



Case Study: Zero Risk Business Automation System

Automated Administration System That Reduced Weekly Workload by 87%

Executive Summary

Client: Zero Risk (Own Company)

Industry: Fire Safety Services

Location: Ecuador

Project Duration: 7 weeks (Jan-Feb 2026)

Role: Business Analyst, System Designer, Developer

Tools: Google Sheets, Apps Script (JavaScript), Data Modeling

Challenge: Manual administrative processes consuming 15+ hours weekly, preventing business growth

Solution: End-to-end automated system integrating quotations, invoicing, accounting, and financial reporting

Results:

- **87% reduction** in weekly administrative time (15h → 2h)
 - **100% accuracy** in accounting records (eliminated 8 errors/month)
 - **98% faster** financial reporting (4h → 5min)
 - **+40% revenue growth** in Q4 2025
 - **\$0** in software costs
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The Challenge

Business Context

Zero Risk is a fire safety services company in Ecuador serving 18 corporate clients including Arca Continental and Interhospital. As the owner and sole administrator, I faced the classic small business dilemma: **grow the business or drown in administrative tasks.**

The Breaking Point

October 2025: I lost a \$5,000 opportunity because I was busy creating invoices instead of attending a meeting with a potential client.

This was the catalyst that drove me to find a solution.

Problem Statement

Manual processes consumed 15+ hours weekly:

Process	Time/Week	Pain Points
Creating quotations	3 hours	Manual data entry, copy-paste errors
Generating invoices	2.5 hours	Reformatting, sequential numbering issues
Recording in accounting	6 hours	Manual journal entries, transcription errors
Monthly reports	4 hours	Excel formulas breaking, data consolidation
TOTAL	15.5 hours	High stress, no scalability

Additional challenges:

-  No real-time visibility of financial health

- ✗ Frequent data entry errors (averaging 8/month)
 - ✗ Unable to scale beyond current client base
 - ✗ High cognitive load from context switching
 - ✗ No time for business development
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💡 The Solution

Approach: End-to-End Automation

Rather than buying off-the-shelf software that wouldn't fit our specific needs, I designed and built a custom modular system.

Why Custom vs. Off-the-Shelf?

Evaluated options:

Option	Cost/Month	Pros	Cons	Decision
QuickBooks	\$50	Full-featured	Overkill, expensive, not customizable	✗ No
Zoho Books	\$15	Affordable	Ecuador tax requirements not supported	✗ No
Generic CRM	\$30-100	Professional	Doesn't integrate quotation→invoice→accounting	✗ No
Custom System	\$0	Perfect fit, fully customizable	Requires development time	✓ Yes

