# TECHNOLOGY CONSULTING IN THE GLOBAL COMMUNITY

# Final Consulting Report

## Agahozo-Shalom Youth Village

Travis Stahl Norikazu Edogawa

August 2018

## **Carnegie Mellon University**



### The Agahozo-Shalom Youth Village Executive Summary

Student Consultant, Travis Stahl Student Consultant, Norikazu Edogawa Consulting Partner, Deo Kabirigi

#### I. About the Organization

The Agahozo-Shalom Youth Village (ASYV) in Rwamagana, Rwanda was founded in 2007. The village was created as a systematic solution to combat the orphan crisis in Rwanda, ASYV was founded with the following mission statement:

Through healing, education, and love, the Agahozo-Shalom Youth Village empowers orphaned and vulnerable Rwandan youth to build lives of dignity and contribute to a better world.

The goal of the 10-week partnership between Technology Consulting in the Global Community (TCinGC) and ASYV was to develop technological solutions to mitigate designated issues within the village. Two graduate students from Carnegie Mellon University's Heinz College represented TCinGC and arrived on June 4th, 2018. Specifically, Norikazu Edogawa focused on the problems related to visitor management and Travis Stahl focused on problems related to farm management.

#### II. Installation of Visitor Management System

Visitor management included the area of scheduled and surprise visits from outside guests. A common occurrence at ASYV, with group sizes ranging from a single person to groups of 75+ people. These visitations benefit the organization by increasing funding, providing an opportunity to transfer skills and knowledge, and spreading awareness of ASYV. However, the visitations also create a security concern for the village due to the extensive amount of people given access to the village and children within.

The Visitor Management System (VMS) was designed by the student consultants to improve village security through enhanced collection of visitor information. Prior to the Visitor Management System, data collection was inconsistent and lacked continuity. The first step in implementing the VMS was designating the online data collection tool, Salesforce, as the primary location for storing both scheduled and surprise visitor data. Next, the CommCare app was created and installed on ten kindle tablets, 4 or 2? which were placed at the security gate. The CommCare app collects the name, organization, email, and nationality of guests as they enter the village. The information gathered is essential in improving ASYV security practices as it allows the organization to see who is entering the village on what days. Additionally, the information can be used for development and outreach purposes.

Major risks that threaten the sustainability of the VMS include:

- Insufficient experience with Salesforce and CommCare
- Coordination between visitor coordinators and security team
- Subscription costs for Salesforce and CommCare

After designing Salesforce and CommCare to fit the needs of the VMS, the consultants trained eight members of the ASYV security team, two members of the Information Technology team, and three visitor coordinators. The goal of the training was to give broad understanding of these data collection tools across separate village departments to provid project sustainability. At the conclusion of the training, the VMS responsibilities were transferred to visitor coordinators.

#### II. Installation of Farm Information System

Currently, there are roughly 500 students and approximately 140 staff members at ASYV. The daily meals of the organization, which feed the students and staff, are generally created from products of the on-site farm. Additional farm production that is not used for village kitchen purposes is sold to outside buyers and staff. However, record keeping for food used in the kitchen or food sold is not effectively tracked. Without collecting sufficient farm data, ASYV was unable to analyze product profitability and seasonal trends.

The Farm Information System (FIS) was developed as a user-friendly form that encouraged consistent and precise record keeping. Farm production data at ASYV has been recorded since January 1st, 2016, however, expense reporting was sporadic. The FIS?

The first step to installing the Farm Information System was to design a high-functioning excel spreadsheet model capable of recording weekly, monthly, and yearly data. The spreadsheet model requires the user to input weekly categorical expenses and monthly production values. In turn, those inputs allow the model to calculate monthly and annual profitability.

Major risk that threaten the sustainability of the FIS include:

- Farm Managers hardware and software is outdated.
- No Wi-Fi connectivity at the farm.
- Challenges with accurate reporting.

Following the development of the FIS spreadsheet model, the consultants trained one farm manager and two IT staff members on proper use of the spreadsheet. Training sessions with the farm manager were weekly one-hour sessions that took place from week 7 through 10. IT staff was trained for two hours in week 8. In addition to excel training, the use of pivot tables was taught as a means of extracting data for the spreadsheet. At the conclusion of the training, FIS responsibilities were transferred to the Farm Manager and IT team.

At the end of the 10-week internship, both the VIS and FIS were installed and used in application. On July 31st, 2018, the student consultant presented their final projects to the Village Director and other staff for final suggestions and feedback.

