



School of Engineering

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MEngSc

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2 Introduction

Ashgrove Renewables is a small company [1] based in North Cork which has a total employment force of 12. Ashgrove is at the forefront of the renewable energy industry in the Republic of Ireland and as the company grew and developed itself into one of the leading companies it was decided in December of 2013 to enter the UK market. The UK market is seen as one of the exploding markets for renewable energy in Europe.

Along with this breakthrough to the UK market a sister company called Everest Energy Solutions has been set up. Everest Energy Solutions role is to handle and provide bespoke renewable energy solutions for large commercial and industrial projects such as apartment blocks, hospitals, plants etc.

Both the UK market and Everest Company is demanding a large share of the engineers' attention for design purposes and technical back up. This, no doubt, led to a huge surge of incoming calls from different customers from both Ireland and the UK requesting documents such as manuals, systems solutions, schematics, guides etc.

Ashgrove is a supply and design company and provide renewable energy system for buildings all across the country. Ashgrove have a select number of partners around the country who they sell to and who also install the systems based on Ashgrove's design philosophies. Ashgrove also sell to end users, developers, builders, plumbers etc.

As Ashgrove have such a large and trusted customer base in Ireland and for the purpose of this module, it was decided to run a trial in the Irish market of providing access to our documents (with internal control of which documents were shared) to try and reduce the number of calls coming into the office and in turn free up time for the engineers so they can focus on more important tasks such as educating themselves on new systems, building relationships with new clients in the UK, creating supplier databases etc.

The documents will be shared online via Google Drive and controlled by a single engineer in the office.

3 Project Methodology

The methodology of the project was based on the Define, Measure, Analyse, Improve and Control (DMAIC) methodology.



Figure 3-1: DMAIC

3.1 Problem Definition

Time management within any company is an important aspect of a successful company and it is vital that each individual understands this and can easily identify where time management can improve.

In Ashgrove, it is very evident from the outset that the time management was not idyllic as each individual was working in “panic mode” and essentially just firefighting tasks at hand. This took place instead of individuals taking a step back and identifying the more important tasks which would realize goals. Based on Covey’s Time Management Matrix [2], it was obvious that callers were causing a problem in Ashgrove to allow the employees to deal with more important issues instead of satisfying other people’s urgent, but not so important, needs or goals. The customers best interest are always at mind but in order for the service at Ashgrove to improve for the customer, the engineers required time to work on more meaningful tasks which would increase sales for our partner installers.

	Urgent	Not Urgent
I m p o r t a n t	I ACTIVITIES <ul style="list-style-type: none"> • Crises • Pressing problems • Deadline-driven projects 	II ACTIVITIES <ul style="list-style-type: none"> • Prevention, capability improvement • Relationship building • Recognising new opportunities • Planning, recreation
N o t I m p o r t a n t	III ACTIVITIES <ul style="list-style-type: none"> • Interruptions, some callers • Some mail, some reports • Some meetings • Proximate, pressing matters • Popular activities 	IV ACTIVITIES <ul style="list-style-type: none"> • Trivia, busy work • Some mail • Some phone calls • Time wasters • Pleasant activities

Figure 3-2: Covey's Time Management Matrix

Figure 4-2 shows Covey's Time Management matrix. Ideally people should be working on tasks from quadrant II but more often than not found themselves working frantically in quadrant III which was not allowing progression, but instead wasting time. A solution to this would be to eliminate calls from installers and end users with trivial questions that could be answered by the installers themselves if they had the correct documents available to them – and the key component was that there would be no input required from the engineers in the office once this system was put in place and rolled out to the installers.

3.1.1 Goal Statement

Ashgrove Renewables is a company whose employees in the engineering department are struggling with Time Management due to the influx of calls to engineers. The goal of this project is to reduce the number of calls to the engineering department.

3.2 Measure

In order to identify the number and type of calls that were grasping the engineers time and to provide a solution the number of phone calls had to be measured over a period of time.

A Google Spreadsheet was created and access was provided to all of the engineers, total of three, in the office. After each phone call the engineers logged the call, the nature of the call and whether or not the call required further action.

