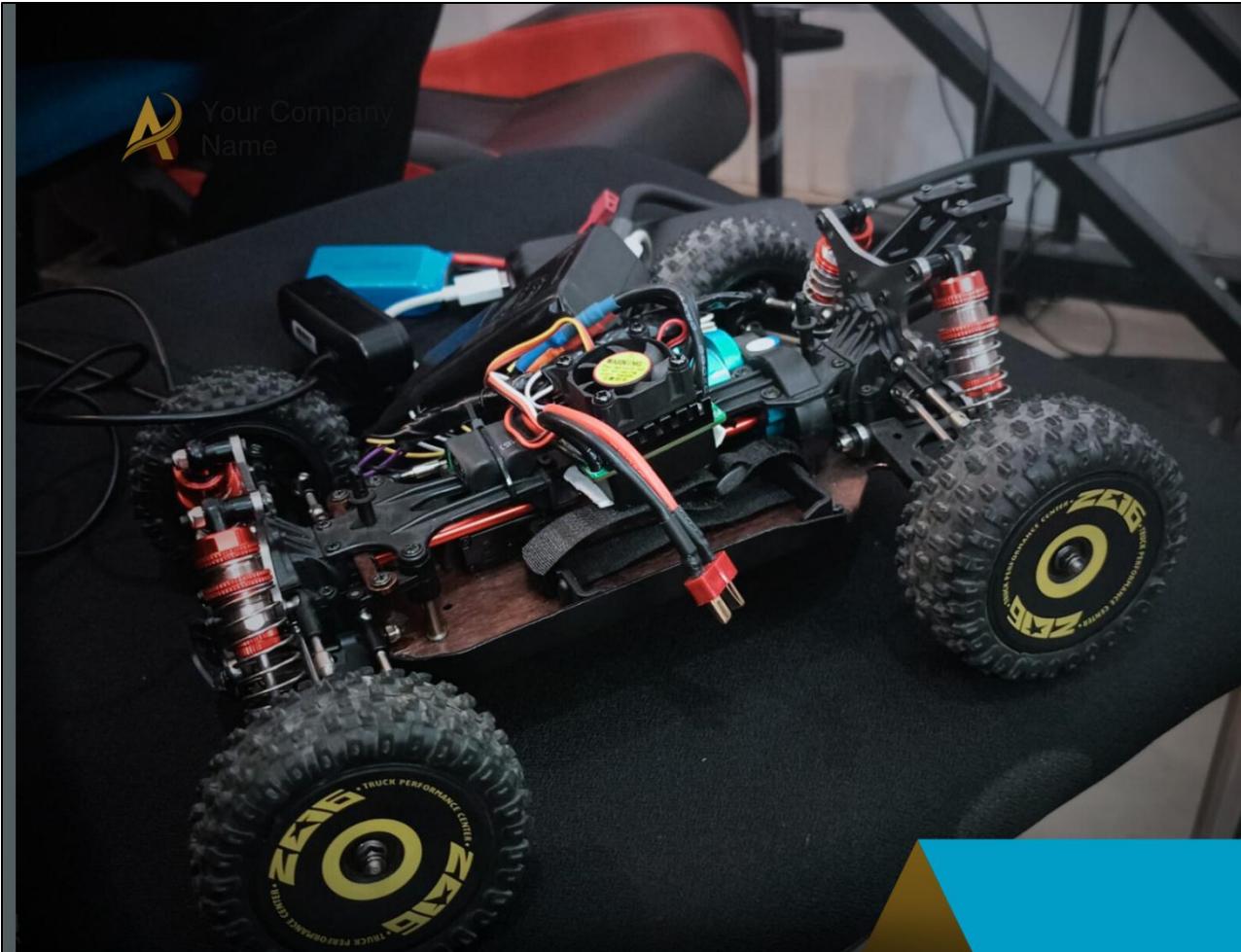


Business Proposal: Remote Rally Driving

RC REMOTE DRIVING

BUSINESS PROPOSAL DOCUMENTATION

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Executive Summary

This proposal outlines a business venture centered on an innovative remote-controlled (RC) car system designed to deliver a uniquely immersive and realistic driving experience. The project, "Remote Rally Driving," utilizes a Raspberry Pi 4-powered RC car integrated with a Logitech G29 steering wheel and pedals, providing real-time, high-fidelity control and a first-person view (FPV) via live video streaming.

