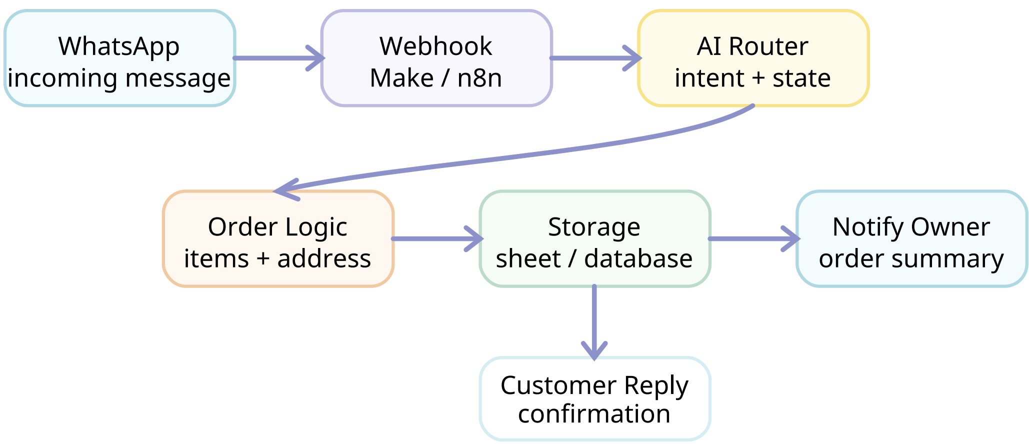
Intent	Customer example	Bot ka action
menu_request	Menu bhej dein	Menu categories aur popular items share kare
price_inquiry	Zinger burger ka rate?	Item price answer kare ya menu section bheje
place_order	2 zinger aur 1 fries bhej dein	Items, quantity, notes extract kare
address_collection	Model Town Lahore, house 12	Address save kare aur confirmation step chalaye
order_confirmation	Haan confirm	Order final kare, sheet mein save kare, owner ko notify kare
human_support	Manager se baat karni hai	Human handoff trigger kare

CHAPTER 17

Restaurant Order Bot Architecture

Is system ka architecture simple hai, lekin ismein proper layers honi chahiye. WhatsApp message receive hota hai, webhook automation tool ya backend ko call karta hai, AI router intent detect karta hai, order data extract hota hai, database ya sheet update hoti hai, aur customer ko reply send hota hai.

Architecture overview



Required Data Fields

Order complete tab hota hai jab required fields available hon. Agar bot bina required fields ke order confirm kar de to restaurant staff ko phir manual follow-up karna padta hai.

Field	Example	Required?
customer_name	Ali Khan	Recommended
phone_number	03001234567	Required if not available from WhatsApp
order_items	2 Zinger Burger, 1 Fries	Required
quantity	2, 1	Required
delivery_address	House 12, Model Town, Lahore	Required for delivery
payment_method	cash_on_delivery	Optional but useful
special_notes	No mayo, extra spicy	Optional

Rule: Agar order_items ya delivery_address missing ho to bot order confirm na kare. Pehle missing field ask kare.

CHAPTER 17

Menu Data Ka Structure

Bot ko menu random text ki tarah nahi dena chahiye. Menu ko structured format mein rakhna better hai taake AI item names, prices, categories aur availability samajh sake.

```
Menu table example:

category: Burgers
item_name: Zinger Burger
price: 550
available: yes
options: regular, extra cheese

category: Sides
item_name: Fries
price: 250
available: yes
options: regular, masala

category: Drinks
item_name: Coke
price: 120
available: yes
options: 345ml
```

Simple setup

Google Sheet mein menu maintain karein. Columns: category, item_name, price, available, notes.

Better setup

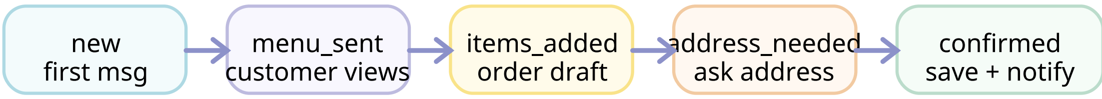
Database table use karein jahan menu item ID, size, price, status aur variation save ho.

CHAPTER 17

Conversation State Machine

Restaurant bot ek hi message se complete order nahi banata. Usually order multiple steps mein complete hota hai. Isliye conversation state zaroori hai.

Order state flow



State ka faida: bot ko pata hota hai ke customer ab kis step par hai.
Without state, bot bar bar same sawal pooch sakta hai.

CHAPTER 17

Router JSON Output

AI router ko clean JSON return karna chahiye taake automation tool easily next module choose kar sake.

```
{
  "intent": "place_order",
  "confidence": "high",
  "current_state": "items_added",
  "order_items": [
    { "item_name": "Zinger Burger", "quantity": 2, "notes": "" },
    { "item_name": "Fries", "quantity": 1, "notes": "masala" }
  ],
  "missing_fields": ["delivery_address"],
  "next_action": "ask_delivery_address",
  "needs_human": false
}
```

Automation rule

Agar **missing_fields** empty nahi hai to bot customer se missing information ask kare. Agar missing_fields empty hai to order confirmation step par le jaye.

CHAPTER 17

Order Extraction Prompt

Yeh prompt customer ke free-text message se order items, quantities, notes aur missing fields extract karta hai.

```
You are a restaurant order extraction assistant.

Task:
Read the customer WhatsApp message and extract order details.
Return only valid JSON.

Rules:
- Do not confirm the order if delivery address is missing.
- If quantity is not clear, add it to missing_fields.
- If item name is not available in menu, set needs_human=true.
- Keep customer reply short and polite in Roman Urdu.

Customer message:
{{customer_message}}

Menu data:
{{menu_data}}

Return JSON with:
intent, confidence, order_items, delivery_address, payment_method, special_notes,
missing_fields, next_action, needs_human, customer_reply
```

Tip: Prompt mein menu data include karna zaroori hai. Warna AI unavailable item ko bhi valid item samajh sakta hai.

CHAPTER 17

Customer Reply Templates

Restaurant bot ki replies short, clear aur polite honi chahiye. WhatsApp par long paragraphs usually user ko heavy lagte hain.

Situation	Reply template
Menu request	Ji, yeh hamara menu hai. Aap item name aur quantity share kar dein, main order note kar deta hoon.
Address missing	Ji, order note ho gaya. Delivery ke liye please apna complete address share kar dein.
Quantity missing	Ji, aap kitni quantity chahte hain? Example: 2 burgers, 1 fries.
Order confirmation	Aapka order confirm karne se pehle details check kar lein: {{order_summary}}. Confirm kar dein?
Human handoff	Is request ke liye main team member ko involve kar raha hoon. Woh aapko shortly guide kar dein ge.

CHAPTER 17

Owner Notification Format

Restaurant owner ya kitchen team ko message clean format mein milna chahiye. Agar notification messy ho to automation ka benefit kam ho jata hai.

```
New WhatsApp Order

Customer: Ali Khan
Phone: 03001234567
Order:
- 2 x Zinger Burger
- 1 x Masala Fries
Address: House 12, Model Town, Lahore
Payment: Cash on Delivery
Notes: Burgers extra spicy
Status: Confirmed
Source: WhatsApp Bot
```

Owner ko kya chahiye?

Sirf useful order information. Extra AI reasoning, confidence score, raw JSON owner ko send na karein.

System ko kya save karna hai?

Order ID, timestamp, customer ID, items, total, status, source, conversation reference.

CHAPTER 17

Google Sheet / Database Structure

Beginner implementation mein Google Sheet enough ho sakti hai. Production setup mein database better hoti hai. Dono mein fields clear hone chahiye.

Column	Example	Purpose
order_id	ORD-1001	Unique tracking
created_at	2026-07-01 08:30 PM	Order time
customer_name	Ali Khan	Customer identity
phone	03001234567	Contact
items	2 Zinger, 1 Fries	Kitchen order
address	Model Town Lahore	Delivery
status	confirmed	Order tracking

Make.com Implementation Plan

Make.com mein is workflow ko modules ki form mein build kiya ja sakta hai. Is level par exact button-by-button setup se zyada important hai ke reader ko system design samajh aaye.

1. **Webhook trigger**

   WhatsApp provider ya custom backend se incoming message receive karein.

2. **AI router module**

   Customer message + menu data AI ko send karein aur JSON result lein.

3. **Router branches**

   menu_request, place_order, address_missing, confirm_order, human_support ke branches banayein.

4. **Google Sheet row**

   Confirmed order ko sheet mein save karein.

5. **Owner notification**

   Restaurant owner ko clean order summary bhejein.

6. **Customer reply**

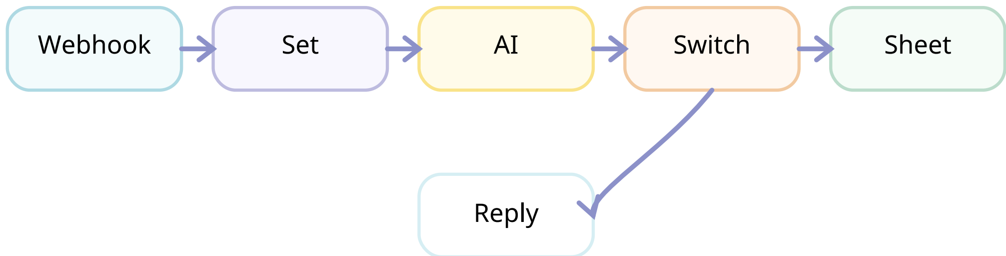
   Customer ko order status ya missing field message send karein.

CHAPTER 17

n8n Implementation Plan

n8n zyada control deta hai. Agar aap backend ya self-hosting samajhte hain to restaurant bot ka scalable version n8n + database ke saath bana sakte hain.

n8n node sequence



n8n advantage: Aap execution logs, credentials, error workflow aur database integration ko zyada control ke saath manage kar sakte hain.

CHAPTER 17

Testing Checklist

Restaurant order bot ko live karne se pehle multiple test cases run karna zaroori hai. Sirf ek happy path test enough nahi hota.

Happy path tests

- Menu request
- Complete order with address
- Order confirmation
- Sheet row created
- Owner notification sent

Edge case tests

- Quantity missing
- Unavailable item
- Incomplete address
- Customer changes order
- Human support request

Test message	Expected intent	Expected action
Menu bhej dein	menu_request	Send menu
2 zinger aur fries	place_order	Ask address
Quantity confirm nahi	missing_quantity	Ask quantity
Manager se baat karni hai	human_support	Handoff

CHAPTER 17

Mini Project

Aapka task hai ek small restaurant ke liye WhatsApp order bot ka complete workflow design karna.

Scenario

Restaurant ka name: Burger Point. Popular items: Zinger Burger, Beef Burger, Fries, Coke. Restaurant WhatsApp par orders leta hai aur owner chahta hai ke orders Google Sheet mein save hon aur owner ko summary message mil jaye.

1

Step 1

Bot ke required intents define karein.

2

Step 2

Required order fields define karein.

3

Step 3

Router JSON output design karein.

4

Step 4

Google Sheet columns define karein.

5

Step 5

Owner notification template likhein.

Upgrade challenge

Is workflow mein delivery charges aur estimated delivery time ka logic add karein.

CHAPTER 17

Exercises

Exercise 1 - Intent identify karein

Message: "Bhai 3 zinger burger, 2 fries aur 2 coke bhej dein." Iska intent, order items aur next action likhein.

Exercise 2 - Missing field detect karein

Message: "1 beef burger aur fries chahiye." Bot ko kya missing information ask karni chahiye?

Exercise 3 - Owner notification

Customer ne order confirm kar diya: 2 zinger, 1 fries, address DHA Phase 5 Lahore. Owner ke liye clean notification likhein.

Exercise 4 - Human handoff

Message: "Mera last order late tha aur food cold tha, manager se baat karni hai." Bot ka action kya hona chahiye?

Answer Key

```
Exercise 1 sample answer:
{
  "intent": "place_order",
  "order_items": [
    {"item_name": "Zinger Burger", "quantity": 3},
    {"item_name": "Fries", "quantity": 2},
    {"item_name": "Coke", "quantity": 2}
  ],
  "missing_fields": ["delivery_address"],
  "next_action": "ask_delivery_address"
}
```

```
Exercise 2 sample answer:
Missing fields:
- delivery_address
- quantity for fries if not clear

Customer reply:
"Ji, 1 beef burger note ho gaya. Fries ki quantity aur delivery address share kar dein."
```

```
Exercise 3 owner notification:
New WhatsApp Order
Order: 2 x Zinger Burger, 1 x Fries
Address: DHA Phase 5 Lahore
Status: Confirmed
Action: Prepare and dispatch
```

Exercise 4 answer: Bot ko apology + human handoff trigger karna chahiye. Complaint ko normal order flow mein continue nahi karna.

CHAPTER 17

Chapter Recap

Is chapter mein hum ne restaurant WhatsApp order bot ka practical architecture design kiya. Aap ne dekha ke bot sirf menu reply karne wala system nahi, balkay complete order pipeline ban sakta hai.

Aap ne seekha

- Restaurant bot intents
- Order fields planning
- Menu data structure
- Order extraction JSON
- Owner notification
- Make.com/n8n implementation plan

Next chapter mein

Hum e-commerce support bot build karenge jahan product inquiry, order status, delivery delay, return/refund query, complaint aur human handoff ko handle kiya jayega.

Final upgrade challenge

Restaurant bot mein order total calculation, delivery charges, estimated delivery time, aur customer ko final invoice-style summary add karein.

CHAPTER 18

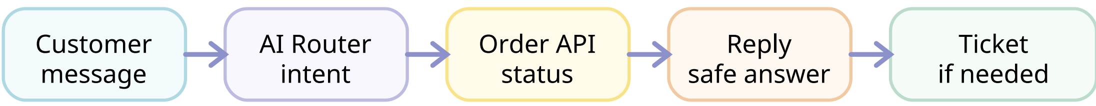
E-commerce Support Bot

Is chapter mein hum e-commerce business ke liye support bot design karenge jo product questions, order status, delivery delay, return/refund, complaint, aur human handoff ko structured workflow mein handle kare.

Product inquiry **Order status** **Return / refund** **Complaint** **Human handoff**

Learning outcome: Chapter ke end tak aap ek client-ready e-commerce support workflow plan kar sakenge jo WhatsApp, website chat, email, CRM, order API, ya ticketing system ke saath connect ho sakta hai.

E-commerce support bot ka simple flow



Support bot ka goal customer ko fast, accurate aur safe help dena hai.
Intent - Required data - API check - Reply - Ticket - Handoff

CHAPTER 18

E-commerce Support Bot Kya Solve Karta Hai?

E-commerce store mein daily same type ke messages aate hain: product available hai, size kya hai, order kab deliver hoga, tracking number chahiye, product damaged aya, return ka process kya hai, payment deduct ho gayi, refund kab milega. Agar in sab ko manually handle kiya jaye to support team par load barhta hai.

Manual support ki problems

- Repeated questions par time waste
- Late replies ki wajah se customer trust kam
- Order ID ke bina support slow
- Complaint priority miss ho sakti hai
- Return/refund policy inconsistent explain hoti hai

Bot ka business value

- Basic questions instant answer
- Order ID collect karke status check
- Complaints ko category aur priority de
- Human handoff ke liye clean summary
- Support tickets aur reports automatically create

Important: Beginner/intermediate level e-commerce bot ko dangerous promises nahi karne chahiye. Refund approve karna, payment reverse karna, ya policy change karna human/team approval ke through hona chahiye.

CHAPTER 18

Common E-commerce Support Intents

Intent router is bot ka core part hai. Har customer message ko ek clear category mein route kiya jata hai taake next action predictable rahe.

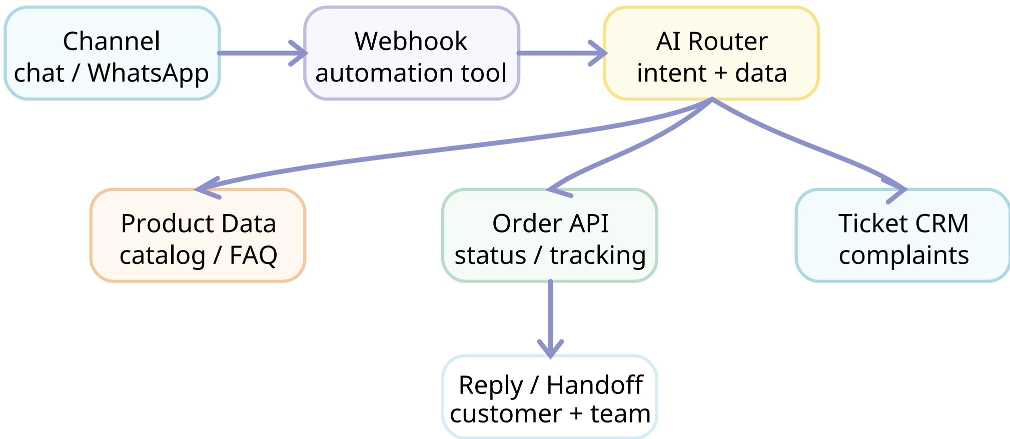
Intent	Customer example	Bot ka next action
product_inquiry	Is shirt ka medium size available hai?	Product/size information ask ya check kare
price_inquiry	Is watch ki price kya hai?	Price/product link share kare
order_status	Mera order kab deliver hoga?	Order ID ask kare ya API se status check kare
delivery_delay	Order late ho gaya hai	Status check + apology + escalation if needed
return_request	Size wrong hai, return karna hai	Policy explain + required data collect
refund_request	Refund kab milega?	Refund status check ya ticket create
complaint	Product damaged aya hai	Complaint ticket + image/order ID ask
human_support	Mujhe agent se baat karni hai	Human handoff trigger kare

CHAPTER 18

Support Bot Architecture

E-commerce support bot mein ek se zyada systems connect ho sakte hain: WhatsApp/ website chat, AI router, product data, order API, CRM, ticketing system, aur support team notification.

Architecture overview



Required Data by Intent

Har intent ke liye same data required nahi hota. Order status ke liye order ID chahiye. Product inquiry ke liye product name ya link chahiye. Return/refund ke liye order ID, reason, product condition aur policy status chahiye.

Intent	Required data	Missing data reply
product_inquiry	product_name, size/color if relevant	Kaunsa product ya size chahiye?
order_status	order_id or phone_number	Please apna order number share kar dein.
delivery_delay	order_id, issue_description	Delay check karne ke liye order number chahiye.
return_request	order_id, reason, product_condition	Return reason aur order number share kar dein.
refund_request	order_id, refund_reference if available	Refund status check ke liye order number chahiye.
complaint	order_id, complaint_type, evidence if needed	Please issue ka short detail aur order number share karein.

CHAPTER 18

Order Status Workflow

Order status query e-commerce support ka sab se common use case hota hai. Is workflow ko clean rakhna bohot zaroori hai kyun ke customer usually delivery update ke liye impatient hota hai.

1

Intent detect karein

AI check kare ke customer order status, tracking, ya delivery date pooch raha hai.

2

Order ID collect karein

Agar order_id missing hai to polite message se order number ask karein.

3

Order API call karein

Automation tool order status endpoint call kare aur delivery/tracking result le.

4

Safe reply generate karein

AI API response ke base par customer ko short aur clear update de.

5

Escalate if needed

Agar status delayed, failed, ya missing ho to support ticket create karein.

CHAPTER 18

Order Status API Response Example

AI ko raw API response directly customer ko nahi bhejna chahiye. Pehle response ko human-readable support message mein convert karna chahiye.

```
API response example:
{
  "order_id": "ORD-2045",
  "status": "shipped",
  "tracking_number": "TRK-88421",
  "courier": "Leopards",
  "estimated_delivery": "2026-07-04",
  "last_update": "Parcel dispatched from Lahore warehouse"
}
```

Customer reply example

Ji, aapka order ORD-2045 dispatch ho chuka hai. Courier: Leopards. Tracking number TRK-88421 hai. Expected delivery 04 July 2026 tak hai.

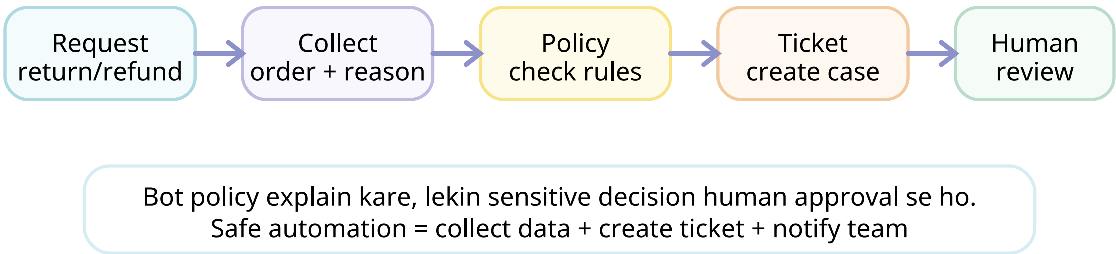
Rule: Bot ko wahi information reply karni chahiye jo API response, CRM, ya approved policy se available ho.

CHAPTER 18

Return and Refund Workflow

Return aur refund queries sensitive hoti hain. Bot ko policy explain karni chahiye, required information collect karni chahiye, ticket create karna chahiye, lekin refund approve ya reject ka final decision human/business rules se hona chahiye.

Return/refund safe flow



CHAPTER 18

Complaint Handling Workflow

Complaint messages ko normal FAQ ki tarah treat nahi karna chahiye. Complaint mein sentiment, priority, category, aur proof requirement important hoti hai.

Complaint type	Priority	Bot action
Payment deducted but order not confirmed	High	Ticket create + payment/order details ask
Damaged product received	High	Order ID + picture ask + support alert
Wrong size/color received	Medium	Return/exchange flow start
Delivery late	Medium	Order status check + escalation if overdue
General dissatisfaction	Medium	Apology + human handoff option

Complaint reply example

Sorry for the inconvenience. Is issue ko check karne ke liye please apna order number aur product ki picture share kar dein. Main aapki complaint support team ko forward kar raha hoon.

CHAPTER 18

E-commerce Router JSON

Support bot ka router output structured hona chahiye taake automation tool easily decide kar sake ke next step API call hai, FAQ reply hai, ticket creation hai, ya human handoff.

```
{
  "intent": "order_status",
  "confidence": "high",
  "customer_sentiment": "neutral",
  "required_fields": ["order_id"],
  "missing_fields": [],
  "extracted_data": {
    "order_id": "ORD-2045",
    "product_name": null,
    "issue_summary": "Customer wants delivery update"
  },
  "next_action": "check_order_status_api",
  "needs_human": false,
  "priority": "medium"
}
```

Tip: Router JSON mein next_action clear hona chahiye. Is se Make.com/n8n mein router paths easy ban jate hain.

CHAPTER 18

Practical E-commerce Support Prompt

Neechay prompt template e-commerce support bot ke router aur action planning ke liye use ho sakta hai.

```
You are an e-commerce support automation router.

Your job:
1. Understand the customer message.
2. Classify the intent.
3. Extract required data.
4. Identify missing fields.
5. Decide the next safe action.

Allowed intents:
product_inquiry, price_inquiry, order_status, delivery_delay,
return_request, refund_request, complaint, human_support, general_faq.

Rules:
- Do not approve refunds yourself.
- Do not promise delivery dates unless API/policy provides it.
- If order_id is missing for order/refund/return, ask for it.
- If customer is angry or issue is payment/damaged product, set needs_human=true.
- Return only valid JSON.
```

CHAPTER 18

Example 1 - Product Inquiry

Customer message:

```
Black sneakers size 42 available hain?
```

Expected AI output:


```
{
  "intent": "product_inquiry",
  "confidence": "high",
  "extracted_data": {
    "product_name": "Black sneakers",
    "size": "42",
    "color": "black"
  },
  "missing_fields": [],
  "next_action": "check_product_availability",
  "needs_human": false,
  "priority": "low"
}
```


Reply after product check

Ji, black sneakers size 42 available hain. Aap order place karna chahen to main aapki details note kar sakta hoon.

CHAPTER 18

Example 2 - Delivery Delay

Customer message:

```
Mera order 5 din se nahi aya. Order number ORD-8842 hai.
```

Expected AI output:


```
{
  "intent": "delivery_delay",
  "confidence": "high",
  "customer_sentiment": "negative",
  "extracted_data": {
    "order_id": "ORD-8842",
    "issue_summary": "Customer reports order delay for 5 days"
  },
  "missing_fields": [],
  "next_action": "check_order_status_api",
  "needs_human": true,
  "priority": "high"
}
```


Why needs_human=true? Delay long hai aur customer frustrated lag raha hai. Bot status check kare, lekin support team ko bhi alert kare.

CHAPTER 18

Make.com Implementation Plan

Make.com mein e-commerce support bot ko simple modules ke saath build kiya ja sakta hai.

1. **Webhook trigger**

   WhatsApp, website chat, ya form se customer message receive karein.

2. **AI router module**

   Message ko classify karein aur JSON output generate karein.

3. **Router paths**

   Intent ke mutabiq product inquiry, order status, return/refund, complaint, ya handoff path banayein.

4. **HTTP module**

   Order API, product API, ya ticket API ko call karein.

5. **Google Sheet/CRM**

   Support log, ticket, aur customer history save karein.

6. **Reply module**

   Customer ko safe response bhejein aur agar zaroorat ho to team ko notify karein.

CHAPTER 18

n8n Implementation Plan

n8n mein same system more flexible way mein ban sakta hai. Webhook node se message receive hoga, AI node se classify hoga, Switch node se route hoga, HTTP Request node API call karega, aur final reply send hoga.

Core nodes

- Webhook node
- Set/Edit Fields node
- AI/OpenAI node
- Switch node
- HTTP Request node
- Google Sheets/Database node

Best practices

- AI output validate karein
- Missing order ID par API call na karein
- Failed API response log karein
- High priority issues team ko send karein
- Customer ko fallback reply dein

n8n flow

Webhook - Set customer fields - AI classify - Switch by intent - HTTP/API action - Save log - Send reply - Human alert if needed.

CHAPTER 18

Testing Checklist

Bot ko live karne se pehle different customer messages ke saath test karna zaroori hai.