#### **Consulting Partner**

Deo Kabirigi Deo@asyv.org

The Agahozo-Shalom Youth Village Rwamagana, Rwanda www.ASYV.org

The Agahozo-Shalom Youth Village Travis Stahl Student, Student Consultant Norikazu Edogawa, Student Consultant About the Consultant

Travis Stahl *Tstahl@andrew.cmu.edu* Norikazu Edogawa *nedogawa@andrew.cmu.edu* Graduate students at Carnegie Mellon University's Heinz College

> Page 2 of 14 August 10th, 2018



#### **Final Consulting Report**

Student Consultant, Travis Stahl Student Consultant, Norikazu Edogawa Tech Development Partner, Deo Kabirigi

#### I. The Agahozo-Shalom Youth Village

The Agahozo-Shalom Youth Village (ASYV) in Rubona Rwamagana, Rwanda was founded in 2007 by Anne Heyman. Formed as a systematic solution to combat the orphan crisis in Rwanda, ASYV was founded with the following mission statement:

Through healing, education, and love, the Agahozo-Shalom Youth Village empowers orphaned and vulnerable Rwandan youth to build lives of dignity and contribute to a better world.

ASYV was modeled after the 1953 Israeli youth village, Yemin Orde, that focused on solving the orphan crisis after the holocaust. The phrase Agahozo-Shalom is comprised of two languages, the Kinyarwanda word Agahozo (comforting someone who is upset) and the Hebrew word Shalom (peace). Together the phrase inspires the idea that ASYV is a "place where tears are dried."

To achieve the organizational goal, four important elements are implemented; parental wholeness, health and wellness, formal education, and life enrichment applied programs. Additionally, ASYV is run with an emphasis on seven core values, commitment, respect, role models, interest of child, support, integrity, and learning community.

ASYV first opened in 2008, welcoming its first 128 students. By 2012, there were 375 students, and as of 2018 there are roughly 500 students. Currently, there are approximately 140 employees to meet the needs of the village. This includes administrations workers, teachers, maintenance workers, house mothers, kitchen workers, and various other staff.

Technology at ASYV is advanced in comparison to the majority of Rwanda. Yet, the village experience occasional power outages. Outages can last anywhere from minutes to several hours. Wi-Fi is available but sporadic around the village. Because Wi-Fi in the administration office typically remains stable, it is reasonable to assume that ASYV could benefit from technology implementations that utilize Wi-Fi. However, ASYV does not operate on a secure network, which is an organizational concern.

#### Facilities

The Agahozo-Shalom Youth Village is over 150 acres, roughly 1/3 of which is leased to solar energy field. However, the solar energy field can't be directly reached from ASYV. The village is completely gated and has 24-hour security.

Facilities at ASYV include the administration office, health and wellness clinic, learning center, high school, community center, family homes, guest homes, and staff homes. All of which have access to Wi-Fi. There are computers in the administration office, high school, learning center, and health and wellness clinic. Additionally, the administration office can turn off the village Wi-Fi and connect directly to the internet under unique circumstances.

#### Programs

The primary service of the village is to provide a home and education for the ASYV students. Education tracks at the high school include math, economics, computers, and foreign languages. There are additional afterschool activities, such as music, art, and photography. The school programs and extracurricular activities are essential in fostering growth within the youth village.

Technology is directly used in variety of ways within these ASYV programs. The students have access to computers at school and the media center, which offer Microsoft Office and Adobe systems. Additionally, the students generally have access to Wi-Fi, which is not password protected.

Student interns from 2016 implemented an E-Learning platform for the children to use at school. However, the adaptation of the E-Learning platform has been difficult because students lack individual devices to access the program.

#### Staff

There are roughly 140 employees at Agahozo-Shalom Youth Village. Many of the staff (maintenance workers, kitchen staff, house mothers) do not require a computer to complete their daily activities. The administration office is most active with their use of technology and consequently has the best access to Wi-Fi, computers, and laptops. Microsoft Office programs are most commonly used. The cloud computing company Salesforce.com and data collection program CommCare are used by staff within the monitoring and evaluation team at ASYV.

ASYV staff have access to variety of IT training. First, ASYV has strong internet capabilities, which will allow them to independently troubleshoot. Second, there are several staff members with backgrounds in information technology. ASYV also has a strong relationship with several American universities including Carnegie Mellon University, Tufts University, and University of Pennsylvania. These relationships allow ASYV to bring in student interns for technical support. However, long-term technical support remains difficult as these interns are typically on campus for a short period of time.

Staff members we will be directly working with include:

**Jean-Claude Nkulikiyimfura** (*Executive Director*) – Jean-Claude (JC) has over 17 years of experience in education, marketing, government, and corporate communication. He received a degree in Journalism and Mass Communication from the University of Central Arkansas. After returning to Rwanda, JC worked as a media and protocol officer in the Office of the President before moving to South Africa to complete a master's degree in International Relations. In 2011, he joined ASYV staff as a Village Director and in 2015 was promoted to Executive Director.

**Deo Kabirigi** (*Information Technology Coordinator*) – Deo studied Information Technology at Adventist University of Central Africa from 2002-2005. In 2006, Deo joined SOS Technical High School as a computer teacher and IT technician. Deo joined ASYV after its founding as a computer teacher and was promoted to Village IT Coordinator in 2012. Deo was again promoted in 2016 to Science and Technology Coordinator.

