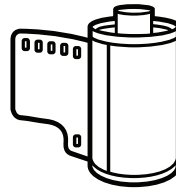


The Sustainability of Analog Photography



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Authenticity Statement

This is to certify that to the best of my knowledge, the content of this report is my own work. This report has not been submitted for any subject or for other purposes. I certify that the intellectual content of this report is the product of my own work and that all the assistance received in preparing this report and sources have been acknowledged.

Kentaro Mikami
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10.09.23

AI Use Statement

I have utilised Generative AI in this report (ChapGPT, Dalle, Bard, or similar) to assist in various ways. The way I have used Generative AI was in the generation and testing of the list of questions asked to the interview participants.

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10.09.23

Abstract

2023 marks the 131st Birthday of commercial analogue (Eastman Kodak Company, 2023). Since its conception the medium has Shifted and evolved with the world, analog photography companies became the titans of the 20th century. However, the millennium shift marked film as an obsolete medium - unable to compete with the efficient digital world. However analog photography has refused to die, younger generations have fuelled an Analog Renaissance and are innovating and evolving the medium once again.

This report investigates how analog photography needs to evolve further to become a sustainable medium to inform a design solution. The current state of the medium is analysed via an in-depth literature review, a survey and 8 Semi structured Interviews. (With 2 preliminary test interviews) to identify gaps in the literature. The report splits the respondents into the three groups of Amateur/ experienced photographers & film labs and analyses the relationships between them. Finding a variety of cost related issues for all groups, barriers to entry surrounding perceived complexity of the medium & an analysis of the current product ecosystem and its flaws/strengths.

These relationships and findings are related to the literature review and advise 5 preliminary designs focused on key intervention points.



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Introduction

Analog photography refers to the process of capturing images using chemical processes. This form of photography has a variety of drawbacks and issues when peering through a lens of sustainability. The physicality of the medium requires the use of certain chemicals. Of which can be harmful to the environment and are becoming more costly as the price of raw materials & logistics rises. The medium was almost lost due to the digital emergence during the millennium shift. However younger generations have begun to bring the medium back into the light saving it from demise (Urth HQ, 2022).

Analog photography has ingrained itself as a vastly important medium. Driven by a community that adores the Aesthetics film provides. A community that enjoys getting lost in the dark room - entranced by the rehearsed dance that is the development process. Analog photography enforces an intricate understanding of the mechanics and physics behind creating a photograph. It slows the process of photography and promotes reflection and Deliberation. Analog photography's history is vast and rich - used to capture some of the most important events in history. It acts as a window into the past through the iconic designs and forms of cameras and photographic equipment. Analog photography is widely considered to be the most pure and elemental form of photography. It represents more than 100 years of continued work and effort - sculpting it into the medium it is today (Verzosa, 2023).

The aim of this research report is to uncover the fundamental sustainability issues surrounding analog photography with a focus on the Environmental, Economic and Social/Cultural aspects of the medium. The report aims to inform how different users of the medium interact within it and how these interactions and relationships can be leveraged through an industrial design solution to promote continuation. Many of the use cycles within analog photography are open and difficult to become familiar with, losing resources after use and acting as barriers to entry. This project aims to close and simplify these cycles so that the medium of analog photography and the processes it encompasses can continue to be utilized as the photographic world evolves.



Report Structure

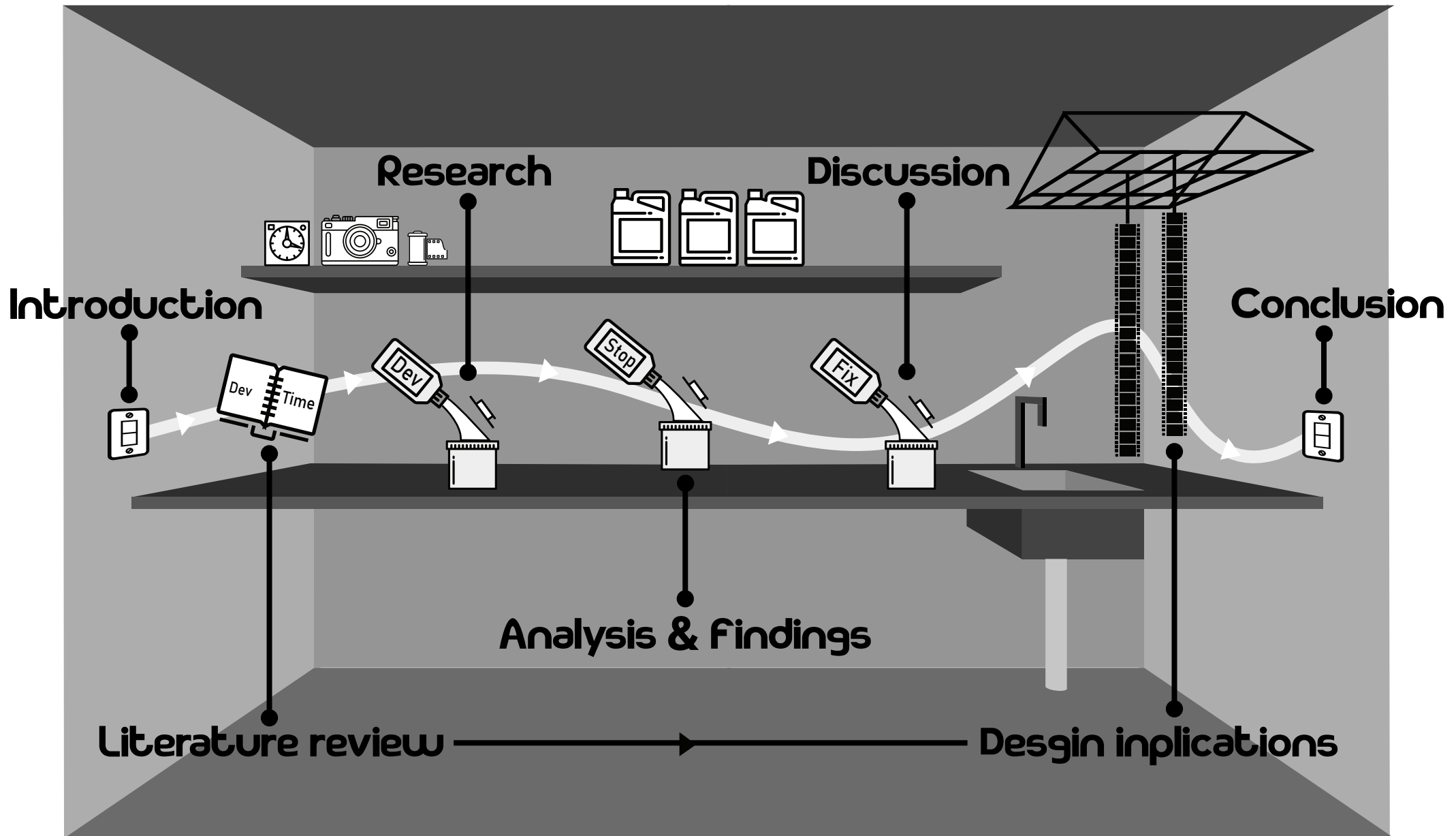
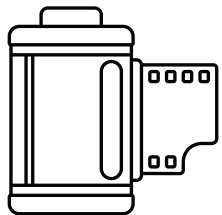


