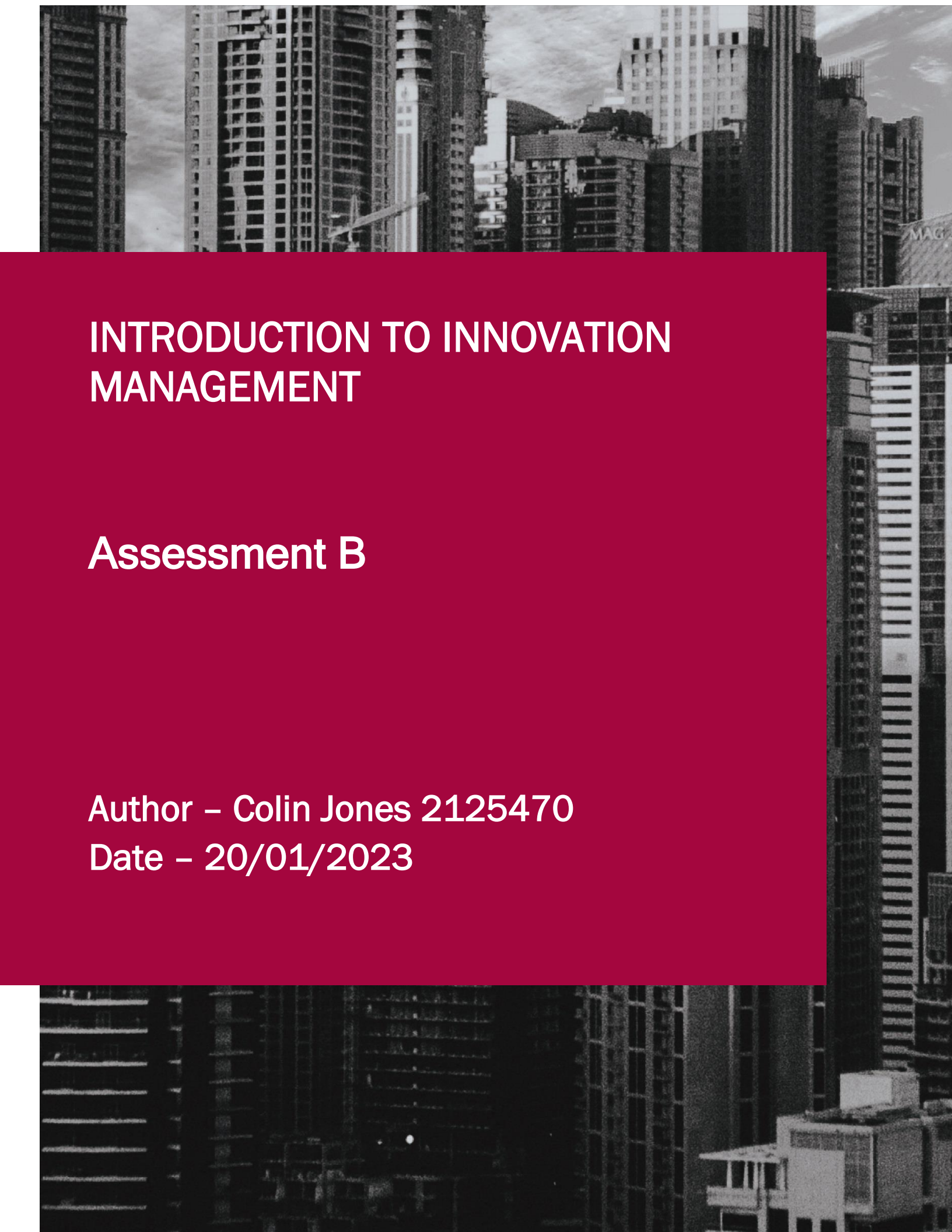




INTRODUCTION TO INNOVATION MANAGEMENT

Assessment B

Author – Colin Jones 2125470

Date – 20/01/2023

Assessment Contents.

- 1 What were the principal drivers for the innovation?
- 2 What were the main barriers and risks faced by the company in developing the innovation?
- 3 What were the key determinants in the process of committing to develop the innovation?
- 4 What were the processes and technologies which the Company used to carry the development forward?
- 5 To what extent did the development rely on resources external to the company and in which ways were their deployment managed?
- 6 How was the management overview of the development maintained?
- 7 To what extent do you feel that this innovation process represents best practice?
- 8 References.

A brief introduction to the innovation.