Functional tests

- Product inquiry correctly classify hoti hai
- Order ID missing ho to ask karta hai
- Order API result se safe reply banta hai
- Return/refund mein ticket create hota hai
- Complaint high priority mark hoti hai

Safety tests

- Refund approve nahi karta
- False delivery promise nahi karta
- Payment issue human ko escalate hota hai
- Angry customer ko polite reply milta hai
- Fallback message available hai

Test message	Expected intent	Expected action
Mera order kahan hai? ORD-123	order_status	Order API call
Product damaged aya hai	complaint	Order ID ask + ticket
Refund chahiye	refund_request	Order ID ask + policy

CHAPTER 18

Mini Project

Ab aap ek e-commerce support bot ka complete plan banayenge. Scenario yeh hai:

Scenario: Ek online clothing store WhatsApp aur website chat par support messages receive karta hai. Store chahta hai ke bot product questions, order status, returns, refunds, aur complaints handle kare.

1. **Intent list banayein**

   Kam az kam 7 support intents define karein.

2. **Required fields define karein**

   Har intent ke required data fields likhein.

3. **Router JSON design karein**

   AI output ka JSON structure banayein.

4. **Workflow design karein**

   Make.com ya n8n ke modules/nodes list karein.

5. **Testing cases likhein**

   Kam az kam 5 test messages aur expected outputs define karein.

CHAPTER 18

Exercises

Exercise 1

Customer message classify karein: "Mera order ORD-900 kal deliver hona tha lekin abhi tak nahi aya."

Exercise 2

Refund request ke liye required fields list karein.

Exercise 3

E-commerce support bot ke liye 5 router intents likhein.

Exercise 4

Damaged product complaint ke liye human handoff message likhein.

Upgrade challenge

Is bot mein customer history add karein taake returning customer ke previous orders aur complaints dekh kar better reply diya ja sake.

CHAPTER 18

Answer Key

Exercise 1 Answer

```
{
  "intent": "delivery_delay",
  "confidence": "high",
  "customer_sentiment": "negative",
  "extracted_data": {
    "order_id": "ORD-900",
    "issue_summary": "Order was expected yesterday but not delivered"
  },
  "missing_fields": [],
  "next_action": "check_order_status_api",
  "needs_human": true,
  "priority": "high"
}
```

Exercise 2 Answer

Refund request ke required fields: order_id, customer_phone ya email, refund_reason, payment_method, refund_reference agar available ho, product_returned_status, aur complaint_summary.

Exercise 3 Answer

Suggested intents: product_inquiry, order_status, delivery_delay, return_request, refund_request, complaint, human_support.

CHAPTER 18

Answer Key Continued

Exercise 4 Answer

Customer reply

Sorry for the inconvenience. Damaged product issue ko priority par check karne ke liye please apna order number aur product ki clear picture share kar dein. Main is case ko support team ko forward kar raha hoon.

Internal team notification

High priority complaint: customer reports damaged product. Required action: check order, review product image, contact customer for resolution.

Chapter Recap

Aap ne seekha

- E-commerce support intents
- Order status workflow
- Return/refund safe handling
- Complaint priority rules
- Make.com/n8n implementation

Yaad rakhein

- Refund approve na karein
- API result ke bina promise na karein
- Missing order ID par API call na karein
- Payment/damaged issues escalate karein
- Every conversation log save karein

Next chapter: Ab hum clinic appointment booking assistant design karenge jahan AI customer se service, date, time, phone, aur appointment confirmation data collect karega.

CHAPTER 19

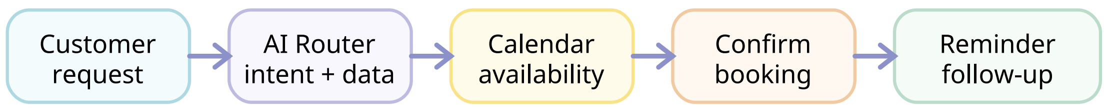
Clinic Appointment Booking Assistant

Is chapter mein hum clinic, dental practice, physiotherapy center, salon, ya service-based business ke liye appointment booking assistant design karenge. Yeh assistant customer se required details collect karega, availability check karega, appointment confirm karega, aur reminder workflow plan karega.

Appointment intent | Required fields | Availability check | Confirmation | Reminder

Learning outcome: Chapter ke end tak aap client ke liye appointment booking workflow plan kar sakenge jo WhatsApp, website chat, Google Sheet, calendar, CRM, ya backend API ke saath connect ho sakta hai.

Appointment booking assistant ka simple flow



Appointment assistant ka goal sirf reply dena nahi hota.
Goal: data collect karna, slot check karna, booking save karna, aur reminder send karna.

Appointment Assistant Kya Karta Hai?

Appointment booking assistant ek structured bot hota hai jo customer ki request ko samajhta hai, required information collect karta hai, available slots check karta hai, aur appointment ko confirmed ya pending status mein save karta hai.

Basic tasks

- Service identify karna
- Date/time preference lena
- Name aur phone collect karna
- Appointment summary banana

Intermediate tasks

- Calendar availability check
- Slot propose karna
- Booking confirm karna
- Reminder schedule karna

Important: Appointment assistant ko final booking tabhi confirm karni chahiye jab required data complete ho aur selected slot available ho.

Business type	Appointment examples	Special requirement
Clinic	Doctor checkup, follow-up, test appointment	Doctor, branch, patient name
Dental clinic	Scaling, pain check, braces consult	Treatment type, preferred doctor
Salon	Haircut, makeup, facial, bridal consultation	Service duration, stylist
Consultant	Business call, legal consult, coaching call	Meeting type, online/offline mode

CHAPTER 19

Required Data Planning

Appointment workflow ka sab se important part required fields hain. Agar required data missing ho to bot ko booking continue nahi karni chahiye. Pehle missing details collect karni chahiye.

Field	Example	Required?	Use
customer_name	Ali Khan	Yes	Appointment record and confirmation
phone_number	03001234567	Yes	Contact and reminders
service_type	Dental checkup	Yes	Slot duration and routing
preferred_date	Tomorrow / 2026-07-05	Yes	Availability search
preferred_time	Evening / 5 PM	Yes	Slot matching
branch_or_location	DHA Branch	Optional	Multi-branch businesses
notes	Tooth pain since 2 days	Optional	Staff preparation

Rule

Bot ka first target complete data collect karna hai. Incomplete data ke saath calendar ya booking API call karna wrong workflow hai.

CHAPTER 19

Appointment Booking Workflow

Intermediate automation mein appointment flow ko step-by-step design karna chahiye. Har step ka output next step ka input banega.

1

Intent detect karein

AI samjhe ke customer appointment book, reschedule, cancel, ya availability ask kar raha hai.

2

Required fields extract karein

Name, phone, service, date, time, branch, notes ko structured JSON mein nikaalein.

3

Missing data ask karein

Agar service ya time missing hai to bot sirf wahi missing data ask kare.

4

Availability check karein

Calendar, sheet, CRM, ya backend API se available slots check karein.

5

Slot confirm karein

Available slot customer ko confirm karein aur booking record save karein.

6

Reminder schedule karein

Appointment se pehle customer ko reminder message schedule karein.

CHAPTER 19

Intent Router for Appointment Bot

Appointment bot sirf booking handle nahi karta. Customer availability bhi pooch sakta hai, existing appointment reschedule kar sakta hai, cancel kar sakta hai, ya service price/timing pooch sakta hai.

Intent	Meaning	Action
book_appointment	Nayi appointment book karni hai	Required data collect + availability check
check_availability	Available slot pooch raha hai	Date/time preference ask + slots show
reschedule_appointment	Existing appointment change karni hai	Existing booking identify + new slot check
cancel_appointment	Appointment cancel karni hai	Booking ID/phone ask + cancel flow
service_inquiry	Service, duration, price pooch raha hai	FAQ/policy based reply
human_support	Staff se baat karni hai	Handoff create

```
Router output example:
{
  "intent": "book_appointment",
  "service_type": "dental checkup",
  "preferred_date": "tomorrow",
  "preferred_time": "evening",
  "missing_fields": ["customer_name", "phone_number"],
  "next_action": "ask_missing_fields"
}
```

CHAPTER 19

Date and Time Handling

Appointment automation mein date/time handling tricky hoti hai. Customer natural language use karta hai: "kal evening", "Friday ko", "shaam 6 baje", "next week Monday". Bot ko isay structured format mein convert karna hota hai.

Raw user message

Kal evening dentist appointment mil sakti hai?

Structured output

preferred_day: tomorrow
preferred_time_window: evening
service_type: dentist appointment

User phrase	Structured meaning	Bot behavior
Kal morning	Tomorrow + morning window	Available morning slots check kare
Friday 5 baje	Specific day + time	Exact slot check kare
Next week	Broad date range	Specific date/time ask kare
Shaam ko	Evening window	Evening slots suggest kare

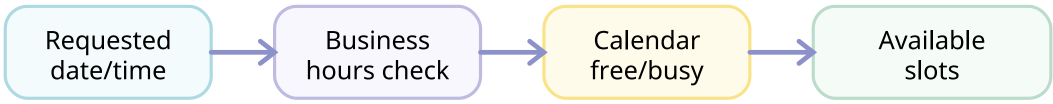
Important: Real system mein timezone, business hours, public holidays, aur doctor/staff availability ka rule bhi consider karna hota hai.

CHAPTER 19

Availability Check Concept

Availability check ka matlab hai: customer ke preferred date/time ke against system check kare ke slot free hai ya nahi. Yeh Google Calendar, Airtable, Google Sheet, CRM, ya custom backend API se ho sakta hai.

Availability check flow



If exact slot not available, bot 2-3 nearest slots suggest kare.
Example: 5 PM unavailable. Available: 4:30 PM, 5:30 PM, 6:00 PM.

CHAPTER 19

Calendar / CRM Record Structure

Appointment confirm hone ke baad record save hona chahiye. Yeh record Google Calendar event, CRM appointment, Google Sheet row, ya database table mein save ho sakta hai.

```
Appointment record example:
{
  "appointment_id": "APT-1007",
  "customer_name": "Ali Khan",
  "phone_number": "03001234567",
  "service_type": "Dental Checkup",
  "appointment_date": "2026-07-05",
  "appointment_time": "17:30",
  "branch": "DHA Branch",
  "status": "confirmed",
  "notes": "Tooth pain since 2 days",
  "reminder_required": true
}
```

Status	Meaning	Next action
pending_info	Required data missing hai	Customer se missing details ask karein
pending_confirmation	Slot available hai, customer confirm nahi kar raha	Confirmation ask karein
confirmed	Appointment booked hai	Reminder schedule karein
rescheduled	Slot change ho gaya	Updated confirmation send karein
cancelled	Appointment cancel ho gayi	Reason save karein if needed

CHAPTER 19

Confirmation and Reminder Messages

Appointment assistant ka reply clear, short, aur actionable hona chahiye. Customer ko date, time, service, branch, aur next instruction clearly milni chahiye.

Confirmation message

Ji Ali, aapki dental checkup appointment 5 July ko 5:30 PM par DHA Branch mein confirm ho gayi hai. Please 10 minutes pehle clinic pohanch jayen.

Reminder message

Reminder: Aapki dental checkup appointment aaj 5:30 PM par DHA Branch mein hai. Agar reschedule karna ho to reply mein "reschedule" likhein.

Reminder timing examples

Clinic: 24 hours before + 2 hours before

Salon: 12 hours before + 1 hour before

Consultation call: 24 hours before + 15 minutes before

CHAPTER 19

Reschedule and Cancel Flow

Real clients ke liye appointment system sirf booking tak limited nahi hota. Customer reschedule ya cancel bhi kar sakta hai. Is flow ko simple aur controlled rakhein.

1. **Existing appointment identify karein**

   Phone number, appointment ID, ya customer name se booking find karein.

2. **New preference collect karein**

   Reschedule ke liye new date/time ask karein.

3. **Availability check karein**

   New slot available hai ya nahi check karein.

4. **Status update karein**

   Appointment ko rescheduled ya cancelled mark karein.

5. **Customer ko confirmation dein**

   Updated date/time ya cancellation confirmation send karein.

Business rule: Kuch clinics same-day cancellation allow nahi karti. Bot ko cancellation policy ke against response dena chahiye.

CHAPTER 19

Appointment Bot Prompt Template

Yeh prompt AI ko appointment booking assistant ka role deta hai. Is prompt ka goal hai message classify karna, appointment data extract karna, missing fields identify karna, aur next action decide karna.

```
You are an appointment booking assistant for a clinic/service business.

Your job:
1. Understand the customer's message.
2. Detect the intent.
3. Extract appointment-related fields.
4. Identify missing required fields.
5. Decide the next action.

Supported intents:
- book_appointment
- check_availability
- reschedule_appointment
- cancel_appointment
- service_inquiry
- human_support

Required fields for booking:
- customer_name
- phone_number
- service_type
- preferred_date
- preferred_time

Return only valid JSON:
{
  "intent": "book_appointment",
  "customer_name": null,
  "phone_number": null,
  "service_type": null,
  "preferred_date": null,
  "preferred_time": null,
  "branch_or_location": null,
  "notes": null,
  "missing_fields": [],
  "next_action": "ask_missing_fields | check_availability | confirm_booking |
handoff_to_human",
  "customer_reply": "short polite reply"
}
```

CHAPTER 19

Make.com Implementation Plan

Make.com mein appointment bot ko modules ke through build kiya ja sakta hai. Beginner/intermediate setup ke liye Google Sheets + Google Calendar + OpenAI + WhatsApp/email notification ka combination enough hota hai.

1. **Webhook trigger**

   Customer message WhatsApp/website form se Make.com webhook par receive karein.

2. **AI module**

   Message ko appointment router prompt mein pass karein aur JSON output lein.

3. **Router module**

   Missing data, availability check, confirm booking, cancel/reschedule ke routes banayein.

4. **Calendar / Sheet module**

   Available slot check karein ya appointment record create karein.

5. **Reply module**

   Customer ko confirmation, missing data request, ya alternative slots send karein.

CHAPTER 19

n8n Implementation Plan

n8n mein same workflow zyada flexible tarike se build ho sakta hai. Agar custom backend ya database use karni ho to n8n ka HTTP Request, Code, IF, Switch, aur database nodes useful hote hain.

n8n node	Purpose	Output
Webhook	Customer message receive	Incoming payload
Set/Edit Fields	Message normalize	Clean customer message
AI/OpenAI	Intent + fields extract	Appointment JSON
IF / Switch	next_action route	Correct workflow branch
HTTP Request / Calendar	Availability or booking action	Slot result / event created
Database / Sheet	Record save	Appointment row
HTTP Reply	Customer reply send	Confirmation or question

Tip: n8n mein execution logs test karna zaroori hai. Har failed node ka input/output dekhein aur error route add karein.

CHAPTER 19

Mini Project: Clinic Appointment Assistant

Is project mein aap ek dental clinic ke liye appointment assistant design karenge. Clinic ka goal hai ke WhatsApp messages se appointment leads automatically collect hon aur available slots ke according booking confirm ho.

Business requirements

- Dental checkup, scaling, braces consult
- DHA and Gulberg branches
- Appointment slot 30 minutes
- Reminder 24 hours before

Automation output

- Appointment JSON
- Calendar/Sheet record
- Customer confirmation
- Staff notification

```
Sample customer message:
Kal evening dental checkup ki appointment mil sakti hai? Mera naam Ali hai aur number
03001234567 hai. DHA branch preferred hai.
```

Expected system behavior

AI required data extract kare, preferred date/time normalize kare, DHA branch ke available evening slots check kare, phir customer ko confirmation ya alternative slots reply kare.

Exercise 1: Required Fields Identify Karein

Neechay customer message diya gaya hai. Is message se available fields aur missing fields identify karein.

```
Customer message:
Mujhe Saturday ko physiotherapy session book karwana hai. Afternoon mein koi slot ho to bata
dein.
```

Aapka task

- intent identify karein
- available fields likhein
- missing fields likhein
- next_action decide karein

Answer Key

```
{
  "intent": "book_appointment",
  "service_type": "physiotherapy session",
  "preferred_date": "Saturday",
  "preferred_time": "afternoon",
  "customer_name": null,
  "phone_number": null,
  "missing_fields": ["customer_name", "phone_number"],
  "next_action": "ask_missing_fields"
}
```

Exercise 2: Reply Draft Likhein

Customer ka message hai:

```
Kal 6 baje dentist available hai?
```

Assume karein system ko customer ka naam aur phone number missing mila. Short, polite reply likhein.

Answer Key

Recommended reply

Ji, kal 6 baje dentist availability check karne ke liye please apna naam aur phone number share kar dein. Details milte hi hum slot confirm kar denge.

Why this works: Reply short hai, required missing fields ask kar raha hai, aur false confirmation nahi de raha.

Exercise 3: Alternative Slot Handling

Agar customer ne 5 PM ask kiya aur 5 PM unavailable hai, lekin 4:30 PM aur 5:30 PM available hain, reply kya hona chahiye?

Answer Key

5 PM ka slot unavailable hai, lekin 4:30 PM aur 5:30 PM available hain. Aap in dono mein se kaunsa slot confirm karna chahenge?

CHAPTER 19

Chapter Recap

Key learning

- Appointment bot required data collect karta hai
- Missing data ke bina booking confirm nahi hoti
- Availability check business system se hota hai
- Reminder workflow appointment value increase karta hai

Client-ready rules

- Business hours check karein
- Calendar double-booking avoid karein
- Confirmation clear rakhein
- Reschedule/cancel policy define karein

Upgrade Challenge

Apne appointment assistant mein yeh features add karein: doctor/staff selection, branch selection, 24-hour reminder, reschedule flow, and no-show tracking.

Next chapter: Ab hum real estate lead qualification bot build karenge jahan location, budget, property type, buying/renting intent, aur lead score ka use hoga.

CHAPTER 20

Real Estate Lead Qualification Bot

Is chapter mein hum property dealers, real estate agencies, builders, and investment consultants ke liye lead qualification bot design karenge. Bot ka kaam hoga customer ki requirement samajhna, budget aur location extract karna, buying ya renting intent identify karna, lead score assign karna, aur agent ko useful summary bhejna.

Property intent | Budget | Location | Lead score | Agent notification

Learning outcome: Chapter ke end tak aap real estate business ke liye WhatsApp ya website chat based lead qualification workflow design kar sakenge jo serious buyers/renters ko low quality queries se separate kare.

Real estate lead qualification ka simple flow

Goal: serious lead ko fast identify karna aur agent ko clean requirement summary dena.
Location + property type + budget + timeline + contact details = better follow-up.

CHAPTER 20

Real Estate Lead Qualification Kya Hoti Hai?

Real estate mein har inquiry equal value nahi rakhti. Kuch log sirf market rate poochte hain, kuch log serious buyer hote hain, kuch investors hotay hain, aur kuch renters urgent requirement ke saath contact karte hain.

Lead qualification ka matlab hai customer ki requirement samajh kar us lead ko useful categories mein convert karna.

Unqualified inquiry

Customer ne sirf yeh poocha: "DHA mein rate kya chal raha hai?" Abhi budget, size, intent, timeline aur contact detail clear nahi.

Qualified lead

Customer ne kaha: "DHA Phase 6 mein 5 marla house chahiye, budget 2.2 crore hai, 1 month ke andar buy karna hai." Yeh strong lead hai.

Simple rule: Real estate bot ka kaam customer ko forcefully sell karna nahi. Bot ka kaam requirement clear karna, missing details lena, aur serious leads ko agent tak fast pohanchana hai.

Lead Qualification Fields

Real estate bot ke liye field planning bohot important hai. Agar fields clear hon to AI ka output CRM, Google Sheet, ya property system mein easily save ho sakta hai.

Field	Example	Required?	Use
lead_intent	buy / rent / sell / invest	Yes	Correct sales route
property_type	house, plot, apartment, commercial	Yes	Inventory matching
location	DHA Lahore, Bahria Town, Gulberg	Yes	Area filter
size	5 marla, 10 marla, 1 kanal	Optional	Better matching
budget	2 crore, 70k rent, 5 million	Yes	Lead scoring
timeline	urgent, this month, 3 months	Optional	Priority
customer_name	Ali Khan	Optional	Follow-up
phone_number	03001234567	Yes	Agent call/message
notes	Corner house preferred	Optional	Agent context

CHAPTER 20

Common Real Estate Intents

Intent router real estate bot ka first decision point hota hai. Customer ka message dekh kar bot decide karega ke customer buying, renting, selling, investment, price inquiry, ya human agent ke liye message kar raha hai.

Intent	Meaning	Next action
buy_property	Customer property khareedna chahta hai	Location, type, size, budget collect karein
rent_property	Customer rental property chahta hai	Area, rent budget, family/bachelor requirement ask karein
sell_property	Customer apni property sell karna chahta hai	Property details, location, demand, contact collect karein
investment_inquiry	Customer investment option pooch raha hai	Budget, risk preference, location ask karein
price_inquiry	Market rate pooch raha hai	Area and property type clarify karein
human_agent	Agent se direct baat karni hai	Handoff create karein

```
Router output example:
{
  "intent": "buy_property",
  "location": "DHA Lahore",
  "property_type": "house",
  "size": "5 marla",
  "budget": "2 crore",
  "missing_fields": ["phone_number", "timeline"],
  "next_action": "ask_missing_fields"
}
```

CHAPTER 20

Lead Score Rules

Lead score automation ka major part hai. Is se sales agent ko pata chalta hai ke kaun se leads par pehle follow-up karna chahiye.

High priority

- Budget clear hai
- Location clear hai
- Timeline urgent hai
- Phone number available hai
- Customer viewing chahta hai

Medium priority

- Requirement clear hai
- Budget approximate hai
- Timeline flexible hai
- Contact detail available hai

Low priority

- Sirf rate pooch raha hai
- Budget missing hai
- Location vague hai
- Contact missing hai

Scoring formula example

Budget clear: +25, location clear: +20, property type clear: +15, phone available: +20, urgent timeline: +20. Total 80+ = high priority.

CHAPTER 20

Lead Qualification Workflow

Real estate bot ka workflow simple rakhein. Pehle customer message samjhein, phir missing data collect karein, phir lead score assign karein, phir agent ko summary bhejein.

1

Message receive karein

Customer WhatsApp, website chat, Facebook lead form, ya landing page form se inquiry bhejta hai.

2

Intent detect karein

AI decide karta hai ke customer buy, rent, sell, invest, price inquiry, ya agent handoff chahta hai.

3

Requirement extract karein

Location, property type, size, budget, timeline, and contact details JSON mein extract hotay hain.

4

Missing data ask karein

Agar budget ya phone missing ho to bot short question pooch kar details complete karta hai.

5

Lead score assign karein

Rules ke according lead high, medium, ya low priority ban jata hai.

6

CRM save + agent notify

Lead CRM/Sheet mein save hota hai aur agent ko clean summary milti hai.

CHAPTER 20

Real Estate JSON Schema

Structured output ke bina real estate automation unreliable ho jati hai. Har lead ko same JSON shape mein convert karna chahiye.


```
{
  "lead_intent": "buy_property",
  "property_type": "house",
  "location": "DHA Lahore Phase 6",
  "size": "5 marla",
  "budget": "2.2 crore",
  "timeline": "within 1 month",
  "customer_name": "Ali Khan",
  "phone_number": "03001234567",
  "preferences": ["near park", "corner preferred"],
  "lead_score": 90,
  "priority": "high",
  "missing_fields": [],
  "next_action": "notify_agent",
  "agent_summary": "High priority buyer looking for 5 marla house in DHA Lahore Phase 6 with
2.2 crore budget. Wants to buy within 1 month."
}
```


Tip: CRM ke liye JSON fields stable rakhein. Agar field names har workflow mein change hotay rahein to automation break ho sakti hai.

CHAPTER 20

Qualification Prompt Template

Yeh prompt customer message ko real estate lead JSON mein convert karta hai. Isay Make.com, n8n, backend API, ya chatbot ke AI step mein use kiya ja sakta hai.

```
You are a real estate lead qualification assistant.

Analyze the customer message and return ONLY valid JSON.
Do not invent missing details.
If any important field is missing, add it to missing_fields.

Required fields:
- lead_intent: buy_property, rent_property, sell_property, investment_inquiry, price_inquiry,
human_agent, unknown
- property_type
- location
- size
- budget
- timeline
- customer_name
- phone_number
- preferences
- lead_score: 0 to 100
- priority: high, medium, low
- missing_fields
- next_action: ask_missing_fields, save_lead, notify_agent, human_handoff
- agent_summary

Scoring rules:
Budget clear +25, location clear +20, property_type clear +15, phone available +20, urgent
timeline +20.

Customer message:
{{customer_message}}
```

Prompt rule

Prompt mein clearly likhein: "Do not invent missing details." Real estate workflow mein fake budget, fake phone, ya fake location dangerous ho sakti hai.

CHAPTER 20

Missing Field Handling

Real estate bot ko ek time par bohot saaray questions nahi poochne chahiye. Customer ko natural conversation feel honi chahiye.

Missing field	Bot question	Why
budget	Aapka approximate budget ya rent range kya hai?	Inventory matching ke liye
location	Aap kis area ya society mein property dekh rahe hain?	Area filter ke liye
property_type	Aap house, plot, apartment, ya commercial property dekh rahe hain?	Correct category ke liye
phone_number	Agent follow-up ke liye please apna phone number share kar dein.	Sales contact ke liye
timeline	Aap kitni jaldi buy/rent karna chahte hain?	Lead priority ke liye

Best practice: Pehle budget, location, property type, and contact number complete karein. Yeh four fields real estate workflow ki backbone hain.

CHAPTER 20

Agent Notification Format

Qualified lead ka sab se important output agent notification hai. Agent ko long raw chat nahi chahiye. Agent ko clean, short, action-ready summary chahiye.

```
New Real Estate Lead - HIGH PRIORITY

Intent: Buy Property
Property: 5 Marla House
Location: DHA Lahore Phase 6
Budget: 2.2 crore
Timeline: Within 1 month
Customer: Ali Khan
Phone: 03001234567
Preferences: Near park, corner preferred

Suggested action: Call within 15 minutes and share 2-3 matching options.
```

Good notification

- Short and clear
- Important fields first
- Priority visible
- Next action included

Bad notification

- Raw chat pasted
- No budget shown
- No priority
- No next action

CHAPTER 20

CRM / Google Sheet Structure

Real estate lead ko CRM ya Google Sheet mein save karte waqt columns clear hone chahiye. Later sales team is data se follow-ups, reports, and deal tracking kar sakti hai.