The calls were recorded for a period of one month (twenty working days) to ensure that a solid basis could be made for this project and to validate the necessity of incorporating a document sharing system with our partner installers. Figure 4-3 shows a screen shot of the call log in Google Spreadsheet.

Dealt	Engineering	Note	Caller	External	Mobile	Engineer
n	y	Trench Sizes - Granagh project	KOD	x		LS
y	y	Wiring terminations	Liam Hill	x		LS
y	y	Pipe sizes	Robert McGarry	x		LS
n	y	COP data for air source heat pump	Joe Murphy	x		LS
n	y	Horizontal collector size for 16kW	Go Green Engineering	x		JOS
y	y	Open loop schematic	MOB	x		JOS
n	n	Ger Honohan - Sage	GH		x	DG
y	n	Sales questions for potential client	New Client	x		LS
n	n	callback about delivery	Tom - source	x		DG
n	y	ESB info - requeries for new application	Mike Sheehy (MOB)	x	x	JOS

Figure 3-3: Screen shot of the call logging spreadsheet

Over the month, the total number of calls recorded was 454 calls. This can be broken down, assuming an average 40 hour working week, to 3 calls per hour. Per engineer, it is not necessarily as simple as dividing by 3 as the more senior engineers receive more calls than the junior engineer in the office. For a simplistic and a departmental (engineering department) approach, it is assumed that the number of calls is divided evenly amongst the three engineers. After all, the aim of this project is to improve the time management and the coherency of the entire department.

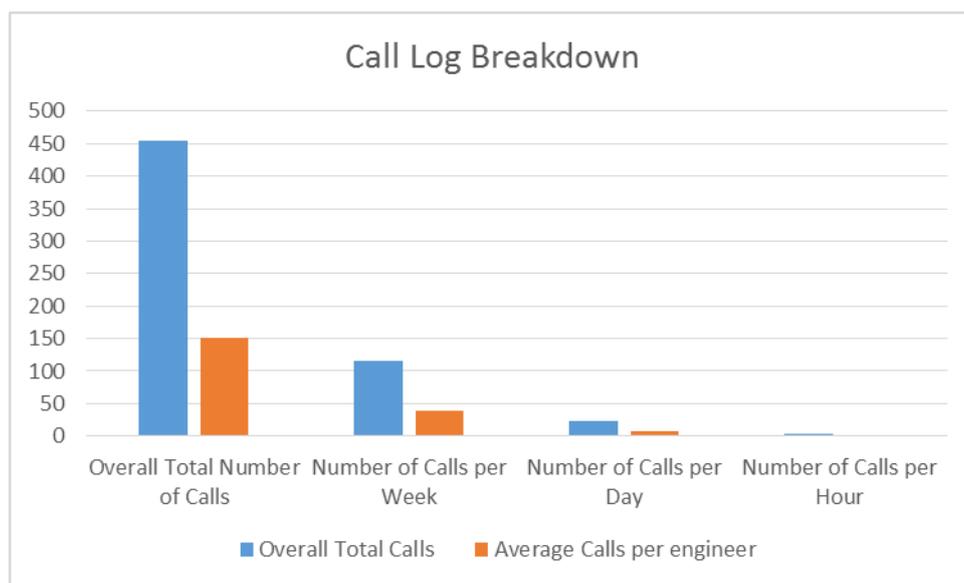


Figure 3-4: Call log breakdown

Further measurements such as whether or not the calls were dealt with and was it of an engineering nature were also recorded. The figures for these can be seen below.



