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voIS Innovation Marathon 2.0

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Project Title:-Vision-Based Smart Assistant for Disabled Persons using Hand Gesture Recognition



Team No. 35



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Problem Statement



Severely disabled individuals struggle to communicate basic needs and emergencies.



Existing solutions depend on costly wearables and still require manual interaction.



Speech loss and limited motor control make keyboards, buttons, and touch devices unusable.



Absence of real-time alerts and centralized monitoring delays caregiver response.

There is an urgent need for a contactless, AI-driven communication system that enables disabled individuals to express needs instantly while ensuring real-time caregiver awareness.

Need of Project

Empowering Silent Voices



Independence & Safety

Improve independence, safety, and quality of life for disabled individuals.



Hands-Free Communication

Enable communication for paralyzed & speech-impaired individuals without speech or physical interaction.



Instant SOS Detection

Ensure quick emergency response through SOS gesture detection.



Caregiver Monitoring Dashboard

Allow caregivers to monitor user actions remotely via a dashboard.

Proposed Solution

- Contactless communication using camera-based gesture recognition
- AI-driven gesture-to-voice conversion
- Real-time caregiver monitoring dashboard
- Intelligent SOS detection for emergencies
- Low-cost hardware, scalable solution

Solution Overview

NO WEARABLES - ONLY CAMERA
Works with any webcam
Cost-effective & accessible

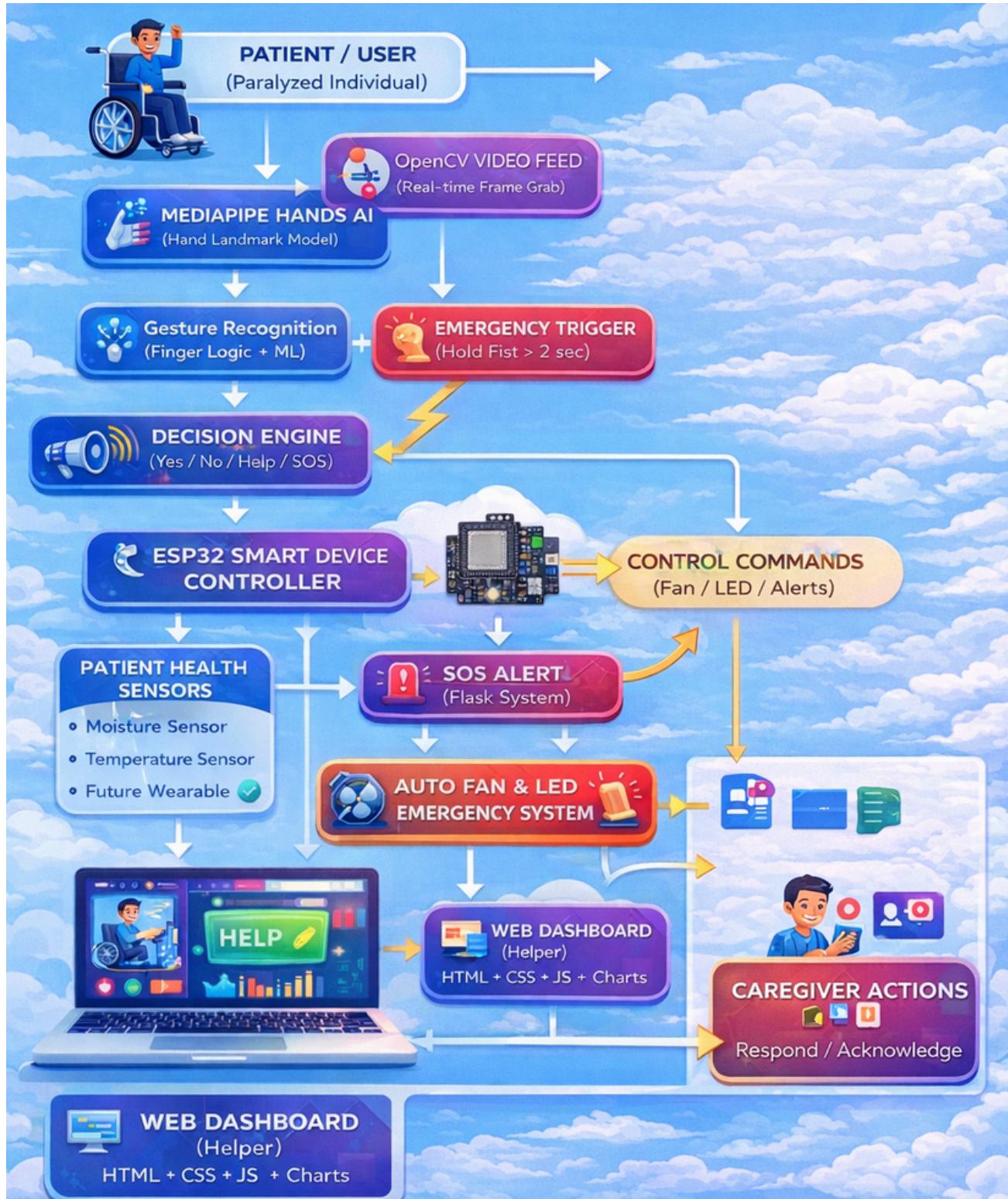
EMERGENCY SOS HOLD-GESTURE
Intentional safety mechanism
Averts false alerts
Life-saving design