Column	Example	Purpose
created_at	2026-07-01 15:30	Lead time tracking
source	WhatsApp	Channel analysis
lead_intent	buy_property	Sales category
location	DHA Lahore	Area matching
property_type	house	Inventory category
budget	2.2 crore	Qualification
priority	high	Follow-up speed
assigned_agent	Agent A	Ownership
status	new	Pipeline tracking
next_follow_up	2026-07-02	Sales reminder

CHAPTER 20

Make.com Implementation Plan

Make.com mein real estate lead bot ka workflow no-code style mein create kiya ja sakta hai. Is chapter ka focus architecture hai, exact account setup nahi.

1. **Webhook trigger**

   WhatsApp, website form, or chatbot se incoming inquiry receive karein.

2. **AI module**

   Customer message ko real estate JSON mein convert karein.

3. **Router**

   High priority, medium priority, low priority, missing fields, and human handoff branches banayein.

4. **Google Sheet / CRM**

   Lead data row create karein ya CRM contact/deal create karein.

5. **Agent notification**

   WhatsApp, Slack, Email, or CRM task ke through agent ko lead summary bhejein.

Tip: Make.com mein filter conditions clear rakhein: priority = high, missing_fields empty, phone_number exists.

CHAPTER 20

n8n Implementation Plan

n8n mein same workflow zyada control ke saath create ho sakta hai. Developer ya technical automation builder ke liye n8n useful hai.

n8n node	Role	Output
Webhook	Incoming lead receive	Raw payload
Set/Edit Fields	Message normalize	Clean customer_message
AI/OpenAI	Lead qualification	Real estate JSON
IF / Switch	Route by next_action and priority	Correct workflow branch
Google Sheets / Database	Lead save	Saved record
HTTP Request	Notify agent or CRM API	Notification result

n8n advantage

n8n mein execution logs, code node, and self-hosting options zyada control dete hain. Real estate agencies ke custom workflows mein yeh useful hota hai.

CHAPTER 20

Testing Checklist

Real estate lead bot deploy karne se pehle realistic messages ke saath test karein.

Test messages

- DHA mein 5 marla house chahiye
- 70k tak rent par apartment chahiye
- Apna 10 marla plot sell karna hai
- Investment ke liye 50 lac ka option chahiye
- Rate kya chal raha hai?

Expected checks

- Intent correct hai
- Budget extract hua
- Location extract hui
- Missing fields correct hain
- Lead priority logical hai
- Agent summary useful hai

Quality rule: Agar bot low quality inquiry ko high priority mark kar raha hai, scoring rules adjust karein.

CHAPTER 20

Mini Project: Property Dealer Lead Bot

Is project mein aap Lahore based property dealer ke liye lead qualification bot design karenge.

Business requirements

- Buy, rent, and sell inquiries handle karein
- DHA, Bahria, Gulberg leads support karein
- High priority leads agent ko notify hon
- All leads Google Sheet mein save hon

Automation output

- Lead qualification JSON
- Lead score
- Missing field question
- Agent notification
- CRM/Sheet row

```
Sample customer message:
DHA Phase 6 mein 5 marla house chahiye. Budget 2.2 crore tak hai. Agar acha option ho to is
week visit kar sakta hoon. Mera number 03001234567 hai.
```

Expected behavior

Bot intent buy_property detect kare, high priority score assign kare, Sheet mein lead save kare, aur agent ko short summary send kare.

CHAPTER 20

Exercise 1: Lead Extract Karein

Neechay customer message diya gaya hai. Isay structured JSON mein convert karein.

```
Customer message:
Bahria Town Lahore mein 10 marla plot chahiye investment ke liye. Budget 1.5 crore tak hai. 2
months mein decision lena hai.
```

Aapka task

- intent identify karein
- property_type, location, size, budget extract karein
- missing_fields likhein
- priority decide karein

Answer Key

```
{
  "lead_intent": "investment_inquiry",
  "property_type": "plot",
  "location": "Bahria Town Lahore",
  "size": "10 marla",
  "budget": "1.5 crore",
  "timeline": "2 months",
  "phone_number": null,
  "missing_fields": ["phone_number", "customer_name"],
  "lead_score": 80,
  "priority": "high",
  "next_action": "ask_missing_fields"
}
```

Exercise 2: Missing Field Reply

Customer ne message bheja:

```
DHA mein apartment rent par chahiye.
```

Short reply likhein jo missing fields politely ask kare.

Answer Key

Recommended reply

Ji, DHA mein apartment ke liye please apna monthly rent budget, required bedrooms, aur phone number share kar dein taake agent aapko relevant options bhej sake.

Exercise 3: Agent Notification

Is lead ke liye agent notification draft karein: customer 5 marla house, DHA Phase 8, budget 2 crore, urgent visit, phone available.

Answer Key

```
New Real Estate Lead - HIGH PRIORITY

Intent: Buy Property
Property: 5 Marla House
Location: DHA Phase 8
Budget: 2 crore
Timeline: Urgent visit required
Phone: Available

Suggested action: Call immediately and share matching DHA Phase 8 options.
```

CHAPTER 20

Chapter Recap

Key learning

- Real estate bot lead intent detect karta hai
- Budget, location, property type, and phone critical fields hain
- Lead score agent follow-up priority decide karta hai
- Agent ko clean summary milni chahiye

Client-ready rules

- Fake information generate na karein
- Missing fields clearly ask karein
- High priority leads fast notify karein
- All leads CRM ya Sheet mein save karein

Upgrade Challenge

Is real estate bot mein inventory matching add karein: agar customer ke budget aur location ke according available property list ho to bot top 3 matching options suggest kare, warna agent handoff create kare.

Next chapter: Ab hum AI complaint ticketing system build karenge jahan complaint detection, category, priority, required fields, aur ticket summary ka use hoga.

CHAPTER 21

AI Complaint Ticketing System

Is chapter mein hum ek practical AI complaint ticketing system design karenge. System customer complaint ko samjhega, category assign karega, priority decide karega, required details collect karega, ticket summary banayega, aur team ya ticketing tool ko action-ready information bhejega.

Complaint detection | Priority | Required fields | Ticket summary | Team handoff

Learning outcome: Chapter ke end tak aap support, e-commerce, service business, clinic, restaurant, ya SaaS ke liye AI-based complaint ticketing workflow design kar sakenge.

Complaint ticketing ka simple flow

Goal: complaint ko raw message se structured, traceable support ticket mein convert karna.
Right category + right priority + required fields = fast resolution.

CHAPTER 21

Complaint Ticketing System Kya Hota Hai?

Complaint ticketing system ek aisa workflow hota hai jo customer ke issue ko trackable record mein convert karta hai. Simple WhatsApp ya email message ko ticket banane se team ko pata hota hai ke issue kya hai, kis customer ka hai, priority kya hai, aur next action kya lena hai.

Raw complaint

Customer likhta hai: "Payment cut gayi lekin order confirm nahi hua." Yeh message useful hai, lekin team ke liye complete ticket nahi.

Structured ticket

AI category, priority, summary, required fields, customer info, and next action ke saath ticket create karta hai.

Important: Complaint ticketing ka goal customer ko ignore karna nahi. Goal yeh hai ke complaint ko organized, trackable, and assignable support task mein convert kiya jaye.

CHAPTER 21

Complaint Message Ko Ticket Mein Convert Karna

AI complaint ticketing system ka basic kaam message ko samajhna aur usay ticket data mein convert karna hota hai.

1

Complaint detect karein

AI identify karta hai ke message complaint hai, general query nahi.

2

Category assign karein

Complaint payment, delivery, product, service, appointment, account, ya technical issue se related ho sakti hai.

3

Priority decide karein

Urgency, customer mood, business impact, aur issue type ke basis par priority assign hoti hai.

4

Required fields check karein

Order ID, payment proof, phone number, appointment ID, ya screenshot missing ho sakta hai.

5

Ticket summary banayein

Team ke liye short, clear, action-ready summary generate hoti hai.

6

Ticket create / notify

Jira, Zendesk, Freshdesk, Google Sheet, Airtable, CRM, ya Slack/Email notification mein ticket create hota hai.

CHAPTER 21

Common Complaint Categories

Ticketing automation mein category system stable hona chahiye. Agar category names har prompt mein change hotay rahen to reporting aur routing difficult ho jati hai.

Category	Example complaint	Suggested team
payment_issue	Payment deduct ho gayi lekin order confirm nahi hua	Billing / Support
delivery_delay	Mera order abhi tak deliver nahi hua	Operations
product_damage	Product broken ya defective aya	Support / Returns
wrong_item	Jo order kiya tha woh item nahi aya	Fulfillment
service_quality	Technician ne issue properly fix nahi kiya	Service manager
appointment_issue	Appointment confirm thi lekin doctor available nahi thay	Clinic admin
technical_issue	App login nahi ho rahi ya feature work nahi kar raha	Technical support
refund_request	Mujhe refund chahiye	Billing / Support

CHAPTER 21

Priority Rules

AI ko priority assign karni hoti hai, lekin priority random nahi honi chahiye. Business rules ke through priority define karein.

High priority

- Payment issue
- Refund demand
- Angry customer
- Repeated complaint
- Business loss risk
- Public review threat

Medium priority

- Delivery delay
- Wrong item
- Service reschedule
- Missing information issue
- Customer mildly upset

Low priority

- General feedback
- Minor question
- Non-urgent correction
- No strong negative sentiment

Rule: Payment, refund, data/privacy, angry customer, or public complaint risk ko usually high priority treat karein.

CHAPTER 21

Required Fields Planning

Har complaint ke liye same fields required nahi hotay. Payment issue ke liye transaction ID helpful hota hai. Delivery issue ke liye order ID required hota hai. Service issue ke liye appointment/service ID helpful hota hai.

Complaint type	Required fields	Bot question
payment_issue	order_id, payment_reference, screenshot	Please order number aur payment reference/screenshot share kar dein.
delivery_delay	order_id, phone_number	Please apna order number share kar dein taake status check ho sake.
product_damage	order_id, product_photo, issue_detail	Please damaged product ki picture aur order number send kar dein.
appointment_issue	appointment_date, customer_name, phone_number	Please appointment date/time aur phone number share kar dein.
technical_issue	account_email, error_message, screenshot	Please error screenshot aur account email share kar dein.

CHAPTER 21

Ticket JSON Schema

Ticketing automation mein AI output ko stable JSON format mein rakhna zaroori hai. Yeh JSON Make.com, n8n, backend API, Jira, Zendesk, Freshdesk, ya Google Sheet mein map ho sakta hai.

```
{
  "is_complaint": true,
  "category": "payment_issue",
  "priority": "high",
  "sentiment": "angry",
  "summary": "Customer payment was deducted but order was not confirmed.",
  "customer_name": null,
  "phone_number": null,
  "order_id": null,
  "required_missing_fields": ["order_id", "payment_reference"],
  "customer_reply": "Sorry for the inconvenience. Please apna order number aur payment
reference share kar dein taake hum issue check kar saken.",
  "team": "billing_support",
  "next_action": "ask_missing_fields",
  "ticket_title": "Payment deducted but order not confirmed"
}
```

Best practice: Ticket title short rakhein. Summary mein customer issue clearly likhein. Raw customer message ko notes mein preserve karein.

CHAPTER 21

Complaint Classifier Prompt

Yeh prompt customer message ko ticket JSON mein convert karta hai. Isay workflow ke AI step mein use kiya ja sakta hai.

```
You are a customer support ticketing assistant.

Analyze the customer message and return ONLY valid JSON.
Do not invent missing details.
If information is missing, add it to required_missing_fields.

Allowed categories:
payment_issue, delivery_delay, product_damage, wrong_item, service_quality,
appointment_issue, technical_issue, refund_request, general_feedback, unknown

Allowed priority:
high, medium, low

Priority rules:
- payment, refund, angry customer, repeated complaint, or public review threat = high
- delivery delay, wrong item, service reschedule = medium
- general feedback or non-urgent issue = low

Return fields:
is_complaint, category, priority, sentiment, summary, customer_name, phone_number, order_id,
appointment_id, required_missing_fields, customer_reply, team, next_action, ticket_title

Customer message:
{{customer_message}}
```

CHAPTER 21

Example 1: Payment Complaint

Customer message:

```
Payment deduct ho gayi lekin order confirm nahi hua. Yeh kya service hai?
```

AI output

```
{
  "is_complaint": true,
  "category": "payment_issue",
  "priority": "high",
  "sentiment": "angry",
  "summary": "Customer payment was deducted but order was not confirmed.",
  "order_id": null,
  "required_missing_fields": ["order_id", "payment_reference"],
  "customer_reply": "Sorry for the inconvenience. Please apna order number aur payment
reference share kar dein taake hum issue urgently check kar saken.",
  "team": "billing_support",
  "next_action": "ask_missing_fields",
  "ticket_title": "Payment deducted but order not confirmed"
}
```

Why high priority?

Payment issue aur angry tone dono present hain. Is liye ticket high priority hona chahiye.

CHAPTER 21

Example 2: Delivery Delay

Customer message:

```
Mera order 4 din se nahi aya. Order number 44321 hai.
```

AI output


```
{
  "is_complaint": true,
  "category": "delivery_delay",
  "priority": "medium",
  "sentiment": "frustrated",
  "summary": "Customer reports that order 44321 has not been delivered for 4 days.",
  "order_id": "44321",
  "required_missing_fields": [],
  "customer_reply": "Sorry for the delay. Hum aapka order 44321 check kar rahe hain aur
status update jald share kar dein ge.",
  "team": "operations",
  "next_action": "create_ticket",
  "ticket_title": "Delivery delayed for order 44321"
}
```


Note: Agar order ID present hai to bot direct ticket create kar sakta hai. Agar order ID missing ho to pehle ask_missing_fields branch chalegi.

CHAPTER 21

Ticket Creation Payload

Agar aap ticketing tool use kar rahe hain to AI output ko API body mein map karna hota hai. Neechay generic ticket creation payload diya gaya hai.

```
{
  "title": "Payment deducted but order not confirmed",
  "description": "Customer payment was deducted but order was not confirmed. Customer is angry and needs urgent support.",
  "category": "payment_issue",
  "priority": "high",
  "customer_phone": "{{phone_number}}",
  "order_id": "{{order_id}}",
  "source": "whatsapp",
  "raw_message": "{{customer_message}}",
  "assigned_team": "billing_support"
}
```

Map carefully

AI JSON ka ticket_title API ke title field mein, summary description mein, aur priority ticket priority mein map hoti hai.

Validate first

Ticket create karne se pehle required fields check karein. Missing critical data ho to customer se poochna better hai.

CHAPTER 21

Ticketing Tools Options

Beginner aur intermediate level par ticketing ke liye different options use kiye ja sakte hain. Tool choice client ke budget, process, aur team size par depend karti hai.

Tool	Use case	Difficulty
Google Sheets	Small business ticket log	Easy
Airtable	Visual ticket tracker	Easy to medium
Trello / Notion	Simple task based support tracking	Easy
Freshdesk / Zendesk	Professional support team	Medium
Jira Service Management	IT/support workflows with request types	Medium to advanced
Custom backend	Full control and custom workflows	Advanced

CHAPTER 21

Make.com Implementation Plan

Make.com mein complaint ticketing workflow no-code style mein build ho sakta hai.

1. **Webhook trigger**

   WhatsApp, website form, email parser, ya chatbot se complaint message receive karein.

2. **AI classifier**

   Customer message ko complaint ticket JSON mein convert karein.

3. **Router**

   next_action ke basis par branch banayein: ask_missing_fields, create_ticket, human_handoff.

4. **Ticket create**

   Google Sheet row, Airtable record, Jira request, Zendesk ticket, ya custom API call create karein.

5. **Customer reply**

   AI generated customer_reply WhatsApp/email par send karein.

6. **Team alert**

   High priority ticket ke liye Slack, email, WhatsApp, ya CRM task notification bhejein.

CHAPTER 21

n8n Implementation Plan

n8n complaint ticketing workflow mein zyada control deta hai, especially validation, custom API calls, and logs ke liye.

n8n node	Role	Output
Webhook	Incoming complaint receive	Raw message
Set/Edit Fields	Message normalize	customer_message
AI/OpenAI	Complaint classify	Ticket JSON
IF / Switch	Route next_action	Correct branch
HTTP Request	Create ticket API call	Ticket ID
Google Sheets / DB	Ticket log save	Record
Email/Slack/WhatsApp	Team/customer notification	Alert sent

n8n advantage

n8n execution logs se aap dekh sakte hain ke kis message par AI ne kya output diya, API call fail hui ya success, aur ticket ID kya generate hua.

CHAPTER 21

Customer Reply Rules

Complaint workflow mein customer reply bohot carefully written hona chahiye. Reply defensive nahi, helpful hona chahiye.

Good reply

- Issue acknowledge karein
- Sorry or empathy include karein
- Next step clearly batayein
- Missing info politely ask karein
- Overpromise na karein

Avoid

- Customer ko blame karna
- Fake resolution promise karna
- Long robotic reply
- Internal system details share karna
- Ticket ID ke bina "resolved" kehna

```
Safe reply template:
Sorry for the inconvenience. Humne aapka issue note kar liya hai. Please {{missing_field}}
share kar dein taake support team isay properly check kar sake.
```

CHAPTER 21

Team Notification Format

Team notification short, structured, and action-oriented honi chahiye.

```
New Complaint Ticket - HIGH PRIORITY

Title: Payment deducted but order not confirmed
Category: payment_issue
Customer sentiment: angry
Order ID: Missing
Payment reference: Missing
Source: WhatsApp

Summary:
Customer says payment was deducted but order was not confirmed.

Next action:
Ask customer for order ID and payment reference, then verify payment status.
```

Rule: High priority ticket ke notification mein category, priority, missing fields, and next action clearly visible honi chahiye.

CHAPTER 21

Testing Checklist

Complaint ticketing workflow deploy karne se pehle multiple scenarios test karein.

Test messages

- Payment deduct ho gayi
- Order late hai
- Wrong product aya
- Refund chahiye
- App login nahi ho rahi
- Technician ne kaam theek nahi kiya

Expected checks

- Complaint detect hoti hai
- Category correct hai
- Priority logical hai
- Missing fields correct hain
- Customer reply polite hai
- Ticket summary useful hai
- Team notification clear hai

Quality signal

Agar support team ticket read kar ke immediately next action samajh jaye, ticket summary useful hai.

CHAPTER 21

Mini Project: Complaint Ticketing Workflow

Is mini project mein aap e-commerce store ke liye AI complaint ticketing workflow design karenge.

Business requirements

- WhatsApp complaints receive hon
- Payment, delivery, return, refund categories support hon
- High priority tickets team ko alert hon
- Missing order ID customer se ask ho
- All tickets Google Sheet ya CRM mein save hon

Automation outputs

- Ticket JSON
- Customer reply
- Ticket title
- Team notification
- Ticket log row

```
Sample customer message:
Mera order 77881 deliver nahi hua aur tracking bhi update nahi ho rahi. 5 din ho gaye hain.
```

Expected behavior

Bot delivery_delay category assign kare, medium priority set kare, order_id extract kare, ticket create kare, customer ko status-check reply bheje, aur operations team ko notify kare.

CHAPTER 21

Exercise 1: Complaint JSON Banayein

Neechay customer message diya gaya hai. Isay complaint ticket JSON mein convert karein.

```
Customer message:
Maine blue shoes order kiye thay lekin black shoes aa gaye. Order number 99021 hai.
```

Answer Key

```
{
  "is_complaint": true,
  "category": "wrong_item",
  "priority": "medium",
  "sentiment": "frustrated",
  "summary": "Customer ordered blue shoes but received black shoes. Order number is 99021.",
  "order_id": "99021",
  "required_missing_fields": ["product_photo"],
  "customer_reply": "Sorry for the inconvenience. Please received product ki picture share
kar dein taake support team exchange process start kar sake.",
  "team": "fulfillment_support",
  "next_action": "ask_missing_fields",
  "ticket_title": "Wrong item received for order 99021"
}
```

Exercise 2: Priority Decide Karein

Har message ke liye priority select karein: high, medium, ya low.

Message	Answer	Reason
Payment cut gayi lekin order confirm nahi hua	High	Payment issue
Order 2 din late hai	Medium	Delivery delay
Packaging achi nahi thi	Low	General feedback
Mujhe refund chahiye warna review post karun ga	High	Refund + public complaint risk
App kabhi kabhi slow hoti hai	Low	Non-urgent technical feedback

Exercise 3: Team Notification

Payment issue ke liye high priority team notification draft karein.

Answer Key

New Complaint Ticket - HIGH PRIORITY
Category: payment_issue
Summary: Customer says payment was deducted but order was not confirmed.
Missing fields: order_id, payment_reference
Next action: Ask customer for missing details and verify payment status.

Chapter Recap

Key learning

- Complaint message ko structured ticket mein convert karna hota hai
- Category and priority support workflow ki backbone hain
- Required missing fields customer se politely ask karne chahiye
- Ticket title aur summary team ke liye clear honi chahiye

Client-ready rules

- Fake details generate na karein
- High priority tickets fast notify karein
- Raw customer message save karein
- Customer reply empathetic aur short rakhein

Upgrade Challenge

Is complaint ticketing system mein SLA rules add karein: high priority ticket 30 minutes mein respond ho, medium priority 4 hours mein, aur low priority 24 hours mein. Agar SLA miss ho to manager ko alert send ho.

Next chapter: Ab hum complete intermediate business automation system design karenge jahan webhook, AI router, CRM, API action, human handoff, and follow-up ek single capstone project mein combine honge.

CHAPTER 22

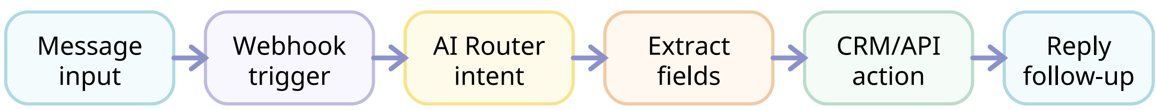
Complete Intermediate Business Automation System

Is final capstone chapter mein hum Book 2 ke tamam concepts ko ek complete client-ready automation system mein combine karenge: webhook, AI intent router, data extraction, CRM/database, API action, customer reply, human handoff, and follow-up automation.

Capstone · Webhook · AI Router · CRM/API · Follow-up

Learning outcome: Chapter ke end tak aap ek complete intermediate automation project ka architecture, workflow, data schema, prompts, testing plan, and client handover design kar sakenge.

Complete system ka high-level flow



Goal: ek message ko useful business outcome mein convert karna.
Lead create, ticket create, appointment book, order record, human handoff, ya follow-up schedule.

CHAPTER 22

Capstone Project Ka Scenario

Is capstone mein hum ek **service business automation system** design karenge. Yeh system AC repair, clinic, real estate, e-commerce, restaurant, ya local service business ke liye adapt ho sakta hai.

Business problem

Customer WhatsApp, website form, email, ya chat widget se message bhejte hain. Team manual reply karti hai, leads miss hoti hain, complaints track nahi hoti, aur follow-up bhool jata hai.

Automation goal

System message samjhe, intent route kare, data extract kare, CRM/database update kare, correct reply bheje, and important cases human team ko handoff kare.

Capstone rule: Yeh project sirf chatbot nahi. Yeh ek proper business workflow automation hai jahan AI decision karta hai aur tools action perform karte hain.

CHAPTER 22

System Requirements

Client-ready automation build karne se pehle requirements clearly define karna zaroori hai. Neechay final system ke main requirements hain.

1

Multi-channel input

WhatsApp, website form, email, ya chat widget se incoming message receive ho.

2

AI intent router

Message ko lead, support, complaint, order, appointment, human_handoff, ya unknown mein classify kare.

3

Data extraction

Name, phone, service, budget, location, order ID, appointment date, issue summary extract kare.

4

CRM/database save

Lead, customer, conversation, ticket, appointment, ya follow-up records save hon.

5

Business action

Lead create, ticket create, appointment request save, order record create, ya team alert send ho.

6

Reply and follow-up

Customer ko helpful reply mile aur warm leads ke liye follow-up schedule ho.

CHAPTER 22

Architecture Components

Complete system ko components mein break karne se project manageable ho jata hai.

Component	Role	Example tool
Input channel	Customer message receive	WhatsApp, form, email, chat widget
Webhook	Message workflow ko trigger kare	Make.com webhook, n8n webhook, backend endpoint
AI router	Intent and next action decide kare	OpenAI / AI module
Data extractor	Required fields extract kare	Structured JSON prompt
Data store	Records save kare	Google Sheets, Airtable, CRM, database
Action layer	API/tool action perform kare	HTTP Request, CRM API, ticket API
Notification layer	Team/customer ko update kare	Email, WhatsApp, Slack

CHAPTER 22

Data Schema Planning

Automation ki quality kaafi had tak data structure par depend karti hai. Agar data clean save ho raha hai to reporting, follow-up, and handoff easy hota hai.

Customer table

- customer_id
- name
- phone
- email
- source
- first_seen_at
- last_seen_at

Lead table

- lead_id
- customer_id
- intent
- service_interest
- budget
- priority
- status
- next_follow_up_at

Ticket table

- ticket_id
- customer_id
- category
- priority
- summary
- status
- assigned_team

Conversation table

- conversation_id
- customer_id
- session_id
- last_intent
- last_message
- memory_state

CHAPTER 22

Incoming Webhook Payload

Har incoming message ko normalize karna chahiye. Is se workflow channels ke difference se free ho jata hai.


```
{
  "source": "whatsapp",
  "message_id": "msg_88421",
  "customer_name": "Ali",
  "customer_phone": "03001234567",
  "message_text": "AC repair ka rate kya hai? Model Town Lahore mein service available hai?",
  "received_at": "2026-07-01T14:30:00Z"
}
```


Normalize first

Website form, email, WhatsApp, and chat widget ka raw format alag ho sakta hai. Workflow ke start mein sab ko same fields mein convert karein: source, customer, message_text, received_at.

CHAPTER 22

Final Intent Router Prompt

Capstone system ka router prompt message ko high-level business intent mein classify karega.

```
You are an AI automation router for a service business.

Analyze the customer message and return ONLY valid JSON.
Do not invent missing details.

Allowed intents:
new_lead, price_inquiry, appointment_request, order_status, complaint, support_question,
human_handoff, unknown

Return fields:
intent, confidence, priority, sentiment, required_missing_fields, next_action, route_to,
short_reason

Rules:
- Complaint, payment issue, angry customer, or refund request = route_to support_team
- Service inquiry, price question, or booking request = route_to sales_team
- Missing required information = next_action ask_missing_fields
- Complete actionable request = next_action create_record

Customer message:
{{message_text}}
```

Tip: Router prompt ko short aur strict rakhein. Zyada creative instructions router ko unstable bana sakti hain.