Figure 1. Graphic visual of overall project structure.

Literature Review

Introduction

Analogue photography at present is a notoriously chemically hazardous field. Analog Photography & the Analog Photography process consists of plastic film that is coated with chemicals and animal products that are toxic to the environment which is developed by more chemicals that are also toxic to the environment. All of which come in plastic containers, use plastic sleeves, and plastic tools. (Maughan-Carr, 2020) This section reviews the literature surrounding the environmental, economic, and cultural/social sustainability issues of analog photography as a photographic medium.



Silver Pollution

The literature surrounding the topic of the environmental impact of analog photography is detailed and expansive - a variety of focal areas are highlighted the most predominant begin the issue of Silver Discharge from commercial photo processing. Edward Maughan-Carr explores this in his thesis (The Ecology of the grain: an ecological analysis of photographic film). The EPA (environmental protection agency) also highlights the hazardous nature of silver in AP in their 1997 Report (Preliminary Data Summary for the Photo processing industry). The EPA presents the toxic weight factor of photographic pollutants in calculation performed in figure X.

$$TWF = \frac{5.6}{AQ} + \frac{5.6}{HHOO}$$

Where:

- TWF = toxic weighting factor
- AQ = Chronic aquatic life value ($\mu\text{g/L}$)
- HHOO = Human health (ingesting organisms only) value ($\mu\text{g/L}$)

Figure 2. EPA Toxic weight factor formula (United States Environmental protection Agency, 1997, p65).

The EPA highlights how silver has considerable toxic weight factor as compared to its relative waste products of 47. As seen in figure 2. This factor is further elaborated on in the report describing the toxicity of silver. Highlighting the adverse environmental effects silver can have on marine eco-systems.

Pollutant	TWF
Ammonia	0.0022
Sulfate	5.6×10^{-6}
Silver	47
Iron	0.0056
Zinc	0.0051

Figure 3. Pollutant toxic weight factors (United States Environmental protection Agency, 1997, p66).

Jan Matuszko's memorandum to Public Record for the 2006 Effluent Guidelines Program Plan highlights updated information regarding the water waste streams analog photography produced in 2003 as well as estimations using updated statistics for the toxic weight factor of silver, the removal of pollutants by Publicly owned treatment works & the Load/subsequent loads after removal via Publicly owned treatment works as seen in figure 4.

Pollutants of Concern	Concentration (mg/L) ¹		Loads Before POTW Removal (lbs/year)		TWF	TWPE Before POTW % Removal (lbs/year)		POTW % Removal		Loads After POTW Removal (lbs/year)		TWPE (lbs/year)	
	Range	Average	1994	2003		1994	2003	%	Data Source	1994	2003	1994	2003
Ammonia	20-300	160	3.02E+06	2.46E+06	0.0022	6.633	5.413	39%	TRI table	1,839,156	1,500,947	4,046	3,302
Biochemical Oxygen Demand (BOD)	200-3000	1600	3.02E+07	2.46E+07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand (COD)	400-5000	2700	5.09E+07	4.15E+07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	<10-100	55	1.04E+06	8.46E+05	0.0056	5.804	4.737	83%	CWTR/RRRL	176,190	143,789	987	805
Silver (tonafer recovery) ^{1,2}	<0.1-5	10	1.88E+05	1.54E+05	16.47	3,103,576	2,532,847	88%	TRI table	22,085	18,024	363,739	296,850
Sulfates	50-250	150	2.83E+06	2.31E+06	5.60E-06	16	13	NA	NA	NA	NA	NA	NA
Thiosulfate	100-1000	550	1.04E+07	8.46E+06	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Dissolved Solids (TDS)	300-3000	1650	3.11E+07	2.54E+07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Kjeldahl Nitrogen (TKN)	30-350	190	3.58E+06	2.92E+06	NA	NA	NA	90%	I&S/Steel POTWs	358,032	292,192	NA	NA
Total Suspended Solids (TSS)	<5-50	27	5.09E+05	4.15E+05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	<0.75	0.75	1.41E+04	1.13E+04	0.0051	NA	NA	79%	TRI table	2,948	2,406	15	12
Total			1.34E+08	1.09E+08		3,116,029	2,343,010			2,398,412	1,957,358	368,787	300,963

Figure 4 Pollutant Loadings Estimated for 1994 and 2003 (Matuszko & USEPA/OW/OST, 2005, p5)

These sources provide a detailed technical analysis of silver halide pollution however their data is limited by the time the survey and analysis were conducted. The millennium shift saw the extensive transition to digital after 2000 and subsequently less data been collected as the medium of analog photography became obsolete (Delaveau, Benoit, 2011). This transition is expressed in figures 5 as the demand for photographic silver drops largely from 2000 to 2009 (The Silver Institute, 2010).

