# Requirements Analysis
# Child Sponsorship and Analytics for AMG Guatemala

To be submitted to the Department of Mathematics and Computer Science
Gordon College
in partial fulfillment of the requirements for the degree of
Bachelor of Science in Computer Science

by

Jacob Buettner
Joshua Richard
Dane Vandenberg

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# 1. Introduction

## 1.1 Purpose of the system

The purpose of this system is to provide local Guatemalan donors the opportunity to support children in their own country and to help AMG Guatemala better focus their aid efforts through computed analytics on the data they will be storing.

## 1.2 Scope of the system

This project will supply AMG Guatemala with a database to house information on supported and unsupported children as well as donor information. This database will communicate with an all Spanish website designed by AMG Guatemala. All financial information will be stored by the bank in Guatemala that will be handling the financial transactions for this new project.

## 1.3 Objectives and success criteria of the project

The primary objective of this system is to provide child sponsorship functionality to AMG International's website and provide local Guatemalan donors the opportunity to support children in their own country. This system will also provide AMG Guatemala with reports based on computed analytics with data from children currently within the organization.

## 1.4 Definitions, acronyms, and abbreviations

AMG Guatemala - division of AMG International which focuses specifically on missions in Guatemala.

AMG International - parent non-profit of AMG Guatemala encompassing all of the countries that AMG supports.

Banco G&T - Bank supporting AMG Guatemala's finances

Banco Rendimento - Online financial transaction service AMG Guatemala would like to leverage for managing online donor payments

GoDaddy - DNS registry that AMG Guatemala currently uses for managing their web infrastructure

MongoDB - NoSQL document database that will be used for storing child and sponsor information

Node.js - an open source, cross platform runtime environment for developing server side web applications

Woord en Daad - Dutch, Christian, non-profit organization both sponsoring children and providing databases that AMG Guatemala uses currently to store child, school, and donor information

### 1.5 References

Brian Dennett - President of AMG Guatemala, project sponsor
Carlos Rios - Web Developer located in Guatemala who developed AMG Guatemala's Spanish website
Alex Orellana - Technical Director for AMG Guatemala
Russ Tuck - School Advisor and Consulting Professor.

### 1.6 Overview

With the 2011 - 2015 five year plan complete, Advancing the Ministries of the Gospel (AMG) Guatemala, a Christian non-profit based in the country of Guatemala, begins a new five year marathon focusing on utilizing local resources. Among the many ideas for leveraging Guatemalan resources, none is more ready for implementation than providing child sponsorship through AMG Guatemala instead of through the larger group, AMG International. Right now, child sponsorship is only available to English speaking, domestic donors through AMG Guatemala's parent group, AMG International. This will allow native Guatemalans to support children in their own country, instead of having the rely solely on international donors.

## 2. Current system

Currently there are three databases used by AMG International located in the Netherlands, Canada, and the United States. Data is stored across these three databases and is not duplicated across different databases. Information stored in these databases is maintained by AMG International and the data is stored in English. As of right now, donations are collected and disbursed by AMG International which makes it difficult for AMG Guatemala who operates in the Guatemalan currency.

## 3. Proposed system

### 3.1 Overview

With the 2011 - 2015 five year plan complete, Advancing the Ministries of the Gospel (AMG) Guatemala, a Christian non-profit based in the country of Guatemala, begins a new five year marathon focusing on utilizing local resources. Among the many ideas for leveraging Guatemalan resources, none is more ready for implementation than providing child sponsorship through AMG Guatemala instead of through the larger group, AMG International. Right now, child sponsorship is only available to English speaking, domestic donors through AMG Guatemala's parent group, AMG International. This will allow native Guatemalans to support children in their own country, instead of having the support entirely outsourced to domestic donors.

Our client and contact is Brian Dennett, President of AMG Guatemala. Brian is in charge of all aspects of the Guatemalan division of AMG, a worldwide company operating in 30 countries around the world. With the inherent need of a formal problem

statement on this new five year plan, Brian and his team have written a summary of the issues.