The primary mission is to revolutionize the entertainment and educational landscape by offering an interactive platform that appeals to all age groups. The current market lacks accessible, lifelike driving simulators that bridge the gap between virtual gaming and real-world interaction. Our solution directly addresses this by providing a hands-on, engaging experience suitable for events, educational fairs, gaming hubs, and recreational use.

Financially, the business model is built on diverse revenue streams including rental income, event registration fees, direct product sales, and strategic partnerships with schools and event organizers. Projections indicate an initial **loss in Year 1** due to development costs, reaching a **break-even point in Year 2**, and achieving significant profitability in Year 3 with a 69% profit margin. This venture is positioned to capture a unique market segment by blending technology, entertainment, and education into a scalable and profitable business.

The Opportunity

Problem Statement

The current market for remote-controlled vehicles is dominated by traditional joystick controls that fail to provide a tactile or realistic driving experience. This limits user engagement for both enthusiasts and casual users. Furthermore, organizations, event organizers, and educational institutions struggle to find truly interactive and captivating entertainment options that encourage participation and provide memorable experiences. There is a clear gap for an innovative solution that merges real-world control dynamics with remote operation.

Our Solution

This project introduces an IoT-enabled RC car system that provides a highly immersive driving experience by using a Logitech G29 steering wheel and pedals for control. A live video feed from a camera mounted on the car gives the user a first-person view, replicating the sensation of driving a real vehicle. This system is designed to be a versatile attraction for various settings, including:

- Events and expos
- Gaming hubs
- Educational fairs and STEM programs
- Family entertainment centers and cafes

Mission and Vision

- **Mission:** To lead the RC industry by blending advanced technology with personalized experiences that create value for enthusiasts and foster a profitable ecosystem of learning and entertainment.

We aim to revolutionize the entertainment landscape by providing a unique, hands-on driving experience that mirrors the thrill of real-world driving and enhances social settings.

- **Vision:** To evolve our project into a versatile platform, starting with dedicated spaces for RC racing and tournaments to build a vibrant community. In the long term, we envision adapting the technology for surveillance, security, and eventually, autonomous vehicles in hazardous environments to improve safety and efficiency.