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Supply										
Mine Production	591.0	606.2	593.9	596.6	613.0	636.8	640.9	664.4	684.7	709.6
Net Government Sales	60.3	63.0	59.2	88.7	61.9	65.9	78.2	42.5	27.6	13.7
Old Silver Scrap	180.7	182.7	187.5	183.9	183.7	186.0	188.0	181.8	176.0	165.7
Producer Hedging	-	18.9	-	-	9.6	27.6	-	-	-	-
Implied Net Disinvestment	87.1	-	12.6	-	-	-	-	-	-	-
Total Supply	919.1	870.9	853.1	869.3	868.2	916.3	907.2	888.7	888.3	889.0
Demand										
Fabrication										
Industrial Applications	374.2	335.6	340.1	350.8	367.6	407.0	427.0	456.1	443.4	352.2
Photography	218.3	213.1	204.3	192.9	178.8	160.3	142.4	124.8	104.9	82.9
Jewelry	170.6	174.3	168.9	179.2	174.8	173.8	166.3	163.5	158.3	156.6
Silverware	96.4	106.1	83.5	83.9	67.2	67.5	61.0	58.4	56.9	59.5
Coins & Medals	32.1	30.5	31.6	35.7	42.4	40.0	39.8	39.7	65.2	78.7
Total Fabrication	891.7	859.4	828.3	842.4	830.8	848.7	836.4	842.5	828.6	729.8
Producer De-Hedging	27.4	-	24.8	20.9	-	-	6.8	24.2	11.6	22.3
Implied Net Investment	-	11.4	-	6.0	37.4	67.6	64.0	22.0	48.2	136.9
Total Demand	919.1	870.9	853.1	869.3	868.2	916.3	907.2	888.7	888.3	889.0
Silver Price (London US\$/oz)	4.953	4.370	4.599	4.879	6.658	7.312	11.549	13.384	14.989	14.674

Figure 5. World silver supply and demand (Millions of ounces) (The Silver Institute, 2010, P8)

A variety of recent sources simply refer to the data collected in 1997 by the Environmental protection agency when quoting the environmental impact of analog photography (Guinness, 2022). However, the 2023 World Silver Survey by the Silver institute examined how the recycling of photographic silver fell by 7% in 2022 (575 Tons). Meaning out of the (885 Tons) of silver used in the photographic Industry 267.875 Tons were not recycled – 32% (The Silver Institute, 2023). Which rose from 27% in 2021 (The Silver Institute, 2021), and 24% in 2014 (The Silver Institute, 2014). The survey states further losses are likely primarily due to silver halide printing taking place on non-Recyclable paper (The Silver Institute, 2023).

Water Waste

The photographic industry has always been known for excessive use of water in all steps of the development process. (Maughan-Carr, 2019) This is characteristic in figure 6. Showing the total United States photo processing amateur market waste streams quantity for 1994. The quantities are outdated, however this estimation sheds light on the primary contributor to waste water which is the wash stage. Upwards of 95% of water waste can be attributed to wash which still holds true in the modern development process (Delaveau, Benoit, 2011).

Waste Stream	Flow Demands	Total U.S. Flow ¹ (Millions of Gallons/Year)		
		Film	Paper	Film and Paper
Total Process ²	3.85 gal/ft ²	-	-	17,000
Developer ³	paper 5 - 30 mL/ft ²	-	19.0	-
	film 15 - 100 mL/ft ²	4.50	-	-
Bleach ³	5 - 30 mL/ft ²	-	-	20.4
Fix ³	15 - 100 mL/ft ²	-	-	67.0
Bleach-Fix ³	5 - 30 mL/ft ²	-	-	20.4
Stabilizer ³	10 - 30 mL/ft ²	-	-	23.3
Wash ³	200 - 1000 mL/ft ²	-	-	699/tank
Total Process Calculated as: Developer + Bleach + Fix + Stabilizer + Three Wash Tanks				2,250
<small>1. When given a flow demand range, the total U.S. flow is calculated using the average flow value. 2. Flow demand from reference EPA 1981a 3. Flow demands from reference WEF 1994</small>				

Figure 6. (United States Environmental protection Agency, 1997, p43).

A variety of modern literature highlights the wasteful nature of modern analog photography as many developers adopt the “leave the tap running mindset” regarding water waste (Ross, 2014).

Home made chemicals

A variety of sources discuss the use of environmentally friendly developing, stopping, fixing, and washing agents. Many of which can be made using simple household products (Gilman, 2022). Reports explore the small environmental impact home brew developers can have such as Caffanol -which is an alternative developing fluid made of coffee, vitamin C powder, washing soda crystals, and Iodized Salt (Maughan-Carr, 2020). Alternative printing processes are explored via the extraction of developing agents from natural sources such as flowers and herbs (Arau-McSweeney, 2019). A variety of sources discuss how silver reclamation can be completed at home using steel wool reclamation, the Electro plate processes or the development precipitate method (Gilman, 2022). The EPA examines more silver recovery methods including but not limited to Metallic Replacement, Electrolytic recovery, batch electrolytic recovery, Chemical Precipitation, Ion exchange & reverse osmosis. Whilst providing a detailed account of the life cycle of photographic waste and methods to minimize waste (United States Environmental protection Agency, 1999).

Literature surrounding sustainable use of chemicals is heavily focused around the Black and white development process. As the color process (C-41) is far more difficult to emulate and manufacture chemicals for in a home setting (Maughan-Carr, 2020).

The Cost of Film

As the film processing chemical market increases globally with the re-emergence of film photography environmental regulations on the use of chemicals increase – manufacturers strive to comply however the result in an increase in costs (Future Market Insights, 2018). Many high-end manufactured products are beginning to become luxury products for consumers turning consumers to cheaper alternatives or forcing them to cut their spending (CT, 2020).