**Issa Jean Marie Vianney Sikubwabo** (Director of Operations and Procurement) – Issa has an undergraduate degree in law and more than 12 years of experience in education and law. In 2014, Issa became ASYV's Director of Informal Education and Training. Later in 2014, Issa completed his master's degree in International Economic and Business Law and soon after took on the role of Director of Operations and Procurement.

#### **Technology Infrastructure**

Overall, technology infrastructure at ASYV is strong. The staff and students at ASYV have access to the computer lab and many also have laptops and tablets. The organization has abundant resources to computer hardware and software. Additionally, ASYV has the monetary resources to purchase additional hardware and software if needed.

Students at ASYV are not allowed to bring individual devices, such as laptops or cellphones, into the village. Thus, students must use the computer lab during the appropriate hours to access the internet. The student population (roughly 500) has access to four computer labs that each have approximately 100 computers.

The monitoring and evaluation staff currently use the cloud computing company, Salesforce, and the data collection software, CommCare. The CommCare software is actively used to track student health information through both laptops and computers. Presently, Salesforce is still being developed at ASYV. The goal of Salesforce is to provide an easy to use database to store information on the students and activities.

#### **Technology Management**

The internet connection is relatively stable at ASYV but is stronger at certain locations and stronger at different hours. For example, Wi-Fi is stronger while the students are in school and not accessing the internet in the computer lab. Also, ASYV does not operate on a secured network, which could contribute to the Wi-Fi instability. Without a password protected Wi-Fi the community around the village can freely connect when in range.

Deo Kabirigi is the Information Technology Coordinator at ASYV. Deo oversees the IT support team at the village and IT daily operations. Deo also works with tech consultant partners from universities that visit the village. The tech consultant partners that Deo works with often arrive with a specific technology issue that needs addressed within ASYV.

Currently, data on visitor information is shared over a google doc between ASYV in Rwanda and New York. The use of CommCare and the implementation of Salesforce should provide a strong database structure for backing up critical information.

#### **Technology Planning**

Deo Kabirigi, Information Technology Coordinator at ASYV, acts as a technology planner for the organization. However, technology advancements are often done on an ad-hoc basis. The IT

coordinator may place a request to administration to purchase additional hardware and software when a project or problem occurs.

The organization does technology planning in the form of year-long fellows and student tech consultants. Planning with tech consultants begins with a drafted problem statement of the current technological issue to the consultants. The consultants arrive and spend anywhere between one and 10 weeks working to create and implement a solution to the issue. Planning with the year-long fellows is more extensive and depends on their role. Currently, the ASYV website is maintained by one of the fellows in the village. ASYV is active in improving technology but would benefit from a long-term tech planning guideline.

#### Communication

Internal communication at ASYV takes place through an ASYV share folder. The folders have limited access dependent upon position, necessity, and tenure. The staff also communicates through a WhatsApp message group, although this is typically informal communication. A primary form of communication at ASYV, and in Rwandan culture, takes place through word of mouth. Word of mouth communication can at times lead to lack of clarity and specificity.

The organization has a high-functioning, well-maintained website. The website addresses donor needs and provides a thorough description of what the organization represents. Access to changing the website is limited to the IT support team in Rwanda and the IT personnel in New York.

External communication between Rwanda to New York is vital for the organization. Information between the two is most commonly shared through email. Other forms of communication between the two branches include google docs, phone calls, and personal visits. ASYV also partakes in outreach to the community. Two staff members are responsible for maintaining partner relationships both within and outside the country.

Problems with communication can arise through both technological difficulties and cultural differences. Wi-Fi connection can be a concern when dealing with online calls between Rwanda and New York. ASYV will occasionally shut off the Wi-Fi and connect directly to the ethernet cord when communication with New York is most important.

The organization benefits from its use of social media in a variety of ways. ASYV is active on Facebook, Instagram, and YouTube. The spread of this information through multiple platforms is powerful for ASYV as most funding comes from donations. ASYV would benefit from having an active database that collects donor information and tracks donor retention.

#### **Information Management**

Visitor information is managed by the visitor coordinator, year-long fellow in Rwanda, and one staff member in New York. Information is collected by the visitor coordinator and then shared with the New York branch via google doc. Information at ASYV is also managed both in an automated form and a paper form, both of which present communication process. Because of the lack of continuity in information sharing and data collection, requested information will often go unanswered. A simpler means of sharing information should promote enhanced communication within the organization.

Many of ASYV's current databases exist in the form of excel sheets. In addition to the excel sheets, monitoring and evaluations has begun to explore the option of storing information on Salesforce.

Although there is no current Salesforce database built, one IT staff member and one year-long fellow have recently began pursuing the use of it.

#### **Business Systems**

Agahozo-Shalom Youth Village business systems operate in both Rwanda and New York. Each department acts independently in the case of accounting. At ASYV in Rwanda, workers at the village pick up checks once a month from the accounting office. Additionally, there are benefits available to the full-time employees such as health insurance and maternity leave.

#### **II. Installation of Visitor Management System**

The safety of the students, staff, and guests is a primary concern for ASYV. A quality Visitor Management System (VMS) provides ASYV with enhanced security for both the visitors and the village community.