Figure 3-5: Breakdown of Calls Dealt With

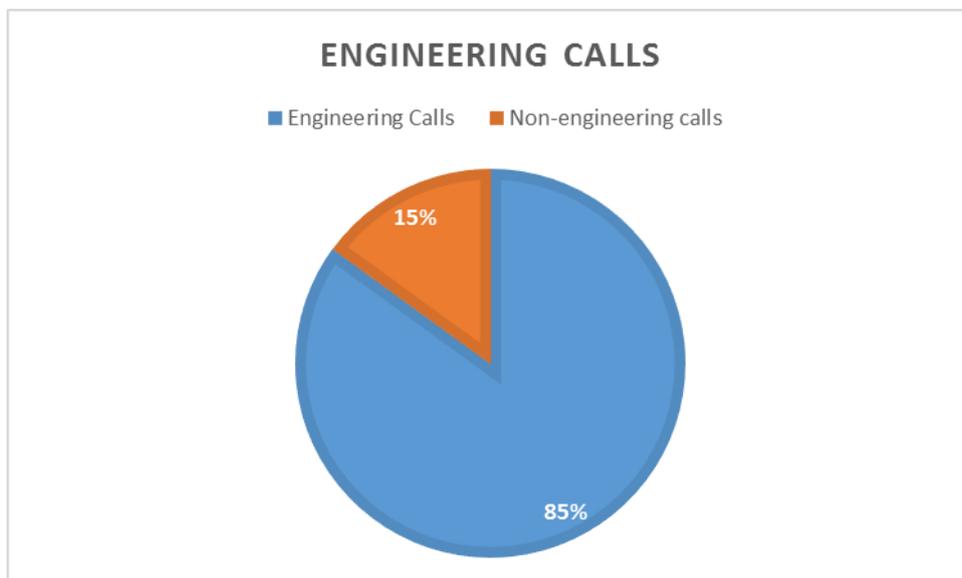


Figure 3-6: Engineering Calls

A process flow for when a query call comes into the engineering department can be seen in figure 4-7.

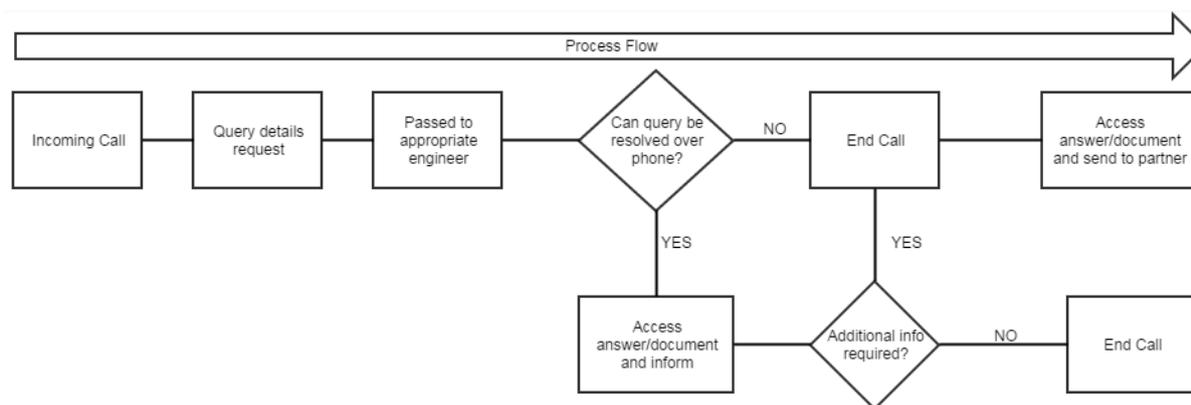


Figure 3-7: Engineering Call Process

The aim is to setup an online server or document sharing server that will eliminate, certainly the queries that can be dealt with over the phone as these are typically trivial queries such as unit dimensions, COP values etc., and also many of the other calls also.

Below is a list of the typical questions and queries that were asked:

- Unit dimensions
- Space requirements
- Performance Data for heat pumps
- Connections for pipe work
- Wiring terminations
- Electrical application form information
- Schematic requests
- Newly installed unit start-up
- Price requests
- Query on cylinder and buffer tank sizes

The data has now been gathered and is ready for analysis so that a solution can be provided.

3.3 Analysis

The data that was collected during the measurement phase of the project was analysed simplistically in order to provide a solution in the given time frame.