CHAPTER 22

Final Data Extraction Prompt

Router ke baad extractor prompt customer message se useful fields nikalta hai.

```
You are a business data extraction assistant.

Extract useful information from the customer message.
Return ONLY valid JSON.
Use null for missing values.
Do not guess.

Return fields:
customer_name, phone_number, email, service_interest, product_interest, location, budget,
preferred_date, preferred_time, order_id, issue_summary, urgency, missing_fields

Customer message:
{{message_text}}
```

Example output


```
{
  "customer_name": null,
  "phone_number": "03001234567",
  "service_interest": "AC repair",
  "location": "Model Town Lahore",
  "budget": null,
  "preferred_date": null,
  "order_id": null,
  "issue_summary": null,
  "urgency": "medium",
  "missing_fields": ["customer_name"]
}
```

CHAPTER 22

Action Routing Rules

AI output ke baad workflow ko clear branches mein divide karein. Har branch ka outcome define hona chahiye.

Intent	Action	Output
new_lead	Create lead record	CRM/Sheet row + sales alert
price_inquiry	Send price guidance + capture lead	Reply + lead status warm
appointment_request	Collect date/time and save request	Appointment request record
order_status	Ask/check order ID	Status reply or missing field reply
complaint	Create ticket	Ticket record + support alert
human_handoff	Notify team	Handoff packet
unknown	Ask clarification	Clarifying response

CHAPTER 22

Customer Reply Generator Prompt

Customer reply business ke tone ke mutabiq short, clear, and useful honi chahiye.

```
You are a polite customer communication assistant.

Write a short Roman Urdu reply for the customer.
Use the intent, extracted data, and next_action.
Do not mention internal JSON or automation.
Do not overpromise.
If information is missing, ask only for the missing fields.
Keep the reply under 4 lines.

Intent: {{intent}}
Next action: {{next_action}}
Missing fields: {{missing_fields}}
Business context: {{business_context}}
Customer message: {{message_text}}
```

Good reply

Ji, AC repair service available hai. Please apna naam aur exact area share kar dein taake hum technician availability check kar saken.

Avoid

Hum 100% guarantee dete hain ke abhi technician aa jaye ga. Yeh overpromise hai agar availability confirm nahi.

CHAPTER 22

Follow-up Rules

Capstone system mein follow-up automation zaroor honi chahiye, lekin har customer ko spam nahi karna.

Lead status	Follow-up timing	Stop condition
hot_lead	2 hours	Customer booked / human took over
warm_lead	24 hours	Customer replied or declined
cold_lead	48-72 hours	No response after 2 follow-ups
complaint	Status update as per SLA	Ticket resolved
appointment_request	Reminder before appointment	Appointment cancelled/completed

Rule: Follow-up ka purpose help karna hai, pressure create karna nahi. Maximum follow-up count define karein.

CHAPTER 22

Human Handoff Rules

Automation ko har case khud handle nahi karna chahiye. Kuch cases human team ko transfer karne chahiye.

Immediate handoff

- Angry customer
- Payment/refund issue
- Legal or privacy issue
- Repeated complaint
- High-value lead
- Bot confidence low

Handoff packet

- Customer name/phone
- Raw message
- Intent
- Summary
- Priority
- Missing fields
- Recommended next action

```
Team Alert:
High priority handoff required.
Customer: {{customer_name}} / {{phone}}
Intent: {{intent}}
Summary: {{summary}}
Recommended action: {{next_action}}
```

CHAPTER 22

Make.com Implementation Plan

Make.com mein yeh capstone workflow no-code style mein build ho sakta hai.

1. **Webhook**

   WhatsApp/form/chat message receive karein.

2. **Normalize data**

   Customer name, phone, message_text, source fields set karein.

3. **AI router**

   Intent, priority, next_action, route_to JSON generate karein.

4. **AI extractor**

   Lead/customer/order/ticket fields extract karein.

5. **Router branches**

   Lead, complaint, appointment, unknown, human handoff branches banayein.

6. **Action modules**

   Google Sheets/CRM row, HTTP API call, email/Slack alert, customer reply send karein.

CHAPTER 22

n8n Implementation Plan

n8n implementation zyada flexible hoti hai, especially logs, code node, validation, and custom APIs ke liye.

Node	Purpose	Output
Webhook	Incoming payload receive	Raw message
Set	Normalize fields	Clean payload
AI/OpenAI	Intent router	Router JSON
AI/OpenAI	Data extraction	Extracted fields
Code / IF	Validation and branch logic	next_action
Switch	Intent-based routing	Branch path
HTTP / DB / Sheet	Create records/actions	Record ID
Notification	Reply and team alert	Message sent

CHAPTER 22

Testing Matrix

Final project ko test karne ke liye different messages aur expected outcomes define karein.

Test message	Expected intent	Expected action
AC repair ka rate kya hai?	price_inquiry	Capture lead + ask area
Kal dentist appointment chahiye	appointment_request	Ask time/service + create request
Payment cut gayi order confirm nahi hua	complaint	Create high priority ticket
Mera order 7788 kahan hai?	order_status	Check/route order status
Mujhe human se baat karni hai	human_handoff	Notify team
Hello	unknown	Ask clarification

CHAPTER 22

Client Delivery Checklist

Client ko automation deliver karte waqt sirf workflow link dena enough nahi. Proper handover zaroori hai.

Before delivery

- All test messages pass
- API keys secure
- Missing field replies tested
- Human handoff tested
- Follow-up stop rules tested
- CRM/Sheet fields clean

Handover items

- Workflow diagram
- Tool access list
- Prompt templates
- Testing examples
- Error handling plan
- Maintenance notes

Professional tip: Client ko ek one-page operating guide dein: automation kya karti hai, kab human intervene kare, aur issue report kaise kare.

CHAPTER 22

Mini Project: Complete Automation Blueprint

Is mini project mein aap AC repair service business ke liye complete automation blueprint design karenge.

Business requirements

- WhatsApp leads capture hon
- Price inquiry reply ho
- Complaint ticket create ho
- Technician request record ho
- Hot leads sales team ko alert hon
- Follow-up after 24 hours ho

Deliverables

- Workflow diagram
- Intent list
- Data schema
- Router prompt
- Extraction prompt
- Testing checklist
- Handoff rules

Expected outcome

Student should be able to explain complete system from customer message to CRM update, reply, handoff, and follow-up.

CHAPTER 22

Exercise 1: Data Schema Design

AC repair business ke liye lead table fields define karein.

Answer Key

```
Lead table fields:
lead_id, customer_name, phone_number, source, service_interest, ac_type, issue_summary,
location, preferred_date, preferred_time, priority, status, assigned_to, next_follow_up_at,
created_at, last_updated_at
```

Exercise 2: Router Output

Customer message: "AC cooling nahi kar raha, technician bhej sakte hain? Model Town Lahore."

```
{
  "intent": "new_lead",
  "confidence": "high",
  "priority": "medium",
  "sentiment": "neutral",
  "required_missing_fields": ["customer_name", "phone_number", "preferred_time"],
  "next_action": "ask_missing_fields",
  "route_to": "sales_team",
  "short_reason": "Customer needs AC repair technician and shared location."
}
```

CHAPTER 22

Exercise 3: Full Workflow Answer

Message: "Payment deduct ho gayi lekin booking confirm nahi hui. Mujhe support chahiye."

Answer Key

1

1. Webhook

Message receive and normalize.

2

2. AI router

intent = complaint, priority = high, route_to = support_team.

3

3. Data extraction

issue_summary = payment deducted but booking not confirmed. Missing: booking_id, payment_reference.

4

4. Ticket action

Create high priority ticket and notify support team.

5

5. Customer reply

Sorry for inconvenience. Booking ID aur payment reference share kar dein.

6

6. Follow-up

If unresolved, support team alert as per SLA.

CHAPTER 22

Book 2 Final Recap

Book 2 ne aapko simple prompt-based automation se real client-ready automation systems tak le aya hai.

You learned

- Business workflow mapping
- Intent routing
- Webhooks
- REST APIs
- HTTP requests in tools
- AI + API actions
- Make.com and n8n workflows
- CRM, follow-up, memory, handoff

You built concepts for

- Restaurant WhatsApp order bot
- E-commerce support bot
- Clinic appointment assistant
- Real estate qualification bot
- Complaint ticketing system
- Complete business automation capstone

Final Upgrade Challenge

Capstone system ko ek real niche par apply karein: restaurant, clinic, e-commerce store, real estate agency, ya AC repair service. Apna workflow diagram, data schema, prompts, testing matrix, and handover checklist prepare karein.

Next step: Book 3 mein hum advanced AI agents, RAG, voice agents, queues, deployment, security, monitoring, and SaaS architecture cover karenge.

BONUS MATERIAL

Webhook Payload Examples

Is bonus section mein ready-to-use webhook payload examples diye gaye hain. In examples ko aap Make.com, n8n, backend APIs, CRM workflows, WhatsApp bots, appointment systems, e-commerce support, aur ticketing automations mein practice ke liye use kar sakte hain.

Webhook | JSON | Make.com | n8n | Testing

Goal: Student ko sirf webhook ka concept nahi, balkay real payload structures samajh aayein taake woh practical workflows test aur build kar sake.

Webhook payload ka simple lifecycle

Event hota hai → Payload JSON data → Webhook receive → Workflow process → Action reply/save

Webhook payload woh data hota hai jo event ke baad workflow ko bheja jata hai.
Agar payload clean ho, to automation reliable hoti hai.

BONUS MATERIAL

Webhook Payload Kya Hota Hai?

Webhook payload woh data hota hai jo ek system dusray system ko send karta hai jab koi event hota hai. Example: WhatsApp par message aaya, website form submit hua, payment successful hua, ya CRM mein lead create hui.

Event

Event woh action hai jo system mein hota hai, jaise new message, new order, new lead, ya payment success.

Payload

Payload us event ka data hota hai. Usually yeh JSON format mein hota hai aur webhook URL par send hota hai.

Practical rule: Webhook payload mein sirf wahi fields rakhein jo workflow ko decision lene, data save karne, aur reply/action perform karne ke liye chahiye hoti hain.

Term	Meaning	Example
source	Data kis channel se aaya	whatsapp, website, email
event_type	Kis event ne webhook trigger kiya	message.received, lead.created
customer	Customer ki identity/details	name, phone, email
payload	Event-specific data	message text, order ID, ticket summary
timestamp	Event kab hua	2026-07-01T12:00:00Z

BONUS MATERIAL

Universal Normalized Payload

Different channels ka raw data alag hota hai. Best practice yeh hai ke workflow ke start mein data ko ek normalized structure mein convert kar dein.


```json
{
  "event_id": "evt_1001",
  "event_type": "message.received",
  "source": "whatsapp",
  "received_at": "2026-07-01T12:30:00Z",
  "customer": {
    "customer_id": "cus_8821",
    "name": "Ali Khan",
    "phone": "03001234567",
    "email": null
  },
  "message": {
    "message_id": "msg_5542",
    "text": "AC repair ka rate kya hai?",
    "language": "roman_urdu"
  },
  "metadata": {
    "campaign": null,
    "page_url": null,
    "raw_source_id": "whatsapp_msg_7788"
  }
}
```


Use case

Is structure ko AI intent router, CRM lead creation, support ticket, ya reply generator ke input ke taur par use kiya ja sakta hai.

BONUS MATERIAL

WhatsApp Incoming Message Payload

WhatsApp automation mein sab se common trigger new incoming message hota hai. Is payload ko testing ke liye Make.com webhook ya n8n webhook mein send kar sakte hain.


```json
{
  "event_type": "whatsapp.message.received",
  "source": "whatsapp",
  "message_id": "wamid.HBgM92345",
  "from": {
    "name": "Sara Ahmed",
    "phone": "03009876543"
  },
  "message": {
    "type": "text",
    "text": "Mujhe inverter AC service ki price chahiye",
    "timestamp": "2026-07-01T13:15:00Z"
  },
  "business": {
    "business_id": "biz_ac_service_01",
    "phone_number_id": "923001112233"
  }
}
```


Router expected intent

price_inquiry ya service_inquiry

Next action

Service type extract karein, city/area ask karein, lead CRM mein save karein.

BONUS MATERIAL

Website Contact Form Payload

Website form lead capture automation mein common hai. Form submit hote hi webhook CRM ya automation tool ko payload send kar sakta hai.


```
{
  "event_type": "form.submitted",
  "source": "website",
  "form_id": "contact_form_homepage",
  "submitted_at": "2026-07-01T14:05:00Z",
  "page_url": "https://example.com/contact",
  "form_data": {
    "name": "Hamid Ali",
    "phone": "03111234567",
    "email": "hamid@example.com",
    "service_interest": "AI chatbot for restaurant",
    "message": "Mujhe restaurant ke liye WhatsApp order bot chahiye."
  },
  "tracking": {
    "utm_source": "facebook",
    "utm_campaign": "restaurant_bot_ad"
  }
}
```


Tip: Website payload mein page_url aur UTM fields rakhna useful hota hai. Is se pata chalta hai lead kis ad ya page se aayi.

BONUS MATERIAL

Lead Capture Payload

AI extraction ke baad lead ko CRM ya Google Sheet mein save karne ke liye structured payload use karein.


```
{
  "event_type": "lead.ready_to_save",
  "lead": {
    "name": "Ayesha Noor",
    "phone": "03211234567",
    "email": null,
    "business_type": "clinic",
    "service_interest": "appointment booking assistant",
    "budget": "not provided",
    "location": "Lahore",
    "lead_source": "whatsapp",
    "lead_score": 78,
    "priority": "high",
    "status": "new"
  },
  "ai_analysis": {
    "intent": "new_lead",
    "sentiment": "positive",
    "missing_fields": ["email", "budget"]
  }
}
```


Recommended action

CRM mein lead create karein, sales team ko alert bhejein, aur customer se missing details politely ask karein.

BONUS MATERIAL

Appointment Booking Payload

Clinic, salon, consultancy, repair service, ya coaching business ke liye appointment payload clean hona chahiye.


```
{
  "event_type": "appointment.requested",
  "source": "whatsapp",
  "customer": {
    "name": "Bilal Hassan",
    "phone": "03004567890"
  },
  "appointment": {
    "service_type": "dental checkup",
    "preferred_date": "2026-07-05",
    "preferred_time": "18:00",
    "branch": "DHA Lahore",
    "doctor_preference": null,
    "status": "pending_availability"
  },
  "next_action": "check_calendar_availability"
}
```


If slot available

Appointment confirm karein, calendar event create karein, reminder schedule karein.

If slot unavailable

Alternative slots propose karein. Direct confirmation na dein.

BONUS MATERIAL

E-commerce Order Status Payload

E-commerce support bot mein customer order status poochta hai. Agar order_id available hai to workflow order API ko call kar sakta hai.


```
{
  "event_type": "order_status.requested",
  "source": "chat_widget",
  "customer": {
    "name": "Zainab",
    "phone": "03001112233",
    "email": "zainab@example.com"
  },
  "request": {
    "message": "Mera order ORD-1044 abhi tak deliver nahi hua",
    "order_id": "ORD-1044",
    "intent": "order_status",
    "priority": "medium"
  },
  "next_action": "call_order_status_api"
}
```


Possible order API response


```
{
  "order_id": "ORD-1044",
  "status": "in_transit",
  "courier": "Leopard",
  "tracking_number": "LP123456789",
  "estimated_delivery": "2026-07-03"
}
```

BONUS MATERIAL

Complaint Ticket Payload

Complaint payload ko support team ke liye clear, short, and actionable banana chahiye.


```json
{
  "event_type": "support.ticket.create",
  "source": "whatsapp",
  "customer": {
    "name": "Usman Tariq",
    "phone": "03009998877"
  },
  "ticket": {
    "category": "payment_issue",
    "priority": "high",
    "summary": "Customer payment deduct ho gayi lekin order confirm nahi hua.",
    "order_id": "ORD-7712",
    "status": "open",
    "assigned_team": "support_team"
  },
  "ai_analysis": {
    "sentiment": "negative",
    "needs_human": true,
    "recommended_reply": "Sorry, hum is issue ko priority par check kar rahe hain."
  }
}
```


Rule: Payment, refund, legal, angry customer, ya sensitive data cases mein human handoff zaroor include karein.

BONUS MATERIAL

Payment Success Payload

Payment webhook e-commerce, SaaS, course platform, subscription, ya service invoice automation mein useful hota hai.


```
{
  "event_type": "payment.succeeded",
  "payment_id": "pay_99321",
  "paid_at": "2026-07-01T15:10:00Z",
  "customer": {
    "name": "Noman Ali",
    "email": "noman@example.com",
    "phone": "03002223344"
  },
  "payment": {
    "amount": 15000,
    "currency": "PKR",
    "method": "card",
    "invoice_id": "INV-2088",
    "product": "AI Automation Setup Fee"
  },
  "next_action": "activate_service_and_send_receipt"
}
```


Recommended automation

Invoice paid mark karein, customer ko receipt bhejein, onboarding email send karein, aur internal team ko delivery task assign karein.

BONUS MATERIAL

CRM Lead Created Payload

Kabhi CRM khud bhi webhook trigger karta hai. Example: CRM mein new lead create hui aur automation follow-up sequence start kare.


```json
{
  "event_type": "crm.lead.created",
  "crm": {
    "system": "hubspot_or_airtable_or_custom_crm",
    "record_id": "lead_90021"
  },
  "lead": {
    "name": "Farah Khan",
    "phone": "03117778899",
    "email": "farah@example.com",
    "service_interest": "WhatsApp chatbot",
    "lead_score": 82,
    "status": "new",
    "owner": "sales_team"
  },
  "automation": {
    "start_follow_up": true,
    "follow_up_after_hours": 24
  }
}
```


Tip: CRM se outgoing webhook use karke lead follow-up, sales notification, and reporting automation start ki ja sakti hai.

BONUS MATERIAL

Webhook Error Payload

Production workflows mein error payload bhi define hona chahiye. Is se debugging easy hoti hai.


```
{
  "event_type": "workflow.error",
  "workflow_id": "wf_lead_router_01",
  "failed_at": "2026-07-01T16:20:00Z",
  "step": "create_crm_lead",
  "error": {
    "code": "CRM_401",
    "message": "CRM API token expired",
    "retryable": false
  },
  "original_payload": {
    "event_id": "evt_1001",
    "customer_phone": "03001234567",
    "intent": "new_lead"
  },
  "next_action": "alert_admin"
}
```


Do not ignore

Failed workflow silently ignore nahi hona chahiye. Team ko alert bhejna zaroori hai.

Good practice

Original payload ka safe summary save karein taake later retry possible ho.

BONUS MATERIAL

Webhook Security Headers

Webhook payload ke saath headers bhi important hotay hain. Security ke liye secret token ya signature verify karna chahiye.

```
POST /webhooks/customer-message HTTP/1.1
Host: automation.example.com
Content-Type: application/json
X-Webhook-Source: whatsapp
X-Webhook-Event: message.received
X-Webhook-Timestamp: 2026-07-01T12:30:00Z
X-Webhook-Signature: sha256=example_signature_here
Authorization: Bearer example_secret_token
```

Security checklist

- Secret token verify karein
- Signature validate karein
- Timestamp old na ho
- Payload schema validate karein

Avoid

- Public webhook without secret
- Raw payload logs with secrets
- No validation
- Unlimited requests

BONUS MATERIAL

Testing Payload Collection

Student practice ke liye neeche 3 short payloads hain. Inhein Make.com, n8n, Postman, Thunder Client, ya custom backend mein test kiya ja sakta hai.

Test 1 - Price inquiry


```
{"source":"whatsapp","event_type":"message.received","name":"Ali","phone":"03001234567","message":"AC service ka rate kya hai?"}
```


Test 2 - Appointment request


```
{"source":"website","event_type":"appointment.requested","name":"Sara","phone":"03005556677","service":"dental checkup","preferred_time":"tomorrow evening"}
```


Test 3 - Complaint


```
{"source":"chat_widget","event_type":"complaint.received","name":"Usman","phone":"03009998877","message":"Payment deduct ho gayi lekin order confirm nahi hua","order_id":"ORD-777"}
```


Testing goal: Har payload ko AI router se pass karein aur dekhein intent, priority, missing_fields, and next_action correct aa rahe hain ya nahi.

BONUS MATERIAL

Exercise: Payload Design Karein

Aapko ek real estate lead webhook design karna hai. Customer ka message hai:

```
DHA Lahore mein 5 marla house chahiye. Budget 2 crore tak hai. Agar koi option ho to details
bhej dein.
```

Aapka task

- event_type decide karein
- customer object banayein
- lead object banayein
- AI analysis object add karein
- next_action define karein

Answer Key

```json
{
  "event_type": "real_estate.lead.received",
  "source": "whatsapp",
  "customer": {
    "name": null,
    "phone": "03000000000"
  },
  "lead": {
    "intent": "buy_property",
    "location": "DHA Lahore",
    "property_type": "house",
    "size": "5 marla",
    "budget": "2 crore",
    "timeline": null,
    "priority": "high"
  },
  "ai_analysis": {
    "missing_fields": ["customer_name", "timeline"],
    "lead_score": 85
  },
  "next_action": "save_lead_and_notify_agent"
}
```

BONUS MATERIAL

Final Payload Quality Checklist

Har webhook payload ko production ya client project mein use karne se pehle neeche wali checklist se verify karein.

Structure

- event_type clear hai
- source included hai
- timestamp included hai
- customer object available hai
- main payload nested object mein hai

Automation ready

- Intent router ke liye message text hai
- Required IDs available hain
- Missing fields null hain
- next_action clear hai
- priority/status useful hai

Safety

- Secret data expose nahi ho raha
- PII unnecessary fields mein nahi
- Signature/secret verification possible hai
- Payload size reasonable hai
- Error payload defined hai

Testing

- Valid JSON hai
- Make.com/n8n mein test hua
- Bad data case test hua
- Missing data case test hua
- API error case test hua

Bonus Challenge

Apne kisi client idea ke liye 5 webhook payloads design karein: new lead, appointment request, complaint, payment success, and workflow error.

BONUS MATERIAL

API Request Templates

Is bonus section mein ready-to-use API request templates diye gaye hain. In templates ko aap Make.com, n8n, Postman, Thunder Client, backend APIs, CRM workflows, WhatsApp bots, appointment systems, e-commerce support, aur ticketing automations mein use kar sakte hain.

REST API | **HTTP** | **JSON Body** | **Auth** | **Testing**

Goal: Student ko API request ka format itna clear ho jaye ke woh AI output ko action mein convert kar sake: lead create karna, ticket banana, appointment save karna, order status check karna, ya WhatsApp message send karna.

API request ka practical lifecycle

AI Output structured data → API Body JSON mapping → HTTP GET/POST → API business system → Response success/error

API request woh bridge hai jo AI decision ko real business action mein convert karta hai.
Clean input, correct method, valid headers, and safe error handling zaroori hain.

BONUS MATERIAL

API Request Ki Basic Anatomy

API request usually 5 parts se mil kar banti hai: method, URL, headers, params, aur body. Automation tools mein in parts ko correctly map karna zaroori hota hai.

1. Method

GET, POST, PUT, PATCH, DELETE. Method batata hai ke system se data lena hai ya system mein data change karna hai.

2. URL

API endpoint jahan request send hoti hai. Example: **/api/leads** ya **/api/orders/ORD-1001**.

3. Headers

Authentication, content type, tenant ID, ya API key headers mein send hotay hain.

4. Body

POST/PUT/PATCH request mein JSON body hoti hai jahan lead, ticket, appointment, ya message data send hota hai.

```
METHOD https://api.example.com/resource
Headers:
  Content-Type: application/json
  Authorization: Bearer YOUR_API_TOKEN
Body:
  {
    "field": "value"
  }
```

Practical rule: GET request mostly data read karne ke liye hoti hai. POST request mostly new record create karne ke liye hoti hai.

BONUS MATERIAL

Authentication Headers Template

Production automation mein API keys, bearer tokens, secret tokens, and tenant IDs ko properly handle karna zaroori hai.

Bearer token header

```
Authorization: Bearer YOUR_ACCESS_TOKEN
Content-Type: application/json
```

API key header

```
X-API-Key: YOUR_API_KEY
Content-Type: application/json
```

Multi-tenant business header

```
Authorization: Bearer YOUR_ACCESS_TOKEN
X-Organization-Id: org_12345
X-Request-Id: req_{{$timestamp}}
```

Good practice

- Token environment variable mein rakhein
- Logs mein secret print na karein
- Expired token handle karein
- Unauthorized response par admin alert karein

Avoid

- API key ko prompt mein paste karna
- Frontend mein secret token expose karna
- Public screenshots mein tokens show karna
- Same token har client ke liye use karna

BONUS MATERIAL

GET

Record Read Template

GET request data read karne ke liye use hoti hai. Example: order status check karna, customer record fetch karna, ya appointment availability check karna.

Generic template

```
GET https://api.example.com/{resource}/{id}
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
```

Order status example

```
GET https://api.example.com/orders/ORD-1044
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
```

Expected response

```
{
  "order_id": "ORD-1044",
  "status": "in_transit",
  "courier": "Leopard",
  "tracking_number": "LP123456789",
  "estimated_delivery": "2026-07-03"
}
```

Automation action

Response status ko customer-friendly message mein convert karein: "Aapka order courier ke paas hai aur expected delivery 3 July hai."

BONUS MATERIAL

POST

Record Create Template

POST request new record create karne ke liye hoti hai. Example: lead create karna, ticket create karna, appointment save karna, ya WhatsApp message send karna.

Generic template

```
POST https://api.example.com/{resource}
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "field_1": "value_1",
  "field_2": "value_2"
}
```

Expected success response

```
{
  "success": true,
  "id": "created_record_id",
  "message": "Record created successfully"
}
```

Practical rule: POST body directly AI output se na bhejein. Pehle validation layer se required fields check karein.

BONUS MATERIAL

PUT / PATCH Update Template

PUT ya PATCH request existing record update karne ke liye hoti hai. Automation mein yeh lead status, ticket status, appointment time, ya follow-up stage update karne ke liye use hoti hai.