Ngoc Nguyen analyses the challenges of shooting film via a survey – highlighting the primary barriers for analog photographers attempting to remain in the medium were the prices of film and the prices of Lab services (Nguyen, 2020). This correlates with the 2020 global price rise of film by manufacturers Kodak and Fujifilm (Fujifilm Corporation, 2022), (Moment, 2023). In addition to the cost of shooting was the difficulty locating qualified camera repair professionals, followed by difficulties acquiring film as seen in figure 7.

	Responses (N)	Percent	Percent of Cases
Price of film	1951	25.60%	62.60%
Price of Lab services	1491	19.50%	47.80%
Availability of qualified CLA/repair services	1266	16.60%	40.60%
Availability of film	942	12.30%	30.20%
Availability of stores selling adequate equipment	825	10.80%	26.50%
Price of gear	679	8.90%	21.80%
The overall effort needed	474	6.20%	15.20%
Total	7628	100.00%	244.80%

Figure 7. Survey responses to the Obstacles to shooting with film (Nguyen, 2020, p45)

Primary photographic suppliers of film, photopaper and chemicals such as Kodak and Fujifilm have presented a clear increase in price over their film stocks in the years leading up to 2023 (Eastman Kodak Company, 2023) as seen in figure 8. Both Kodak and Fujifilm present the Covid 19 Pandemic as the primary drive behind the increase. Along with the cost of raw materials, energy, & Supply Chain disruptions (Fujifilm, 2023). Kodak states another drive behind the price increase is the companies attempt to keep up with the re-emergence in the popularity of film having to hire hundreds of workers across film and chemical floors (Schneider, 2023).

Price revision date	Products	Details of revision ^{*1}
April 1, 2022	photographic film	20-60%
May 1, 2022	color photo paper	10-20%
	Color photo processing chemicals	about 10%
June 1, 2022	Professional lab products, printing products and services	8-94%

Figure 8. Notice of price revision for FujiFilm photo related products. (Fujiim, 2022, p1)

An analysis of literature surrounding the increase in price of film conducted by (Hagelstein, 2021) & (Ruscitti, 2023) highlights that film prices have not fluctuated far when adjusting for inflation prior to 2000. And that these large price jumps appear outrageous only because many new digital native photographers born into the digital age have not experienced the price of film as it was prior to 2000.

As the world transitioned from analogue to digital technology in the early 2000s the large film corporations sold film at a disproportionately low price. Manufacturers attempted to stay competitive with the digital market by artificially lowering their prices. Selling film at or below cost just to maintain cashflow (CT, 2020). So as film returns to the cost associated with modern production new age photographers only exposed to these artificial prices find the cost jumps too great - turning many off analog photography (Ruscitti, 2023), (Nguyen, 2020).

An Analog Renaissance

A Myriad of literature analyses analog photography and its recent re-emergence as a popular and sought after format. 2017 was marked the year that film returned with the announcement of resurrected film stocks by manufacturers and the release for new analog cameras (Minniti, 2020). Ilford conducted a global survey in 2018 focusing on "the appeal of film". The aesthetic film provides was outlined as the primary benefit of film. Closely followed by the creative control analog photography allows (ILFORD PHOTO, 2019). This love for aesthetics can be seen in social media such as Instagram attempting to capture the analog aesthetic in the digital era. The analysis of the phenomenon of Analogue Nostalgia dictates a positive preference for the past and a negative preference towards the future/present. However, a large portion of the individuals currently associated with the Analog Renaissance never experienced the time of light leaks, underdevelopment, and analog artifacts as they have been born into the digital world, thus have no past to reference. (Minniti, 2020). (Jurgenson, 2011) argues this resurgence stems from an attempt to evoke powerful feelings associated with nostalgia. This is accomplished by combining current memories and experiences with the technologies and practices associated with the past. This could be by picking up an old medium or applying the medium's characteristics to its modern counterparts.

Other literature argues analog photography grants materialism - film photos represent a way to stay connected with the past and generate more meaningful memories through the physicality of the medium (CAODURO, 2014). A separate analysis dictates analog photos are perceived to be fuller regarding their narrative and storytelling potential. Also stating analog photography provides users with a more meaningful photographic experience and the ability personally influence the outcome to a higher degree (Morlot, 2013). The literature that covers how film can cause a shift in how one approaches photography is extensive. The technological limitations, price and effort required in analog photography allows users to slow down, reflect and immerse themselves in the moment unlike the spam culture of the digital age (Naulin, 2020).

Ilford outlines the resurgence and growth of film users from the years of 2013 - 2018. seeing 57% of their survey respondents either returning to the medium or trying the medium for the first time (ILFORD PHOTO, 2019). A variety of literature presents the analog renaissance as a movement primarily driven by young people. A Global survey conducted in 2012 by Lomography analysing their global community outlines 66% of respondents were under 30 (Lomography USA, 2012).

(Nguyen, 2020) discusses the categorisation of the two larger segments of individuals that utilise analog photography. These being: Analog Newcomers who are dominantly younger than 24 years old and Analog Professionals who are more mature in their age. A Survey conducted in 2017 shows analog newcomers only represented 20.8% but nearly half of the group in 2020.

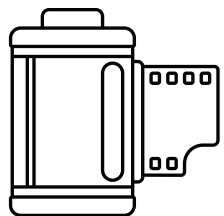
Gaps to investigate in research

- Separate analysis of different levels of Analog Photographers. Spanning the Amateur Photographer (those who use disposables, do not develop their own film), Experienced photographers (Those who are familiar with the chemical processes and dynamics behind the photographic medium) Film labs (Those dealing with the commercial aspects of the medium).
- The barriers between Amateurs are not taking the next steps to become experienced photographers.
- The barriers faced by experienced photographers as they participate in the medium.
- The Dynamics behind the relationships and interconnections between these three groups and how collaboration can be most effectively utilised.
- Specific industry related insight into the current state of the art and how conventional products, processes or services are being utilised and are evolving.
- What the largest gaps in these products, processes or services are, and what aspects need to be maintained due to their already proficient design and ability to preserve the essence of the medium.
- How current industry professionals approach the environmental sustainability issues brought forward in the literature review.
- Analysis of the relationship between the cost of analog photography and the ability to develop film once self.
- An analysis of film lab culture and the driving forces behind an abstinence from home processing.