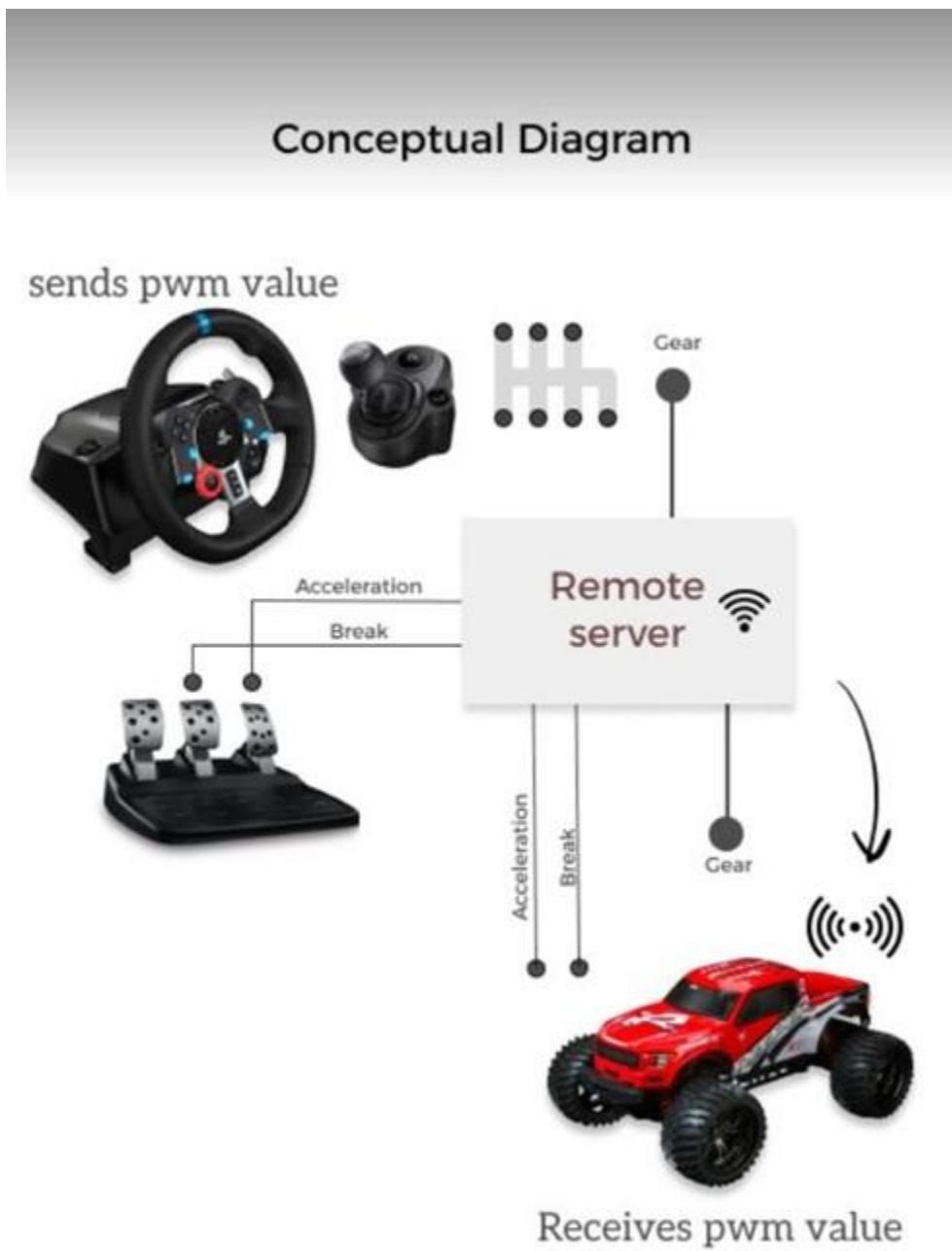
Technical Overview

How It Works

The system integrates precision hardware and robust software to deliver a seamless remote driving experience.

1. **User Input:** The user operates a Logitech G29 steering wheel and pedals connected to a client laptop.
2. **Data Processing & Transmission:** Python libraries on the laptop process the inputs for steering, acceleration, and braking. This data is transmitted via a web socket over WiFi to the RC car.
3. **Onboard Control:** A Raspberry Pi 4, serving as the car's central processor, receives the data. It uses PigPi to generate PWM (Pulse Width Modulation) signals.
4. **Vehicle Actuation:** These signals control the hardware: a servo motor for precise steering and an Electronic Speed Controller (ESC) for managing the DC motor's speed.
5. **Live Feedback:** A camera on the car streams live video back to the user, creating an immersive FPV driving mode.

Conceptual Diagram:



3.2. Project Aim and Objectives

Aim: To develop an IoT-enabled remote-

controlled car that provides a realistic driving experience using a Logitech G29 steering wheel and pedals, integrating live video streaming and precise vehicle control.

Objectives:

- Develop a responsive remote-controlled car system using Raspberry Pi 4 and Logitech G29.
- Enable real-time processing of steering, acceleration, and braking inputs.

- Integrate live video streaming for first-person view driving using OpenCV and Flask.
- Ensure seamless communication between the hardware and the control interface.
- Provide an immersive and realistic driving experience.

Market Analysis

Customer Segments

The product is designed to appeal to a diverse range of customers:

- Racing Enthusiasts: Individuals passionate about motorsports seeking experiences that offer the thrill of real racing.
- Youth and Students: A tech-savvy demographic interested in the fusion of technology and entertainment, with a curiosity for innovative, hands-on activities.
- Educational Institutions: STEM-focused schools and programs can use the system as a practical tool to teach robotics, programming, and control systems.
- Automotive Industry Partners: Companies that can utilize the platform for demonstrations or training.

Unique Value Proposition

Experience the thrill of racing anywhere, anytime. Our project offers a unique blend of realism and innovation by merging physical, real-world controls with a remote-controlled vehicle. The live video feedback and tactile controls deliver an unparalleled level of engagement that sets it apart from traditional RC cars or virtual simulators.