Lead status update

```
PATCH https://api.example.com/leads/lead_1001
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "status": "contacted",
  "last_contacted_at": "2026-07-01T15:00:00Z",
  "notes": "Customer asked for pricing and wants follow-up tomorrow."
}
```

Ticket status update

```
PATCH https://api.example.com/tickets/ticket_5531
Body:
{
  "status": "escalated",
  "priority": "high",
  "assigned_team": "billing_support"
}
```

BONUS MATERIAL

DELETE / Cancel Template

DELETE request sensitive hoti hai. Beginner and intermediate automations mein direct delete avoid karein. Better approach yeh hai ke record ko cancel, inactive, ya archived status mein update karein.

Soft cancel appointment

```
PATCH https://api.example.com/appointments/appt_7788
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "status": "cancelled",
  "cancel_reason": "Customer requested cancellation",
  "cancelled_at": "2026-07-01T16:00:00Z"
}
```

Safety rule: AI ko direct delete permission na dein. Delete/cancel actions ke liye human confirmation ya business rules zaroor add karein.

Use DELETE only when

- Client ne explicit approval diya ho
- Record recoverable ho
- Audit log available ho
- Action legally/business-wise safe ho

BONUS MATERIAL

CRM Create Lead Request

Yeh template lead capture automation mein use hota hai. AI lead details extract karega, validation layer required fields check karegi, phir CRM API ko request send hogi.

```
POST https://api.example.com/crm/leads
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "name": "Ayesha Noor",
  "phone": "03211234567",
  "email": null,
  "source": "whatsapp",
  "service_interest": "appointment booking assistant",
  "business_type": "clinic",
  "city": "Lahore",
  "budget": null,
  "lead_score": 78,
  "priority": "high",
  "status": "new",
  "notes": "Customer wants appointment booking automation for clinic."
}
```

Required fields

name ya phone, service_interest, source, status

Next step

Sales team ko notify karein aur follow-up reminder schedule karein.

BONUS MATERIAL

Support Ticket Create Request

Complaint automation mein AI category, priority, and summary generate karta hai. API request ticketing system mein ticket create karti hai.

```
POST https://api.example.com/support/tickets
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "customer_name": "Usman Tariq",
  "customer_phone": "03009998877",
  "category": "payment_issue",
  "priority": "high",
  "summary": "Payment deduct ho gayi lekin order confirm nahi hua.",
  "description": "Customer says amount was deducted but order confirmation was not received.",
  "order_id": "ORD-7712",
  "source": "whatsapp",
  "status": "open",
  "assigned_team": "support_team"
}
```

Expected response

```
{
  "ticket_id": "TCK-9001",
  "status": "open",
  "priority": "high"
}
```

BONUS MATERIAL

Appointment Create Request

Clinic, salon, repair service, or consultation business mein appointment create request use hoti hai.

```
POST https://api.example.com/appointments
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "customer_name": "Bilal Hassan",
  "customer_phone": "03004567890",
  "service_type": "dental checkup",
  "preferred_date": "2026-07-05",
  "preferred_time": "18:00",
  "branch": "DHA Lahore",
  "status": "pending_confirmation",
  "source": "whatsapp",
  "notes": "Customer asked for evening appointment."
}
```

Important: Agar calendar availability check nahi hui, to appointment ko confirmed na mark karein. Pehle status pending_confirmation rakhein.

BONUS MATERIAL

WhatsApp Send Message Request

WhatsApp bot mein reply send karne ke liye message API request use hoti hai. Actual provider ke fields different ho sakte hain, lekin core structure yeh hota hai.

```
POST https://api.example.com/whatsapp/messages
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "to": "923001234567",
  "type": "text",
  "message": "Ji, aapki request receive ho gayi hai. Hamari team jald aap se contact karegi.",
  "metadata": {
    "conversation_id": "conv_1001",
    "customer_id": "cus_8821",
    "intent": "new_lead"
  }
}
```

Recommended sequence

First save lead/ticket/order, then customer ko confirmation reply send karein. Is se record missing nahi hota.

BONUS MATERIAL

Follow-up Schedule Request

Lead follow-up automation mein delayed task create karna useful hota hai. Example: high priority lead ko 2 hours baad follow-up, warm lead ko 24 hours baad.

```
POST https://api.example.com/followups
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "customer_id": "cus_8821",
  "lead_id": "lead_1001",
  "channel": "whatsapp",
  "scheduled_for": "2026-07-02T10:00:00Z",
  "message_template": "lead_followup_01",
  "status": "scheduled",
  "stop_if": {
    "lead_status_in": ["converted", "not_interested", "closed"]
  }
}
```

Stop condition: Follow-up automation mein stop rules zaroor hon. Warna customer ko unnecessary repeated messages ja sakte hain.

BONUS MATERIAL

AI Output to API Body Mapping

AI output ko directly API body mein map karne se pehle field names standardize karein. Neeche simple mapping pattern diya gaya hai.

```
AI Output:
{
  "intent": "new_lead",
  "name": "Ali Khan",
  "phone": "03001234567",
  "service": "AC repair",
  "priority": "medium"
}
```

```
API Body:
{
  "name": "{{ai.name}}",
  "phone": "{{ai.phone}}",
  "service_interest": "{{ai.service}}",
  "lead_source": "whatsapp",
  "priority": "{{ai.priority}}",
  "status": "new"
}
```

Mapping checklist

- Required fields present
- Phone format valid
- Null fields allowed
- Enum values correct
- Status default set

Common mistake

- AI field name aur API field name different hota hai
- AI priority "urgent" de, API sirf high/ medium/low accept kare

BONUS MATERIAL

Error Response Handling Templates

Har API request ke liye success and error handling plan hona chahiye. Error ko ignore karna automation ko unreliable banata hai.

401 Unauthorized

```
{
  "status": 401,
  "error": "Unauthorized",
  "action": "refresh_token_or_alert_admin"
}
```

400 Validation error

```
{
  "status": 400,
  "error": "Validation failed",
  "missing_fields": ["phone", "service_interest"],
  "action": "ask_customer_for_missing_data"
}
```

500 Server error

```
{
  "status": 500,
  "error": "Server error",
  "retryable": true,
  "action": "retry_and_alert_team"
}
```

BONUS MATERIAL

Make.com and n8n Mapping Notes

Make.com

- HTTP module select karein
- Method choose karein
- URL paste karein
- Headers add karein
- Body type Raw JSON rakhein
- Variables map karein

n8n

- HTTP Request node use karein
- Method and URL set karein
- Authentication configure karein
- Send Body as JSON enable karein
- Expressions se values map karein
- Error output handle karein

```
Example n8n expression:
{{$json.customer.name}}
{{$json.message.text}}
{{$json.ai.priority}}
```

Tip: Pehle request Postman/Thunder Client mein test karein. Phir same request Make.com ya n8n mein build karein.

BONUS MATERIAL

Exercise: API Request Design Karein

Aapko ek service business ke liye lead create API request design karni hai. Customer message:

```
Mujhe Lahore mein AC repair service chahiye. Kal technician bhej sakte hain? Mera number
03001234567 hai.
```

Aapka task

- Endpoint choose karein
- Method decide karein
- Headers likhein
- JSON body banayein
- Expected next action likhein

Answer Key

```
POST https://api.example.com/crm/leads
Headers:
  Authorization: Bearer YOUR_TOKEN
  Content-Type: application/json
Body:
{
  "name": null,
  "phone": "03001234567",
  "source": "whatsapp",
  "service_interest": "AC repair service",
  "city": "Lahore",
  "preferred_date": "tomorrow",
  "priority": "high",
  "status": "new",
  "notes": "Customer wants technician visit tomorrow."
}
Next Action:
  Save lead, ask for area/location, and notify service team.
```

BONUS MATERIAL

Final API Request Quality Checklist

Har API request ko production workflow mein use karne se pehle is checklist se verify karein.

Request

- Correct method selected
- Correct endpoint URL
- Headers complete
- Body valid JSON
- Required fields present

Data

- AI output validated
- Phone/email format checked
- Enum values correct
- Null fields allowed
- Default status set

Security

- Token hidden
- Secret not logged
- Tenant ID correct
- Permission limited
- Risky action approved

Response

- Success handled
- 400 handled
- 401 handled
- 500 handled
- Retry/alert plan ready

Bonus Challenge

Apne kisi client idea ke liye 5 API requests design karein: create lead, create ticket, check order status, send WhatsApp reply, and schedule follow-up.

BONUS MATERIAL

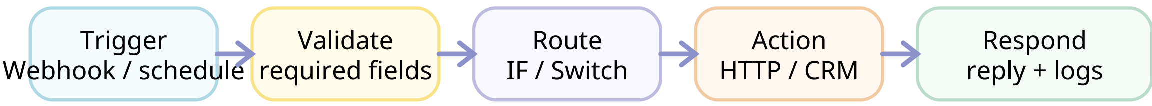
n8n Workflow Checklist

Is bonus section ka goal yeh hai ke student n8n workflow build karte waqt important steps miss na kare. Checklist ko har project ke start, testing, delivery, aur maintenance phase mein use kiya ja sakta hai.

n8n | Workflow | Webhook | HTTP | Testing

Best use: Is checklist ko print kar ke har workflow project ke saath fill karein. Is se client delivery clean hoti hai aur debugging mein time save hota hai.

n8n workflow ka practical lifecycle



Acha n8n workflow sirf nodes ka chain nahi hota.
Us mein validation, routing, error handling, logs, aur handover clearly defined hotay hain.

BONUS MATERIAL

Checklist Ko Use Karne Ka Tareeqa

n8n workflow banane se pehle har section ko tick karein. Agar koi item clear nahi hai to pehle woh detail client se confirm karein ya workflow design mein add karein.

1. **Project goal define karein**
   Workflow kis problem ko solve kar raha hai? Lead capture, support ticket, order status, appointment, ya follow-up?

2. **Input data identify karein**
   Trigger se kaunsa data ayega? Customer name, phone, message, order ID, service type, ya appointment time?

3. **Required actions list karein**
   Data save karna hai, API call karni hai, AI reply generate karna hai, ya team ko notify karna hai?

4. **Testing cases likhein**
   Normal case, missing data case, wrong data case, API failure case, aur human handoff case test karein.

Rule: Jo workflow sirf happy path par kaam kare, woh client-ready nahi hota. Real workflow ko missing data aur errors handle karne chahiye.

PLANNING CHECKLIST

1. Workflow Planning Checklist

Business goal

- [ ] Workflow ka exact goal likha gaya hai
- [ ] Client ka manual process samjha gaya hai
- [ ] Expected output clear hai
- [ ] Success metric define hai

Scope

- [ ] Workflow mein kya include hai clear hai
- [ ] Kya include nahi hai clearly written hai
- [ ] Human handoff boundary define hai
- [ ] Future upgrades separate rakhe gaye hain

Input source

- [ ] Webhook, form, schedule, ya manual trigger clear hai
- [ ] Sample payload available hai
- [ ] Required fields list available hai
- [ ] Optional fields list available hai

Output destination

- [ ] Google Sheet, CRM, database, email, Slack, ya WhatsApp selected hai
- [ ] Output field mapping ready hai
- [ ] Duplicate record rule clear hai
- [ ] Confirmation response planned hai

TRIGGER CHECKLIST

2. Webhook Trigger Checklist

n8n mein webhook trigger most common entry point hai. Is checklist se webhook reliable banega.

Webhook setup

- [ ] Webhook node ka URL copied hai
- [ ] Test URL aur production URL ka difference samjha gaya hai
- [ ] HTTP method correct hai
- [ ] Response mode selected hai

Payload validation

- [ ] Sample payload captured hai
- [ ] Empty payload test kiya gaya hai
- [ ] Wrong field names test kiye gaye hain
- [ ] Required fields check hotay hain

Response

- [ ] Webhook response quick hai
- [ ] Client ko status response milta hai
- [ ] Long tasks background mein handle hotay hain
- [ ] Error response friendly hai

Security

- [ ] Secret token/header use ho raha hai
- [ ] Unknown source requests reject hoti hain
- [ ] Webhook URL public share nahi kiya gaya
- [ ] Rate abuse ka basic plan hai

```
Expected webhook input example:
{
  "source": "website_form",
  "customer_name": "Ali Khan",
  "phone": "03001234567",
  "message": "Mujhe WhatsApp bot setup karwana hai"
}
```

VALIDATION CHECKLIST

3. Input Data Validation Checklist

Automation ka sab se common issue missing ya wrong data hota hai. Validation layer workflow ko stable banati hai.

Validation item	Question	Action
Required fields	Kya name, phone, message, order ID, ya service type required hai?	Missing ho to customer se ask-back message bhejein.
Phone format	Kya phone number valid hai?	Normalize karein: 0300..., +92300..., ya country code rule.
Email format	Kya email valid format mein hai?	Invalid ho to optional rakhein ya correction request karein.
Duplicate lead	Kya same customer pehle se CRM mein hai?	New record ke bajaye existing lead update karein.
Intent confidence	Kya AI intent confidence low hai?	Human review ya clarification route use karein.

Practical tip: Validation node ko workflow ke start ke qareeb rakhein. Is se wrong data aage ke nodes ko break nahi karta.

AI NODE CHECKLIST

4. AI Prompt and Output Checklist

n8n mein AI node ka output aksar next nodes mein use hota hai. Is liye output predictable hona chahiye.

Prompt quality

- [ ] Role clear hai
- [ ] Business context diya gaya hai
- [ ] Allowed intents listed hain
- [ ] Unknown case ka rule defined hai

Structured output

- [ ] JSON output required hai
- [ ] Keys fixed hain
- [ ] Extra text disabled hai
- [ ] Confidence score included hai

Safety

- [ ] AI ko secret data expose nahi ho raha
- [ ] AI direct destructive action nahi kar sakta
- [ ] Low confidence handoff hota hai
- [ ] Prompt injection basic rule added hai

Testing

- [ ] 10 real messages test kiye gaye
- [ ] Missing data case test hua
- [ ] Angry customer case test hua
- [ ] Wrong language/slang case test hua

```
Recommended AI JSON output:
{
  "intent": "lead_inquiry",
  "confidence": 0.86,
  "priority": "high",
  "required_action": "create_lead",
  "missing_fields": [],
  "human_handoff": false
}
```

ROUTING CHECKLIST

5. IF and Switch Node Checklist

IF aur Switch nodes workflow routing ke liye use hotay hain. Intent router ke baad paths clearly defined honay chahiye.

AI Output
intent + action

→

Switch Node
route by intent

→

Action Path
lead, ticket, order

Routing rules

- [ ] Har intent ka path available hai
- [ ] Default fallback path available hai
- [ ] Low confidence path available hai
- [ ] Human handoff path available hai

Common routes

- [ ] lead_inquiry
- [ ] support_question
- [ ] complaint
- [ ] order_status
- [ ] appointment_booking
- [ ] human_support

Important: Agar default route nahi hai to unexpected AI output workflow ko break kar sakta hai.

6. HTTP Request Node Checklist

HTTP Request node external APIs ke saath connect karta hai. Is node mein small mistake bhi workflow fail kar sakti hai.

Request setup

- [ ] HTTP method correct hai
- [ ] URL correct hai
- [ ] Headers added hain
- [ ] Authentication configured hai

Body mapping

- [ ] JSON body valid hai
- [ ] AI output fields correctly mapped hain
- [ ] Null values handle hoti hain
- [ ] Required fields missing nahi hain

Response handling

- [ ] Success response parsed hai
- [ ] Error response parsed hai
- [ ] API ID saved hoti hai
- [ ] Customer reply response ke basis par banti hai

Failure handling

- [ ] Timeout case handled hai
- [ ] 401 unauthorized alert hai
- [ ] 429 rate limit fallback hai
- [ ] 500 server error retry plan hai

```
HTTP Request body example:
{
  "name": "{{$json.customer_name}}",
  "phone": "{{$json.phone}}",
  "source": "whatsapp",
  "priority": "{{$json.priority}}"
}
```

STORAGE CHECKLIST

7. Google Sheets / CRM / Database Checklist

Workflow data ko save karne ke liye Google Sheets, Airtable, CRM, ya database use ki ja sakti hai. Field structure clear hona zaroori hai.

Area	Checklist	Reason
Columns	Name, phone, message, intent, priority, status, created_at	Lead tracking easy hoti hai.
Status	new, contacted, follow_up, won, lost, handoff	Sales pipeline clear rehti hai.
Conversation ID	session_id ya phone as unique key	Memory aur updates possible hotay hain.
API IDs	lead_id, ticket_id, appointment_id save karein	Future updates ke liye needed hota hai.
Audit	created_at, updated_at, source, workflow_name	Debugging aur reporting easy hoti hai.

Rule: Sirf message save karna enough nahi. Intent, status, priority, aur next action bhi save karein.

8. Error Handling and Fallback Checklist

Client-ready n8n workflow mein error handling zaroori hai. Agar workflow fail ho to customer ko confusing silence nahi milni chahiye.

Missing data

- [ ] Ask-back reply ready hai
- [ ] Missing fields list save hoti hai
- [ ] Workflow stop/retry rule clear hai
- [ ] Customer ko friendly message milta hai

API errors

- [ ] 401 admin alert
- [ ] 429 retry later
- [ ] 500 fallback message
- [ ] Timeout retry or handoff

AI errors

- [ ] Invalid JSON handle hota hai
- [ ] Low confidence fallback hai
- [ ] Empty response handle hota hai
- [ ] Human handoff path hai

Internal alert

- [ ] Slack/email alert configured hai
- [ ] Error payload include hota hai
- [ ] Customer data limited hai
- [ ] Workflow name included hai

```
Fallback reply:
"Sorry, system abhi aapki request complete process nahi kar saka. Main ne aapki request team ko forward kar
di hai. Woh jald aap se contact karein ge."
```

SECURITY CHECKLIST

9. Credentials and Security Checklist

n8n credentials ko secure rakhna production workflow ka important part hai.

Credentials

- [ ] API keys n8n Credentials mein saved hain
- [ ] Hardcoded token nodes mein nahi hai
- [ ] Client-specific credentials separate hain
- [ ] Expired tokens ka process clear hai

Webhook security

- [ ] Secret header/token validate hota hai
- [ ] Unknown requests reject hoti hain
- [ ] Public URL unnecessary share nahi kiya gaya
- [ ] Payload size limit considered hai

Data privacy

- [ ] Only required customer data save hota hai
- [ ] Sensitive data logs mein avoid hota hai
- [ ] Access roles clear hain
- [ ] Export/sharing rules clear hain

AI safety

- [ ] Prompt injection rule added hai
- [ ] AI ko credentials nahi miltay
- [ ] Destructive actions require approval
- [ ] Human handoff for risky cases

TESTING CHECKLIST

10. Testing and Execution Logs Checklist

Workflow deliver karne se pehle execution logs zaroor inspect karein. Sirf ek successful test enough nahi hota.

Test case	Expected behavior	Status
Valid lead message	Lead save ho, priority assign ho, reply generate ho	Pass / Fail
Missing phone	Bot phone number politely ask kare	Pass / Fail
Complaint message	Ticket path ya human handoff path run ho	Pass / Fail
API failure	Fallback reply + internal alert send ho	Pass / Fail
Duplicate customer	Existing record update ho, duplicate na bane	Pass / Fail
Low AI confidence	Clarification ya human review route trigger ho	Pass / Fail

Delivery rule: Client ko workflow tab dikhayein jab kam az kam 10 realistic test cases pass ho chuke hon.

DELIVERY CHECKLIST

11. Deployment and Handover Checklist

Before activation

- [ ] Test webhook se production webhook par switch kiya
- [ ] Credentials production environment mein correct hain
- [ ] Client data destination checked hai
- [ ] Error alert channel active hai

Client handover

- [ ] Workflow diagram shared hai
- [ ] Input/output fields explain kiye
- [ ] Manual fallback process explain hai
- [ ] Testing examples shared hain

Documentation

- [ ] Workflow purpose written hai
- [ ] Node-by-node summary available hai
- [ ] Credentials owner mentioned hai
- [ ] Known limitations listed hain

Maintenance

- [ ] Monthly check plan defined hai
- [ ] Error review schedule set hai
- [ ] API usage/cost review planned hai
- [ ] Change request process clear hai

Handover message example

Workflow live kar diya gaya hai. Aap Google Sheet/CRM mein new leads dekh sakte hain. Agar bot kisi message ko handle na kar sake to woh human handoff path par chala jayega.

MAINTENANCE CHECKLIST

12. Monthly Maintenance Checklist

n8n workflows set-and-forget nahi hotay. API changes, token expiry, prompt issues, aur client process changes ki wajah se monthly review zaroori hai.

Workflow health

- [ ] Failed executions review kiye
- [ ] Slow nodes identify kiye
- [ ] Retry failures check kiye
- [ ] Old test data clean kiya

AI quality

- [ ] Wrong classifications review ki
- [ ] Customer replies improve ki
- [ ] New intents add kiye
- [ ] Prompt version updated hai

Business changes

- [ ] New services/products add kiye
- [ ] Pricing/menu updates included hain
- [ ] Team notification contacts updated hain
- [ ] Operating hours updated hain

Security and cost

- [ ] API tokens valid hain
- [ ] Usage cost reviewed hai
- [ ] Unexpected spike check kiya
- [ ] Access permissions reviewed hain

MINI PROJECT

Mini Project: n8n Lead Router Checklist

Scenario: Ek service business website form se leads receive karta hai. Workflow ko lead save karni hai, AI se intent classify karna hai, high priority lead ko sales team ko notify karna hai, aur customer ko auto reply send karna hai.

Student task

Workflow nodes

- [ ] Webhook node
- [ ] Set/Edit Fields node
- [ ] AI classification node
- [ ] Switch node
- [ ] Google Sheets/CRM node
- [ ] HTTP/Slack notification node
- [ ] Respond to Webhook node

Required behavior

- [ ] Missing phone par ask-back
- [ ] High priority lead par team alert
- [ ] Normal lead par CRM save
- [ ] Error par fallback response
- [ ] Execution log review

Sample answer workflow

Webhook receive lead →	**Validate** required fields →	**AI Router** intent + priority
Switch route by priority →	**CRM** save lead →	**Notify** reply + alert

SCORECARD

Final n8n Workflow Quality Score

Workflow deliver karne se pehle is scorecard ko fill karein. Har category ko 0 se 10 score dein.

Category	Quality question	Score
Goal clarity	Kya workflow ka purpose aur expected output clear hai?	/10
Input validation	Kya missing/wrong data handle hota hai?	/10
Routing	Kya IF/Switch routes complete hain, including fallback?	/10
AI output	Kya AI structured JSON reliably return karta hai?	/10
API mapping	Kya HTTP body and response handling correct hai?	/10
Error handling	Kya API, AI, and webhook errors handled hain?	/10
Security	Kya credentials, tokens, and customer data safe hain?	/10
Testing	Kya realistic test cases pass huay hain?	/10

Recommended standard: Client-ready workflow ka score 80/100 se kam nahi hona chahiye. Agar score low hai to pehle checklist complete karein, phir delivery karein.

Final reminder

n8n workflow ka real value nodes ki quantity se nahi, reliability, clarity, error handling, aur business outcome se measure hota hai.

BONUS MATERIAL

Make.com Workflow Checklist

Is bonus section ka goal yeh hai ke student Make.com scenario build karte waqt planning, modules, routes, filters, API requests, error handling, testing, aur handover ke important points miss na kare.

Make.com | Scenario | Router | HTTP | Testing

Make.com workflow quality flow

Trigger webhook/form → AI classify/extract → Router filters/paths → Action sheet/api/crm → Reply customer/team

Client-ready Make.com scenario happy path ke saath error path bhi handle karta hai.
Har route, filter, data mapping, token, retry, aur response test hona chahiye.

BONUS MATERIAL

Checklist Ko Use Karne Ka Tareeqa

Make.com mein scenario visually simple lagta hai, lekin real client project mein small missing details workflow ko break kar sakti hain. Is checklist ko project ke start, build, testing, aur delivery phase mein use karein.

1. **Scenario goal likhein**
   Workflow exactly kya karega: lead capture, appointment, support ticket, order status, complaint, ya follow-up?

2. **Input aur output confirm karein**
   Data kahan se ayega aur kahan jana hai: webhook, Google Sheet, CRM, email, WhatsApp, ya API?

3. **Routes aur filters plan karein**
   Har intent ka route clear hona chahiye. Unknown, missing data, aur human handoff ke liye default route zaroor rakhein.

4. **Error path test karein**
   API fail, AI wrong JSON, missing phone, duplicate lead, aur slow response cases test karein.

Rule: Make.com scenario tab client-ready hota hai jab woh sirf normal case nahi, balkay missing data, duplicate data, API error, aur human handoff bhi handle kare.

PLANNING CHECKLIST

1. Scenario Planning Checklist

Business goal

- [ ] Scenario ka exact business goal written hai
- [ ] Client ka current manual process samjha gaya hai
- [ ] Expected final output clear hai
- [ ] Success metric define hai

Scenario scope

- [ ] Included features clearly listed hain
- [ ] Out of scope items clearly noted hain
- [ ] Human approval boundary defined hai
- [ ] Future upgrades separate rakhe gaye hain

Input source

- [ ] Webhook, form, schedule, email, ya sheet trigger selected hai
- [ ] Sample payload available hai
- [ ] Required fields list ready hai
- [ ] Optional fields list ready hai

Output destination

- [ ] Google Sheets, Airtable, CRM, API, email, ya WhatsApp selected hai
- [ ] Field mapping ready hai
- [ ] Duplicate record rule clear hai
- [ ] Confirmation response planned hai

TRIGGER CHECKLIST

2. Trigger Module Checklist

Trigger scenario ka starting point hota hai. Agar trigger unclear ho to poora automation unstable ho jata hai.

Webhook trigger

- [ ] Custom webhook created hai
- [ ] Test payload captured hai
- [ ] Webhook URL safely stored hai
- [ ] Production scenario mein correct URL use ho raha hai

Schedule trigger

- [ ] Run frequency clear hai
- [ ] Timezone confirm hai
- [ ] Duplicate runs ka risk checked hai
- [ ] Holiday/off-hours rule clear hai

App trigger

- [ ] Connected app account correct hai
- [ ] Permissions confirm hain
- [ ] Polling delay samjha gaya hai
- [ ] Old records reprocess nahi honge

Manual testing

- [ ] Run once test kiya gaya hai
- [ ] Payload data visible hai
- [ ] Empty payload test hua hai
- [ ] Unexpected payload test hua hai

```
Example trigger payload:
{
  "source": "website_form",
  "customer_name": "Ali Khan",
  "phone": "03001234567",
  "message": "Mujhe WhatsApp bot setup karwana hai",
  "created_at": "2026-07-01T12:30:00Z"
}
```

3. Make.com Webhook Checklist

Item	Check	Action
Payload capture	Kya webhook ne real sample data receive kiya?	Run once mode mein payload capture karein.
Required fields	Kya name, phone, message, email, ya order_id available hai?	Missing ho to route customer clarification par bhejein.
Security	Kya request mein secret key ya trusted source check hai?	Header token, query token, ya validation filter add karein.
Fast response	Kya customer-facing webhook timely respond karta hai?	Long tasks ko async/secondary path mein rakhein.
Payload version	Kya future field changes ka plan hai?	payload_version field include karein.