> *AMG's plan for the next five years (2016-2020) revolves around going deeper not wider. We have an excellent ministry model in the Bridge to Life, an excellent staff, presence in 30 key communities of the country and strong partnerships with relevant and like-minded organizations, and of course, the local church. We want to be sure that there is a high level of quality and results within all of our interventions before continuing a grow wider plan in the future. An important part of our long-term sustainability will be to leverage the resources already here in Guatemala, the private sector, organizations and individuals that should be helping in the development of their own country. We will maintain and attempt to grow our international funding base, while focusing intently on mobilizing Guatemalans to serve with their time, talents and treasures. AMG has operated a child sponsorship program for years and has thousands of child sponsors in the U.S, Canada and Europe. It is time for Guatemalans to have the opportunity to sponsor children as well. We hope to offer them that chance in 2016 and beyond. Therefore, we need a database system that will offer us the ability to present children for sponsorship to the population of Guatemala. We have several awareness campaigns planned in the next five years that will inspire Guatemalans to become more philanthropic and we have solid relationships with churches and the Christian media in Guatemala in order to promote. Among the opportunities they will have to participate, we hope that sponsorship will be at the forefront! We have registered the domain "miniño.org" and "yolevoyaguate.com" and hope to direct potential givers to that site in order to select children by age, gender, location, etc… for sponsorship.*

As we build this new child sponsorship component, we expect there to be several potential risks involved with the development of this system. The first and potentially most damaging of these risks is the difficulty in developing communication and collaboration across teams that is both blatantly clear and strictly concise. Because we will need to bridge geographic, language, and cultural gaps with our client organization and their contacts, frequent communication will play a vital role in the success of our system.

The second possible risk will be handling financial transactions, because we will have to collect, and maintain secure financial transactions without any room for error. This will require us to securely communicate with bank APIs while dealing with any infrastructure challenges that Guatemala presents. No financial data will be stored by our system, as previously stated above it will be collected, packaged, and sent securely to AMG Guatemala's financial transaction vendor. Because we are not storing the data, any risks involved with this are avoided with the development of our system, but we will still need to maintain the integrity of AMG Guatemala's donor information when our system does come in contact with this critical data.

## 3.2 Functional requirements

Child sponsorship functionality is the main functional requirement for our system. AMG Guatemala wants to allow their local donors the opportunity to sponsor a child on a monthly basis. To complete this, we will be building a backend infrastructure with the use of API calls in the website to our new database.

A sponsor will be allowed to select one or more children to sponsor through the spanish website and will be able to sponsor those children. While our project is concerned with creating the child sponsorship functionality, AMG Guatemala will presumably add functionality to allow a donor to check their current giving and edit those givings, and cancel them if they wish.

Payment and financial information will be handled by the financial institution AMG Guatemala choose to work with. Our system will not be storing any financial information to reduce security risks. The information we send to the bank will have to be sent of https.

Intuitive and convenient organization of our client's data is the next functional goal we will be addressing. We are tasked with providing our client with a new cloud-based database for currently unsponsored children with the knowledge that they will continue to add the rest of their child data to this. Ultimately, sponsor and child data will be replicated in this new database.

## 3.3 Non-functional requirements

### 3.3.1 Usability

This system will need to be easy to use for the employees of AMG Guatemala and easy to maintain.

### 3.3.2 Reliability

This system will have to be highly reliable. We will be handling sensitive data on donors and children as well as financial data from the donors. This information cannot be lost nor can it corrupted in anyway. To ensure reliability we will implement transaction logging and we will work with AMG Guatemala to backup for their data as they see fit.

### 3.3.3 Performance

Our system will have to be able to handle the traffic AMG Guatemala will be experiencing. We have decided to use Node.js so that we will be able to

accommodate any amount of traffic our system will be experiencing from our customers. Node interacts with the database using a single thread that remains open between the website and the database, which allows for non-blocking asynchronous task completion.

### 3.3.4 Supportability

The system we create will have to be easy to support for AMG Guatemala after the conclusion of our project. To reduce to cost of supportability for AMG Guatemala we will be automating as much of the databases functionality as possible.

### 3.3.5 Implementation

The database we will be creating for AMG Guatemala will be deployed on the cloud, as our client has requested. This database will store information on all children AMG Guatemala will be responsible for and will have to interact with an all Spanish website designed by AMG Guatemala.

### 3.3.6 Interface

AMG Guatemala employees will be able to interact with the database through Mongo-Express, a web based interface, or AMG Guatemala employees may interact with the database through the command line. The analytics will be visualized and interacted with through D3, a JavaScript library for manipulating documents based on data. Our fields and tables will be written in english and translated to spanish by us.