ANALYTICS FOR CAREGIVERS
Gesture frequency
SOS trends
Patient behavior insights

LIVE AI → WEB DASHBOARD
Gesture recognized on backend
Instantly reflected on frontend
Real-time caregiver monitoring

VOICE + VISUAL CONFIRMATION
User sees confirmation
Helper hears alert
Dual-mode feedback

TECHNICAL FLOW



“Our technical flow ensures secure caregiver access, real-time AI gesture recognition, intelligent decision making, and instant emergency response – all integrated into a single scalable platform.”

TECH STACK



AI / ML USED

Current Model

- MediaPipe Hands (Google AI)
- CNN-based hand landmark detection
- 10 key points per hand
- High accuracy & low latency

Logic Layer

- Rule-based gesture mapping
- Temporal validation (SOS hold)

DASHBOARD FEATURES

Caregiver Dashboard

- Live camera feed
- Current gesture & message
- Emergency alerts
- Analytics & logs

Analytics

- Gesture usage frequency
- SOS history
- Behavior trends

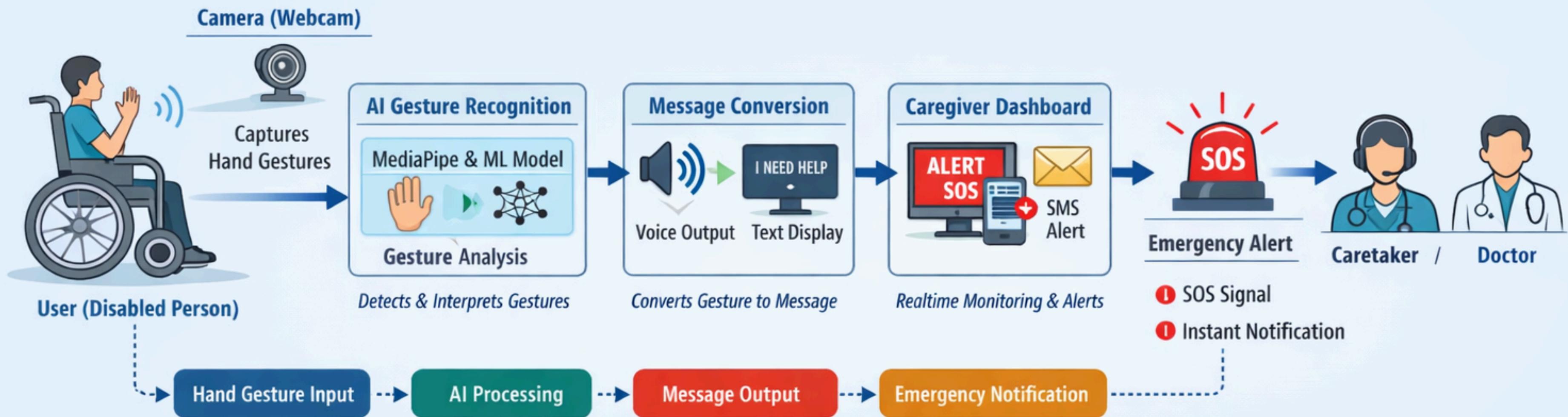
Security

- Login / Signup
- Role-based

Architecture Blueprint



Workflow diagram



Screen shots of your project -

The screenshot displays the VisionCare interface for the ICU Ward 104 - Cardiac. The top navigation bar includes the VisionCare logo, the location "ICU Ward 104 - Cardiac", the time "00:00:00 AM", a status indicator "• ONLINE", the user "Dr. Admin Chief Medical Officer", and a "DA" profile icon.