Practical note: Webhook URL ko public docs, screenshots, ya client group chats mein casually share na karein. Public URL par spam requests aa sakti hain.

4. AI Module Checklist

Make.com mein AI module ka output usually router, filter, HTTP request, ya Google Sheet modules mein use hota hai. Is liye output structured aur predictable hona chahiye.

Prompt setup

- [ ] Role clear hai
- [ ] Business context diya gaya hai
- [ ] Allowed intents listed hain
- [ ] Output format JSON hai

Output quality

- [ ] Fixed keys use ho rahe hain
- [ ] Extra explanation disabled hai
- [ ] Confidence score included hai
- [ ] Missing fields array included hai

Safety rules

- [ ] AI ko secret tokens nahi diye gaye
- [ ] Destructive action direct allowed nahi
- [ ] Low confidence handoff hota hai
- [ ] Prompt injection rule added hai

Testing

- [ ] 10 real messages test kiye gaye
- [ ] Roman Urdu/slang test hua
- [ ] Angry customer test hua
- [ ] Missing data test hua

```
Recommended AI output:
{
  "intent": "lead_inquiry",
  "confidence": 0.88,
  "priority": "high",
  "required_action": "create_lead",
  "missing_fields": [],
  "human_handoff": false
}
```

ROUTER CHECKLIST

5. Router and Filters Checklist

Router Make.com ka most important intermediate feature hai. Har branch ka purpose clear hona chahiye.

AI JSON	→	Router	→	Business Action
intent + action		multiple routes		lead, ticket, order

Route planning

- [ ] Har intent ke liye route hai
- [ ] Default unknown route available hai
- [ ] Low confidence route available hai
- [ ] Human handoff route available hai

Filter rules

- [ ] Filter exact JSON key par based hai
- [ ] Case-sensitive values checked hain
- [ ] Priority filter clear hai
- [ ] Missing fields filter available hai

Route order

- [ ] Important routes pehle placed hain
- [ ] Duplicate routes nahi hain
- [ ] Fallback last route hai
- [ ] Testing each route separately hui hai

Route outputs

- [ ] Har route ka output destination clear hai
- [ ] Customer reply planned hai
- [ ] Internal notification planned hai
- [ ] Logs save ho rahe hain

HTTP CHECKLIST

6. HTTP Module Checklist

HTTP module Make.com ko external APIs se connect karta hai. Is module mein small mistake se request fail ho sakti hai.

Area	Checklist	Common mistake
Method	GET, POST, PATCH, DELETE correct hai	POST ki jagah GET use karna
URL	Base URL aur endpoint correct hain	Extra slash ya wrong path
Headers	Authorization aur Content-Type correct hain	Bearer token missing
Body	JSON body valid hai	Broken JSON ya wrong field name
Response	Status code aur response fields mapped hain	Assume karna ke API hamesha success degi

```
POST request body example:
{
  "name": "{{customer_name}}",
  "phone": "{{phone}}",
  "source": "make_com_webhook",
  "interest": "{{service_interest}}",
  "priority": "{{priority}}"
}
```

MAPPING CHECKLIST

7. Data Mapping Checklist

Make.com mein mapping ka matlab hai ek module ke output ko next module ke input mein correctly use karna.

Field mapping

- [ ] Customer name correct field se aa raha hai
- [ ] Phone normalized field se aa raha hai
- [ ] Message original payload se aa raha hai
- [ ] AI intent correct output se aa raha hai

Default values

- [ ] Missing email ke liye empty string ya null rule hai
- [ ] Unknown priority ke liye medium default hai
- [ ] Source field fixed hai
- [ ] Created_at timestamp added hai

Data cleanup

- [ ] Extra spaces trim ho rahe hain
- [ ] Phone number format clean hai
- [ ] JSON string parse ho raha hai
- [ ] Invalid values route ho rahe hain

Audit fields

- [ ] Scenario name saved hai
- [ ] Run ID saved hai
- [ ] Received time saved hai
- [ ] Processing status saved hai

Tip: Client delivery se pehle ek mapping table create karein jisme source field, transformed field, aur destination field clearly written hon.

STORAGE CHECKLIST

8. Google Sheets, Airtable, CRM Checklist

Automation ka data clean store hona chahiye. Agar data messy ho to client ko workflow ka value feel nahi hota.

Google Sheets

- [ ] Headers fixed hain
- [ ] No merged cells in data table
- [ ] Date/time column available hai
- [ ] Status column available hai

Airtable

- [ ] Base and table selected hain
- [ ] Field types correct hain
- [ ] Single select options ready hain
- [ ] Record ID update ke liye saved hai

CRM

- [ ] Pipeline selected hai
- [ ] Lead owner field available hai
- [ ] Stage mapping clear hai
- [ ] Duplicate lead rule available hai

Database/API

- [ ] Required fields match karte hain
- [ ] Validation errors handled hain
- [ ] Response ID saved hai
- [ ] Failed records retry plan mein hain

NOTIFICATION CHECKLIST

9. Customer Reply and Team Notification Checklist

Automation sirf data save karne ke liye nahi hoti. Customer aur internal team dono ko clear communication milni chahiye.

Customer reply

Reply short, polite, aur context-aware hona chahiye. Agar data missing hai to bot ek hi clear question poochay.

- Confirmation reply
- Missing information ask-back
- Handoff reply
- Error fallback reply

Team notification

Team ko wohi data bhejein jo action ke liye needed ho. Long conversation dump avoid karein.

- Customer name/phone
- Intent and priority
- Summary
- Suggested next action

```
Team notification format:
New high-priority lead received
Name: {{customer_name}}
Phone: {{phone}}
Need: {{summary}}
Priority: {{priority}}
Next action: {{suggested_action}}
```

10. Error Handler and Retry Checklist

Make.com scenario mein error handling missing ho to small API issue bhi client workflow ko stop kar sakta hai.

Module errors

- [ ] HTTP failure route available hai
- [ ] AI output parse failure handled hai
- [ ] Google Sheet insert failure handled hai
- [ ] Webhook invalid payload handled hai

Retry rules

- [ ] Temporary API failure retry hota hai
- [ ] Permanent validation error retry nahi hota
- [ ] Max retry limit set hai
- [ ] Retry failure team ko notify karta hai

Fallback replies

- [ ] Customer ko generic technical error nahi bheja jata
- [ ] Friendly delay message ready hai
- [ ] Human team alert hota hai
- [ ] Issue log save hota hai

Logs

- [ ] Failed module name saved hai
- [ ] Error message saved hai
- [ ] Payload snapshot saved hai
- [ ] Run time saved hai

```
Fallback reply example:
Maazrat, is waqt aapki request process karne mein thora issue aa raha hai. Hamari team ko notify kar diya gaya hai. Aapko jald update mil jayega.
```

TESTING CHECKLIST

11. Make.com Testing Checklist

Test case	Input	Expected result
Normal lead	Name, phone, message complete	Lead save, reply send, team notify
Missing phone	Name/message available, phone missing	Ask-back message, no CRM create yet
Complaint	Angry customer issue	Ticket route, high priority, team alert
Low confidence	Unclear message	Clarification or human handoff
API failure	CRM API returns 500	Error route, log, retry/alert
Duplicate lead	Same phone number again	Existing record update, not duplicate create

Delivery rule: Client ko scenario tab handover karein jab at least 10 realistic test cases successfully pass ho jayein.

HANDOVER CHECKLIST

12. Delivery and Handover Checklist

Client access

- [ ] Client ke Make.com account mein scenario hai
- [ ] Connected accounts client-owned hain
- [ ] API keys client ke secure account se hain
- [ ] Shared credentials avoid kiye gaye hain

Documentation

- [ ] Scenario purpose written hai
- [ ] Trigger source documented hai
- [ ] Modules explained hain
- [ ] Error handling explained hai

Training

- [ ] Client ko test run dikhaya gaya hai
- [ ] Manual pause/resume bataya gaya hai
- [ ] Data sheet/CRM view explain kiya gaya hai
- [ ] Handoff process explain kiya gaya hai

Maintenance

- [ ] Monthly check schedule set hai
- [ ] API token expiry note hai
- [ ] Change request process clear hai
- [ ] Monitoring responsibility clear hai

MINI PROJECT

Mini Project: Make.com Lead Routing Scenario

Scenario: Ek service business website form se leads receive karta hai. Make.com webhook data receive karega, AI se intent and priority detect karega, lead Google Sheet mein save karega, aur team ko email/WhatsApp notification bhejega.

1. **Webhook trigger**
   Website form payload receive karein: name, phone, service, message, source.
2. **AI module**
   Message classify karein: lead_inquiry, complaint, support_question, unknown.
3. **Router**
   High priority lead route, complaint route, missing data route, aur fallback route banayein.
4. **Actions**
   Sheet update karein, team notify karein, aur customer ko suitable reply bhejein.

```
Sample answer route plan:
1. lead_inquiry + no missing fields -> Save lead + notify sales + send confirmation
2. lead_inquiry + missing phone -> Ask for phone number
3. complaint -> Create ticket + notify support + send apology
4. unknown/low confidence -> Human handoff or clarification
```

QUALITY SCORECARD

Final Make.com Workflow Quality Score

Scenario deliver karne se pehle scorecard fill karein. 80+ score ka matlab workflow client-ready ke qareeb hai.

Area	Question	Score
Planning	Goal, scope, input, output, and success metric clear hain?	/10
Trigger	Webhook/schedule/app trigger correctly configured and tested hai?	/10
AI output	AI structured JSON consistent aur tested hai?	/10
Routing	Router, filters, fallback, and handoff paths complete hain?	/10
HTTP/API	External API requests properly authenticated and mapped hain?	/10
Storage	Data clean format mein sheet/CRM/database mein save hota hai?	/10
Error handling	Failures, retries, logs, and alerts configured hain?	/10
Testing	Realistic test cases pass ho chuke hain?	/10
Handover	Client documentation and training complete hai?	/10
Maintenance	Monitoring and monthly review plan clear hai?	/10

Final standard: Make.com workflow ko sirf chalna nahi chahiye; usay understandable, testable, maintainable, aur client-safe bhi hona chahiye.

BONUS MATERIAL

WhatsApp Bot Message Templates

Is bonus section mein ready-to-use WhatsApp bot messages diye gaye hain jo restaurant, e-commerce, service business, clinic, real estate, CRM, aur support automation workflows mein use kiye ja sakte hain.

WhatsApp Bot | Templates | Human Handoff | Follow-up | Client Ready

Message template flow

Customer WhatsApp message → AI Router intent + missing data → Template right message → Action reply + save data

Good WhatsApp template = short, clear, polite, action-focused.
Har message customer ko next step samjha deta hai.

HOW TO USE

Templates Ko Use Karne Ka Tareeqa

WhatsApp automation mein message ka tone bohot important hota hai. Message na bohot robotic ho, na bohot lamba. Customer ko simple tareeqe se samajh aa jaye ke next step kya hai.

1. **Template select karein**
   Intent ke mutabiq template choose karein: lead, order, complaint, appointment, follow-up, ya human handoff.
2. **Placeholders replace karein**
   {customer_name}, {business_name}, {order_id}, {service_name}, {appointment_time} jaise placeholders real values se replace karein.
3. **Message short rakhein**
   WhatsApp par short message zyada effective hota hai. Long paragraph avoid karein.
4. **Action clear rakhein**
   Har message ke end mein customer ko clear next step dein: phone share karein, address bhejein, order confirm karein, ya agent ka wait karein.

Important rule: WhatsApp bot ka message customer ke liye natural hona chahiye. Sirf template paste na karein; business tone ke mutabiq halka customize zaroor karein.

TEMPLATE RULES

WhatsApp Message Writing Rules

Short and clear

Message ko 2-4 lines mein rakhein. Customer ko quickly samajh aana chahiye ke bot kya keh raha hai.

One action at a time

Ek message mein 3-4 questions na poochein. Pehle naam/phone, phir address, phir confirmation.

Natural Roman Urdu

Pakistani audience ke liye Roman Urdu practical hai. Lekin business ki audience ke hisaab se English/Urdu mix use karein.

No fake promises

Bot kabhi guarantee na de jab tak backend/API se status confirm na ho. Example: “hum check kar rahe hain” better hai.

Weak message	Better message
Aapka issue noted.	Ji, hum ne aapka issue note kar liya hai. Please order number share kar dein taake hum status check kar saken.
Send details.	Ji, please apna naam aur phone number share kar dein. Hamari team aap se shortly contact karegi.
Wait.	Thanks. Main aapka request team ko forward kar raha hoon. Aapko shortly update mil jayega.

TEMPLATE 1

Greeting and First Response Templates

Use when customer first time message kare ya bot conversation start kare.

General business greeting

```
Assalam o Alaikum {customer_name}, {business_name} mein welcome.
Aap kis cheez mein help chahte hain?

1. Price / service details
2. Order status
3. Appointment booking
4. Complaint / support
5. Human agent se baat
```

Short greeting for website/lead flow

```
Hi {customer_name}, thanks for contacting {business_name}.
Please apni requirement short message mein share kar dein. Main aapki request right team tak forward kar
dunga.
```

Unknown first message response

```
Ji, main help karne ke liye yahan hoon.
Please batayein aapko kis cheez mein help chahiye: price, order status, booking, complaint, ya human
support?
```

TEMPLATE 2

Lead Qualification Templates

Use when customer service ya product mein interest show kare aur bot ko basic lead details collect karni hon.

Service inquiry lead

```
Ji, {service_name} ke liye hum aapki help kar sakte hain.
Please ye details share kar dein:

1. Aapka naam
2. Phone number
3. City / area
4. Requirement ka short detail

Is ke baad hamari team aapko guide kar degi.
```

High-intent lead

```
Great. Aapki requirement clear lag rahi hai.
Please apna phone number aur preferred time share kar dein. Hamari team aap se call/WhatsApp par details
discuss kar legi.
```

Budget qualification

```
Ji, better recommendation ke liye please apna approximate budget range share kar dein.
Example: Rs. 20,000 - 40,000 ya Rs. 50,000+
```

TEMPLATE 3

Missing Information Templates

Use when AI router/extractor missing fields detect kare. Customer se ek waqt mein sirf important missing info poochein.

```
Phone missing:
Ji, please apna phone number share kar dein taake
hamari team aap se contact kar sake.
```

```
Name missing:
Ji, please apna naam share kar dein taake hum aapki
request properly record kar saken.
```

```
Address missing:
Ji, delivery/service ke liye please apna complete
address ya area share kar dein.
```

```
Order ID missing:
Ji, please apna order number share kar dein taake hum
status check kar saken.
```

Multiple fields missing

```
Ji, request complete karne ke liye please ye details share kar dein:
- Name:
- Phone:
- Area/City:
- Requirement:

Details milte hi hum next step start kar denge.
```

TEMPLATE 4

Restaurant Order Templates

Use for restaurant WhatsApp order bot, menu request, order collection, address, and confirmation.

Menu request

```
Ji, yeh hamara menu hai:

{menu_summary}

Order place karne ke liye item name aur quantity send kar dein.
Example: 2 Zinger Burger, 1 Fries, 1 Drink
```

Order received, address required

```
Thanks. Aapka order note ho gaya:
{order_items}

Please delivery address aur phone number share kar dein taake order confirm ho sake.
```

Final order confirmation

```
Please confirm:
Order: {order_items}
Total: {total_amount}
Address: {delivery_address}

Reply “Confirm” kar dein taake order kitchen ko forward ho jaye.
```

TEMPLATE 5

E-commerce Support Templates

Use for product inquiry, order status, delivery delay, return/refund, and complaint support.

```
Product inquiry:
Ji, {product_name} ke baare mein aapko kis detail ki
zaroorat hai?
Price, size, color, availability, ya delivery time?
```

```
Order status:
Ji, please apna order number share kar dein. Main
aapka order status check karwa deta hoon.
```

```
Delivery delay:
Sorry for the delay. Please order number share kar
dein taake hum exact delivery status verify kar
saken.
```

```
Return/refund:
Ji, return/refund check karne ke liye please order
number aur issue ka short detail share kar dein.
```

Order status found

```
Aapka order status: {order_status}
Expected delivery: {expected_delivery}

Agar aapko further help chahiye to reply kar dein.
```

TEMPLATE 6

Appointment Booking Templates

Use for clinic, salon, consultancy, repair service, or appointment-based businesses.

Appointment details collection

```
Ji, appointment book karne ke liye please ye details share kar dein:

1. Name
2. Phone number
3. Service / doctor / consultant
4. Preferred date
5. Preferred time

Details milte hi availability check kar di jayegi.
```

Availability response

```
Ji, {service_name} ke liye {date} ko ye slots available hain:

1. {slot_1}
2. {slot_2}
3. {slot_3}

Please preferred slot number reply kar dein.
```

Appointment confirmation

```
Your appointment is confirmed.

Name: {customer_name}
Service: {service_name}
Date: {appointment_date}
Time: {appointment_time}
Location: {business_location}

Please time se 10 minutes pehle arrive karne ki koshish karein.
```

TEMPLATE 7

Complaint and Ticket Templates

Use when customer angry ho, issue report kare, payment/order problem ho, ya ticket create karna ho.

Complaint acknowledgment

```
Sorry for the inconvenience. Hum ne aapki complaint note kar li hai.

Issue: {issue_summary}
Ticket ID: {ticket_id}
Priority: {priority}

Hamari support team is par kaam karegi aur aapko update de degi.
```

Payment issue

```
Sorry, payment issue ke liye hum aapki help karenge.
Please ye details share kar dein:

1. Order number
2. Payment screenshot/reference
3. Payment date/time

Details milte hi team verify kar legi.
```

Angry customer safe response

```
I understand your concern, and sorry for the inconvenience.
Main aapka issue priority par support team ko forward kar raha hoon.
Please order/ticket number share kar dein taake team quickly check kar sake.
```

TEMPLATE 8

Human Handoff Templates

Use when bot should stop handling and human team should take over.

Customer handoff message

```
Thanks for sharing the details. Main aapki request human support team ko forward kar raha hoon.

Reason: {handoff_reason}
Expected response time: {response_time}

Team member aapko shortly reply karega.
```

Internal team notification

```
New human handoff required

Customer: {customer_name}
Phone: {phone}
Intent: {intent}
Priority: {priority}
Reason: {handoff_reason}
Summary: {conversation_summary}
Required action: {required_action}
```

Low confidence fallback

```
Main aapki request fully samajh nahi saka.
Aap please thora sa detail mein bata dein, ya main aapko human support team se connect kar deta hoon.
```

TEMPLATE 9

Follow-up Message Templates

Use for warm leads, pending orders, abandoned inquiry, appointment reminder, or after-support follow-up.

```
Warm lead follow-up:
Hi {customer_name}, kal aap ne {service_name} ke
baare mein inquiry ki thi.
Kya aap chahenge ke hamari team aapko details/share
price guide kar de?
```

```
No response follow-up:
Hi {customer_name}, just checking if you still need
help with {topic}.
Aap reply kar dein, main next step guide kar dunga.
```

```
Appointment reminder:
Reminder: Aapki appointment {date} ko {time} par
scheduled hai.
Agar reschedule karna ho to please reply kar dein.
```

```
After support follow-up:
Hi {customer_name}, kya aapka issue resolve ho gaya?
Agar further help chahiye ho to please reply kar
dein.
```

Follow-up rule: Customer ko spam na karein. Follow-up ka frequency business ke tone aur customer consent ke mutabiq rakhein.

TEMPLATE 10

Business Hours and Status Templates

Use when team offline ho, delivery closed ho, or request after-hours aayi ho.

After-hours response

```
Thanks for contacting {business_name}.
Hamari team abhi offline hai. Working hours: {working_hours}

Aap apni requirement yahan share kar dein. Team next working time mein aapko reply kar degi.
```

Busy team response

```
Thanks for your message. Hamari team currently busy hai, lekin aapki request queue mein add ho gayi hai.
Expected response time: {response_time}
```

Delivery unavailable

```
Sorry, is waqt {area_name} mein delivery available nahi hai.
Aap pickup choose kar sakte hain ya kisi alternate address par delivery check kar sakte hain.
```

Service unavailable

```
Sorry, currently {service_name} available nahi hai.
Aap chahen to hum aapko notify kar sakte hain jab yeh service dobara available ho.
```

TECHNICAL TEMPLATE

WhatsApp Send Message Payload

Automation tools mein usually final message API ke through send hota hai. Neechay generic payload structure diya gaya hai. Actual API provider ke hisaab se field names change ho sakte hain.

```
POST /api/messages/send
Authorization: Bearer {api_token}
Content-Type: application/json

{
  "to": "{customer_phone}",
  "channel": "whatsapp",
  "message_type": "text",
  "text": "{final_message}",
  "metadata": {
    "customer_id": "{customer_id}",
    "conversation_id": "{conversation_id}",
    "intent": "{intent}",
    "template_name": "{template_name}",
    "sent_by": "automation"
  }
}
```

Field	Purpose
to	Customer ka WhatsApp number.
text	Final generated or selected message.
intent	Router ka detected intent for logging.
template_name	Kaunsa template use hua, tracking ke liye.

AUTOMATION LOGIC

Template Selector JSON

AI router se template select karwane ke liye output predictable hona chahiye. Is JSON ko Make.com/n8n router ke saath map kiya ja sakta hai.

```
{
  "intent": "appointment_booking",
  "confidence": 0.91,
  "template_name": "appointment_details_collection",
  "language_style": "roman_urdu",
  "message_goal": "collect_missing_information",
  "placeholders": {
    "customer_name": "Ali",
    "business_name": "ABC Clinic",
    "service_name": "Dental Checkup"
  },
  "missing_fields": ["preferred_date", "preferred_time"],
  "human_handoff": false
}
```

Router checks

- [ ] intent available hai
- [ ] confidence threshold pass hai
- [ ] template_name valid hai
- [ ] missing_fields checked hain

Message checks

- [ ] Placeholders replace hue hain
- [ ] Tone business-friendly hai
- [ ] Message short hai
- [ ] Next action clear hai

MINI PROJECT

Mini Project: WhatsApp Bot Message Pack

Ek service business ke liye WhatsApp bot message pack banayein. Business example: AC repair service, clinic, restaurant, real estate agency, ya e-commerce store.

Required templates

- [ ] Greeting message
- [ ] Lead qualification message
- [ ] Missing phone message
- [ ] Complaint acknowledgment
- [ ] Human handoff message
- [ ] Follow-up message

Required placeholders

- [ ] {customer_name}
- [ ] {business_name}
- [ ] {service_name}
- [ ] {phone}
- [ ] {city}
- [ ] {issue_summary}

Quality checks

- [ ] Har message short hai
- [ ] Har message mein one action hai
- [ ] Tone polite hai
- [ ] No fake guarantee hai

Testing

- [ ] New customer test
- [ ] Missing data test
- [ ] Angry customer test
- [ ] Follow-up test

Sample answer: AC repair service

```
Greeting:
Assalam o Alaikum, {business_name} mein welcome.
Aap AC repair, installation, gas refill, ya service mein se kis cheez ke liye help chahte hain?

Lead qualification:
Ji, AC service ke liye please apna naam, phone number, area, aur AC ka issue share kar dein.

Complaint:
Sorry for the inconvenience. Hum ne aapka issue note kar liya hai: {issue_summary}.
Team aapko shortly update kar degi.

Follow-up:
Hi {customer_name}, kya aapko abhi bhi AC service ki zaroorat hai? Aap reply kar dein, hamari team guide kar degi.
```

QUALITY CHECKLIST

Final WhatsApp Template Quality Checklist

Area	Question	Score
Clarity	Kya customer ko next step clear samajh aa raha hai?	/10
Tone	Kya message polite, natural, aur business-friendly hai?	/10
Length	Kya message WhatsApp ke liye short enough hai?	/10
Action	Kya har message mein sirf ek primary action hai?	/10
Placeholders	Kya all placeholders real data se replace ho rahe hain?	/10
Safety	Kya bot fake promise, wrong guarantee, ya sensitive info expose nahi kar raha?	/10
Fallback	Kya unknown/low confidence case ke liye fallback message hai?	/10
Handoff	Kya human handoff message aur team notification ready hai?	/10

Target score: 70/80 ya above. Agar score low ho to templates ko shorter, clearer, aur more action-focused banayein.

Yeh bonus material Book 2 ke WhatsApp bot, CRM, support, lead capture, restaurant order, appointment, aur complaint ticketing projects ke saath use kiya ja sakta hai.

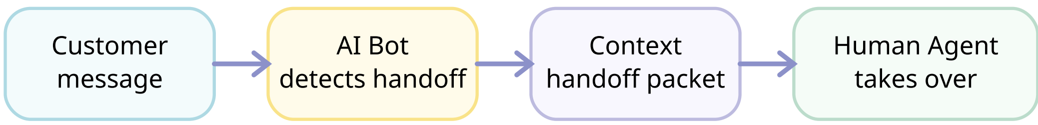
BONUS MATERIAL

Human Handoff Templates

Is bonus section ka goal yeh hai ke bot se human agent tak transition professional, clear, aur trackable ho. Jab AI bot ko human help chahiye ho, to customer ko bhi clear update mile aur internal team ko complete context bhi mil jaye.

Human Handoff | Escalation | Team Alerts | Support | Sales Ready

Bot se human tak clean handoff flow



Good handoff = customer ko update + team ko context + CRM mein record.
Bot ko chup nahi hona chahiye; clear transition deni chahiye.

CONCEPT

Human Handoff Kya Hota Hai?

Human handoff ka matlab hai ke AI bot conversation ko human agent, sales team, support team, ya manager ko transfer kar de. Yeh transfer tab hota hai jab bot ko issue solve karne ke liye human judgement, approval, access, ya sensitive handling chahiye hoti hai.

Customer ko wait na karwain

Handoff ke waqt customer ko clear batayein ke request team ko forward ho gayi hai aur expected response time kya hai.