Literature Review

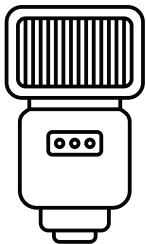
Summary

The literature surrounding sustainability in analog photography analyses the adverse environmental aspects of the medium. Conducted around the millennium shift - at the peak of analog photography, these sources may appear to be outdated however the medium has remained consistent in many ways and the issues associated with AP then are still current. The economic analysis of the market presents cost as a primary issue for entering or remaining apart of AP's core users. Research outlines the resurgence of analog photography in the period after 2017 & highlights the roll of younger generations in keeping the medium alive and working towards how it can evolve to become more sustainable.



Research Introduction

For this research report a triangulation data collection approach was implemented - mixed method Surveys & Semi Structured interview. These methods and questions were focused on 3 Primary user groups of analog photography processes, products, and objects. Amateur Photographers, Experienced Photographers, and Expert Lab technicians/Photo Labs. Overall, 1 Survey was conducted with a run of 44 Participants with a general focus on amateur Photographers & 8 interviews were conducted spanning all primary user groups with 2 additional preliminary test interviews. These Methods were utilised to explore the user dynamics of analog photography attempting to cover the entry into the medium, the continuation of the medium & evolution of the medium.



Methodology

The Survey tool was chosen to focus on the entry into the medium of analog photography – Amateur analog photographers make up by far the largest user group and are thus easily sampled through social media sharing methods. The Survey data aims to inform the barrier of entry into analog photography to inform design.

The Interview tool was chosen to gain understanding surrounding the continuation and evolution of Analog Photography. Experienced photographers that had to overcome the barriers of entry as well as industry professional where chosen. These interviews aim to investigate the current situation of Analog Photography as a medium and what needs to change to keep people invested as well as foster growth for future photographers.