“Onelesscharlie” sound moderators.



Firearms, in particular, rifles, are inherently noisy when fired, this has the negative impact of potentially causing flight of quarry for the sporting shooter and obviously has even greater impact on a covert military application, as such, items described as silencers or sound moderators are widely fitted to reduce the noise and muzzle flash to what would be deemed as an acceptable level. As a secondary issue, the moderator also requires to be capable of longevity when faced with corrosive gases, massive pressure and elevated temperatures. Our innovation plan was to design, develop and manufacture a market leading range of sound moderators with excellent corrosion resistance and enhanced longevity with no prior knowledge or experience of them. This in hand with a shoestring budget, minimal production or process facilities and no marketing plan resulted in a process that turned out to be something of a challenge. I would hope that this report outlines the pitfalls of a project initiated on a company director's whim because of a personal interest with little or no management or steering.

WHAT WERE THE PRINCIPAL DRIVERS FOR THE INNOVATION?

1. Opportunity within the market - At the time, it was considered that there was a potential gap in the sound moderator market for custom design complete with higher specification materials, however, was there a gap in the market for a reason? As covered on a Bath University web page on entrepreneurial business strategy, there are numerous ways to spot a gap in the market, one of them being Maslows Hierarchy..

<https://online.bath.ac.uk/articles/how-do-you-spot-a-gap-in-the-market>

Maslow's hierarchy of needs is a good place to start when categorising the types of area you can look to innovate in. Made up of basic, psychological and self-fulfillment needs, it gives us a framework for understanding human motivation and what we need to feel satisfied. The model comprises of five levels, in which people must have their needs met in each tier before moving up to the next"



Maslow's hierarchy of needs

Perhaps the technological improvements in the way that a person “hunts” taps into some form of deep seated hunter/gatherer instinct and fits into the “Physiological needs” base layer of the hierarchy.

2. An alternative market - The Company, whilst enjoying a busy and profitable period, was totally reliant on its core product range of filling and capping machinery. If this marketplace should collapse, then the Company would have no alternative product to fall back on. The range of moderators seemed at the time to be a tentative step into an alternative marketplace and I hoped that my personal interest and knowledge would offer some protection when it came to getting the product right in the shortest possible time frame. Indeed, as mentioned by Jan Dawson there are “particular challenges” in being a one trick pony.

www.vox.com/ the challenges of being a one trick pony
December 11, 2015

The most successful companies in the technology market are often those able to develop broad portfolios of products and ideally create ecosystems around their products. By contrast, there are other companies that are heavily reliant on a single product. When the product is highly differentiated, that may be the basis of a decent business over time. But one of the most challenging places to be as a business is a “one-trick pony,” especially when the single product or service is relatively undifferentiated.

WHAT WERE THE BARRIERS AND RISKS FACED BY THE COMPANY IN DEVELOPING THIS INNOVATION?

Barriers and obstacles	Associated risks
Limited production facilities	Requirement for sub-contract machining
Limited staff availability	Taking staff away from core duties
Lack of in-depth product knowledge	Product failure and time wasting
Item weight limitations	Stainless steel would not meet limitation
Item cost limitations	Stainless steel would be too expensive
Limited material availability	Material availability would restrict design envelope
New market and no reputation	Little or no consumer confidence
Legislative and legal restrictions	Police would not issue a registered firearm dealer certificate
Pressure from co-directors	Difference of opinion with fellow directors

Limited production facilities and staff -

SP Filling Systems were a small family company with 10 employees, only three of these were trained in the use of the machine tools in the workshop. These three employees were already fully engaged in the manufacture of component parts for the range of filling and cap tightening machinery and any use of their time would have a negative impact on the scheduling of those parts. I was a time served machinist and could free up other members of staff, however this in turn would have a similar negative impact on my sales and marketing role within the company, I did not wish to employ the services and costs of a sub-contract engineering company, so something had to give and it was decided that I would machine the required components for the prototypes myself.

Limited technical knowledge -

What to the untrained eye resembled a simple tube with an internal set of baffles turned out to be anything but. There were numerous considerations, including complicated pressure and gas flow calculations, extreme heat for a split second and the requirement for extremely tight concentricity tolerances, we simply had little or no concept of the mathematical impact involved in the design and utilized existing market leading moderators as a base line.

The main risk associated with this lack of knowledge was that it was not the environment to “learn as you went along”, if you got something wrong there was the potential for serious injury to the tester.