Team ko context dein

Internal team ko sirf “customer needs help” na bhejein. Name, phone, issue, priority, conversation summary, aur next action bhejein.

CRM mein record rakhein

Har handoff ko CRM, Google Sheet, ticket system, ya database mein save karein.

Bot ka role clear rakhein

Bot human ka replacement nahi. Bot repetitive info collect kare, human critical cases handle kare.

Professional rule: Handoff message hamesha polite aur transparent ho. Customer ko aisa feel nahi hona chahiye ke bot fail ho gaya; feel yeh ho ke business ne issue right person tak forward kar diya.

Common Handoff Triggers

Trigger	Example	Recommended action
Angry customer	“Aap log reply nahi karte, refund chahiye.”	High priority support handoff
Payment issue	“Payment deduct ho gayi lekin order confirm nahi hua.”	Ticket + finance/support alert
Refund/return	“Mujhe product return karna hai.”	Policy check + human approval
Sales-ready lead	“Budget ready hai, today call kar sakte hain?”	Sales team handoff
Appointment conflict	Requested time unavailable but customer insists.	Reception/team handoff
Bot unsure	Intent low confidence ya data confusing.	Clarify once, then handoff

High priority handoff

- [ ] Payment issue
- [ ] Angry customer
- [ ] Legal/sensitive issue
- [ ] Repeated failed attempts

Sales handoff

- [ ] Customer shared budget
- [ ] Customer asked for call
- [ ] Urgent setup required
- [ ] High value inquiry

CUSTOMER FACING

Customer Handoff Message Templates

Yeh messages customer ko WhatsApp, website chat, email, ya support widget par send kiye ja sakte hain.

General human handoff

```
Ji, main aapki request hamari team ko forward kar raha hoon.
Ek human agent aapko shortly guide kar dega.

Request summary: {short_summary}
```

Urgent support handoff

```
Sorry for the inconvenience.
Aapka issue priority par support team ko forward kar diya gaya hai.
Please thora sa wait karein, hamari team aapko shortly update degi.

Issue: {issue_summary}
```

Bot uncertain handoff

```
Is request ko accurately handle karne ke liye main isay human team ko forward kar raha hoon.
Team aapki details review karke aapko proper response degi.
```

TEAM ALERT

Internal Team Notification Templates

Internal notification ka kaam team ko actionable context dena hai. Team ko pata hona chahiye ke customer ka issue kya hai, priority kya hai, aur next step kya lena hai.

Slack / WhatsApp team alert

```
New Human Handoff Required

Priority: {priority}
Type: {handoff_type}
Customer: {customer_name}
Phone: {phone}
Channel: {channel}
Summary: {summary}
Missing info: {missing_fields}
Recommended next action: {next_action}
Conversation link / ID: {conversation_id}
```

Sales team alert

```
Sales-ready lead received

Name: {customer_name}
Phone: {phone}
Service/product: {interest}
Budget: {budget}
Timeline: {timeline}
Lead score: {lead_score}
Suggested action: Call/WhatsApp within {response_time}.
```

JSON PACKET

Handoff Data Packet

Automation system mein handoff sirf message nahi hota. Bot ko ek structured handoff packet generate karna chahiye jo CRM, ticket system, database, Slack, WhatsApp team group, ya email alert mein use ho sake.

```json
{
  "handoff_required": true,
  "handoff_type": "support_escalation",
  "priority": "high",
  "customer": {
    "name": "Ali Khan",
    "phone": "03001234567",
    "email": null
  },
  "channel": "whatsapp",
  "summary": "Customer says payment was deducted but order was not confirmed.",
  "sentiment": "angry",
  "missing_fields": ["order_id"],
  "recommended_next_action": "Ask for order ID and verify payment status.",
  "conversation_id": "wa_12345"
}
```

Tip: Handoff packet ko standardized rakhein. Har project mein same fields use hon to CRM, alerts, reports, aur testing easy ho jati hai.

Sales-Ready Lead Handoff Templates

Use when customer serious buyer lag raha ho, budget/timeline share kar chuka ho, ya direct call/demo chahta ho.

Customer reply

```
Great, aapki requirement clear hai.
Main aapki details sales team ko forward kar raha hoon. Team aapko shortly contact karegi.

Please confirm: kya {preferred_time} par call theek rahegi?
```

Internal sales handoff

```
High Intent Sales Lead

Customer: {customer_name}
Phone: {phone}
Interest: {product_or_service}
Budget: {budget}
Timeline: {timeline}
Location: {location}
Conversation summary: {summary}
Recommended pitch: {recommended_pitch}
Follow-up deadline: {follow_up_deadline}
```

CRM note

```
Lead status: sales_ready
Priority: high
Next action: call_customer
Owner: sales_team
Notes: {summary}
```

SUPPORT HANDOFF

Complaint and Support Handoff Templates

Customer complaint reply

```
Sorry for the inconvenience.
Aapka complaint support team ko forward kar diya gaya hai.
Please apna order number / reference number share kar dein agar available ho.

Issue summary: {issue_summary}
```

High-priority complaint alert

```
High Priority Complaint

Customer: {customer_name}
Phone: {phone}
Complaint category: {category}
Priority: {priority}
Sentiment: {sentiment}
Issue summary: {summary}
Evidence/attachment: {attachment_status}
Required action: {next_action}
SLA: reply within {sla_time}
```

Payment issue template

```
Payment Issue Handoff

Customer says payment was deducted but service/order is not confirmed.
Amount: {amount}
Payment method: {payment_method}
Order/reference: {reference_id}
Next action: verify payment and update customer.
```

NICHE TEMPLATES

Restaurant, Clinic, and E-commerce Handoff

```
Restaurant order issue:
New restaurant handoff
Customer: {customer_name}
Phone: {phone}
Order items: {items}
Issue: {issue}
Address: {address}
Action: restaurant owner/staff should confirm
manually.
```

```
Clinic appointment issue:
New clinic handoff
Patient: {customer_name}
Phone: {phone}
Service: {service}
Preferred time: {preferred_time}
Issue: {issue}
Action: receptionist should confirm available slot.
```

```
E-commerce refund issue:
New refund handoff
Customer: {customer_name}
Order ID: {order_id}
Reason: {refund_reason}
Product: {product_name}
Action: support team should review return/refund
eligibility.
```

```
Real estate lead handoff:
New property lead
Name: {customer_name}
Phone: {phone}
Intent: {buy_or_rent}
Location: {location}
Budget: {budget}
Property type: {property_type}
Action: agent should call within {time_window}.
```

AFTER HANDOFF

Follow-up After Human Handoff

Handoff ke baad bhi automation ka role khatam nahi hota. System ko track karna chahiye ke human agent ne response diya ya nahi, lead close hui ya nahi, aur customer ko follow-up ki zaroorat hai ya nahi.

Customer follow-up after handoff

```
Hi {customer_name}, just checking - kya hamari team ne aapko required update de diya?
Agar abhi bhi help chahiye ho to please reply kar dein.
```

Internal no-response reminder

```
Reminder: Human handoff pending

Customer: {customer_name}
Phone: {phone}
Priority: {priority}
Handoff time: {handoff_time}
Pending since: {pending_duration}
Action needed: Please respond/update CRM.
```

Condition	Follow-up action
High priority handoff, no agent response in 15 min	Send internal reminder to team lead
Sales lead, no follow-up in 2 hours	Notify sales owner
Customer says issue solved	Mark ticket/lead as resolved

IMPLEMENTATION

Make.com and n8n Implementation Plan

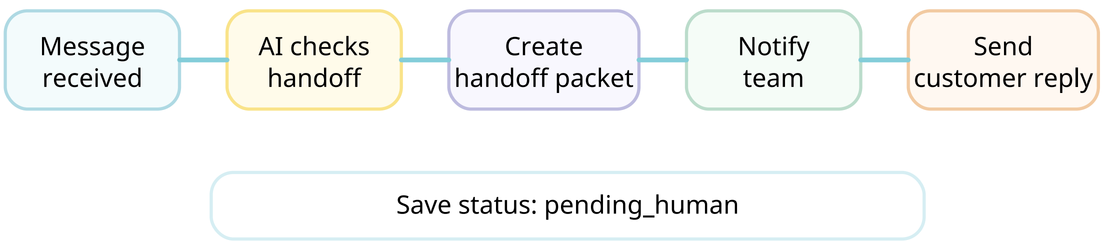
Make.com plan

- [ ] Webhook receives message
- [ ] AI router detects handoff_required
- [ ] Router path: human handoff
- [ ] Create CRM/ticket row
- [ ] Send customer handoff reply
- [ ] Send internal alert to team
- [ ] Schedule follow-up/reminder

n8n plan

- [ ] Webhook node receives message
- [ ] OpenAI/AI node returns handoff JSON
- [ ] IF node checks handoff_required=true
- [ ] Set node prepares handoff packet
- [ ] HTTP/WhatsApp node sends customer reply
- [ ] Slack/Email/CRM node alerts team
- [ ] Wait node or scheduled workflow checks pending status

Automation path



PROMPT TEMPLATE

Human Handoff Decision Prompt

Is prompt ko AI router ke baad ya router ke andar use kiya ja sakta hai. Output structured JSON hona chahiye.

```
You are a human handoff decision assistant for a business automation system.

Analyze the customer message and conversation context.
Decide if the conversation should be handed off to a human agent.

Handoff is required when:
- Customer is angry or frustrated
- Payment/refund/return issue exists
- Bot is unsure or missing critical context
- Customer asks for human agent
- Sales lead is high value or ready to buy
- Issue needs manual approval

Return only valid JSON:
{
  "handoff_required": true,
  "handoff_type": "sales|support|complaint|payment|appointment|general",
  "priority": "low|medium|high|urgent",
  "reason": "short reason",
  "customer_message_to_send": "polite customer-facing message",
  "internal_team_alert": "short internal alert",
  "missing_fields": [],
  "recommended_next_action": "what human should do next"
}
```

MINI PROJECT

Mini Project: Handoff Layer Add Karein

Is mini project mein aap apne existing WhatsApp support bot mein human handoff layer add karenge.

1. **Trigger define karein**
   Angry customer, payment issue, refund request, bot unsure, aur sales-ready lead ko handoff triggers banayein.
2. **Handoff packet design karein**
   Name, phone, issue, priority, summary, missing fields, aur next action fields include karein.
3. **Customer template add karein**
   Bot customer ko polite message send kare ke request team ko forward ho gayi hai.
4. **Team alert add karein**
   Slack, email, WhatsApp group, CRM, ya Google Sheet mein internal alert save/send karein.
5. **Status track karein**
   Conversation status ko pending_human, in_progress, resolved, ya closed mark karein.

EXERCISE

Exercise + Sample Answer

Scenario: Customer WhatsApp par message karta hai: “Payment deduct ho gayi lekin order confirm nahi hua. Ab koi reply bhi nahi kar raha.”

Task: Is message ke liye handoff JSON, customer reply, aur internal team alert likhein.

Sample answer JSON

```
{
  "handoff_required": true,
  "handoff_type": "payment",
  "priority": "high",
  "reason": "Customer has payment issue and is frustrated due to no response.",
  "customer_message_to_send": "Sorry for the inconvenience. Aapka payment issue support team ko priority par forward
kar diya gaya hai. Please apna order/reference number share kar dein taake team payment verify kar sake.",
  "internal_team_alert": "High priority payment issue: customer says payment was deducted but order was not confirmed.
Contact customer and verify payment/order status.",
  "missing_fields": ["order_id", "payment_reference"],
  "recommended_next_action": "Ask for order/reference number, verify payment, then update customer."
}
```

Short customer reply

```
Sorry for the inconvenience. Aapka payment issue support team ko priority par forward kar diya gaya hai. Please order/
reference number share kar dein taake team payment verify kar sake.
```

QUALITY CHECKLIST

Human Handoff Quality Checklist

Customer message

- [ ] Polite and clear
- [ ] No blame on customer
- [ ] Expected next step mentioned
- [ ] No fake guarantee

Internal alert

- [ ] Priority included
- [ ] Customer contact included
- [ ] Summary included
- [ ] Recommended next action included

Data packet

- [ ] handoff_required field exists
- [ ] handoff_type exists
- [ ] priority exists
- [ ] missing_fields exists
- [ ] conversation_id exists

Tracking

- [ ] CRM/ticket row created
- [ ] Status set to pending_human
- [ ] Follow-up reminder scheduled
- [ ] Resolution status updated later

Final Rule

Human handoff ka purpose bot ki weakness hide karna nahi, balkay customer experience ko better banana hai. Jahan human judgement chahiye, wahan fast and clean handoff best automation decision hota hai.

SCORECARD

Final Handoff Scorecard

Har client project deliver karne se pehle is scorecard se handoff system audit karein.

Area	Question	Score
Triggers	Kya handoff triggers clearly defined hain?	/10
Customer reply	Kya customer ko clear and polite update milta hai?	/10
Team context	Kya internal team ko complete context milta hai?	/10
Data tracking	Kya CRM/ticket/database mein handoff save hota hai?	/10
Follow-up	Kya pending handoff ke liye reminder system hai?	/10

Target score: 40/50 se upar handoff system client delivery ke liye acceptable hai. 45/50 se upar professional level mana ja sakta hai.

Bonus material complete. Ab aap is template pack ko restaurant, e-commerce, clinic, real estate, support, aur lead generation workflows mein reuse kar sakte hain.

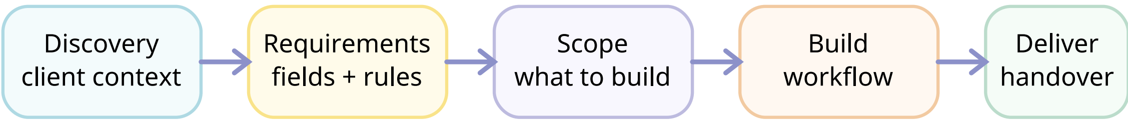
BONUS MATERIAL

Client Requirement Form

Is bonus section ka goal yeh hai ke aap client se automation project start karne se pehle clear, complete, aur practical requirements collect kar saken. Ye form students aur freelancers dono ke liye useful hai: pehle discovery, phir scope, phir build.

Requirements | Scope | Client Form | Automation Planning | Delivery Ready

Requirement se delivery tak clean process



Good requirement form = less confusion, less rework, better pricing.
Client se pehle clarity lein, phir automation build karein.

HOW TO USE

Is Form Ko Kaise Use Karna Hai?

Client requirement form sirf ek questionnaire nahi hai. Yeh aapka project control document hai. Is se aapko pata chalta hai ke client ka current process kya hai, automation kis problem ko solve karegi, data kahan se aayega, output kahan save hoga, aur human team kab involve hogi.

1. **Discovery call se pehle**
   Form ka short version client ko bhejein taake basic context mil jaye.
2. **Discovery call ke waqt**
   Client ke answers ko clarify karein aur missing details fill karein.
3. **Proposal banane se pehle**
   Scope, integrations, timeline, access, aur testing criteria confirm karein.
4. **Build start karne se pehle**
   Client se written approval lein ke requirements correct hain.

Practical rule: Agar requirement form incomplete hai, to project start mat karein. Incomplete requirement ka result usually scope creep, rework, aur client confusion hota hai.

SECTION 1

Client and Business Information

Is page par client ki basic details collect karein. Yeh details proposal, invoice, project folder, CRM record, aur support handover mein use hoti hain.

Business Profile

Business name

Industry / niche

Website / social link

City / country

Primary contact person

Phone / WhatsApp

Email

Preferred communication channel

Client type

- [ ] Restaurant
- [ ] Clinic / appointment business
- [ ] Service business
- [ ] Support team
- [ ] E-commerce store
- [ ] Real estate agency
- [ ] Education institute
- [ ] Other: _________

SECTION 2

Project Goal and Success Metrics

Automation ka goal clear na ho to system technically build ho jata hai lekin business value unclear rehti hai. Client se measurable goals zaroor poochein.

Main problem

Client ka sab se bara repetitive problem kya hai?

Desired outcome

Automation se client kya result expect karta hai?

Success Metrics

- [ ] Response time kam karna
- [ ] Manual data entry reduce karna
- [ ] Support tickets organize karna
- [ ] Order/appointment process improve karna
- [ ] More leads capture karna
- [ ] Missed messages reduce karna
- [ ] Follow-ups automate karna
- [ ] Team alerts automate karna

Example: "WhatsApp par aane wali restaurant orders ko automatically collect karna, Google Sheet mein save karna, aur owner ko confirmation alert bhejna."

SECTION 3

Current Workflow Snapshot

Client ka existing process samjhe baghair automation design karna risky hai. Pehle “abhi ka process” document karein, phir usko “automated process” mein convert karein.

Current Manual Process

Customer message kahan aata hai?

Kaun reply karta hai?

Data kahan save hota hai?

Follow-up kaise hota hai?

Daily approx messages/leads

Biggest bottleneck

Step-by-step current process

Workflow quality check

- [ ] Input source clear hai
- [ ] Manual steps clear hain
- [ ] Decision points clear hain
- [ ] Output destination clear hai
- [ ] Human responsibility clear hai

SECTION 4

Automation Scope Selection

Scope ko clear boxes mein define karein. Is se client ko samajh aata hai ke project mein kya include hai aur kya include nahi.

Included features

- [ ] AI intent detection
- [ ] Data extraction
- [ ] Google Sheet/ CRM save
- [ ] Auto reply
- [ ] Team notification
- [ ] Human handoff
- [ ] Follow-up automation
- [ ] Basic dashboard/ report

Not included unless agreed

- [ ] Custom mobile app
- [ ] Full CRM build
- [ ] Payment integration
- [ ] Advanced analytics
- [ ] Voice calls
- [ ] Multi-language support
- [ ] Custom admin panel
- [ ] 24/7 maintenance

Final scope notes

Project mein exactly kya build hoga?

Out of scope items

SECTION 5

Channels and Message Sources

Automation tab hi sahi work karegi jab input source clear ho. Har channel ka payload, access, rate limit, aur response method alag ho sakta hai.

Channel	Required details	Notes
WhatsApp	Business App, Cloud API, provider, number	Official API recommended for production
Website form	Form fields, webhook URL, spam protection	Best for lead capture
Email	Inbox, labels, reply rules	Useful for support workflows
Facebook/ Instagram	Page access, message source, lead form	May need platform permissions
Website chat	Widget, session ID, transcript	Good for FAQs and leads

Selected channels

- ☐ WhatsApp
- ☐ Website form
- ☐ Website chat
- ☐ Email
- ☐ Facebook/Instagram
- ☐ Other: __________

SECTION 6

Required Data Fields

Data fields define karna sab se important step hai. Agar required fields clear nahi honge to AI response vague rahega aur CRM/Sheet data messy ho jayega.

Common fields

Customer name	Phone	Email
Service/product	Location	Budget
Priority	Status	Assigned team

Business-specific fields

List all extra fields required for this project

```
{
  "required_fields": ["name", "phone", "service", "location"],
  "optional_fields": ["budget", "preferred_time", "notes"],
  "missing_field_action": "ask_customer_once_then_handoff"
}
```

SECTION 7

CRM, Sheet, and Database Mapping

Client se confirm karein ke data exactly kahan save hoga. Simple projects Google Sheets/ Airtable se start ho sakte hain. Advanced projects CRM ya database use karte hain.

Data type	Destination	Owner
New lead	Google Sheet / CRM	Sales team
Customer conversation	Database / n8n data store / CRM note	Support team
Complaint ticket	Ticketing system / Sheet	Support manager
Follow-up reminder	CRM task / Calendar / workflow schedule	Sales/support

Data destination

- [ ] Google Sheets
- [ ] HubSpot/CRM
- [ ] PostgreSQL/MongoDB
- [ ] Airtable
- [ ] Notion
- [ ] Other: __________

SECTION 8

AI Behavior, Tone, and Language

AI bot ka tone business ke brand jaisa hona chahiye. Client se language, response length, allowed claims, aur forbidden responses clear kar lein.

Tone rules

- [ ] Formal
- [ ] Friendly
- [ ] Short replies
- [ ] Detailed replies
- [ ] Roman Urdu
- [ ] English
- [ ] Urdu
- [ ] Mixed

Safety rules

- [ ] Never invent prices
- [ ] Never promise delivery time
- [ ] Ask missing fields
- [ ] Escalate payment issues
- [ ] Do not share internal info
- [ ] Follow policy only

Example approved reply style

Client ke brand ke mutabiq 2-3 sample replies likhwa lein

SECTION 9

Integrations and Access Checklist

Automation project mein delay aksar access na milne ki wajah se hota hai. Client ko start mein hi access list de dein.

Possible access required

- [ ] Make.com / n8n workspace
- [ ] Google Sheet / Airtable access
- [ ] WhatsApp Business / API access
- [ ] CRM API key
- [ ] Email account or label access
- [ ] Website form/webhook access

Security rules

- [ ] API keys private rakhein
- [ ] Temporary access prefer karein
- [ ] Password screenshots avoid karein
- [ ] Production keys public docs mein na likhein
- [ ] Access handover document maintain karein

Integration notes

Kaun se tools connect honge aur kis account se?

SECTION 10

Human Handoff and Follow-up Rules

Client se handoff and follow-up rules clearly confirm karein. Bot ko pata hona chahiye ke kab answer karna hai, kab data collect karna hai, aur kab team ko alert karna hai.

Handoff triggers

- [ ] Angry customer
- [ ] Payment issue
- [ ] Refund/return
- [ ] High value lead
- [ ] Bot unsure
- [ ] Customer asks for human

Follow-up rules

- [ ] After 1 hour
- [ ] After 24 hours
- [ ] After 3 days
- [ ] Only high priority leads
- [ ] Stop after reply
- [ ] Stop after deal closed

Team notification destination

Slack / WhatsApp group / Email

____

Response SLA

____

SECTION 11

Testing, Approval, and Handover

Project complete tab hota hai jab workflow test cases pass kar jayein aur client approve kar de. Sirf "workflow chal raha hai" enough nahi.

Testing scenarios

- [ ] Normal lead
- [ ] Complaint
- [ ] Human handoff
- [ ] Duplicate lead
- [ ] Missing phone
- [ ] Order status
- [ ] API failure
- [ ] Follow-up stop rule

Approval criteria

Client kin conditions par project approve karega?

Handover items

- [ ] Workflow link / scenario name
- [ ] Connected tools list
- [ ] API keys location note
- [ ] Testing examples
- [ ] Maintenance terms
- [ ] Change request process

SECTION 12

Timeline, Budget, and Maintenance

Client requirement form mein business and technical details ke saath commercial details bhi clear honi chahiye.

Commercial Details

Expected delivery date

Urgency level

Setup budget

Monthly maintenance budget

Number of revisions included

Support response time

Pricing note: Client ke tool subscriptions, WhatsApp/API charges, AI usage cost, hosting, and maintenance charges separately mention karein.

ONE PAGE FORM

Printable One-Page Client Requirement Form

Client / business name

Contact person

Industry

Phone / email

Main problem to solve

Automation goal

- [ ] WhatsApp
- [ ] Email
- [ ] Auto reply
- [ ] Follow-up
- [ ] Website form
- [ ] CRM/Sheet
- [ ] Human handoff
- [ ] Team notification

Required fields to collect

Delivery date

Budget

SAMPLE

Sample Filled Form - AC Service Business

Yeh example students ko samjhane ke liye hai ke form answers practical aur specific hone chahiye.

```
Business: Lahore AC Repair Services
Industry: Home services
Main problem: WhatsApp par daily 40-60 inquiries aati hain, staff manually area, issue, AC type, and timing
poochta hai.
Automation goal: Bot customer se basic info collect kare, service lead Google Sheet mein save kare, aur
technician coordinator ko WhatsApp alert bheje.
Channels: WhatsApp + website form
Required fields: name, phone, area, AC type, issue, preferred time
Handoff triggers: angry customer, gas leakage issue, urgent same-day repair, unclear location
Follow-up: agar customer reply na kare to 3 hours baad one follow-up
Success metric: missed leads reduce, response time under 1 minute, all leads saved in Sheet
```

Good requirement quality: Is sample mein problem, channel, data fields, handoff, follow-up, and success metric sab clear hain. Isi level ki clarity client se leni chahiye.

PROMPT SUPPORT

Requirement Summary Prompt

Discovery call ke notes ko clean requirement summary mein convert karne ke liye yeh prompt use karein.

```
You are an AI automation project analyst.
Convert the following messy client notes into a clean project requirement summary.

Return the output in these sections:
1. Business overview
2. Main problem
3. Automation goal
4. Input channels
5. Required data fields
6. Integrations required
7. Human handoff rules
8. Follow-up rules
9. Out of scope items
10. Open questions before project starts

Rules:
- Do not invent missing details.
- If something is unclear, add it under open questions.
- Keep the language simple and practical.

CLIENT NOTES:
{paste_client_notes_here}
```

Open questions after AI summary

List missing items that need client confirmation

EXERCISE

Mini Project: Requirement Form Fill Karein

Scenario: Ek e-commerce store chahta hai ke customer WhatsApp par order status, delivery delay, return/refund aur product questions poochein to bot handle kare. Bot ko serious complaint par human support ko alert karna hai.

Your answer

Main problem

Required fields

Handoff triggers

Testing scenarios

Task: Is scenario ke liye one-page requirement form fill karein. Answer dekhne se pehle apna version zaroor likhein.

ANSWER KEY

Sample Answer

```
Main problem:
Store ke WhatsApp par repetitive order status, delivery delay, return/refund, and product questions aate
hain. Staff manually order ID poochta hai, status check karta hai, aur complaints ko note karta hai.

Automation goal:
Bot customer intent detect kare, order ID collect kare, order status API/Sheet se check kare, normal queries
ka reply de, and serious complaints support team ko forward kare.

Required fields:
customer_name, phone, order_id, issue_type, product_name, message_summary, priority, status, created_at

Handoff triggers:
payment issue, refund request, angry customer, wrong item received, delivery delay more than 3 days, bot low
confidence

Testing scenarios:
1. Customer asks order status with order ID
2. Customer asks order status without order ID
3. Customer asks refund
4. Customer complains angrily
5. API fails
6. Duplicate message received
7. Human handoff required
8. Follow-up stop after customer replies
```

FINAL CHECKLIST

Client Requirement Quality Scorecard

Project start karne se pehle is scorecard se requirement quality check karein.