Unfair Advantage

Our competitive edge lies in being a first-mover in Nepal with this specific hybrid model. The system is built with innovative integration of affordable and accessible components like the Raspberry Pi and Logitech G29, ensuring cost-effectiveness without sacrificing performance. This allows us to offer a high-quality, unique, and scalable interactive experience that traditional systems cannot match.

Go-to-Market Strategy

Channels

We will reach our customer segments through a multi-channel approach:

- Referral Channels: Leveraging word-of-mouth within tight-knit communities of racing and gaming enthusiasts.
- Digital Channels: Utilizing social media, a dedicated website, and online marketing campaigns to create buzz and engage a wide audience.
- Partnerships: Collaborating with event organizers, educational institutions, and gaming hubs to directly showcase the product to target audiences.

Revenue Streams

Our revenue will be generated from multiple sources, ensuring financial stability and growth:

- Rental Income: Offering the RC driving experience on a pay-per-hour basis at dedicated venues or events.
- Event Registrations: Charging fees for participation in organized racing challenges, tournaments, and league events.
- Direct Sales: Selling complete RC car kits to hobbyists and enthusiasts.
- Partnerships: Collaborating with schools and event organizers for paid engagements.

Financial Projections

The financial plan is structured for sustainable growth, moving from an initial investment phase to profitability by the third year.

Cost Structure Estimation

Costs are categorized into development, maintenance, and operations. The primary investment occurs in Year 1 for hardware and development, with costs decreasing significantly in subsequent years.

Cost Items	Year 1 (NPR)	Year 2 (NPR)	Year 3 (NPR)	Total (NPR)
Development Costs				
Hardware Components	330,000	165,000	-	495,000
Software Development	55,000	30,000	20,000	105,000
Prototyping	40,000	-	-	40,000
Maintenance Costs				
Repairs and Replacements	10,000	12,000	15,000	37,000
Software Updates	5,000	7,000	10,000	22,000
Operational Costs				
Transportation (Events)	60,000	80,000	100,000	240,000
Venue Rentals (Events)	120,000	150,000	200,000	470,000
Marketing and Promotion	480,000	600,000	720,000	1,800,000
Total Costs	1,100,000	1,044,000	1,065,000	3,209,000

Revenue Streams Estimation

Revenue is projected to grow steadily as market presence and customer demand increase.

Revenue Streams	Year 1 (NPR)	Year 2 (NPR)	Year 3 (NPR)	Total (NPR)
Rental Income	600,000	900,000	1,500,000	3,000,000
Event Registrations	200,000	400,000	800,000	1,400,000
Direct Sales of RC Cars	150,000	360,000	540,000	1,050,000
Partnerships with Schools/Events	140,000	360,000	600,000	1,100,000
Total Revenue	990,000	2,020,000	3,440,000	6,450,000

Financial Summary

The business is projected to absorb an initial loss, break even in the second year, and become highly profitable by the third year of operation.

Year	Total Revenue (NPR)	Total Costs (NPR)	Net Profit/Loss (NPR)	Margin
Year 1	990,000	1,100,000	(110,000)	-10% (Loss)
Year 2	2,020,000	1,044,000	976,000	48% (Break-even) *
Year 3	3,440,000	1,065,000	2,375,000	69% (Profit)

Future Works and Recommendations

The long-term vision for this project involves expanding its technological capabilities to achieve higher levels of autonomy and functionality. Key areas for future development include:

- AI for Autonomous Driving: Implementing AI and machine learning algorithms for autonomous navigation.

- Object Detection: Integrating real-time object detection and obstacle avoidance to improve safety and decision-making in complex environments.
- Enhanced Connectivity: Upgrading to BLE (Bluetooth Low Energy) or 5G to ensure lower latency and more robust communication.
- Data and Location Services: Incorporating GPS for location tracking and telemetry systems for advanced data collection.

Conclusion

The Remote Rally Driving project represents a significant business opportunity to merge innovation, entertainment, and education. By creating an immersive experience that caters to a diverse audience, the venture is poised for success in a growing market. The financial strategy is sound, with a clear path to profitability based on scalable operations and multiple revenue streams. With a commitment to continuous innovation and a strong focus on customer engagement, this project has the potential to become a leader in interactive entertainment in Nepal and beyond.