The left sidebar contains the following menu items:

- Monitor (selected)
- Patients
- Analytics
- Staff Chat
- Logs
- Settings

ACCESSIBILITY options include Contrast, Broadcast, and Logout.

The main content area shows two patients in a video feed. On the left, an AI overlay displays "AI CORE: ACTIVE", "ACTION: --", "PAIN: YES", and "BLINK: 0". On the right, a "VOICE OFF" button is visible. Below the video are controls for "START AI" (with camera icons), "HEAD TRACK", "VOICE" (with microphone icon), and another camera icon.

Two patient cards are shown below the video:

- Alex Smith (Bed 1 • Cardiac) - CRITICAL status
- Sarah Doe (Bed 2 • Ortho) - STABLE status

An "EMERGENCY" button is located at the bottom center, flanked by two sets of control icons (lightbulb, fan, head/foot sliders).

To the right, there are two panels: "DIGITAL SKELETON" showing a 3D skeleton model and "AAC Speech Board" showing four categories: WATER, PAIN, FAMILY, and LIGHTS.

On the far right, vital signs are listed: HR: --, SpO2: --, and RR: 18.

Screen shots of your project -

VisionCare

ICU Ward 104 - Cardiac
00:00:00 AM

Dr. Admin Chief Medical Officer DA

ONLINE

System Audit Log

Clear Logs

| Timestamp | Module | Event | Severity |
|------------|--------|----------------------|----------|
| 2:03:58 PM | System | Patient in Distress! | CRIT |
| 2:03:58 PM | System | Patient in Distress! | CRIT |
| 2:03:58 PM | System | Patient in Distress! | CRIT |
| 2:03:57 PM | System | Patient in Distress! | CRIT |
| 2:03:57 PM | System | Patient in Distress! | CRIT |
| 2:03:57 PM | System | Patient in Distress! | CRIT |
| 2:03:57 PM | System | Patient in Distress! | CRIT |
| 2:03:57 PM | System | Patient in Distress! | CRIT |
| 2:03:57 PM | System | Patient in Distress! | CRIT |
| 2:03:56 PM | System | Patient in Distress! | CRIT |
| 2:03:56 PM | System | Patient in Distress! | CRIT |
| 2:03:56 PM | System | Patient in Distress! | CRIT |
| 2:03:55 PM | System | Patient in Distress! | CRIT |
| 2:03:55 PM | System | Request: MEDICINE | INFO |
| 2:03:55 PM | System | Patient in Distress! | CRIT |
| 2:03:55 PM | System | Request: FAN ON | INFO |
| 2:03:55 PM | System | Patient in Distress! | CRIT |
| 2:03:55 PM | System | Request: FAN ON | INFO |
| 2:03:55 PM | System | Patient in Distress! | CRIT |
| 2:03:55 PM | System | Request: FAN ON | INFO |
| 2:03:54 PM | System | Patient in Distress! | CRIT |
| 2:03:54 PM | System | Request: FAN ON | INFO |
| 2:03:54 PM | System | Patient in Distress! | CRIT |
| 2:03:54 PM | System | Request: FAN ON | INFO |

Monitor

Patients

Analytics

Staff Chat

Logs

Settings

Contrast

Broadcast

Logout

ONLINE

DA

Chief Medical Officer

ACTIVE

hi

ICU Ward 104 - Cardiac
00:00 AM

Dr. Admin Chief Medical Officer DA

ONLINE

Channels

N Nurse Station

L Lab Tech

P Pharmacy

Nurse Station

Message Received.

Type a message...