In addition to the calls being measured, the engineers were asked to give a reasonably figure on the amount of time that it took them to get entirely focused on the task that they were working on before they were interrupted with a phone call. This varied from engineer to engineer and it was also found that the length of the call had an effect on the time it took to re-focus. A short call, less than two minutes, typically required anywhere between 1-3 minutes to get re-focused, a five minute call took 2-4 minutes, and any call that the duration went above five minutes, it would certainly take more than 4 minutes to get fully immersed and focused in the original task. With this in mind, it is clear that by taking a phone call it was not just capturing the time of the duration of the call but also valuable time to re-focus etc.

It would take more time to become re-focused on higher level tasks when compared to menial tasks also.

As shown above the calls were broken down into calls dealt with or not and also if the calls were actually of an engineering nature.

It was found that just under 15% of the overall calls were not actually of an engineering nature. As a result of carrying out the measurement of the calls it was easily identified that there was an obvious problem in that calls were being passed to the engineering department even though the call had actually nothing to do with the engineering department. This highlighted an issue that required an immediate action to be taken that would instantly free time up for the engineers. This was dealt with internally and is not discussed in this report. By carrying out this project in the workplace it allowed other unknown or more so hidden issues to come to light and be rectified to allow a slicker work place to begin operating.

Of the calls that were dealt with it was found that over 70% of these calls could have been avoided if the partners had access to the information to which they were looking. The installers would have been sent documents in the past but they would somehow always call the office again looking for the information that they would have. A solution to this needed to be delivered. The remainder of the calls, the other 30%, required a task for the engineer to complete, such as a heat loss calculation etc.

Of the calls that were not dealt with, again, required the engineers to carry out tasks in order to answer the query of the installer. In the case that there was no task to complete, it was simply that the engineer did not have the information at hand and had to go searching for this on servers etc. Once again, a great deal of this information was not difficult to know or access and certainly did not warrant the partner to call the engineering department if they were previously sent the document or if they were provided access to our documents of choice in a central repository.

It was found that the installers did not see an issue with calling the engineering department looking for information which they had already been sent via email. They were unable to recognise that this was taking time from the engineer's working day and decreasing the engineer's effectiveness. This was certainly something that would be required to be addressed going forward and the engineering department that if this issue communicated in the correct manner to the partners that they would understand and would openly accept the provided solution.

3.4 Improve

It was decided that two things needed to happen in order to improve the calls process in the engineering department and to reduce the calls that the engineers were receiving:

1. Setup a central repository where partners will have controlled access to the documents that the engineers would like to share with them

2. Invite the partners to the office, for a day, and go through the new system with them in order to remove any ambiguity

This project was discussed in the engineering department and there were many ideas. It was decided that Google Drive would be used initially, but only on a trial basis in the Irish market. The success of the implementation of this would be monitored over a six month period and if it was producing positive results then a similar system would be introduced in the UK market. The Google Drive method was going to be used as a trial for a better future system if successful. There is currently a new website being built to suit both the Irish and UK markets and it was mooted that the partners could be given a login to the website where they would be able to access required documents and information.

Google Drive was setup and arranged as per the company structure:

1. Accounts
2. Administration
3. Engineering
4. Sales
5. Service and Maintenance
6. Stores

This ensured that the folder layout was intuitive and that any newcomer to the system would be able to find the document they were looking for without the need to ask another employee. For example, if someone was looking for an installation manual, for the Thermia Atec unit (air to water heat pump); they would find it by drilling down through the folders using the following file path:

Engineering > Product Information > Heat Pumps > Air to Water > Thermia > Atec > Installation – and there they would find the installation manual.

This file path method was used for each department on the google drive and it was found, within the company, that it was a very useful way of storing files. So much, in fact, that the entire server was mapped to the google drive to use this type of layout. The original server was not very efficient as people were not following any set rules and saving documents where they wished, whereas with this method it was very clear and intuitive that there was only one location to save, and in turn find, particular files. Once again, this highlights another by-product of this project that will allow improvement within the company.