An example of one of the less complex mathematical equations for the gas flow can be seen below, taken from the Defence Science Journal, Vol.71, No.1, 2021.

$$\frac{Dp}{Dt} + \frac{d(PVx)}{Dx} + \frac{d(PVy)}{Dy} + \frac{d(PVz)}{Dz} = 0$$

(Paulson A.C., Silencer History and Performance, Sporting and Tactical Silencers, Paladin Press, USA, 1996.)

A further example of the naivety within our test procedure and analytic process can be seen if it is considered against the following extract from a military process:

“The numerical analysis was solved with the ANSYS Fluent software. During the analysis, a turbulence flow was considered with a mixture of chemical compounds generated by the deflagration of the double base powder, this solution includes the dissipation model (Eddy Dissipation) with a complete conversion of the reaction”

(Torres, et al: Numerical and experimental analysis of a sound moderator)

We simply put a round in the test rifle and fired the thing.

Weight sensitive marketplace -

The existing long standing and respected mild steel moderators used their gross weight as a major selling point, it would be very difficult to be able to match their weight considering cross sectionally mild steel was less dense than stainless steel and any aluminium alloy bodied variants were significantly less dense

www.theworldmaterial.com/density-of-materials/

"The density of common metals such as iron is 7.87 g/cm³, mild steel is 7.85 g/cm³, 304 stainless steel is 8.0 g/cm³, aluminum is 2.7g/cm³"

For the unit to be competitive both the negative input of the limited material availability and the associated weight issues had to be overcome, this is where the major innovative elements began to show themselves and the design started to fall into place.

Cost sensitive marketplace -

Stainless steel was significantly more expensive in all the formats that was required to manufacture the unit.

www.sciencing.com/about-6711987-price-steel-vs-stainless-steel.html

updated January 09, 2018 by Daniel Wallace.

"Stainless steel costs four to five times much as galvanized steel in material costs. Structural steel is holding somewhere between 30 to 80 cents per pound, while stainless steel is at least \$3 per pound."

As such, even if we simply reproduced an existing mild steel moderator the material element of the overall cost was going to be at least four times as much. The existing moderators retailed at approximately £285, this was inclusive of a general 30% profit margin for the retailer. That meant that if we were happy with a gross profit of 30% we had to be able to manufacture for £150. Assuming that the other manufacturers were running at a similar level of profitability it was going to be very difficult to be able to deliver a quality item, however, the plan was to be able to offer a higher specification unit at a similar price.

Limited material availability -

We were looking at utilizing either 304 or 316 stainless steel in our variant of the sound moderator, these materials we chosen due to the following:

1. Sound deadening nature of the stainless steels.
2. Increased corrosion resistance against the acidic properties of the gases created when the firearm was fired.

Unfortunately, the range of material sizes available in both tube and bar stock formats was limited when compared to mild steels, as such coming up with a design that was competitive dimensionally against mild steel competitors was somewhat challenging. The range of pipe and tube had the additional issue of only being available in Imperial sizes, this offered an additional complication when matching it to Metric sized bar stock.

For the unit to be competitive both the negative input of the limited material availability and the associated weight issues had to be overcome, this is where the major innovative elements began to show themselves and the design started to fall into place.

New marketplace with no reputation -

As a company we had been designing and manufacturing a range of filling and capping machinery for over 30 years. We had an excellent reputation within the UK packaging industry for good design, good quality and products that encompassed an innovative nature. Within the UK shooting industry we were an unknown and while I had held a personal presence on a number of shooting based forums for a number of years, this was hardly going to be an endorsement for our proposed range of sound moderators.

The strategy adopted to circumvent this was to have the range of products endorsed by those regarded to be among the best in their field, as such, a number of specialist rifle builders and competition shooters were approached to test and report back their findings.

The main risk associated with this strategy was the potential for the prototypes to fall flat on their faces during testing, if this occurred there was every chance that the testers would simply just walk away believing that we were simply wasting their time.

Legislative restrictions -

Taken from the Firearms Act 1968

1.1 Section 57 (Interpretation) provides the definition of "firearm" and includes all lethal barrelled weapons, prohibited weapons (including some which are not strictly guns in the conventional sense or lethal weapons such as CS sprays and electronic stun devices).

(1) In this Act, the expression "firearm" means a lethal barrelled weapon of any description from which any shot, bullet or other missile can be discharged and includes—

(a) any prohibited weapon, whether it is such a lethal weapon as aforesaid or not; and

(b) any component part of such a lethal or prohibited weapon; and .