The current means of tracking visitors is a google form. However, the following problems persist under this tracking platform:

- 1. Trouble registering groups that arrive in large numbers
- 2. Difficult for one person (visitor coordinator) to track all visitors at the village.
- 3. Lack of record keeping continuity. Records done by different people on different platforms.
- 4. Issue with pre-registered guests vs. surprise guests

The problems above create a myriad of issues for the organization. First, there is a safety concern when ASYV does not have specific information on who is coming and going from the village. For the safety of the children, it is important to know who is coming to visit them as well as who is coming to do a tour. A database would also allow ASYV to note any special circumstances surrounding a visit.

Second, the current system lacks clarity on guest information. Has the guest been here before? Where are they coming from? When will they arrive? And how long are they staying? Obtaining this important information will allow ASYV to provide the optimal experience for all guests who visit. The implementation of a high-functioning visitor database will simultaneously ameliorate both critical issues that ASYV face.

Moving forward the system will help consolidate pre-registered and surprise guest information. Preregistered guests will continue to provide information through a google form or through an email exchange with the village coordinator. Information will then be taken from emails and exported from google docs and imported into Salesforce manually by the village coordinator.

Surprise visitors will now input their information through the CommCare application on a tablet provide by the security guard. The visitor coordinator will then export the information from CommCare and import the data into Salesforce, where it will be stored with pre-registered guest information.

Presently, CommCare is used by monitoring and evaluation staff to track the health records of children, whereas a Salesforce subscription has only been purchased and not yet formally used. The integration of the software to the organization will be paramount in the success of the VMS. This solution will mitigate the issue of unregistered visitors entering the village and will compile all data

in one single area. Moreover, the Salesforce database will provide ASYV the ability to analyze visitor data for security purposes and improve visitor outreach.

#### Activities

- Toured the village.
- Interviewed staff to understand the existing visitor management process.
- Conducted needs assessment for project.
- Analyzed the existing visitors' data from 2012 to now.
- Developed new app on Salesforce to store visitor data.
- Created new app on CommCare platform to collect group or surprise visitors' data.
- Migrated all existing data into Salesforce platform.
- Conducted Training Sessions for security team, IT team, and visitor coordinators.
- Review of performance.

The listed activities took place between June 4th, 2018 and August 14th, 2018.

#### **Outputs (What was produced)**

- Single and consolidated database to store all visitors' information.
- New tablet app to collect visitors' data at the security gate.
- Salesforce User Manual (See Appendix A)

Some of visitor data are missing or spread out to multiple locations in the past, however, now all data can be collected and stored in Salesforce database

#### **Outcomes (What objectives were met)**

- Collected more visitor data, especially surprise or group visitors.
- Improved safety and security in the village by reducing the risk of unknown or unexpected visitors.
- Visitor data analysis is improved by producing customized reports on Salesforce.

#### Evidence

• The village collected 58 visitors from 8 countries when the big group visited on July 11<sup>th</sup>, 2018.

#### III. Installation of Farm Management System

Proper management of the farmland will help ASYV capitalize on their agriculture and breeding assets. The new Farm Management System will help the organization analyze important farming aspects, such as profitability and fertility.

The current means of tracking farm records is done in a standard excel sheet. However, the following problems exist:

- 1. Inconsistent data reporting
- 2. Difficult to analyze data
- 3. Lack of continuity in Excel formatting
- 4. Data is not backed up

The problems above are a serious concern for many departments at ASYV. Currently, it is difficult to understand if items are being underreported or if the amount of goods the farm produces are declining. Without optimal bookkeeping, ASYV's accounting department is unable to understand the profitability of the farm.

Moreover, the current format of the database doesn't not allow the user to easily analyze the data. For example, the information from expense sheets and production sheets is kept on separate workbooks. Consolidating farm records will improve database functionality and allow data to be easily analyzed.

Improved farming records through a new FMS will also provide ASYV with a more exact understanding of their financial condition. This information will help the Operations and Procurement Department with future planning regarding the farm. Additionally, improved records will offer information on the fertility of crops in relation to individuals fields.

#### Activities

- Toured Village.
- Interviewed staff.
- Conducted needs assessment for project.
- Analyzed historical farm data.
- Created Spreadsheet Model for Farm Management.
- Conducted Training Sessions.
- Implemented use of the Spreadsheet Model.
- Review of performance.

The listed activities took place between June 4th, 2018 and August 14th, 2018.

#### Outputs

- Predictive Analysis Spreadsheet. (See Appendix B)
- ASYV Pivot Table Tutorial. (See Appendix C)
- 2018-2020 Farm Production spreadsheet model. (See Appendix D)

The Predictive Analysis Spreadsheet uses the analytics trend function in Microsoft excel to predict future production based on past data. In addition to the trend function, the VLookup function is used to take into consideration seasonal patterns that may impact the data. The ASYV Pivot Table Tutorial will help ASYV collect and analyze data that can be used in the Farm Production

Spreadsheet. The Farm Production spreadsheet model was designed in Microsoft Excel and requires only basic excel functions.