Google Drive has the great feature which allows files and folders alike, to be shared with any person. It can be predefined who has access permissions such as “can view” and “can edit”. This will be useful going forward when sharing folders/files with external parties. It was decided that the partners would only be provided with view only permissions as there would be no reason why they would require to edit anything on the Google Drive. As well as documents, there were many design tools on the Google Drive. These were mostly excel workbooks which were designed by the engineering department and were used for designing

systems etc. These were placed on the Google Drive and it was required to ensure that these design tools could not be tampered and in turn jeopardise the tool. This reason was also used in the argument about the type of permissions that the partners would be granted.

Once all documents, files etc. were mapped to the Google Drive, the author began managing the drive and ensuring that all documents uploaded were the latest revisions. Revision control is important in relation to schematics and design tools for the systems to guarantee that partners have the most up to date design details for the systems.

The next step was to decide what folders were going to be shared with the partners. This was discussed at length within the engineering department and when it was decided by the engineering department it was then presented to the manager for approval. The manager approved of it was then signed off so the file and folder sharing could commence.

The folders that were being shared were then colour coded within the Google Drive to signify to everyone within the company which folders the installers would have access to.

The folders which were shared were all within the engineering folder:

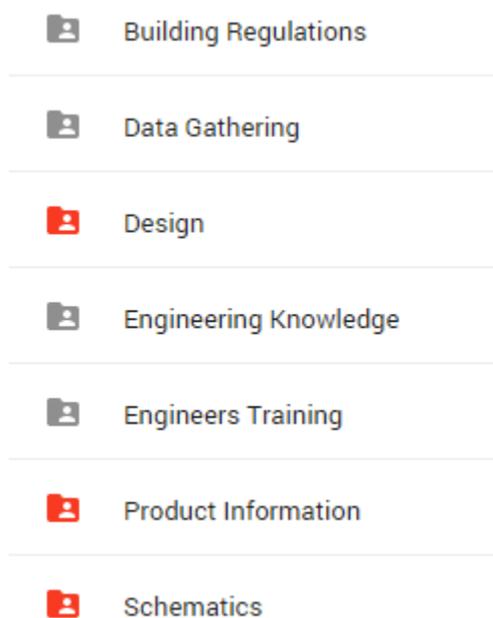


Figure 3-8: Engineering folder on Google Drive

Figure 4-8 shows the colour coded folders in the engineering folder – the folders coloured **RED** will be shared with the partners. There are subfolders within the **RED** folders above which were not required to be shared so it was possible to only share certain sub folders also which is a good feature – this prevents the necessity of having to create duplicate folders – one for internal use and another for external use.

Before rolling out the sharing process to the partners, they were all invited to the company's office in order to brief them on the proposed plans and to explain the reasoning behind it. This would be much better to do in person as opposed to over the phone or via email. All

partners attended a one day “workshop” in our office where they received technical training and sales training. For a period of just over an hour towards the end of the day it was discussed with the partners about the Google Drive and explained why the company were taking this new approach. All of the partners agreed that it would save the engineer’s time by reducing calls and they all felt like it would be the best if they have access to the documents instead of having to call an engineer each time they needed small pieces of information. It was mutually agreed that this was the best option, for a trial run at least, going forward and that it was ready to begin the roll out process.

The author took charge of the Google Drive to ensure that there was only person in control of the Drive to provide and remove users with access etc. The roll out of file sharing began by providing all of the partners access to the highlighted folders. There was an option to send an email to the partners once they were provided access but this function was disabled and a separate follow up email was sent by the author to each of the partners with instructions on how to setup, bookmark and access the Google Drive, including a link to the shared folders.

Each partner, over the next two days, received a phone call to discuss the Google Drive and to talk them through it if they had any issues. It was made clear to the partners that if they had any issues with the Google Drive that the author was the only engineer to speak to about it. This would ensure that this would not affect the other engineers time.

Once, again the engineers were asked to log the calls that they were receiving each day for the next 20 working days in order to be able to measure the success of the document sharing project.

