Sales of robotic lawn mowers are beginning to take off, and with fewer and fewer people interested in maintaining their own equipment, there has been a spike in the need for businesses willing to sell and then support different lawn care equipment. Emma's Small Engines was a small family operation until they were hit by the increased demand for services. In the last few years, they have expanded by adding a new sales department and taking in large numbers of new customers. The speed at which they have expanded is starting to create stress within the business' system as they try to use the old, antiquated system to meet new demand.

## Current System

Currently, when a customer enters the business they are met by a sales representative who tries to determine what the customer needs. If they are there for a repair and/or to make a purchase (versus just looking for advice or information), the sales rep records the customer's information in the one computer at the front desk. Here, they use the Sale Record template to record the basic customer information and other data related to the transaction.

### Purchases

If the customer makes a purchase, the sales person completes the Sale Record and final transaction in the same single computer. If the item is in inventory, it is removed from the shelf and given to the customer. If it is not in inventory, the Sale Record is printed and delivered to Parts and Ordering who places the order using their specialized ordering system. The company purchases the item, an order number is written on the Sale Record and the document is kept in a binder that is used to compare against deliveries so that the orders can be filled.

When an order arrives, the Parts and Ordering department compares the arrivals to items in the binder, the Sale Record is retrieved from the binder, the Parts staff add a 1% markup to cover shipping and receiving costs (only applied to ordered parts, not those from current inventory), record the new cost beside the item, and the information is returned to the sales team to find the Sale Record in the computer, contact the customer, and complete the sale.

#324683

INVOICE

123 Grand Falcon Ave
Fonthill, ON W3E 4R5
Phone: (206) 555-1163
Fax: (206) 555-1164

**Date** 2018-06-25
**Invoice #** 1111

**Bill To:**
Angela Devin
400 Excalibur St.
St. Catherines, ON Y6R 6y5
(206) 555-1163

**Equipment:**
Lawn mower
Kohler
S/N: 34567553434
M/N: B73CX432
Yellow, green

| Quantity | Description | Item # | Unit price | Amount |
|---|---|---|---|---|
| 1 | Air filter | 30546 | $ 5.99 | $ 5.99 |
| | | | | $ - |
| | | | | $ - |
| | | | | $ - |
| Subtotal | | | | $ 5.99 |

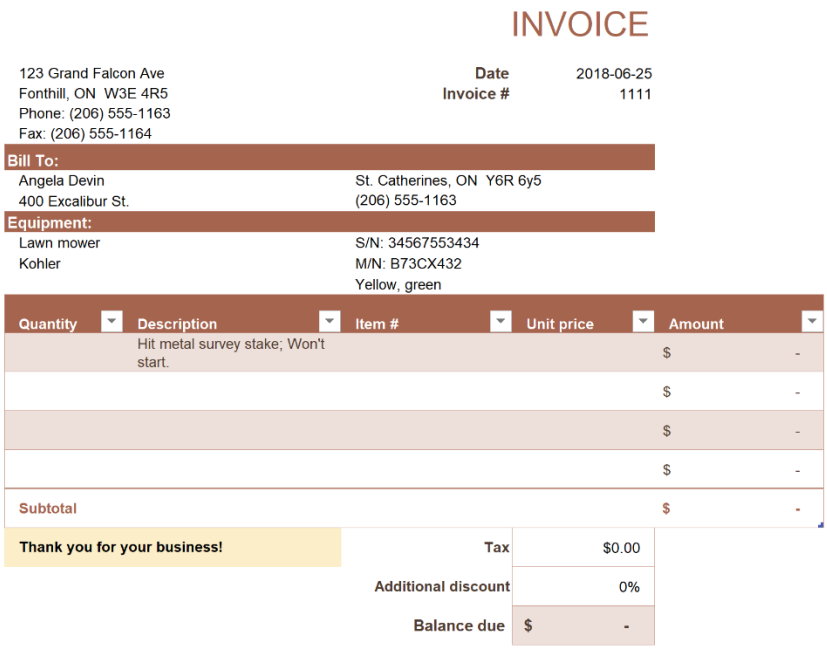
| | | |
|---|---|---|
| Thank you for your business! | Tax | $0.78 |
| | Additional discount | 0% |
| | Balance due | $ 6.77 |

*Figure 1- Sale Report Example*

## Repairs

If the customer is there for a repair, the sales rep completes and prints 2 copies of the Repair Request form (two copies of a Sale Record with the repair listed as a line item), one is attached to the customer's device and the device is placed in the yard to wait for the technicians. The second copy is placed on a clipboard and added to the bottom of the pile for the technicians to get to.