#### Outcomes

- Improved excel capabilities for ASYV farm manager.
- Creation of farm reports became more time efficient.
- Discovered information on declining farm production from 2016 to 2017.
- 2018 seasonal forecast predicted a 9% decrease from 2017 to 2018.

#### Evidence

- Farm manager was able to use pivot tables to extract farm data.
- Time to create a farm report decreased 75%. From 1 hour to 15 minutes.
- Analysis showed a 16% decrease in farm production from 2016 to 2017.
- 2018 seasonal forecast predicted a 9% decrease from 2017 to 2018.

The improved Microsoft Excel capabilities have led to a 75% increase in time efficiency when creating farm reports. Moreover, the reports showed a 16% decrease of total farm production from 2016 to 2017. Seasonal forecasting methods were then used to predict an approximate 9% decrease in farm production from 2017 to 2018. The declining rate of farm production is a concern for ASYV, especially when considering the farm has expanded in size and capacity each year and inflation has marginally increased prices. The strongest possibility for the decline in production is inadequate reporting. Therefore, it is essential for ASYV to be more exact in their data collection to rule this out and have a true understanding of production, expenses, and profitability.

#### About the Consultant

Travis Stahl is a graduate student in Public Policy and Management at Carnegie Mellon University's Heinz College. He will intern for Technology Consulting in the Global Community during the Summer of 2018 and return to school in the fall to complete his final semester.

Norikazu Edogawa is a graduate student in Information Systems and Management at Carnegie Mellon University's Heinz College. He will intern for Technology Consulting in the Global Community during the Summer of 2018 and return to school in the fall to complete his final semester.

#### Appendix A. Salesforce User Manual

Salestorce User Manual X + V								-	Ċ
→ ひ ᡬ ① file:///C:/Users/tstah/Desktop/	Salesforce%20User%20Manual%20#1_Visitor%20Coordinators[11174].pdf					☆	7=	: 1.	E
1 of 10 ,0	□ — ·	+	ୢ		A»	¢		P/	2
	Visitor Management System								
	Salesforce User Manual								
	<for coordinators="" visitor=""></for>								
	August 14 <sup>th</sup> , 2018								
	Page   1								

The Visitor Management System Salesforce User Manual can be used to troubleshoot potential issues that ASYV may encounter with the new platform. Additionally, the user manual can be used to train new staff and promote sustainability of the project.

#### Appendix B. Predictive Analysis Spreadsheet



The Predictive Analysis Spreadsheet was created to analyze existing farm production records and predict production for the remainder of 2018. The information showed a declining production rate over the last two years with a predicted downward trend for 2018. Additionally, the report showed that the number of annual transactions reported by the Farm Manager declined from 2016 to present.

#### Appendix C. ASYV Pivot Table Tutorial



The ASYV Pivot Table Tutorial will provide support for the Farm Manager when creating farm production reports. Moreover, the use of pivot tables in general can be advanced through different departments of ASYV to efficiently analyze data.