(c) any accessory to any such weapon designed or adapted to diminish the noise or flash caused by firing the weapon;

Sound moderators are classified as "Controlled items" under the Firearms Act 1968, as such we were advised that we could manufacture the components but not assemble them to complete an assembly unless we became Registered Firearm Dealers. This is a very grey area within the terms of the Act and it took weeks for the head of the Dyfed Powys Police Firearms Department after liaising with the Home Office to offer a final decision. It then took a further two months to complete the required application and get it processed and approved. Once we were recognized as DPP RFD1421 we were clear to proceed and manufacture of prototypes could begin.

Pressure from Co-directors -



As mentioned in the introduction, the development and innovation of this product was instigated due to the personal interest of the subject matter of one company director. None of the other directors shared this interest and at the outset simply tolerated the fact that I was not at my desk doing what I was being paid to do. I on the other hand had some knowledge of the market for this product and knew that if we could get all the contributors right that we could potentially have a market beating product at our finger tips.

Our core business had a minimum item sales price for machinery of approximately £4500, automated line prices elevated this price to in excess of £200,000. It quite quickly became apparent that they were of the opinion that the amount of time I was dedicating to the project was not inline with a product that would have a limited market and a far reduced item sales price and that my time would be better spent on the sales and marketing of filling and capping machinery. I could understand their point of view, however, continued to strive to develop an alternative product that I hoped would see us through any lean times in our core business.

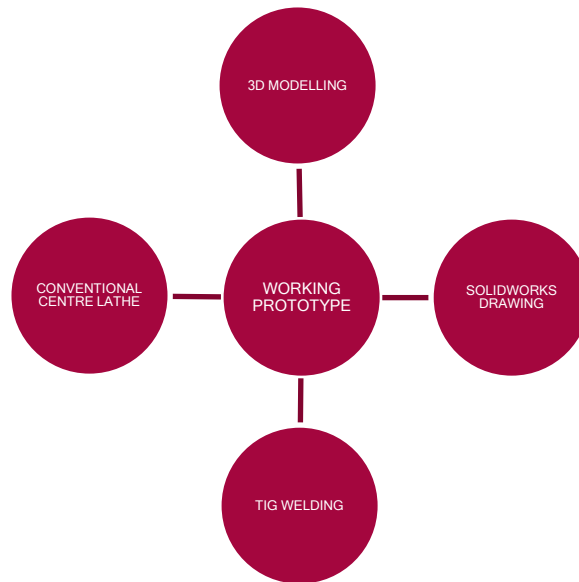
What were the key determinants in the process of committing to develop the innovation? -



Because of the way the innovation was managed there were few determinants in the process, I had already decided that it was a project that I wanted to undertake, and I had determined that I would utilize as few of the companies resources both process and financially based as possible.

I would say that the key determinant would be the granting of a Registered Firearms Dealership Certificate, as without this the project would be dead in the water.

The processes and technologies which the company used to carry this development forward.

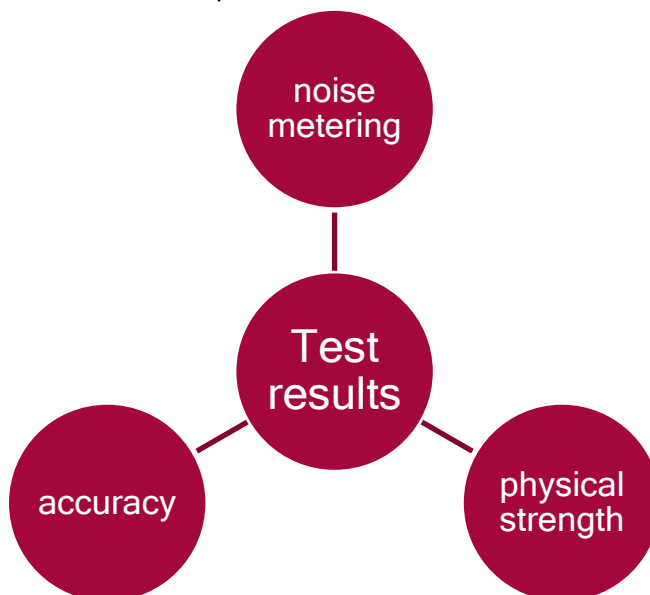


Stage one was to 3D model the prototype design, this removed a cad designer from his core duties and transferred him to the project. Once the model was complete and we were happy with the concept the detail drawings were configured by the design department.