Some machines enter the shop that are still covered by warranties. If a machine is covered by a warranty, the sales associate will include that information as part of the description in the line item. Then when the work is completed, the customer is not charged for the work, but it has to appear on the order as warranty work.



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**Equipment:**

Lawn mower
Kohler

S/N: 34567553434
M/N: B73CX432
Yellow, green

| Quantity | Description | Item # | Unit price | Amount |
|---|---|---|---|---|
| | Hit metal survey stake; Won't start. | | | $ - |
| | | | | $ - |
| | | | | $ - |
| | | | | $ - |
| Subtotal | | | | $ - |

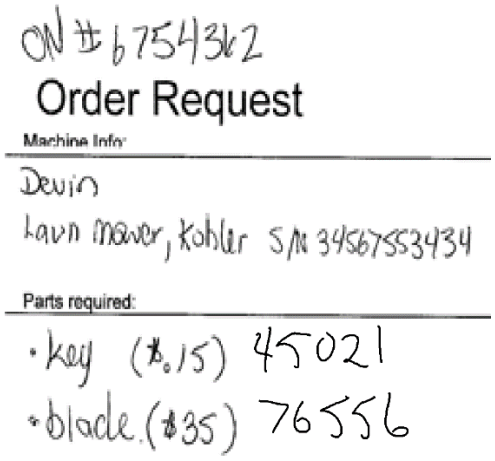
Thank you for your business!

| | |
|---|---|
| Tax | $0.00 |
| Additional discount | 0% |
| Balance due | $ - |

*Figure 2 - Example of Initial Repair Request*

In the shop, the technicians will take a clipboard, write their starting time on the Repair Request, and bring the device into the shop. There, they begin the process of determining the issue and repairing the device. Once done, they write their stop time, write down any parts used and pass the Repair Request back to sales who create a new Sales Record from the provided documents and call the customer.

If the repair requires parts that aren't part of the shop's inventory (a small inventory of oil and common parts are kept in house), the technician fills out a part request form by hand (taken from specially printed note pads), takes it over to Parts and Ordering, writes their stop time on the Repair Request and puts the clipboard back onto a hook for those jobs requiring parts. Parts processes the order using their ordering system, writes the order number and the part number(s) on the document and places the order into a separate parts binder. When the part(s) arrives, and is confirmed by the Parts department, the Parts staff add a 1% markup to cover shipping and receiving costs (only applied to ordered parts, not those from current inventory), record the new cost beside the item, and pass the document back to the shop.



ON # 754362

Order Request

Machine Info:

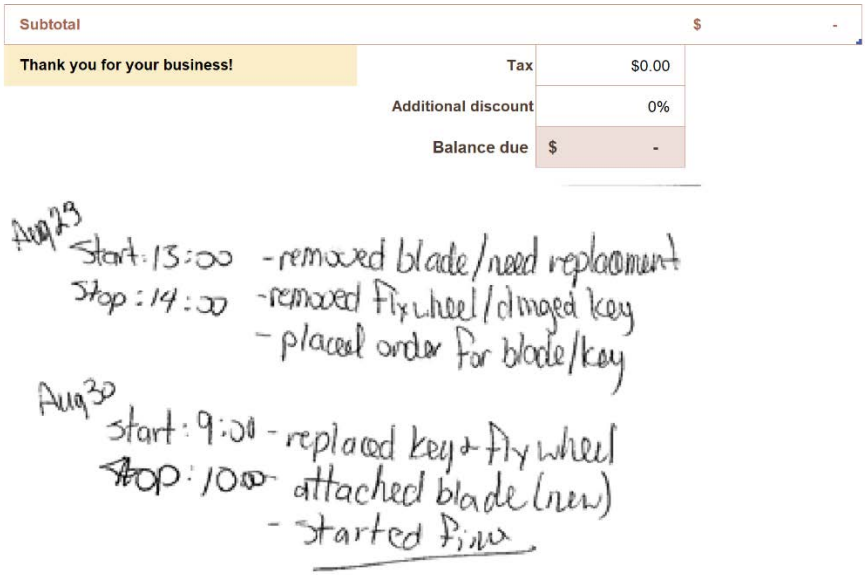
Devin

Lawn mower, Kohler S/N 34567553434

Parts required:

- key ($.15) 45021
- blade ($35) 76556

*Figure 3- Completed Parts Request*



| | | |
|---|---|---|
| Subtotal | | $ - |
| Thank you for your business! | Tax | $0.00 |
| | Additional discount | 0% |
| | Balance due | $ - |

Aug 23
Start: 13:00 - removed blade/need replacement
Stop: 14:00 - removed flywheel/dimaged key
- placed order for blade/key

Aug 30
start: 9:00 - replaced key + flywheel
Stop: 10:00 - attached blade (new)
- started fine

*Figure 4- Example of Shop Notes Added to Bottom of Sale Record*

The technician retrieves the clipboard, writes their start time, staples all paper work to the initial Repair Request and completes the repair. When done, they write their stop time and pass the sheet back to sales. Sales then creates a new Sales Record using all the attached documents and contacts the customer. When the customer arrives, sales reviews the repairs with the customer and finalizes the sale.

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**Equipment:**
Lawn mower
Kohler
S/N: 34567553434
M/N: B73CX432
Yellow, green

| Quantity | Description | Item # | Unit price | Amount |
|---|---|---|---|---|
| | Hit metal survey stake; Won't start. | | | $ - |
| 1 | Timing key | 45021 | $ 0.15 | $ 0.15 |
| 1 | Blade | 76556 | $ 35.00 | $ 35.00 |
| 2 | Shop | 0000 | $ 30.00 | $ 60.00 |
| **Subtotal** | | | | **$ 95.15** |

**Thank you for your business!**

| | |
|---|---|
| **Tax** | $12.37 |
| **Additional discount** | 0% |
| **Balance due** | **$ 107.52** |

*Figure 5- Completed Invoice for Repairs*

Once Sales has finalized a sale and the customer leaves satisfied, all the Sales Records are passed to the admin whose job it is to enter all the paperwork into a series of Excel templates that allows the admin to create a series of reports that management needs to run the business. And the documentation is placed in filing cabinets by customer last name in case they are required.

## Additional Notes

A sale record can also contain both a sale and repair. Usually, the whole bill is paid for at once upon completion of the repair. If the customer wants, the sale can be completed separately using a separate sale record. In this case two sales records will be issued.

## Inventory

Inventory is currently handled using an Excel spreadsheet where at the end of the week, the sales staff must perform a true inventory. To perform the inventory process, one of the sales staff will count and call out the number of items they can see, and then the other sales staff will record the numbers in an Excel spreadsheet.

If an item needs to be ordered, the sales staff use the same order request sheets that the technicians use. After filling out what they need, the sheet is sent to Parts and Ordering. The same process is followed for ordering and receiving the item (including the 1% markup). Once Sales has the new stock, they modify the Excel spreadsheet with the details (quantity, cost before markup), add an additional 10% markup to the cost and place the items on the shelf.

# The Case

Emma has seen the stress levels of her staff rising over the last few months. The technicians, Eugene and Sarah, are overworked and spending far too much time on paper work. Emily, the administrative assistant has recently taken stress leave and sales reps (Wendy and William) can barely keep up. And, Sam in Parts and Ordering is swamped with papers and deliveries that are piling up more everyday. Even pitching in, Emma isn't able to make much difference in the workload and when she does, she loses time that she needs to spend on advertising, merchandising and simply just keeping the books up-to-date. Errors are creeping into the business documents and trying to eliminate these errors are creating more stress.

In an effort to save her apparently struggling business, Emma has approached a local college to try and find help for her predicament. The college business outreach department has advised her that their computer programming department may be able to help her.