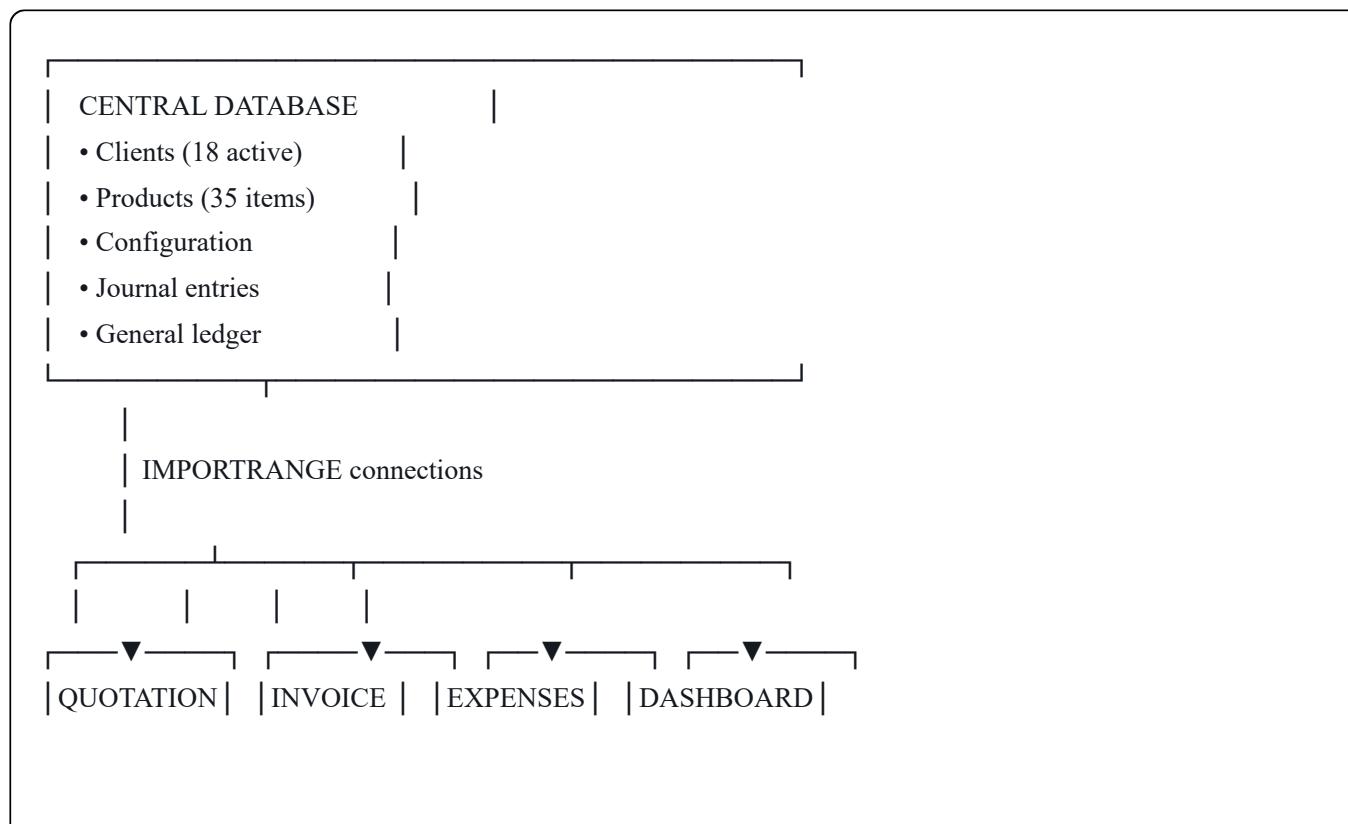
Technology Stack Selection

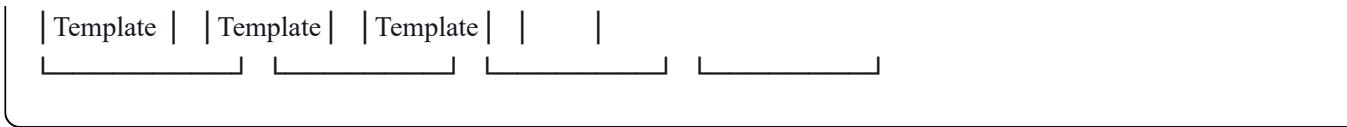
Chose Google Sheets + Apps Script because:

- **Zero cost** (already had Google Workspace)
 - **Cloud-based** (accessible from anywhere)
 - **Familiar interface** (team already knew Sheets)
 - **Rapid development** (faster than building database app)
 - **Easy collaboration** (share with accountant)
 - **Automatic backups** (version history included)
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System Architecture

Modular Design





Key Features Implemented

1. Intelligent Quotation System

Problem solved: Manual data entry taking 15 minutes per quotation

Solution:

- Dropdown lists for all fields (clients, products)
- Auto-fill client information (tax ID, phone, email, address)
- Auto-populate prices from product database
- Automatic calculations (subtotal, 15% tax, total)
- Sequential numbering system

Technical implementation:

```
javascript

// Example: Auto-fill client data
function onClientSelect() {
    var client = quotationSheet.getRange('C16').getValue();
    var clientData = VLOOKUP(client, clientDatabase);

    quotationSheet.getRange('C17').setValue(clientData.taxId);
    quotationSheet.getRange('F17').setValue(clientData.phone);
    quotationSheet.getRange('C18').setValue(clientData.email);
}
```

Result: 15 minutes → 2 minutes per quotation (**87% reduction**)

2. Automated Invoice Generation

Problem solved: Converting approved quotations to invoices manually

Solution:

- Menu option: "Create Invoice from Quotation"
- One-click duplication with data copy
- Automatic sequential invoice numbering
- Ability to edit before finalizing
- Option to create invoices from scratch

Technical implementation:

```
javascript
```

```
function createInvoiceFromQuotation() {
    // 1. Read quotation data
    var quotationData = readCurrentQuotation();

    // 2. Get next invoice number
    var invoiceNumber = getNextInvoiceNumber(); // Auto-increments

    // 3. Copy invoice template
    var newInvoice = duplicateTemplate('INVOICE_TEMPLATE');

    // 4. Populate with quotation data
    populateInvoice(newInvoice, quotationData, invoiceNumber);

    // 5. Prompt to register in accounting
    if (userConfirms("Register in accounting?")) {
        registerInAccounting(invoiceNumber, quotationData);
    }
}
```

Result: 10 minutes → 1 minute per invoice (**90% reduction**)