ACTIVE

hi

Role of Agentic AI and Gen AI in the solution

Agentic AI in our system enables autonomous decision-making. After detecting patients using the YOLOv8 model, the system can decide whether to trigger alerts, activate devices like fan or LED, or notify staff without human intervention. This makes the system proactive rather than just reactive.”

Generative AI helps in interpreting detected situations and generating meaningful alerts or summaries, such as converting sensor and vision data into readable medical notifications for staff or dashboards.



Novelty and Uniqueness

1

Multi-Patient
Monitoring from a
Single Camera

2

Detects AND reacts
automatically
System can trigger fan,
LED, and alerts in real time.

3

Dual Feedback with
Analytics-Driven Care
system provides both
voice confirmation to the
user and visual alerts

4

Combines Vision AI + IoT +
Automation
Not separate modules - one
intelligent healthcare
system.

Git Hub Link

Please test and Paste the working GitHub URL –<https://github.com/yash14063/vois-35>

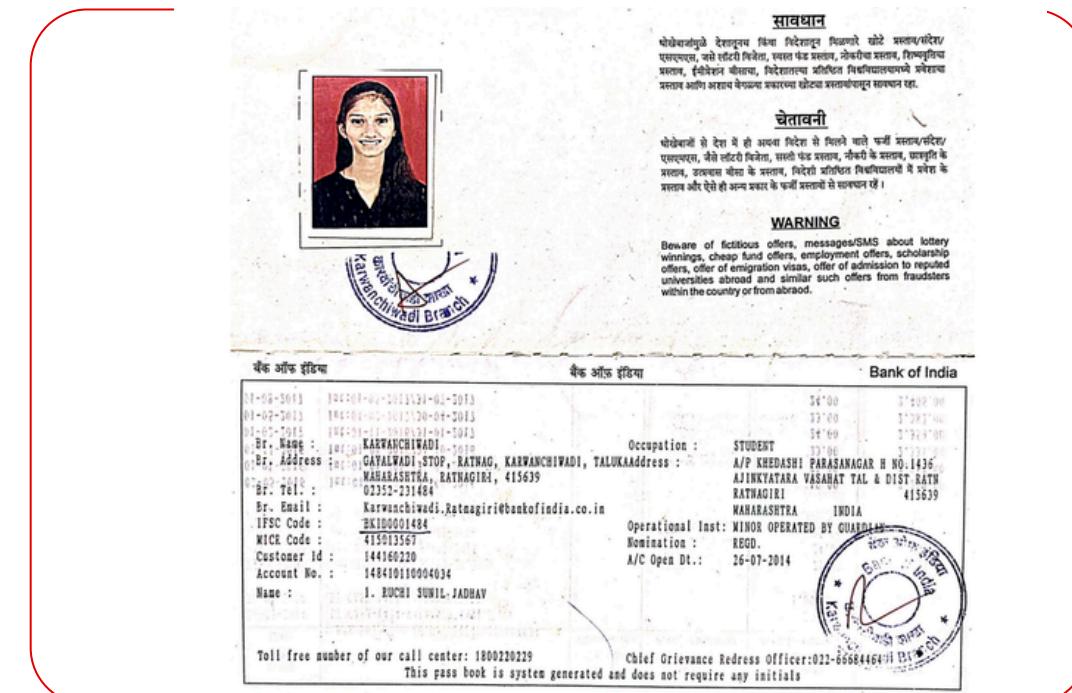
Future Scope

- Emotion & Stress Detection (NEXT-LEVEL AI)
- AI Voice Cloning (Personalized Speech)
- Real-Time Language Translation
- Self-Learning Gesture Intelligence
- Mobile + Wearable App (Mass Adoption)
- Blockchain-Based Medical Data Security
- Emergency Response Connectivity:
Auto-notify ambulance services with patient
data and location