#### Appendix D. Farm Production Spreadsheet Model

Home	ort Draw Pa	ne lavout - For	mulas _Du	ata Roviow	View	Add-ins	Help	Analytic Se	lvor Platfo	orm -¥L	Miner Pla	tform	SolverH	Iome O-T-		
X Cut	Calibri 44			ab Mran T-	view	Goneral	neip -						⇒i Σ	AutoSum - 1	A (	
Copy -	BIU- H-	Å • A • ≣		→	¿ Center +	\$ • %	€.0 .00	Condition	al Format	as Cell	⊞ Insert	Delete Fo	ormat 🦼	Fill - S	Z I 🖍 🖍	1 &
Format Painter Clipboard G	Font	6	A	lignment	5	Numb	er 5	Formatting	g ∗ Table Styles	<ul> <li>Styles *</li> </ul>		Cells	Ť	Editin	ilter * Sele g	ct *
• : (	$\times \checkmark f_x$															
A	вс	D	Ε	F	G	н		J	к	L	м	N	0	Р		Q
019 FA	<b>RM EX</b>	PENS	E RE		D											
Week	Seeds & Plants Medic	v ine Cow Feeds	Fertilizer	Labour Pay	Pesticides	Fungicides	Physical Materlials	Repairs & Maint	Fuel	Utilities	Other	Total Amount	Comments &	8		
ry 6, 2018 ry 13, 2018 ry 20, 2018				cascarray			materials					RF 0 RF 0	notos		Мо	nthly Expense
ry 27, 2018 ary 3, 2018 ary 10, 2018									_			RF 0 RF 0 RF 0		January Tol	tal	RF 0
ary 17, 2018 ary 24, 2018 3, 2018											-	RF 0 RF 0		February To	tal	RF 0
10, 2018 17, 2018 24, 2018											-	BF 0 BF 0 BF 0				
31, 2018 , 2018 4, 2018											-	RF 0 RF 0 RF 0		March Tota	al	RF 0
1, 2018 8, 2018 2018											Ē	RF0 RF0 RF0		April Tota	1	RF 0
2, 2018 9, 2018 5, 2018											Ē	RF 0 RF 0 RF 0		May Total		RF 0
, 2018 , 2018 6, 2018											Ē	RF 0 RF 0 RF 0				
3, 2018 10, 2018 2018												RF 0 RF 0 RF 0		June Tota	I	RF 0
		_									-					
			1	Сору	of FARM P	RODUCTIO	N FROM 20		NOW - Ex	cel		RF 61		Travis St	ahl 🕅	
Save ( Off)	حج مح و محمد و محمد ert Draw Pa	juty + ≠ ge Layout Fo	rmulas D	Copy ata Review	of FARM P View	RODUCTIO Add-ins	N FROM 20 Help	16 UP TO N Analytic S	NOW - Ex	ccel	LMiner P	RF 81	Solver I	Travis Sta Home 🔎 T	ahl 📧 Tell me	
Save ● Off) Home Inse K Cut Copy ~	ert Draw Pa Calibri 111	$ \mathbf{U} + \mathbf{v} $ ge Layout Fo $ \mathbf{v} \mathbf{A}^* \mathbf{A}^* \equiv \mathbf{v} $	rmulas D	Copy ata Review	of FARM P View	RODUCTIO Add-ins General	N FROM 20 Help	16 UP TO N Analytic S	NOW - Ex olver Platfo	ccel	LMiner P	latform	Solver I	Travis St Home ♀ ⊤ ∑ AutoSum ▾ ¥ Fill ▾	ahl 📧 Tell me	
Save (● Off) Ind Home Inse X: Cut Copy ~ ✓ Format Painter	← → ← ← ← ← ← ← ← ← ← ← ← ← ← ← ← ← ← ←	ge Layout Fo	rmulas D ≡ ≡ ≫ ≣ ≣ €	Copy ata Review - 문화 Wrap Te 호텔 면arge &	r of FARM P View ext & Center ~	RODUCTIO Add-ins General \$ - %	N FROM 20 Help	16 UP TO N Analytic S € Condition Formattin	NOW - Ex olver Platfa nal Forma g = Table	ccel form X t as Cell e Styles	LMiner P Insert	atform t Delete F	Solver	Travis St Home ♀ Ţ ∑ AutoSum ↔ ♀ Clear ↔	ahl 📧 Tell me A T J Sort & Fir Filter ~ Sel	D nd & lect *
Save ( O) Home Inse Copy Copy Copy Copy Copy Copy Copy Copy	•5 • € • & • ert Draw Pa Calibri • 11 B I U • ⊞ • Font X ✓ &	$\begin{array}{c} \bullet \\ \bullet $	rmulas D	Copy ata Review - 란 Wrap Te 로 Merge & Nignment	r of FARM P View ext & Center +	RODUCTIO Add-ins General \$ - % Num	N FROM 20 Help	16 UP TO N Analytic S Condition Formattin	NOW - Ex olver Platfo nal Forma g ~ Table Styles	ccel form X tas Cell a * Styles	LMiner P	latform t Delete F Cells	Solver	Travis St. Home ♀ Ţ ∑ AutoSum ▾ ↓ Fill ▾ ✔ Clear ▾ Editi	ahl 🖭 ell me Z Y J Sort & Fir Filter * Sel	- O nd & ect *
Home Ins Cut Copy - Format Painter Lipboard rs	• • • • • • • • • • • • • • • • • • •	ge Layout Fo → A' A' = → A' A → = - - - - - - - - - - - - -	nmulas D ≡ ≡ ≫ ≣ ≡ ∎ •	Copy ata Review · 완 Wrap Te 를 描 Merge &	view View ext & Center ~	RODUCTIO Add-ins General \$ - % Num	N FROM 20 Help 9 0.00 00 9 00 00 9 500 00 500 00000000	16 UP TO N Analytic S IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	NOW - Ex olver Platfa nal Forma g * Table Styles	ccel form Xi It as Cell a - Styles	LMiner P Inseri	atform t Delete F Cells	Solver I	Travis St Home ♀ T ∑ AutoSum ~ ↓ Fill ~ ◆ Clear ~ Editi	ahl 🖭 ell me A T Sort & Fir Filter - Sel	- D nd & ect *