Stage two was the manufacture and machining of all the component parts, this again removed a machine operator from his core duties.

Stage three was the fabrication of the completed unit using stainless steel TIG welding.

At this point we had a viable product that we could test on a firearm under controlled conditions.



A positive test result would require a satisfactory level of noise reduction, no reduction in the accuracy of the donor firearm once the moderator was fitted and the moderator had to retain structural integrity when the firearm was fired.

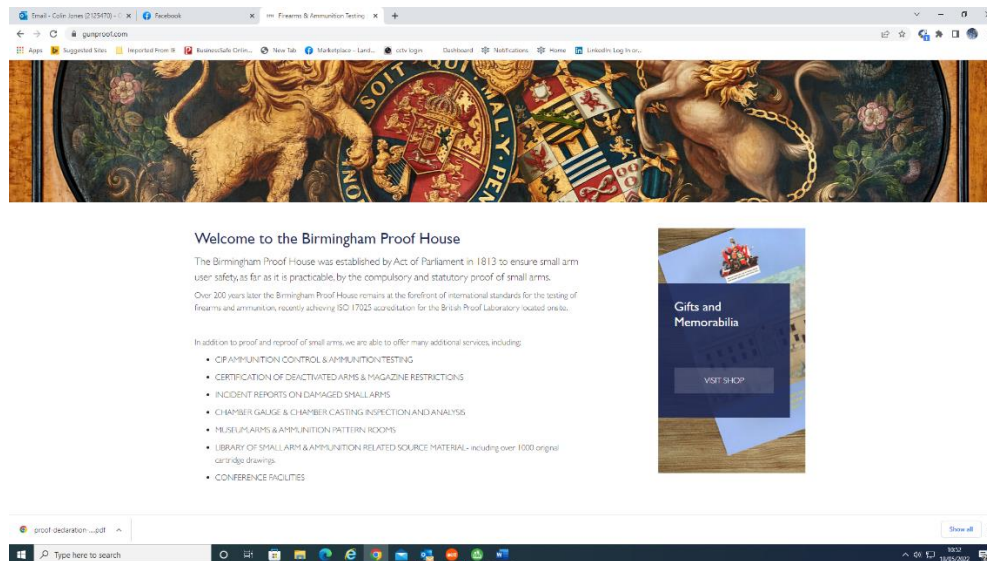


The extent to which the development relied on resources external to the company and the ways in which the deployment of these resources was managed.

Most of the resources relied on to develop the product were internal to the company, however, to give the product some industry credentials it was given the following, however there was no management of these external resources:

1. Testing by one of the UK Proof Houses.
2. Testing by an industry recognized professional and competitive use.

Proof testing.



As moderators are offered the same firearm classification as a rifle they are required to carry a recognized mark of Proof to be sold in the UK. These can be applied by either of the two Proof houses in the UK. A simple form is completed indicating which service is required and they then test to ensure that the item is of sufficient quality to carry the mark. The test example passed with flying colours and we were free to offer them for sales as and when required

The test for a moderator is as follows:

1. Visual internal and external examination
2. Fitment to an appropriate test firearm and firing at standard pressure
3. Fitment to an appropriate firearm and firing at 150% of standard pressure
4. Visual internal and external inspection

Field testing results

lifeinthewilderness.uk/threads/onelesscharlie-custom-sound-moderator.179978/

Home Forums What's new Resources Media Log in Register

You are currently viewing the site as a guest and some content may not be available to you.

Registration is quick and easy and will give you full access to the site and allow you to ask questions or make comments and join in on the conversation. If you would like to join then please Register

Home > Forums > Activities > Shooting >

Onelesscharlie custom sound moderator.

Ystranc · Jun 11, 2019

Ystranc
Moderator
Tier 1 Donor
Tier 2 Donor
Tier 3 Donor
Tier 7 Donor
Messages: 8,658
Points: 1,880

Jun 11, 2019

I've been waiting with bated breath for this little beauty to arrive, the hand crafted stainless steel and alloy mod's build quality makes Parker Hale or SAK look sloppy by comparison. It's a little heavier than the all alloy SAK but it's smaller diameter and shorter length mean that it doesn't even feel like it's there on the end of your barrel. It's a pleasure to use and so easy to strip and clean it's unbelievable. Often favourably compared to a Wildcat moderator for performance Onelesscharlie sound moderators also seem inexpensive. Whether you're using air rifles, rimfire or centre fire rifles you need to try these moderators, Colin, who makes them has the skills to manufacture a mod to pretty much any specification. Based in Powys, mid Wales this is a high quality British made product.