Bank Details

| Full Name (as per bank records): | Bank Name | Branch Name | Account Number | Account Type (Savings / Current) | IFSC Code |
|----------------------------------|---------------------|---------------|-----------------|----------------------------------|-------------|
| YASH SAMADHAN SAOJKHEDE | KOTAK MAHINDRA BANK | JALGAON | 4748453258 | SAVINGS | KKBK0000697 |
| RUCHI SUNIL JADHAV | BANK OF INDIA | KARWANCHIWADI | 148410110004034 | SAVINGS | BKID0001484 |
| YUKTA BHARAT CHAUDHARI | UNION BANK OF INDIA | SHAHADA | 597102120016029 | SAVINGS | UNIN0559717 |

| | |
|---|---|
|  |  Kotak Mahindra Bank |
| <h1 style="margin: 0;">Account Statement</h1> | |
| 01 Jan 2026 - 31 Jan 2026 | |
| <hr/> | |
| <p>Yash Samadhan Saokhede</p> | |
| CRN xxxxxx605 | |
| Plot No 30 Block N 04 Yamuna Nagar Bhusawal Road Jalgaon Jalgaon - 425001 Maharashtra - India | |
| Account No. 4748453258 Account Type Savings Branch Jalgaon - Shivaji Nagar | |
| Account Status Active Nominee Registered Yes | |
| Currency INDIAN RUPEE | |
| <hr/> | |
| MICR 425485002 IFSC Code KKBK0000697 | |



| | | |
|--|--|--|
| <p>नवीनतय संशोधन / Latest Amendments</p> <p>1. निर्वाचक खाते के संबंध में / About Dormant Accounts</p> <ul style="list-style-type: none"> • लगातार 12 महीने के संबंध में न हुए कामों खाते को निर्वाचक खाते के समय में वर्तीकृत कर दिया जावेगा। निर्वाचक खाते में परिवालन करे अनुच्छेद नहीं होते। खाते का संख्या जारी के लिए इस कामों खाता प्रक्रिया में समाप्त कर तो यह निर्वाचक खाते को पुनः साझा कराया जिस समय पर भी यह एक खाता न हो। • Saving Banks Accounts, which are inoperative for a continuous period of 12 months will be classified as Dormant. Operations will not be allowed in Dormant Account. Customers are requested to contact the Branch Manager for re-activating the account and are requested not to issue any cheques on Dormant Account before they are reactivated. <p>2. चेक पर परिवर्तन / अपरिवर्तन के संबंध में / About Alterations / Overwritings on cheques</p> <ul style="list-style-type: none"> • चेक पर जोई परिवर्तन / सांखेति न किया जाए, अपरिवर्तन के लाय, रकम (पुनः चेकबॉर्ड को द्वारा से दिलाई में परिवर्तन को छोड़कर) आदि में परिवर्तन के लिए नया चेक प्रयोग करें। • No changes/corrections should be carried out on the cheques. For any change in the payee's name, the amount (other than date for validation purpose) etc, fresh cheque forms should be used. <p style="text-align: right;"><i>(Photo)</i></p> | | <p>युनियन बैंक  Union Bank <small>of India</small></p> <p>SHARADA TAL SHARADA ANUSAYA SANKUL CS. 1000016029 DONDALCHA BLDG. NO. 10, 1st FLOOR MUMBAI - 400 001 INDIA</p> <p>Issue Date: 25-09-2013 Sr. No.: 1 IFSC Code : UBLB00559717</p> <p>शाखा / Branch : शाखा का पाया / Branch Address :</p> <p>शाखा का पाया No. / Branch Phone No: 02220016029 चालू क्र. / Account No.: 00000000000000000000 In the Name of : MS YUKTA BHARAT CHAUHARI Name / Name (i) : ELECTRICAL/ELECTRONICS/ENG'S IT (ii) : RANI MEDICAL SHARADA TAL SHARADA (iii) : SHARADA Pin : 425409 MAHARASHTRA INDIA पेश / Occupation: 27-05-2012 पाया / Address : Branch Phone No : 2565224114 पाया खाते की नामिता Date of Opening A/c: Each of the Beneficiaries in your accounts including locker, to avoid responsibilities to your legal heirs in settlement of claims after you. Nomination can be changed/modified. General info: / Note: If Registered at MCA 21 N Branch Accountant</p> |
|--|--|--|

Team Member 1

Passbook/ Bank Statement With Name and Account Number

Team Member 2

Passbook/ Bank Statement With Name and Account Number

Team Member 3

Passbook/ Bank Statement With Name and Account Number

Thank You