### 3.3.7 Packaging

There will be no need for packaging since this project will be implemented in the cloud and everything will be installed and set up by the Gordon team.

### 3.3.8 Legal

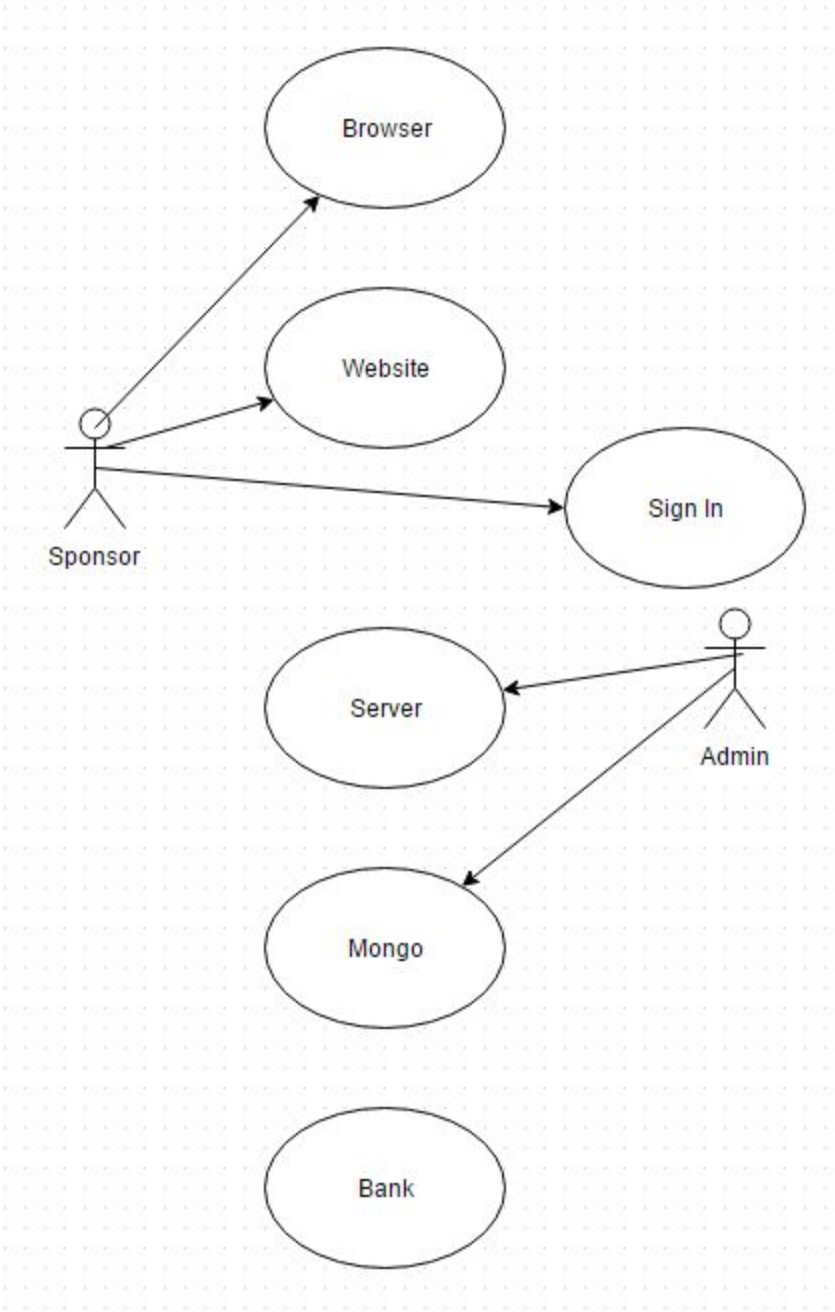
All legal considerations beyond donor and child privacy and information security, which are discussed above, will be handled by AMG Guatemala.

## 3.4 System models

### 3.4.1 Scenarios

The only scenario we'll be working with immediately is one where a donor is attempting to sponsor a child through the spanish website.

### 3.4.2 Use case model




### 3.4.5 User interface—navigational paths and screen mock-ups

We will not be developing a user interface for this system.

## 4. Glossary

N/A