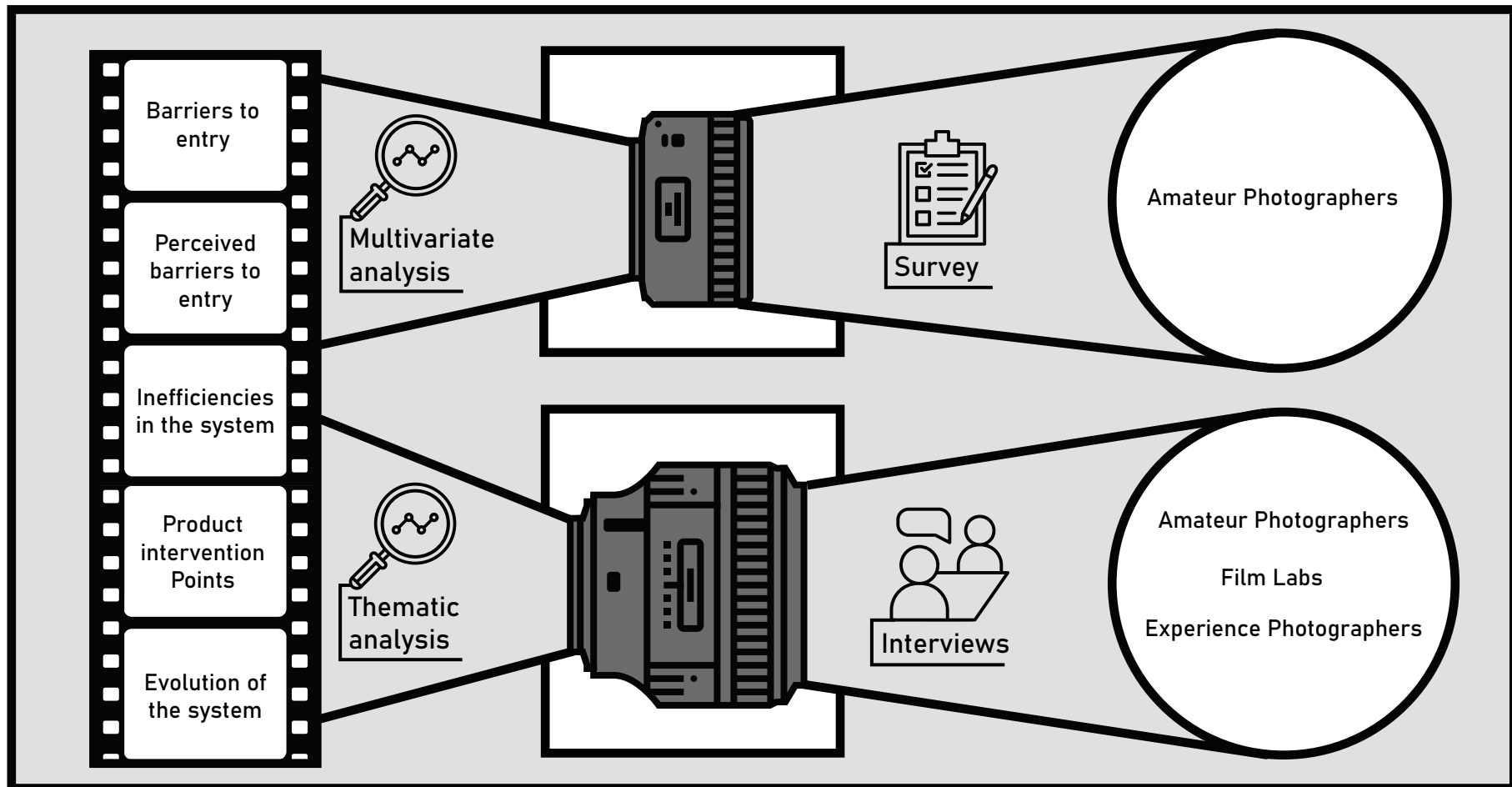


Figure 9. Graphic visual of the Research Research Methodology

Survey

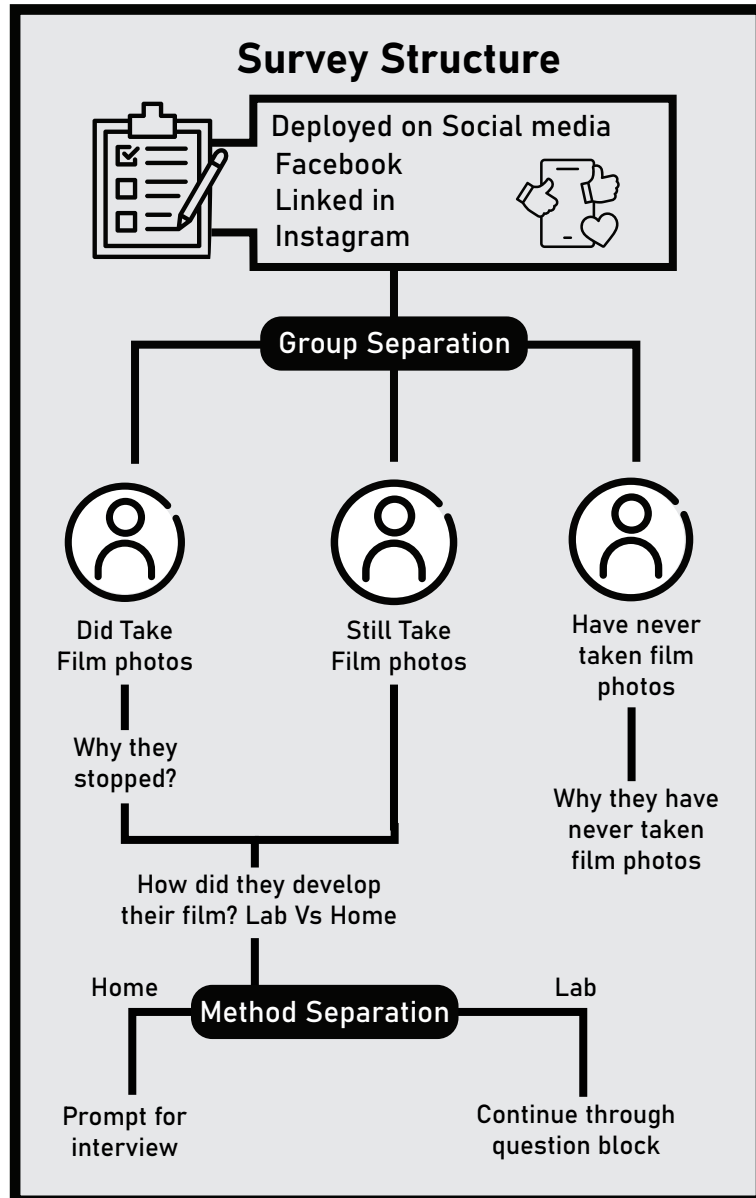


Figure 10. Graphic visual of the Surveys structure

Survey design

A single Survey was conducted utilising a mix of rating questions, partially structured questions, non-Structured questions (Science Buddies, 2012). The Survey used a diverting structure that separated participants into different groups so that the most efficient use of participants could be observed through targeted questions. These groups were Individuals who still taking photos using film, did take photos using film and have since stopped, & those who have never used film. Users who have never taken film photos were simply prompted as to why they have not (survey end) – the other two groups continued. These groups were then separated again into individuals who developed their own film and individuals who developed their film at a lab. The former was prompted to participate in an interview as their knowledge on the medium could be more effectively utilised. The latter was exposed to pre-set survey questions as seen in Appendix A.

The survey questions were attempting to provide insight into the following research questions.

- What are the real and perceived barriers to entering and progressing in analog photography as a photographic medium?
- Why are amateur photographers currently utilising this medium?
- What market trends are amateur photographers currently following?
- Further exploration into the market segmentation of analog photography.
- Confirming information gathered in the literature review.

The primary survey was released after a short testing period of 8 participants. To test the questions and seek feedback. The survey had a multi-roll purpose firstly the exploration of the research questions/gaps. Secondly to divert individuals with greater experience in analog photography towards the interview – in which 2 participants were obtained.