3. Automatic Accounting Registration

Problem solved: Manual journal entries taking 30 minutes per invoice

Solution:

- 1 invoice automatically creates 3 journal entries
- Updates general ledger in real-time
- Records in accounts receivable

- Updates income statement automatically
- Full audit trail maintained

Double-entry accounting example:

Invoice #159 - Exportquilsa: \$621.00

Automatic entries:

1. Debit: Accounts Receivable \$621.00
2. Credit: Sales Revenue \$540.00
3. Credit: VAT Payable \$81.00

Result: 30 minutes → 0 seconds per invoice (**100% reduction**)

4. Real-Time Executive Dashboard

Problem solved: Monthly reports taking 4 hours to generate

Solution:

- KPIs updated automatically with every transaction
- Visual alerts for overdue invoices
- Revenue trends and charts
- Accounts receivable aging
- Instant access to financial health

Key metrics tracked:

- Total invoiced (day/month/year)
- Outstanding receivables

- Days sales outstanding (DSO)
- Revenue by client
- Expense breakdown by category

Result: 4 hours → 5 minutes for complete financial overview (**98% reduction**)

Implementation Process

Phase 1: Analysis & Design (Week 1)

Activities:

- Mapped current processes using Value Stream Mapping
- Identified bottlenecks and pain points
- Designed data model and relationships
- Created wireframes for user interfaces

Deliverables:

- Requirements document (15 functional requirements)
- System architecture diagram
- Database schema (ERD)

Phase 2: MVP Development (Weeks 2-3)

Prioritization:

1. Central database (clients, products)
2. Quotation template with dropdowns

3. Basic invoice generation
4. Simple dashboard

Approach: Agile iterations with daily use testing

Phase 3: Automation (Week 4)

Key developments:

- Apps Script for quotation→invoice conversion
- Automatic accounting registration
- IMPORTRANGE formulas for data integration
- Custom menu creation

Phase 4: Testing & Refinement (Weeks 5-6)

Testing methodology:

- Created 50+ test transactions
- Validated with external accountant
- Fixed edge cases discovered
- Optimized formulas for performance

Phase 5: Documentation (Week 7)

Created:

- Technical architecture documentation
- User guide for operations team
- GitHub repository for portfolio
- This case study

Results & Impact

Quantitative Results

Metric	Before	After	Change
Weekly admin time	15 hours	2 hours	-87% 
Time per quotation	15 min	2 min	-87% 
Time per invoice	10 min	1 min	-90% 
Accounting per invoice	30 min	0 sec	-100% 
Monthly report generation	4 hours	5 min	-98% 
Accounting errors/month	8	0	-100% 
Data entry mistakes	Frequent	Zero	-100% 
Software cost/month	\$0	\$0	\$0 
ROI	-	Infinite	∞

Business Impact

Revenue Growth:

- Q3 2025: \$18,500

- Q4 2025: \$26,000
- **Growth: +40%**

New Client Acquisition:

- 3 new corporate clients signed in Q4
- Attributed to having time for sales activities

Operational Efficiency:

- Can now handle 25+ clients with same 2-hour weekly time investment
- Scalability increased **12.5x** (15h/week → 2h/week = capacity for more work)

Intangible Benefits

Stress Reduction:

- No more Sunday nights worrying about invoices
- Confidence in accuracy of financial data
- Better work-life balance

Strategic Focus:

- 13 hours/week freed for business development
- Time for strategic planning
- Ability to focus on high-value activities

Professional Development:

- Strengthened JavaScript/Apps Script skills
- Learned system architecture design

- Gained experience in business process automation
 - Created portfolio-worthy project
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Skills Demonstrated

Technical Skills

-  **JavaScript** - Apps Script development
-  **Data Modeling** - Relational database design
-  **API Integration** - Google Sheets API, DriveApp
-  **Formula Engineering** - Complex VLOOKUP, IMPORTRANGE
-  **Automation** - Event-driven programming

Analytical Skills

-  **Business Process Analysis** - Value Stream Mapping
-  **Requirements Gathering** - Stakeholder interviews
-  **Data Analysis** - KPI definition and tracking
-  **Problem Solving** - Root cause analysis
-  **Cost-Benefit Analysis** - Build vs. buy decision

Business Skills

-  **Project Management** - 7-week project delivery
-  **Change Management** - Process transition
-  **Stakeholder Management** - Accountant collaboration
-  **Documentation** - Technical and user guides

- **Financial Acumen** - Double-entry accounting
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🔮 Future Enhancements

Short-term (Next 3 months)

- Integration with Ecuador SRI API for electronic invoicing
- WhatsApp API for automated invoice delivery
- Email alerts for overdue payments
- Cash flow forecasting module