After meeting with the staff, they have assured her that their students would be able to help. The college has created teams of students who will tackle Emma's problems and design a system that will help her, and her team integrate all systems and improve business tracking hopefully eliminating several errors. Emma will pick the best application to implement.

As part of the project, the students, with Emma's help, get a chance to meet with key members of the team and ask some pointed questions to determine if they understand the system correctly and that they know what each person requires from the new system.

## Staff Interviews

### Emma's Interview (Owner)

"What exactly are you looking for?" asked one student.

"What I'm looking for is a program that will streamline and interconnect our processes and remove the need for paper. We are using more and more paper, it's expensive and we are starting to lose and misplace some of that paperwork," replied Emma. "I also need to create a few reports that currently require a lot of time to create. Emily can fill you in on those reports."

"Are you willing to spend some money to get new equipment such as a computer for the shop area?" asked another student.

"Yes, though I don't want to spend exorbitant amounts of money. I will try my best if it will help my team adjust to the increased sales.

"I also want to show my appreciation to my staff. I would love to have a way to calculate say a .02% portion of any sales (including shop work) that I can put aside so I can have a staff party once a year. That means that with combined sales and repairs of $10, 000, I would have put aside $200 over the year. I just want to give back to my team."

### Sam's Interview (Ordering and Purchasing)

"Your system currently uses two specialized systems, one for sales and one for ordering parts. Do we need to integrate those into this new program?"

"The ordering system is a proprietary system, so I doubt we could. In the new system, if I had a place to enter the order number, the item ordered, the price and the order it is attached to, I could live with having to transfer the information from system to system. It would be even better if in the new system, I could search for the order number to complete the delivery.

"The sales system is really just a web look up to see if our partners carry the item, so it really isn't all that specialized."

### Eugene and Sarah (technicians)

"What would you like to see from the new system?"

"We'd love to stop looking for pens," jokes Eugene with a sideways glance at Sarah. "With so many tools in the shop, pens go missing all the time."

"And, a better way to track our time on task would be awesome," adds Sarah. "We do sometimes forget to record stop and start times so we have to estimate. It's not fair for the customers. Also, it might be a great idea that if we had a task, such as changing a key, we could look up how long the last one took us so that we can better tell the customer, if they ask, how long it might take and plan our day to get more done.

"Oh, and one more thing. Would it be possible to have a way to better mark a repair that requires a warranty? When we do warranty work, we need to keep better notes because to be paid for the work, we need to collect all our work notes and send them off to the company who reimburses us for the work done. We need to know if a job is warranty, so we can ensure we are providing enough detail. Currently, it's hard to catch the note when it's written on the repair line and we've sometimes lost the payback because we didn't see it and didn't provide the right information."

### Wendy and William (Sales)

"We keep typing in the same information all the time. It would be wonderful if we could get a system that remembers stuff we've entered like a certain type of repair and then allows us to select it from a list to save us typing time. Or, if we have a repeat customer, that we can call up their personal info and equipment info with a single click.

"And, a way to automate the inventory system would be awesome. We've recently run in to an issue where we tried to sell an item, but our inventory numbers aren't updated until the end of the week and we think the item is there, but we sold out of it earlier in the week. This has happened a few times recently and can only get worse. It would be nice to have a system where we can see real-time numbers for our on-hand inventory and if we are getting low, order some."

### Emily (Admin)

"Save me time. I spend so much time entering numbers and doing calculations that I have no time to do the other parts of my job. Mondays and most of Tuesdays are write offs as I enter the paperwork from the week before and the paperwork keeps getting higher and higher. And, now, there's no money or time to higher part-time staff to help.

"There are two key reports that I would love. Both would be new to us, so you have some freedom in design: a new Weekly Review and the warranty report.

"The first is the Weekly Review. This document would take all the information for the last week and create an overall summary of the week's monetary events. It would be nice to see total sales broken down by repairs and sales. Totals for inventory used and totals for items that had to be ordered. Emma's .02% and how much of the total orders is actually for shipping and receiving.

" The second is the warranty report. I need to find the jobs for a company, say all warranty work for Yamaha, and create a report that lists the job, a summary of the work performed and our final cost for the work. It takes forever to produce that report by hand."