Interviews

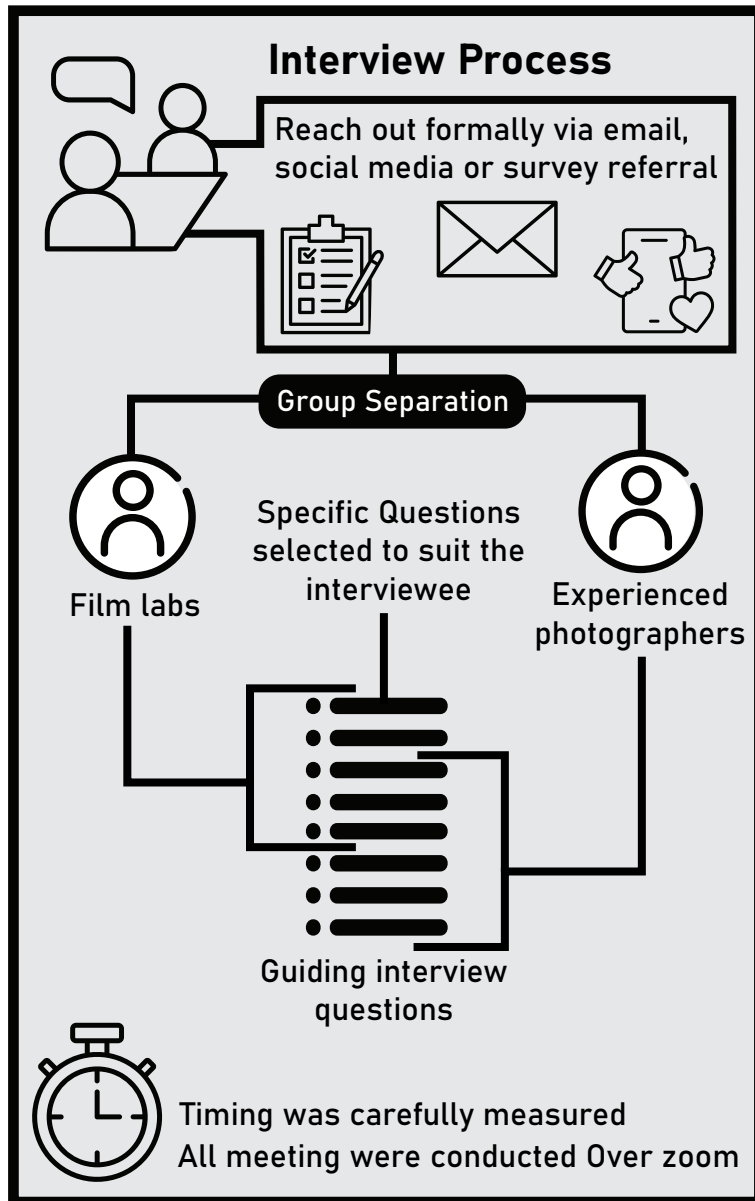


Figure 11. Graphic visual of the Interview structure

Interview design

Interviews were conducted in a semi-Structured format following a list of pre-planned questions. Participants were diverted into three primary groups. These being amateur analog photographers, experienced analog photographers, and film labs. The effectiveness of the interview was maximized by purposefully selecting questions from the pool depending on the participant. The interviewees were contacted formally via email or social media or were referred via the survey. After the interviewee had agreed to participate a list of potential questions was sent to them providing them time to consider and prepare their answers before the interview took place. The minimum time between obtaining the questions and the interview was 48 hours. The interviews were carefully timed to not exceed 30 minutes maximum, however none ran under 15 minutes.

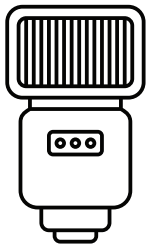
The Interview questions were attempting to provide insight into the following research questions.

- What are the firsthand perspectives of industry professionals regarding the focal points of sustainability in analog photography?
- What emerging technologies are having the largest impact on sustainability?
- Where are the primary intervention points in the current system?
- Further exploration into the market segmentation of analog photography.
- Confirming information gathered in the literature review.

All 8 formal interviews were conducted via Zoom with 2 initial test interviews taking place to develop and test the questions. The interviews served as guides to focal areas of the analog photography process and help analyses existing and emerging products and processes to inform design.

Research Summary

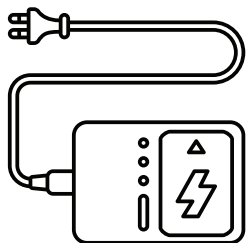
The research conducted during this report attempts to highlight the dynamics behind progression in the medium of analog photography through the survey format. It also attempts to cover a broad range of topics with the ability to shift and direct specific questions towards the interview participants given their background described to the interviewer.



Analysis and Findings

Introduction

This section of the report focuses on the analysis of the data collected in the research phase. It highlights the primary findings from both research methods and presents them using thematic and multivariate framework. The analysis also highlights the key relationships between primary user groups of analog photography and why these relationship dynamics are important to consider within the context of key intervention points.



Survey Findings

Survey Participants groups



Figure 12. Graphic visual of survey participant grouping of film use.



Home Vs Lab development



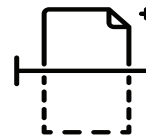
Figure 13. Graphic visual of home vs lab development preference.



Optional extras selected when getting film developed



Figure 14. Graphic visual of optional extras selected when getting film developed.



What people take photos of using analog photography

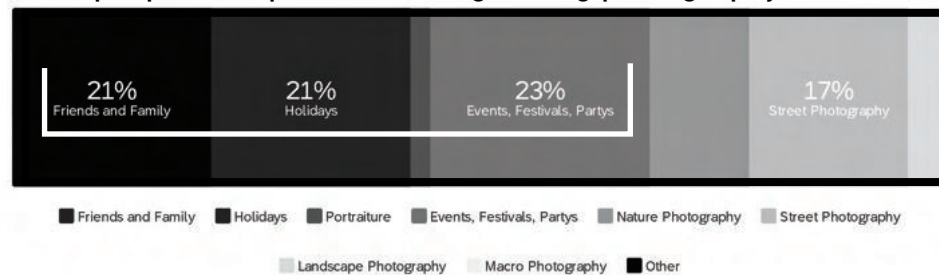


Figure 15. Graphic visual of photographic subject preference.



Participant grouping

79% Of the interviewees had/have experience shooting on film with 49% Currently shooting with film. This information is important as the primary user of the survey is in fact individuals that can correctly provide insight.

Home vs Lab development

93% Of individuals who shoot or did shoot using film used photo labs to develop their film. This highlights the overall developing preference of Amateur Photographers - this statistic is further expanded upon in figure 19.

User behavior analysis

When film is developed at the lab the most common option extra selected is digital scans making up 42% of selections with the least common being the rush service. This presents the users priorities when engaging with film. Prints was also split evenly by preference.

Market analysis

The Primary subjects for amateur photographers are friends/family, holidays & parties/Events. These take up the larger majority of 65% of all answers. Straying away from the more Art/passion driven answers of Portraiture, Nature photography, Landscape photography & macro-Photography that a more seasoned veteran photographer may be partake in.

Survey Findings

Cost analysis

The common trend of the data collected via the Survey outlines the impact the cost of analog photography has on its users. Cost being the primary barrier for preventing amateur photographers from developing their own film as well as the primary driving factor for individuals that have stop taking photos with film as see in figures x and y.



What are the main reasons you haven't developed your own film?