This site uses cookies to help personalise content, tailor your experience and to keep you logged in if you register. By continuing to use this site, you are consenting to our use of cookies.

[Accept](#) [Learn more...](#)

proof-declaration-...pdf

Type here to search

11:10 18/05/2022

gunmart.net/shooting-accessories/equipment/moderators/oneless-charlie-moderators

Oneless Charlie Moderators

By Pete Moore · Shooting Accessories, Equipment, Moderators · 6 Comments
Last updated: 24/11/2016

Review Guns For Sale Comments



Oneless Charlie Moderators

For me as a long term user the world of firearms moderators has changed considerably in the last 20-years. Back then there was not a lot of choice around with perhaps the ubiquitous Parker Hale 75 calibrator and the Danish Valmet for full bore use. But the choice was not large on so much

Knife Warehouse
HUNTING KNIVES
POCKET KNIVES
MACHETES
SHOP NOW

Geco OPTICS
UP TO 65% OFF!
GECO OPTICS CLEARANCE OFFER!
Whilst stocks last! on selected lines only.
www.ruag.co.uk

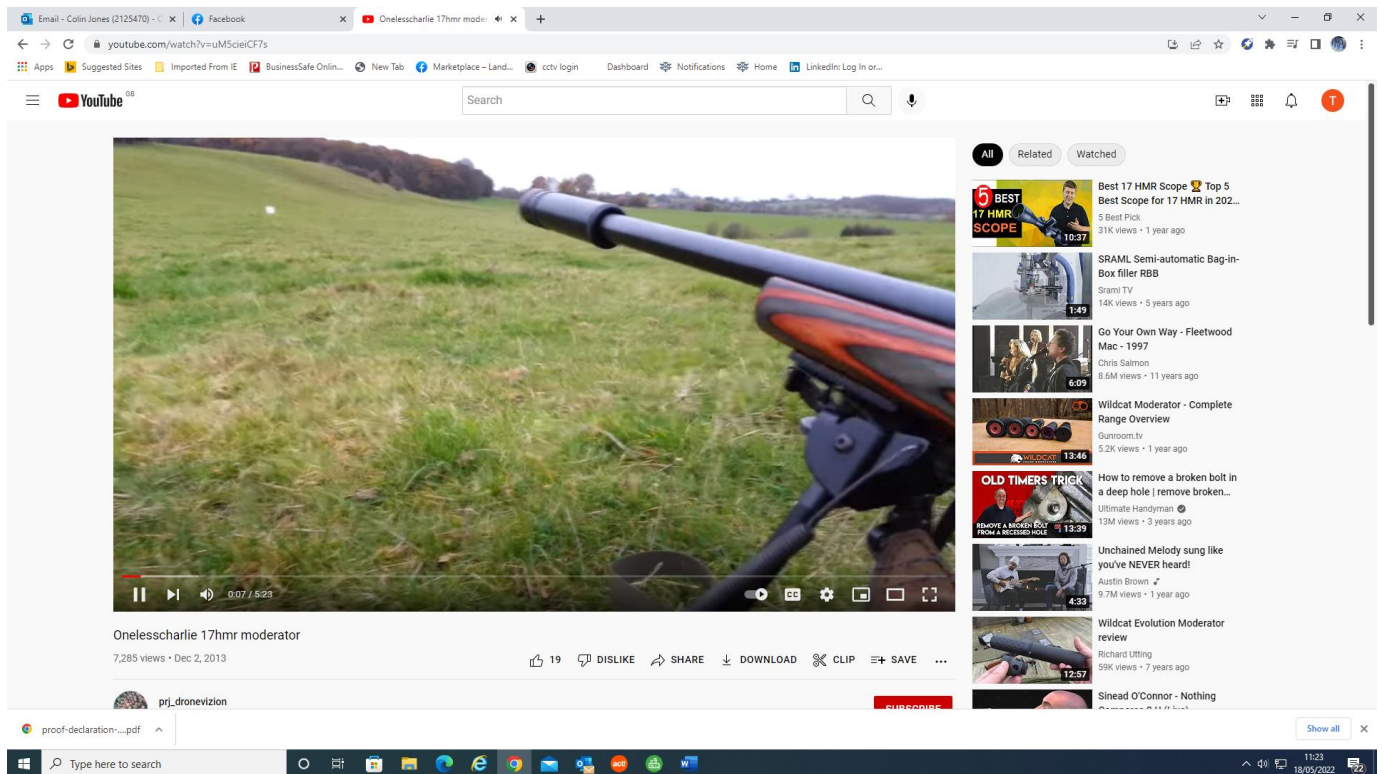
Knife Warehouse
WIDE RANGE
GREAT PRICES
SALE
FAST DELIVERY
SHOP NOW