Sove ( ) la Home Ins & Cut Copy - Format Painter Tipboard rs	<ul> <li>S - C - S - S - S - S - S - S - S - S -</li></ul>	ge Layout Fo	rmulas D	Copy ata Review · 완 Wrap Te · Merge & Nignment	v of FARM P View ext & Center +	RODUCTIO Add-ins General \$ - % Num	N FROM 20 Help • 6.00 -00 per 5.	16 UP TO N Analytic S Condition Formattin	NOW - Ex olver Platfo nal Forma g ~ Table Styles	ccel form X It as Cell a * Styles	LMiner P Insert	latform t Delete F Cells	Solver I	Travis St Home ♀ T ∑ AutoSum ← ♀ Fill ← € Clear ← Editi	ahl 🖭	O d & ect *
Home Inst Copy - Format Painter Cipboard r- Lipboard r	S • S • S • S • S • S • S • S • S • S •	ge Layout Fo	rmulas D = + + + + + + + + + + + + + + + + + + +	Copy ata Review & Wrap Te Marge & Marge &	c of FARM P View ext & Center ~ G	RODUCTIO Add-ins General \$ ~ % Num	N FROM 20 Help 9 0.00 0.00 9 500 0.00 9 500 0.00 1	16 UP TO N Analytic S E Condition Formattin	NOW - Ex olver Platfa nal Forma g - Table Styles	ccel form X t as Cell e > Styles	LMiner P Insert	latform t Delete F Cells	Solver I	Travis St Home Ω Ţ ∑ AutoSum - ↓ Fill - ✔ Clear - Editi	ahl 🖭	P nd & lect *
Home Inst Copy - Format Painter Cipboard rs iber 1, 2018 ther 2, 2018 total 2, 2018 total 2, 2018	5         •         •         •         •           ert         Draw         Pa         •         •         •           Calibri         •         11         •         •         •         •         •           B         I         U         •         ●         •	ge Layout Fo → A <sup>+</sup> A <sup>+</sup> =	rmulas D Ξ Ξ ψ Ξ Ξ ψ ε ε ο πr(	Copy ata Review 관 Wrap To 관 Marge & Marge & Marge &	r of FARM P View ext & Center + G G	RODUCTIO Add-ins General \$ - % Num	N FROM 20 Help 9 (*.0 .00 9 (*.0 .00) 9 (*.0 .00)	16 UP TO N Analytic S Condition Formattin	NOW - Ex olver Platfo nal Forma g + Table Styles	ccel form X it as Cell a + Styles	M	Real Altform Cells	Solver	Travis St Home Ω τ ∑ AutoSum - ≩ Fill - € Clear - Editi	ahl Internet Sel	Q nd & ect -
Home Insc Cut Copy - Format Painter Lipboard rs ber 1, 2018 bes 6, 2018 bes 72, 2018 ter 22, 2018 TOTAL		ge Layout Fo	rmulas D	Copy ata Review 2 2 Wrap To Merge & Merge &	v of FARM P View Ext & Center ~ Fo	RODUCTIO Add-ins General \$ - % Num	N FROM 20 Help	16 UP TO N Analytic S Condition Formattin	NOW - Ex olver Platfa al Forma g - Table Styles	kcel form X I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	M M RF 0	N RE AL	Solver I	Travis St Home ♀ ↑ ∑ AutoSum ← ♀ Clear ← Editi December 201 E	ahl iell me A Z Sort & Fir Filter ~ Sel ing Total 8 Total xpense	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Sever ( or of ) La Home Ins Cott Copy - Format Painter Tipboard rs Format Painter Tipboard rs Format Painter Tipboard rs Format Painter Sever 2, 2018 Bar 22, 2018		ge Layout Fo	rmulas D = + + + + + + + + + + + + + + + + + + +	Copy ata Review 관 방자ap To 클 Marge & Marge & Marge & Marge & Nap To Participation Nap To Nap	of FARM P View ext & Center ~ G	RODUCTIO Add-ins General \$ - % Num H	N FROM 20 Help 9 0.00 0.00 9 0.00 0.00 9 0.00 0.00 9 0.00 0.00	16 UP TO N Analytic S Condition Formattin	NOW - Ex olver Platfo nal Forma g ~ Table Styles	ccel form X it as Cell a Styles	M N RF 0	ne al latform Delete f Cells	Solver I	Travis St Home ♪ T 2 AutoSum ~ 4 Fill ~ Editi December 201 E	ahl 🖭 ell me A T T Sort & Fir Filter - Sel ing	0 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Home Inse K Cut Copy - Format Painter Cipboard r- Solution 1, 2018 beer 2, 2018 beer 22, 2018 Torrac 9 Production Ar	sert Draw Pa Calibri + 11 B I U Font X J fx B Calibri - 11 B I U Font X J Font X J -	ge Layout Fo	rmulas D = • • • • • • • • • • • • • • • • • • •	Copy ata Review → ② ② ○ Marge & → ③ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	st of FARM P View ext & Center ~	RODUCTIO Add-ins General \$ - % Num #	N FROM 20 Help 9 0.0 0.0 9 0.0 0.0 1 1	16 UP TO N Analytic S Condition Formattin	NOW - Ex olver Platfall Forma g * Tableb Styles	ccel form XI it as Cell a Styles	N N N N	N attorm Delete F Cells	Solver Control	Travis St Home	ehl El me A Y J Sort & Fir ing Total Total Total Value	0 d & ect * RF 0 RF 0