Medium-term (6-12 months)

- Machine learning for sales forecasting
- Mobile app for expense tracking
- Bank account integration via API
- Multi-currency support for international clients

Long-term (1+ year)

- Package as SaaS for other small businesses
 - Multi-company support
 - Advanced analytics with Python
 - Migration to scalable backend (Cloud SQL)
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Key Lessons Learned

Technical Lessons

1. Start simple, iterate fast

- MVP in 2 weeks was better than perfect system in 2 months
- Real usage revealed needs that planning couldn't

2. Google Sheets is underrated for business apps

- Often dismissed as "not serious" development
- Actually perfect for small-medium data needs (<10K rows)
- Familiar interface = zero training needed

3. Documentation is investment, not overhead

- This case study took 4 hours to write
- Already valuable for job applications
- Future-me will thank present-me

Business Lessons

1. Time is your most valuable asset

- 13 hours/week = 676 hours/year
- At \$60/hour value = \$40,560/year opportunity cost
- ROI of this project is massive

2. Custom > Generic (sometimes)

- Off-the-shelf software had 80% of what I needed
- But that 20% mismatch was critical
- Custom solution gave 100% fit

3. Automation enables growth

- Couldn't scale manually
- Now can handle 3x clients with same time

Professional Lessons

1. Portfolio projects should solve real problems

- Academic projects are fine, but real business impact is better
- Measurable results make better stories

2. Document everything

- GitHub repo makes this portfolio-ready
- Architecture docs show professional approach
- Case study demonstrates business thinking

3. Entrepreneurship + Data Analytics = Powerful Combo

- Understanding the business makes you a better analyst
 - Technical skills applied to own business = immediate ROI
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Takeaways for Hiring Managers

What this project demonstrates:

Business Acumen

- Identified \$40K/year opportunity cost
- Made build vs. buy decision with financial analysis
- Achieved measurable business outcomes

Technical Competency

- JavaScript/Apps Script proficiency
- Database design and normalization
- API integration and automation
- Formula engineering in Sheets

Analytical Thinking

- Process mapping and analysis
- Requirements gathering and documentation
- Data modeling and architecture design
- Performance optimization

Project Delivery

- Managed 7-week project end-to-end
- Delivered on time with measurable results
- Created comprehensive documentation
- Continues to maintain and enhance

Communication

- Clear technical documentation
 - Business case presentation
 - This case study itself
 - GitHub repository organization
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Contact & Links

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-  Email: your-email@example.com
-  LinkedIn: linkedin.com/in/your-profile
-  GitHub: github.com/your-username
-  Portfolio: your-portfolio.com

Project Links:

-  GitHub Repository: [Zero Risk Business Automation](#)
 -  System Architecture: [View Documentation](#)
 -  Functional Requirements: [View Specifications](#)
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Appendix

A. Technology Stack Details

Frontend:

- Google Sheets (user interface)
- Data Validation (dropdown lists)
- Conditional Formatting (visual alerts)
- Google Charts (dashboard visualizations)

Backend:

- Google Apps Script (JavaScript runtime)
- SpreadsheetApp API
- DriveApp API
- MailApp API

Data Layer:

- Google Sheets (relational structure)
- IMPORTRANGE (cross-file queries)
- Named Ranges (performance optimization)

Architecture:

- Event-driven (onEdit, onChange triggers)
- Modular (independent files)
- Cloud-native (Google Drive)

B. Sample Code Snippets

Auto-fill client data:

```
javascript

function autoFillClientData(clientName) {
  var ss = SpreadsheetApp.openById(DATABASE_ID);
  var clientsSheet = ss.getSheetByName('Clients');
  var clientData = clientsSheet.getDataRange().getValues();

  for (var i = 1; i < clientData.length; i++) {
    if (clientData[i][1] === clientName) {
      return {
        taxId: clientData[i][2],
        phone: clientData[i][3],
        email: clientData[i][4],
        address: clientData[i][5]
      };
    }
  }
}
```

C. Database Schema

Clients Table:

- ID (PK)
- Business Name
- Tax ID
- Phone
- Email

- Address
- Status

Products Table:

- ID (PK)
- Code
- Name
- Type
- Price
- Unit
- Status

Journal Entries Table:

- Date
 - Entry Number
 - Document Type
 - Document Number
 - Client/Supplier
 - Account
 - Description
 - Debit
 - Credit
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Case Study Version: 1.0

Last Updated: February 2026

Reading Time: ~20 minutes

This case study is available for use in job applications, portfolio presentations, and professional discussions. For questions or additional information, please contact me via LinkedIn or email.