MORE SHOOTING ACCESSORY REVIEWS
REVIEWS X-CLOSE
Keeping you shooting for over 50 years
MADE IN THE UK
BISLEY

proof-declaration-...pdf

Type here to search

11:11 18/05/2022



Whilst we had the opportunity to carry out initial test firing trials ourselves, we also required the input of recognized and respected shooters from multiple disciplines across the Country. This input was required to give the product the credibility that came from the use by these ambassadors. All the recognized testers gave the moderators glowing reports, these reports were to be found and can also still be found archived on almost every shooting forum in the UK.

How the management overview of the development was maintained



The innovation was assessed by a single director and due to its success became integrated into the product portfolio of the Company, while not offering a large revenue stream it did offer an alternative product range if required.

The issue of financial impact was minimal, however, time and effort costs were an issue as they had a negative effect on the sales and marketing of the core products.

The extent to which you feel this innovation process represents best practice.



I would have expected that if this innovation management process was measured against any recognized format that it would be expected to fail, however, I would also state that the ability to develop a market leading product with no project management whatsoever could be viewed as innovative in its own right. This innovation process was designed to fluidly fit into the available finances and combined resources of the company, best practices are guidelines and surely should be adapted to suit the challenges and limitations thrown at them at any time.

If you look at any of the following descriptions of best practice, the haphazard methodology that was used in the development of the sound moderators comes surprisingly close, especially considering that none of the models were followed intentionally.

Kyllainen, J. (2018) 6 best practices and success factors for innovation management, Available from: <https://vima.com/blog/innovation-management-best-practices> (16/05/2022)

“It's not smart to slavishly follow other's success stories because what may have worked well for someone in the past, might not work for you, and most certainly isn't guaranteed to work in the future.”

6 Success Factors

- Constant improvement
- Create value for your customers
- Implement The Lean Startup Model
- Allocate resources properly to support your strategy
- Create an innovative company culture
- Stay focused

Floyd, S. (2013) Microsoft's innovation management framework, Available from <https://sharpcloud.com/innovationmanagement> (16/05/2022)

“Why should some companies adopt standard practices for innovation? There are some people that believe innovation is simply the inspiration of a few talented individuals..... While people are critical, harnessing the innovative potential of an organization requires process in addition to culture and strategy.

“some may think that the ‘innovation process’ is an oxymoron, but you need a fairly structured process to drive innovation or you have little chance of collecting great ideas and no chance of bringing them to market” explains Ben Chamberlain of UMT.

Five sub-processes for innovation management.

- Envision
- Engage
- Evolve
- Evaluate
- Execute

Seabrook, D. Jearenaud, S. Bessant, J. (2012) managing innovation for sustainability, Available from: <https://onlinelibrary-wiley.com.uwtsd.ac.uk/r&dmanagement> (16/05/2022)

“innovation research highlights a well established framework for what might be termed “best practice innovation” – “a suite of routines around which organisations can organize the search, select and implement stages of an innovation process” (Tidd and Bessant 2009)

Critique.

In offering a critique of this innovation process I am also offering a critique of myself, the project was my idea, my timescale, my budget and my pet. If the outcome is poor then I should be strong enough to take it on the chin, alternatively if the outcome is positive then I may revisit the project, this time however, also attempt to facilitate best practice where it fits.

The framework I will use for the critique is the one cited above and featured in the Microsoft's innovation management framework, it is used by and contributed to by some of the largest and most successful companies and organizations in the world, so I would assume be viable for a small engineering company of 10 people.

Envision: There is no doubt that there was a degree of forward thinking involved in this process. There was a realization that the company had a reliance of the stability and performance of a single market place and that the development of a secondary product line would offer some stability should the primary market place falter. In this template Envision is the first and a somewhat critical step in a managed innovation process, the step existed, however, not as part of any planned scenario, as an individual step it carried weight but the fact that it was purely an individual's assessment of what may succeed as a secondary product line left it open to failure.