Area	Quality question	Score
Business goal	Kya automation ka business result clear hai?	/10
Input channels	Kya message/data source clearly defined hai?	/10
Required fields	Kya data fields required vs optional clear hain?	/10
Integrations	Kya tools/API access list clear hai?	/10
AI behavior	Kya tone, language, and safety rules clear hain?	/10
Handoff	Kya human handoff triggers and team destination clear hain?	/10
Testing	Kya approval criteria and test cases defined hain?	/10

Final rule: 70/100 se kam score par build start na karein. Pehle client se missing details confirm karein.

BONUS MATERIAL

Testing Checklist

Intermediate automation project complete tab hota hai jab workflow real messages, missing data, API failures, human handoff, aur client approval test pass kar le. Is bonus checklist ka goal yeh hai ke student ya freelancer apni automation ko client ko dene se pehle confidently verify kar sake.

Testing | QA | Workflow | Client Approval | Delivery Ready

Testing ka practical flow

Agar testing weak hai, to automation client ke saamne fail hogi.
Test before delivery, document the results, then hand over.

MINDSET

Testing Ka Real Purpose

Testing ka matlab sirf yeh nahi ke “workflow run ho raha hai”. Testing ka real purpose yeh confirm karna hai ke system messy real-world data ke saath bhi safe, predictable, aur useful result de.

Technical testing

- [ ] Webhook receive ho raha hai
- [ ] AI valid JSON de raha hai
- [ ] API request correct ja rahi hai
- [ ] Data Sheet/CRM mein save ho raha hai
- [ ] Error case handle ho raha hai

Business testing

- [ ] Customer ko right reply mil raha hai
- [ ] Team ko useful notification mil raha hai
- [ ] Lead/ticket/order ka status clear hai
- [ ] Human handoff timely hai
- [ ] Client ka process improve ho raha hai

Simple rule: Har automation ko happy path, missing data path, error path, aur human handoff path par test karein.

CHECKLIST 1

Pre-Test Setup Checklist

Testing start karne se pehle environment clear hona chahiye. Agar test data aur credentials messy hon to debugging mushkil ho jati hai.

Environment

- [ ] Test workflow copy bana li
- [ ] Production workflow accidentally active nahi
- [ ] Test WhatsApp/email/form source ready
- [ ] Test Sheet/CRM table ready
- [ ] Test API endpoint confirm

Credentials

- [ ] API keys secure hain
- [ ] Access token valid hai
- [ ] Webhook URL correct hai
- [ ] CRM/Sheet permission available hai
- [ ] Team notification channel connected hai

Test Data

- [ ] Normal message samples ready
- [ ] Missing data samples ready
- [ ] Complaint samples ready
- [ ] Invalid data samples ready
- [ ] Duplicate lead samples ready

Expected Result

- [ ] Expected intent defined hai
- [ ] Expected JSON fields defined hain
- [ ] Expected action clear hai
- [ ] Expected customer reply clear hai
- [ ] Pass/fail criteria written hai

CHECKLIST 2

Webhook and Input Testing

Webhook automation ka entry point hota hai. Agar input wrong receive ho raha hai to baad ke AI, API, CRM, aur reply steps bhi wrong ho jayen ge.

Test	Expected result	Status
Valid webhook payload send karein	Workflow trigger ho aur payload visible ho	Pass / Fail
Missing phone/message field send karein	Validation error ya fallback route chale	Pass / Fail
Duplicate event ID send karein	Duplicate processing avoid ho	Pass / Fail
Invalid JSON send karein	Workflow crash na ho, error log create ho	Pass / Fail
Webhook secret/token missing ho	Request reject ho	Pass / Fail

```
{
  "event_id": "evt_test_001",
  "source": "whatsapp",
  "customer": { "name": "Ali", "phone": "03001234567" },
  "message": { "text": "AC service ka rate bata dein", "timestamp": "2026-07-01T12:00:00Z" }
}
```

CHECKLIST 3

AI Router Testing

AI router ka kaam message ko correct intent aur next action mein convert karna hai. Router ko sirf normal messages par nahi, confused aur mixed messages par bhi test karein.

Router test cases

Customer message	Expected intent	Expected action
Price kya hai?	price_inquiry	ask_service_or_product
Mera order late hai	order_status	ask_order_id
Payment deduct ho gayi, order confirm nahi hua	complaint	create_ticket
Kal evening appointment chahiye	appointment_booking	collect_name_phone
Human se baat karni hai	human_handoff	notify_team

Pass criteria: Router JSON valid ho, intent correct ho, confidence useful ho, aur risky cases human handoff par jayein.

CHECKLIST 4

Data Extraction Testing

Extraction testing mein check karein ke AI customer message se required fields correctly nikal raha hai ya missing fields identify kar raha hai.

Fields to test

- [ ] Customer name
- [ ] Phone number
- [ ] Email
- [ ] Service/product
- [ ] Budget
- [ ] Location/address
- [ ] Order ID
- [ ] Preferred date/time

Edge cases

- [ ] Phone number with spaces
- [ ] Roman Urdu mixed with English
- [ ] Multiple products in one message
- [ ] Budget range instead of exact value
- [ ] Missing location
- [ ] Ambiguous date like “kal evening”
- [ ] Wrong or fake order ID
- [ ] Very short message like “details?”

```
Expected extraction output:
{
  "customer_name": "Ali",
  "phone": "03001234567",
  "service": "AC service",
  "location": null,
  "missing_fields": ["location"],
  "next_question": "Please apna area/location share kar dein."
}
```

CHECKLIST 5

API and HTTP Request Testing

API testing se confirm hota hai ke workflow external systems ke saath correct communicate kar raha hai. Yahan headers, body, method, auth, aur response mapping check hoti hai.

Area	Check	Pass criteria
Method	GET/POST/PUT correct hai	Wrong method error nahi aa raha
URL	Endpoint correct hai	404 nahi aa raha
Headers	Authorization and Content-Type correct	401/415 nahi aa raha
Body	Required fields present	400 validation error nahi aa raha
Response	ID/status parse ho raha hai	Next step mein value use ho rahi hai

```
API test response sample:
{
  "success": true,
  "lead_id": "lead_1021",
  "status": "new",
  "assigned_to": "sales_team"
}
```

CHECKLIST 6

Make.com and n8n Workflow Testing

No-code/low-code workflow mein visual flow correct nazar aa sakta hai, lekin mapping ya conditions wrong ho sakti hain. Har route ko separate test karein.

Make.com tests

- [ ] Webhook module run hota hai
- [ ] AI module output valid hai
- [ ] Router filters correct hain
- [ ] HTTP module body mapped hai
- [ ] Sheet/CRM row create hoti hai
- [ ] Error handler attached hai
- [ ] Scenario scheduling/activation checked hai

n8n tests

- [ ] Webhook execution visible hai
- [ ] Set node fields clean kar raha hai
- [ ] IF/Switch route correct hai
- [ ] HTTP Request response parsed hai
- [ ] Credentials secure hain
- [ ] Error workflow configured hai
- [ ] Execution logs review kiye gaye

Tip: Workflow ko ek dafa full run se test na karein. Pehle node by node test karein, phir complete end-to-end test karein.

CHECKLIST 7

CRM, Sheet, and Database Testing

Automation ka output agar wrong table, wrong column, ya duplicate records mein save ho raha hai to client ke liye system unreliable ban jata hai.

Field mapping

- [ ] Name correct column mein save ho
- [ ] Phone format consistent ho
- [ ] Intent/status save ho
- [ ] Source channel save ho
- [ ] Timestamp save ho

Data quality

- [ ] Duplicate lead handling
- [ ] Empty required fields blocked
- [ ] Invalid phone/email flagged
- [ ] Long messages truncate na hon
- [ ] Notes field readable ho

Status updates

- [ ] new lead status set ho
- [ ] ticket priority save ho
- [ ] order status update ho
- [ ] follow-up date set ho
- [ ] handoff flag save ho

Access

- [ ] Client correct Sheet/CRM access rakhta ho
- [ ] Private data public share na ho
- [ ] Team roles clear hon
- [ ] Backup/export option ho
- [ ] Audit notes available hon

CHECKLIST 8

Customer Reply Testing

Customer reply ko sirf grammatically correct nahi, business-wise useful bhi hona chahiye. Reply mein tone, missing question, confirmation, aur handoff clarity check karein.

Check	Expected	Status
Tone	Professional, polite, client brand ke mutabiq	Pass / Fail
Language	Roman Urdu / English as required	Pass / Fail
Missing data question	Sirf required missing info pooche	Pass / Fail
No fake promise	Bot unavailable cheez confirm na kare	Pass / Fail
Human handoff	Customer ko clear message mile	Pass / Fail

```
Good reply sample:
Ji, aapki AC service request note kar li gayi hai. Please apna area/location share kar dein taake technician availability check ki ja sake.
```

CHECKLIST 9

Human Handoff Testing

Handoff ka test bohot important hai, kyun ke real projects mein bot ko har case solve nahi karna chahiye. Kuch cases human team ko timely transfer hone chahiye.

Handoff triggers

- [ ] Customer asks for human
- [ ] Payment complaint
- [ ] Angry customer
- [ ] Low confidence AI output
- [ ] Policy/refund issue
- [ ] High-value sales lead
- [ ] Repeated failed attempts

Team notification

- [ ] Customer name and phone
- [ ] Conversation summary
- [ ] Issue category
- [ ] Priority
- [ ] Recommended next step
- [ ] Original message
- [ ] CRM/ticket link if available

Pass criteria: Customer ko respectful handoff message mile, team ko complete context mile, aur bot duplicate replies na bheje.

CHECKLIST 10

Follow-up Automation Testing

Follow-up automation useful hai, lekin wrong timing ya repeated messages client ki brand ko damage kar sakte hain. Follow-up rules carefully test karein.

Follow-up test checklist

- [ ] Follow-up only eligible leads ko jaye
- [ ] Converted lead ko follow-up na jaye
- [ ] Human handoff case mein auto follow-up pause ho
- [ ] Message duplicate na ho
- [ ] Time delay correct ho
- [ ] Timezone correct ho
- [ ] Stop condition work kar rahi ho
- [ ] CRM status update ho raha ho

```
Follow-up rule sample:
{
  "send_follow_up": true,
  "delay_hours": 24,
  "condition": "lead_status == 'new' AND human_handoff == false",
  "stop_if": ["lead_status == 'converted'", "lead_status == 'not_interested'"]
}
```

TEST MATRIX

Final Testing Matrix

Is matrix ko har client project mein duplicate kar sakte hain. Har row mein sample input, expected output, actual result, aur pass/fail status fill karein.

#	Scenario	Input	Expected result	Status
1	New lead	Price inquiry	Lead save + reply	
2	Missing data	No phone/location	Ask missing info	
3	Complaint	Payment issue	Ticket + handoff	
4	Order status	Order ID given	API check + reply	
5	Appointment	Date/time request	Collect required fields	
6	Duplicate lead	Same phone again	Update existing record	
7	API failure	API timeout	Fallback + log	
8	Human request	Human se baat karni hai	Team alert	

CLIENT UAT

Client Approval Testing

UAT ka matlab hai User Acceptance Testing. Is stage par client khud workflow ko real-life style messages se test karta hai aur confirm karta hai ke system business process ke mutabiq hai.

1. **Client ko test scenarios dein**
   Client ko 8-10 ready scenarios dein: new lead, complaint, order status, missing info, handoff, follow-up.
2. **Client se actual messages bhejwayen**
   Client apne natural style mein messages bheje taake automation real tone handle kar sake.
3. **Feedback collect karein**
   Reply tone, missing questions, lead fields, notification format, aur status updates par feedback lein.
4. **Final approval lein**
   Fixes ke baad client se final written approval lein ke workflow go-live ke liye ready hai.

Client sign-off

Client name ______________________ **Date** ______________________

Approval notes

MINI PROJECT

Mini Project: AC Service Lead Automation Test Plan

Scenario: Client ka AC service business hai. Customer WhatsApp par messages bhejte hain. Workflow customer message receive karta hai, AI intent detect karta hai, lead extract karta hai, Google Sheet mein save karta hai, aur reply bhejta hai.

Aapka task

- [ ] 8 test cases design karein
- [ ] Har test case ka expected intent likhein
- [ ] Required fields define karein
- [ ] Pass/fail criteria likhein
- [ ] Human handoff case include karein

Test case	Input	Expected result
New service lead	AC cooling nahi kar raha, Johar Town	service_request + save lead
Missing location	AC service chahiye	Ask location
Urgent case	Aaj hi technician chahiye	High priority + team alert
Complaint	Technician nahi aya	Complaint + human handoff

ANSWER KEY

Mini Project Sample Answer

#	Scenario	Expected intent	Expected action
1	Price inquiry	price_inquiry	Ask service type/location
2	Service request with location	service_request	Save lead + reply
3	Missing phone	service_request	Ask phone number
4	Urgent request	urgent_service	High priority + team alert
5	Complaint	complaint	Create ticket + handoff
6	Duplicate lead	service_request	Update existing lead
7	API failure	service_request	Fallback + error log
8	Human request	human_handoff	Notify team

```
Expected pass criteria:
- JSON valid ho
- Required fields correctly extract hon
- Missing fields identify hon
- Sheet/CRM record create ya update ho
- Customer reply polite ho
- Team alert only relevant cases mein jaye
- Error case mein workflow crash na ho
```

SCORECARD

Final Workflow Testing Scorecard

Is scorecard ko project delivery se pehle complete karein. Agar score 80 se kam ho to workflow ko client ko deliver karne se pehle improve karein.

Area	Criteria	Score
Webhook input	Payload receive, validation, duplicate prevention	/10
AI router	Intent, confidence, next action, handoff flag	/10
Data extraction	Required fields, missing fields, clean JSON	/10
API actions	Correct method, headers, body, response mapping	/10
CRM/Sheet	Correct columns, no duplicates, status updates	/10
Customer reply	Tone, clarity, no fake promises	/10
Human handoff	Right trigger, useful team notification	/10
Follow-up	Timing, stop conditions, no spam	/10
Error handling	Fallback, logs, retry, alerts	/10
Client UAT	Client tested and approved	/10

Final rule: Deliver only when workflow score 80+ ho aur client UAT completed ho.

FINAL CHECKLIST

Delivery Se Pehle Final Checklist

Technical

- [ ] All test cases pass
- [ ] Error handlers active
- [ ] Credentials secure
- [ ] Logs available
- [ ] Workflow activated

Business

- [ ] Client flow approved
- [ ] Reply tone approved
- [ ] Team notifications approved
- [ ] CRM fields approved
- [ ] Follow-up rules approved

Handover

- [ ] Client ko workflow overview diya
- [ ] Access details documented
- [ ] Maintenance scope clear
- [ ] Change request process clear
- [ ] Support contact shared

Documentation

- [ ] Test matrix complete
- [ ] Known limitations written
- [ ] API/webhook notes added
- [ ] Handoff rules documented
- [ ] Final sign-off saved

Conclusion: Aapka automation tab professional lagega jab client ko sirf working workflow nahi, balkay tested workflow, documentation, aur handover clarity milegi.

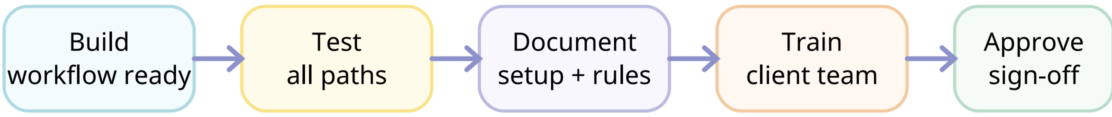
BONUS MATERIAL

Delivery Checklist

Automation build karna ek part hai. Client ko professionally deliver karna alag skill hai. Is checklist ka goal yeh hai ke student ya freelancer apna project clean, documented, tested, aur handover-ready form mein client ko de sake.

Client Delivery | Handover | Documentation | Approval | Maintenance Ready

Delivery ka professional flow



Good delivery client trust banati hai.
Acha workflow + weak handover = future support problems.

DELIVERY MINDSET

Client Ko Sirf Workflow Nahi, System Deliver Karein

Intermediate AI automation project mein client ko final result yeh feel hona chahiye ke unke paas ek useful business system aa gaya hai. Sirf Make.com scenario ya n8n workflow dena enough nahi hota.

Weak delivery

- [ ] Workflow bana kar link bhej diya
- [ ] No documentation
- [ ] No testing report
- [ ] No backup plan
- [ ] Client ko use karna nahi aata

Professional delivery

- [ ] Workflow tested hai
- [ ] Clear documentation hai
- [ ] Client team ko training di gayi
- [ ] Access aur credentials safe hain
- [ ] Maintenance process clear hai

Delivery rule: Client ko final system ke saath yeh bhi pata hona chahiye ke system kya karta hai, kab fail ho sakta hai, aur issue aaye to kya karna hai.

CHECKLIST 1

Pre-Delivery Quality Checklist

Project deliver karne se pehle final QA pass zaroor karein. Yeh checklist developer ya automation builder ke liye hai.

Workflow quality

- [ ] Workflow name clear hai
- [ ] Each module/node ka purpose clear hai
- [ ] Unused test nodes remove ho gaye
- [ ] Filters and routers readable hain
- [ ] Production scenario active karne se pehle final test hua

Data quality

- [ ] Required fields mapped hain
- [ ] Missing fields handle ho rahe hain
- [ ] Duplicate lead/order logic checked hai
- [ ] CRM/Sheet columns clean hain
- [ ] Test rows clearly marked ya removed hain

AI quality

- [ ] Prompt final version saved hai
- [ ] AI output format consistent hai
- [ ] Fallback messages tested hain
- [ ] Wrong/irrelevant questions handled hain
- [ ] Human handoff triggers correct hain

Integration quality

- [ ] Webhook URL correct hai
- [ ] API endpoint correct hai
- [ ] Tokens valid hain
- [ ] Team notifications ja rahi hain
- [ ] Error path tested hai

CHECKLIST 2

Client Demo Checklist

Delivery se pehle client ko short demo dikhana zaroori hai. Demo mein sirf happy path na dikhayein; important edge cases bhi show karein.

Demo item	Kya dikhana hai?	Status
Normal customer message	Bot correct intent detect kare aur reply de	Done / Pending
Missing information	Bot required missing field politely ask kare	Done / Pending
Lead save	CRM/Sheet mein correct record create ho	Done / Pending
Human handoff	Team ko complete context ke saath notification mile	Done / Pending
Error case	Fallback response aur internal alert show karein	Done / Pending
Follow-up	Follow-up timing aur stop condition explain karein	Done / Pending

Tip: Demo ko 15-20 minutes mein complete rakhein. Client ko technical details se zyada business outcome dikhayein.

CHECKLIST 3

Documentation Checklist

Documentation client ke liye future confusion kam karti hai. Agar client ko samajh nahi aata ke system kaise kaam karta hai to wo har choti cheez ke liye aapko message karega.

System overview

- [ ] Project ka goal
- [ ] Workflow diagram
- [ ] Input channels
- [ ] Output/actions
- [ ] Human handoff rules

Operations guide

- [ ] Workflow kaise start/stop karna hai
- [ ] Leads/tickets/orders kahan dekhne hain
- [ ] Bot replies kaise update karni hain
- [ ] Team notifications kahan milengi
- [ ] Error aaye to kya check karna hai

Access list

- [ ] Make.com/n8n workspace
- [ ] Google Sheet/CRM
- [ ] WhatsApp provider
- [ ] Email/API account
- [ ] Admin users

Change log

- [ ] Final prompt version
- [ ] Integration list
- [ ] Workflow version
- [ ] Known limitations
- [ ] Future improvements

TEMPLATE

One-Page Handover Summary

Is template ko copy karke har client project ke saath attach kiya ja sakta hai.

Project Handover Summary

Client / Business Name

Delivery Date

Project Name

Primary Channel

Automation Goal

Main Workflow Steps

Data Destination

Team Notification Channel

Human Handoff Rules

Known Limitations / Notes

CHECKLIST 4

Access and Credentials Checklist

Credentials delivery ka sensitive part hai. API keys, tokens, passwords, aur admin access ko casual WhatsApp message mein share nahi karna chahiye.

Access confirmed

- [ ] Client admin account available hai
- [ ] Developer temporary access remove/limit kiya
- [ ] Required team members added hain
- [ ] Owner email correct hai
- [ ] Recovery email/phone set hai

Secrets safe

- [ ] API keys environment/credentials manager mein hain
- [ ] Keys screenshots mein visible nahi
- [ ] Test keys and production keys separate hain
- [ ] Unused tokens remove kiye
- [ ] Secret rotation process explain kiya

Permissions

- [ ] Sheet/CRM write access working hai
- [ ] Notification channel access working hai
- [ ] Webhook provider access working hai
- [ ] Billing owner client ke paas hai
- [ ] Least-privilege access follow hua

Backup access

- [ ] Backup admin assigned hai
- [ ] Workflow export saved hai
- [ ] Important prompt templates saved hain
- [ ] Client docs shared folder mein hain
- [ ] Emergency contact defined hai

CHECKLIST 5

Training and Handover Call Checklist

Client ko system use karna sikhana delivery ka part hai. Training short, practical, aur role-based honi chahiye.

1. **System overview explain karein**
   Client ko simple words mein batayein ke automation input se output tak kaise kaam karti hai.
2. **Daily use case run karein**
   Ek real customer message se start karein aur CRM/Sheet notification tak complete flow show karein.
3. **Human handoff show karein**
   Client team ko batayein ke bot kab handoff karega aur team ko kya action lena hai.
4. **Data update process explain karein**
   FAQs, menu, pricing, services, ya reply templates update karne ka safe tareeqa show karein.
5. **Error handling explain karein**
   Client ko basic troubleshooting steps dein: workflow logs, API status, Sheet/CRM permissions, aur support contact.

CHECKLIST 6

Client Approval Checklist

Approval written form mein lena professional practice hai. Is se scope clear rehta hai aur future misunderstanding kam hoti hai.

Client Approval Sign-off

- [ ] Workflow demo complete hua
- [ ] CRM/Sheet data correct hai
- [ ] Human handoff rules approved hain
- [ ] Documentation received hai
- [ ] Test cases pass huay
- [ ] Customer replies approved hain
- [ ] Follow-up timing approved hai
- [ ] Training completed hai

Client Feedback / Required Changes

Client Name / Signature

Date

Important: Agar client changes maangta hai, to unhein “minor fix”, “scope change”, ya “future improvement” mein categorize karein.

CHECKLIST 7

Post-Delivery Support Checklist

Delivery ke baad first week mein monitoring important hoti hai. Real customers se new edge cases mil sakte hain.

Time period	Kya monitor karna hai?	Action
Day 1	Webhook runs, failed modules, customer replies	Critical issues immediately fix karein
First 3 days	Wrong intents, missing fields, team notifications	Prompt/rules adjust karein
First week	Lead quality, handoff accuracy, duplicate records	Optimization list banayein
Monthly	Usage, cost, failures, client feedback	Maintenance report share karein

Support boundary

Client ko pehle se clear karein ke free support mein bug fixes included hain, lekin new features separate scope hain.

Maintenance offer

Monthly maintenance mein monitoring, small prompt updates, failed workflow fixes, and usage report include kiya ja sakta hai.

TEMPLATE

Delivery Email / Message Template

Project complete hone ke baad client ko professional delivery message bhejna chahiye.

```
Hi [Client Name],

Your AI automation system has been completed and tested.

Included in this delivery:
- Workflow setup
- AI routing and reply logic
- CRM / Sheet integration
- Human handoff rules
- Testing checklist
- Handover documentation

I have also attached the handover notes and testing summary. Please review the system and confirm approval.
If you notice any issue during the first testing period, share the exact example message so I can adjust the
workflow.

Thank you.
```

Roman Urdu version: “System complete aur tested hai. Documentation attach kar di hai. Aap review kar ke approval confirm kar dein. Agar koi issue aaye to exact example message share kar dein.”

MINI PROJECT

Mini Project: AC Service Bot Delivery Plan

Scenario: Aap ne AC service business ke liye WhatsApp lead capture bot banaya hai. Bot customer se service type, location, phone, and preferred time collect karta hai, lead Google Sheet mein save karta hai, aur sales team ko notification bhejta hai.

Student Task

- [ ] Delivery ke liye 6 final checks likhein.
- [ ] Client demo ke 4 steps likhein.
- [ ] Client approval form mein 5 approval items add karein.
- [ ] Post-delivery support plan likhein.

Sample Answer

```
Final checks:
1. WhatsApp webhook test
2. AI router test
3. Missing location handling
4. Google Sheet row creation
5. Team notification
6. Human handoff for urgent complaint

Demo steps:
1. Price inquiry message
2. Service booking message
3. Missing field message
4. Human handoff message

Approval items:
- Bot reply tone approved
- Required fields approved
- Sheet columns approved
- Handoff rules approved
- Follow-up timing approved

Support plan:
Monitor workflow for 7 days. Fix bugs included. New features separate scope.
```

SCORECARD

Final Delivery Quality Scorecard

Project handover se pehle apni delivery ko score karein. Agar score 80% se kam hai, to delivery se pehle improvements karein.

Area	Question	Score
Testing	Kya happy path, missing data, error path, aur handoff test huay?	/20
Documentation	Kya client ke paas workflow overview, access list, aur operation guide hai?	/20
Training	Kya client team system use karna samajh gayi hai?	/15
Security	Kya API keys, permissions, aur admin access safe hain?	/15
Approval	Kya client ne replies, rules, aur data fields approve kiye?	/15
Support	Kya post-delivery support and maintenance boundary clear hai?	/15

Delivery ready rule

80+ score: delivery ready. 60-79: minor improvements required. 60 se kam: workflow ya documentation incomplete hai.

FINAL CHECKLIST

Before You Send The Final File

System

- [ ] Workflow active hai
- [ ] Test data clean hai
- [ ] Client data destination correct hai
- [ ] Notifications working hain
- [ ] Error path working hai

Client

- [ ] Client demo complete hai
- [ ] Client approval received hai
- [ ] Training complete hai
- [ ] Documentation shared hai
- [ ] Support terms clear hain

Security

- [ ] Secrets hidden hain
- [ ] Temporary access removed hai
- [ ] Billing ownership clear hai
- [ ] Backup/export saved hai
- [ ] Admin recovery available hai

Professional finish

- [ ] Delivery message sent hai
- [ ] Files named properly hain
- [ ] Change log included hai
- [ ] Future improvements noted hain
- [ ] Maintenance offer ready hai

Final note: Achi delivery client ko yeh confidence deti hai ke aap sirf automation builder nahi, balkay reliable implementation partner hain.