Home Inse Cut Inse Cut Format Painter Format Painte		ge Layout Fo	rmulas D = · · · · · · · · · · · · · · · · · · ·	Copy ata Review * #2 Wrap To * Marge & Wignment *	s of FARM P View ext & Center ~ 5	RODUCTIO Add-ins General \$ - % Num • H • • • • • • • • • • • • • • • • • •	N FROM 20 Help • 1 • 1 • 1 • 1 • 1 • 1	16 UP TO N Analytic S Condition Formattin	NOW - Ex solver Platfa hal Forman Styles	ccel orm X it as Cell it as Cell	M M FF 0	N atform	Solver I	Travis St Home P T E AutoSum - Glar - Editi December 2011 E 2013 Total Production 1	ahl 21 ell me 2 Y Sort & Fir Filter - Se Filter - Se 8 Total 8 Total Value	0 0 0 0 0 0 0 0 0 0 0 0 0 0
Home Inst Copy - Copy - Format Painter Format Painter Total Production Ar Total Production	set Draw Pa Calibri • 111 B I U • ⊞ • Font X ✓ fr U • • • • U • • • • U • • • •	ge Layout Fo		Copy ata Review & Wrap To Marge & Ulgnment	st of FARM P View ext & Center	RODUCTIO Add-ins General \$ - % Num H H General Fr 0	N FROM 20 Help • 100 .000 ser 15	16 UP TO N Analytic S Condition Formattin	KOW - Ex solver Platfe	ccel orm X t as Cell re o re o June December	Miner P Insert	No al Autorm	Solver I	Travis St Home P T S AutoSum ~ Fill ~ Clear ~ Editi December 2018 Total Production 1	ahl E ell me A Y Sort & Fir Filter - Se Total Total Xalue Value	0 0 0 0 0 0 0 0 0 0 0 0 0 0
Home Inso Cut Inso Cut Cut Inso Format Painter Lipboard rs Format Painter Lipboard rs Format Painter Lipboard rs Format Painter State 7, 2018 Inso 7	ert Draw Pa Calibri • 111 B I U • ⊞ • Font × ✓ fr 0 c 0 c 0 c 0 c 0 c 0 c 0 c 0 c	y y v v ge Layout Fo r A' A' = r c r c r c r c r c r c r c r c r c r c		Copy ata Review Partial Review	s of FARM P View ext & Center + rs	RODUCTIO Add-ins General \$ - % Num H H April October	N FROM 20 Help • 6.00 .000 seer rs	16 UP TO N Analytic S Condition Formattin	NOW - Ex NOW - Ex Nolver Platfe All Forma Styles K	ccel orm X t as Cell + Styles	Miner Pi Inserie	Ne al atform	Solver	Travis St Home ♀ ↑ ∑ AutoSum ← ♀ Clear ← Editi December 2018 Total Production 1	ahl E ell me A T Filter - Se Filter - Se Total Total Xpense	0 nd & ect + RF 0 RF 0
L with Home Insc & Cut Copy - Format Painter Dipboard rs Format Painter Dipboard rs i i Portal Painter State 22, 2018 ther 22, 2018 Total Public Control Tatal Public Control Tat		ge Layout Fo a Layout Fo A A A Fo Fo Fobruary August Fobruary RF-		Copy ata Review	c of FARM P View ext & Center ~ rs c RF 0 RF	RODUCTIO Add-ins General \$ - % Num # # # # # # # # # # # # # # # # # # #	N FROM 20 Help	16 UP TO N Analytic S Condition Formattin	NOW - Ex NOW - Ex Notice Platfe anal Forman Styles	ccel orm X L Stas Cell tas Cell tas Cell une Bro Desember RF 0	M M RF 0	Ne al atform	Colver Const C	Travis St Home ♀ T ∑ AutoSum ← ♀ Fill ← Clear ← Editi Pocember 2015 E	ahl El me A T T Sort & Finder	0 d & ect + RF 0 RF 0
Serve and a server of the serv	ert Draw Pa Calibri + 11 B I U - ⊡ + Font X ✓ Jx 0 0 0 0 0 0 0 0 0 0 0 0 0	ge Layout Fo ge Layout Fo A A A Fo Fo Fo February RF - August RF - RF -		Copy ata Review	c of FARM P View ext & Center ~ 5 C C C C C C C C C C C C C C C C C C	RODUCTIO Add-ins General \$ - % Num 0 FF 0 0 FF 0 0 FF 0 0 FF 0 0 FF 0	N FROM 20 Help 9 6.00,00 9 er 15 1	16 UP TO N Analytic S Condition Formattin Formattin May November RF 0	NOW - Ex NOW - Ex Notice Platfing styles	L L June RF 0 December	M M	N attorn t Delete f cells	Solver C	Travis St Home ♀ T AutoSum - Fill + Clear - Editi P December 2011 E 2019 Clear N E 2019 Clear N E 2019 Clear N E 2019 Clear N E Clear N E	ahl all all and all all all all all all all all all al	0 0 0 0 0 0 0 0 0 0 0 0 0 0

The Farm Production Spreadsheet categorizes expenses while dynamically producing monthly and annual profitability. Additionally, the spreadsheet model holds the user accountable for consistent data input, which was a major issue with the previous methods,