Engage: Once again, at no point did the originator of this innovation engage the opinion of any other individual within the company to seek a second opinion as to the viability of the project. There was failure to engage, fellow employees, partners, sub-contractors and potential customers in the process. At a more commercial level, there was a failure to assess if this new product range had any viable means of adding additional turnover or profit to the business. As is mentioned elsewhere (Braden Kelly of Business Strategy Innovation) [“The key in the engagement process is to get closer to the customer, what they desire, how it will make their lives better and how it will displace something”](#).

There was no engagement of potential customers even though there was ample opportunity to engage more than suitable opinion on the numerous forums on which the originator was a member.

Evolve: This stage of the process would generally implement the findings of the “engage” stage and perhaps look into modifications that would increase the quality or commercial viability of the original idea.

I would suggest that you may have a perfect acorn, however, that is no guarantee that you will have a perfect oak tree when it germinates. If this stage is pushed to hard, then the overall integrity of the product may be irreversibly damaged.

This stage was probably the first occasion where the originator engaged the services of anyone external to the company for an opinion. The moderator prototypes were released to recognized individuals for field testing and further to the primary testing various modifications were made and additional models manufactured and also summarily tested.

Evaluate: In a company where the innovative culture returns numerous innovations, there will no doubt be a requirement to filter through them and examine which of them offer the greatest potential and interest for further investment of time, finance and resources.

This company differed in the fact that this was potentially the only innovation being examined other than those in its core business. Further to feedback from the professional testers the opportunity was taken to evaluate the quality and potential marketability of the product when compared to the competition in the marketplace. Any models or variants that were deemed to be unsuccessful at the test stage were also evaluated, a decision was taken as to if they were worthy of further modifications to make them a contender or simply to put them to bed.

Execute: This stage takes the outputs from the previous stages and “executes” a project to continue development or actively produce and market. It can be challenging to deliver the project on time and in budget and retain the level of quality that was envisaged, however, an effective “execute” stage will drive the project to market more rapidly. It is difficult to establish if this was the case in this particular project as there was neither a projected timeframe or budget and the product was simply marketed once it was deemed suitable.

General evaluation

Considering there was no predetermined project outline or formal management of the project the Onelesscharlie range of sound moderators became and is still one of the best in the world. When in production and available to the marketplace, the moderators were the first choice for rifle shooters of all disciplines and were used by multiple British record holders.

The product spoke for itself, however, the fact that the manufacture and marketing of the range became engulfed by the necessities of the core business is a stark indicator as to the weakness of the overall project management and long term plan.

Reference list

<https://online.bath.ac.uk/articles/how-do-you-spot-a-gap-in-the-market> “Maslows Hierarchy of Needs” (accessed 12 December 2022)

www.vox.com/ the challenges of being a one trick pony, [December 11, 2015](#) (accessed 12 December 2022)

Paulson A.C., *Silencer History and Performance, Sporting and Tactical Silencers*, Paladin Press, USA, 1996.

Defence Science Journal, Vol.71, No.1, 2021.

Torres, et al: Numerical and experimental analysis of a sound moderator

Birmingham Proof House (2022) Firearms and ammunition testing. Available at <https://www.gunproof.com> (Accessed 18th May 2022)

Firearms Act 1968 (1968) Section57 (interpretation). Available at <https://legislation.gov.uk> (accessed 16 May 2022)

Floyd.S (2013) Microsoft’s innovation management framework. Available at <https://sharpcloud.com/innovationmanagement/> (accessed 16 May 2022)

Jain. V (2017) Innovation without borders. Available at <https://innovationmanagement.se/2015/06/17> (accessed 16 May 2022)

Kyllainen. J (2017) Six best practices and success factors for innovation management. Available at <https://vima.com/blog/innovation-management-best-practices/> (accessed 16 May 2022)

Sciencing.com (2018) Price of steel vs stainless steel. Available at <https://sciencing.com/about-6711987-price-steel-vs-stainless-steel.html> (accessed 16 My 2022)

Seabrook. D, Jeaurenaud. S, Bessant. J (2012) Managing innovation for sustainability. Available at <https://onlinelibrary-wiley.com.uwtsd.ac.uk/r&dmanagement> (accessed 17 May 2022)

The World material (2022) Density of metals. Available at <https://theworldmaterial.com/densityofmetals/> (accessed 16 May 2022)