

PROJECT FORMAT: *AI Storytelling Robot for Kids*

◊ 1. Project Overview

Project Title: Smart AI Storytelling Robot

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Goal:

To build a **low-cost smart robot** that interacts with children by telling stories, answering questions, reading cards, and connecting with AI (like Alexa) for global knowledge.

Estimated Cost: ₹1000 – ₹1500

◊ 2. Objectives

1. To develop a small robot capable of **speech recognition** and **voice output**.
 2. To integrate **AI-based storytelling** (predefined stories + online AI).
 3. To use a **card reader** module (like RFID or NFC) to detect cards that trigger specific stories.
 4. To allow **global AI connectivity** via Wi-Fi or phone hotspot (using simple APIs).
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◊ 3. Required Components (Hardware)

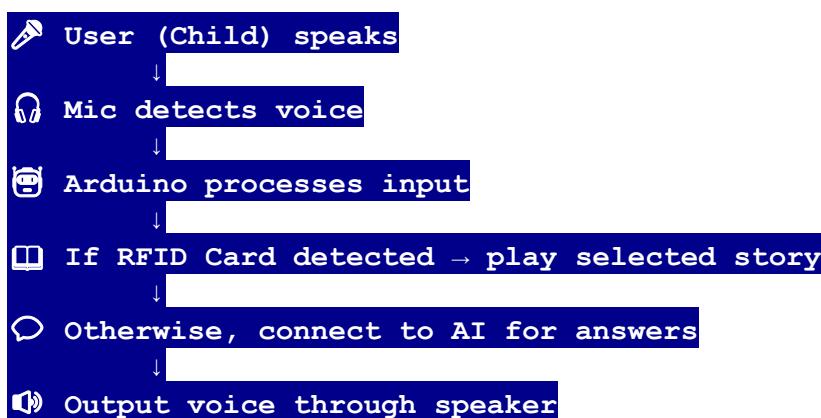
Component	Description	Approx. Cost
Arduino UNO / NodeMCU (ESP8266)	Brain of robot	₹400
Microphone Module (KY-038)	For voice input	₹100
Speaker Module	For story audio output	₹150
RFID Reader Module (RC522)	For card reading	₹200
Servo Motor (SG90)	For head movement	₹100
LED Lights / RGB Eyes	For animation effect	₹50
Power Source (Battery)	5V rechargeable battery	₹150
Plastic/3D body / DIY Box	Robot casing	₹100

Total: ₹1200–₹1400 (approx.)

◊ 4. Software & Tools

Tool	Purpose
Arduino IDE	Microcontroller coding
Python (optional)	For AI voice and story processing
Google Text-to-Speech (gTTS)	Convert text into audio
SpeechRecognition (Python library)	Voice command detection
IFTTT or OpenAI API	To connect with global AI (optional cloud feature)

◊ 5. System Flow Diagram (Concept)



◊ 6. Core Features

Feature	Description
VOICE Interaction	Child can talk with robot; robot answers back
Storytelling Mode	Reads stories when a specific card is scanned
LED Expression	Robot eyes blink during conversation
AI Connection	Can answer basic questions using OpenAI or online API
Offline Story Mode	Preloaded stories for when internet is off

◊ 7. Coding Part (Sample Structure)

A. Arduino Side (main controller):

```
#include <SPI.h>
#include <MFRC522.h>
#include <SoftwareSerial.h>
```

```

#define RST_PIN 9
#define SS_PIN 10
MFRC522 mfrc522(SS_PIN, RST_PIN);

void setup() {
  Serial.begin(9600);
  SPI.begin();
  mfrc522.PCD_Init();
  pinMode(8, OUTPUT);
  Serial.println("AI Robot Ready...");
}

void loop() {
  if ( ! mfrc522.PICC_IsNewCardPresent()) return;
  if ( ! mfrc522.PICC_ReadCardSerial()) return;

  String story = "default";
  if (mfrc522.uid.uidByte[0] == 0xA1) story = "rabbit_story";
  else if (mfrc522.uid.uidByte[0] == 0xB2) story = "lion_story";

  Serial.println(story); // send to Python to speak
  digitalWrite(8, HIGH);
  delay(1000);
  digitalWrite(8, LOW);
}

```

B. Python Side (AI + Voice):

```

import serial
import pyttsx3
from gtts import gTTS
import os
import openai

ser = serial.Serial('COM3', 9600)
openai.api_key = "YOUR_OPENAI_API_KEY"

def tell_story(story):
    if story == "rabbit_story":
        text = "Once upon a time, a rabbit lived in a forest..."
    elif story == "lion_story":
        text = "A brave lion ruled the jungle..."
    else:
        text = "Hello! What story do you want to hear today?"
    tts = gTTS(text)
    tts.save("story.mp3")
    os.system("start story.mp3")

while True:
    data = ser.readline().decode().strip()
    if data:
        tell_story(data)

```

❖ 8. Output (Expected Behavior)

- When robot is powered on → greets the user
- When a card is scanned → tells a specific story

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- When child says “Tell me a story” → plays a random story
 - When child asks a question → connects to AI and answers it
 - Eyes blink and mouth LED glows while speaking
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◊ 9. Future Upgrade Ideas

1. Add **Bluetooth or Wi-Fi control via mobile app**
 2. Use **ESP32 with inbuilt mic & speaker** for smoother performance
 3. Add **motion sensors** so robot can follow sound or move its head
 4. Add **face recognition** for personalized storytelling
 5. Add **emotion detection** to respond differently to child’s tone
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◊ 10. Summary

Parameter	Detail
Type	AI Storytelling Robot
Budget	₹1000–₹1500
Control System	Arduino + Python
Input	Voice + RFID Card
Output	Audio Story + LED animation
Special Feature	Connects to global AI for answers