The first week saw a minute reduction as a lot of the partners were still familiarising themselves with the Google Drive, but these calls were taken by the author and so did not have a massive overall effect on the engineering department. As the days and weeks passed, a reduction in the amount of calls coming into the engineering department was noticed and the engineers were noting this reduction and recognising the lack of interruptions. The partners had also provided positive feedback as they now did not have to persistently call the office for certain information.

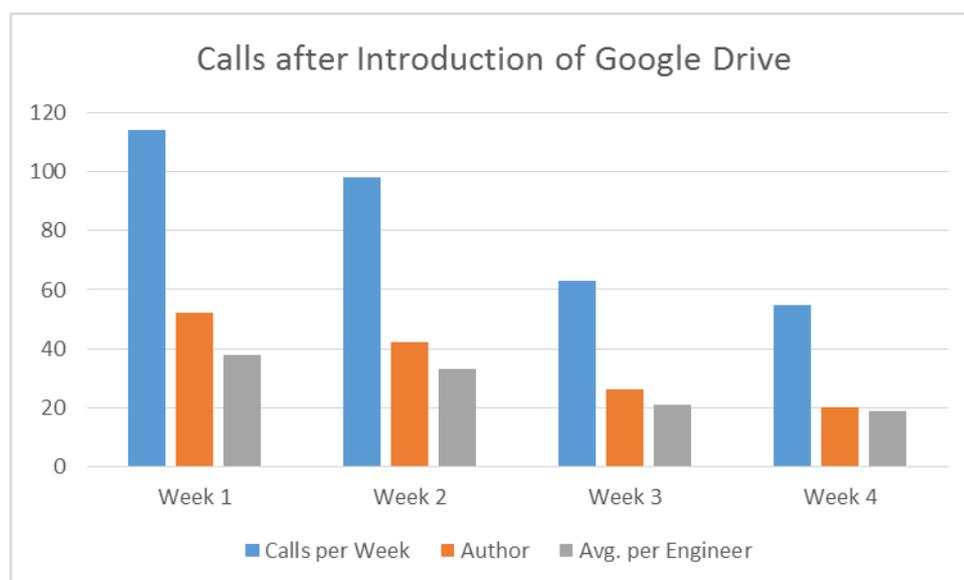


Figure 3-9: Calls after introduction of Google Drive

Figure 4-9 shows the number of calls received by the engineering company over the measure 20 working days. There is an obvious reduction of calls and this can be put down to the introduction of the Google Drive. It can be seen that the author received above the average of calls between the engineers which can also be put down to the introduction of the Google Drive.

It was also noticed that not only were calls reduced from the company's partners, but also from end users of the systems. This is down to the end user who typically contacts the partner first with a query and more often than not the installer tells the end user to call Ashgrove directly for an answer. As the partners now have the information they are now capable of answering such queries from the end users. This was a positive unforeseen result.

3.5 Control

As mentioned above, the author took charge of managing the google drive. Any new documents that were required to be added were done so by the author. The entire Google Drive was maintained which is quite simple.

Access permissions are also managed by the author i.e. addition of new partner, removing of old partner etc.

4 Conclusion

The aim of this project was to create a document sharing platform that can be used to share information and documents with external parties. Google Drive was used and the company's documents were uploaded as a trial, for the Irish market, in order to determine whether or not it would be worth implementing a similar system for both the Ireland and the UK market.

The main reason this was implemented was to attempt and reduce the number of calls that the engineering department were receiving each day with questions and requests for information. Once the document sharing system was implemented there was an immediate positive result. After just four weeks the number of calls that the engineering department was reduced by over 50%, and it is expected that this figure will keep increasing over the following weeks.

It was found that the use of computer mediated communication and the use of document sharing that it is both beneficial to the company and the partners. There is less calls required between both and this in turn leads to more productivity between both.

The success of this project within the company has led to management deciding to use this in the website and upload the sharable documents and provide access to our partners in both the Irish and UK market. This will introduce a more professional, accessible and positive system between the company and the companies in both Ireland and the UK.

5 References

- [1] http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-definition/index_en.htm
- [2] Covey, S.R., 1996. *First Things First*. 1st ed. New York: SIMON & SCHUSTER.