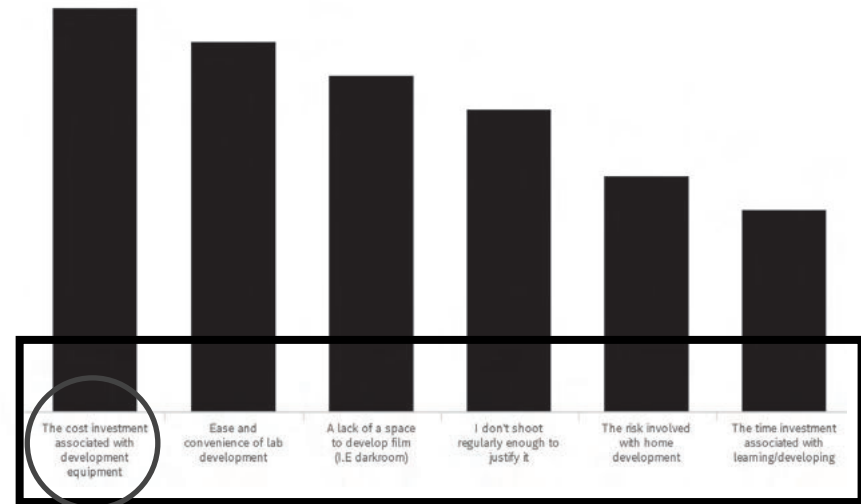


Figure 16. Visual graphic of Main reasons as to why you haven't developed your own film responses.

Social/cultural analysis

The Survey also presents the reasoning behind why people still utilise analog photography as a medium - Favouring the aesthetics that film provides.



Why did you stop shooting film?



Figure 17. Visual graphic of why you stopped shooting film responses.

Why do you enjoy shooting film?

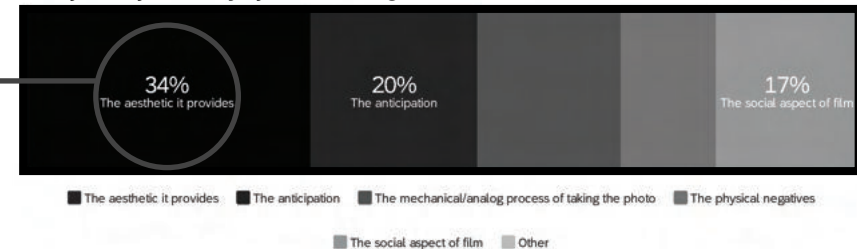
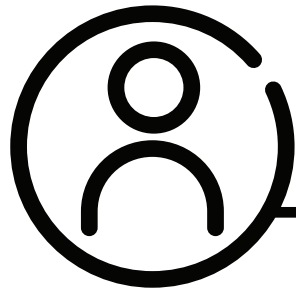


Figure 18. Visual graphic of Why do you enjoy shooting film responses.

Survey Findings

Average Survey Participants
(44 Respondents)



The relationship between perceived cost lab development

The survey responses combined with a multivariate analysis between questions presents the appearance of trends followed by amateur photographers and causalities within the medium. An example is the dominance of colour film amongst users with none of the interviews reporting they shoot with only Black and white. This preference makes it harder for individuals to develop their own film as colour is considerably more difficult and expensive to develop at home when compared to black and white (Horaczek, 2017). The survey showcases a large overestimation in price, time, and rate of failure by users. These features are far above what has been highlighted by experienced photographers. Seen in figure 21 combined with the safety of subscription models presents a paradoxical relationship between developing from home and perceived costs. Users with less knowledge are more likely to perceive home development as a larger investment and stick to lab without realising their yearly lab expenditures 7.65 rolls x \$22.84 = \$174.726 would cover their development supplies.

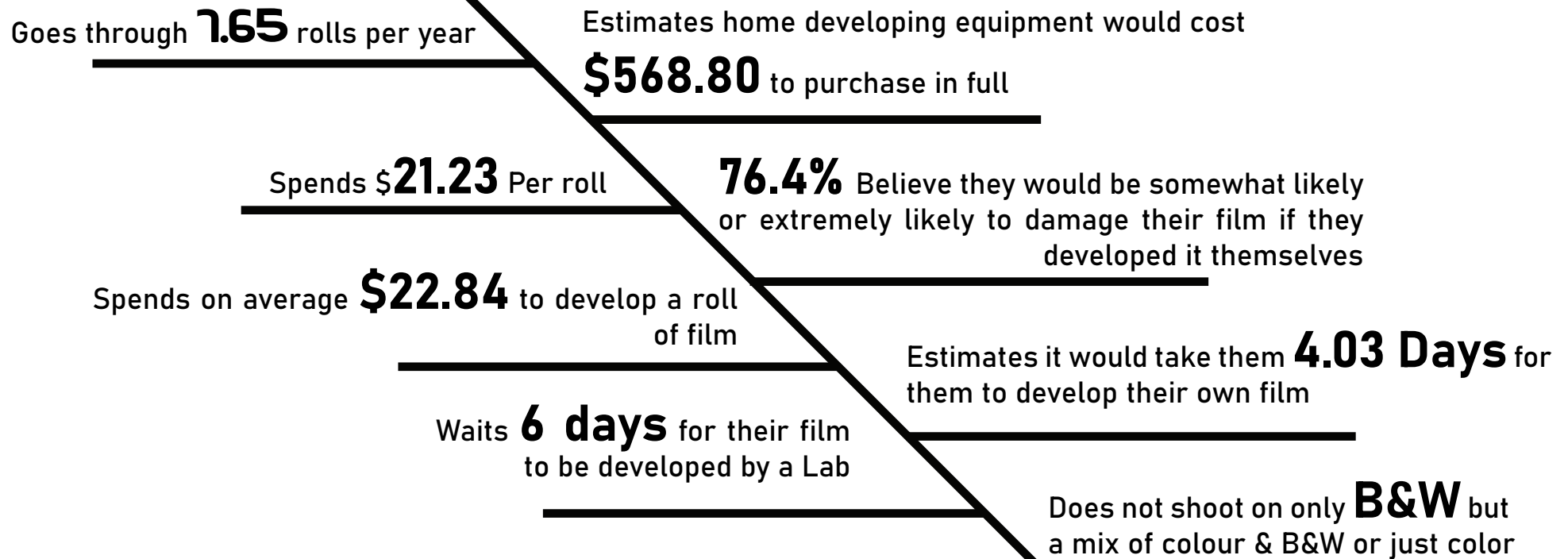


Figure 19 Survey response statistics - Average survey participant.

Interview Analysis

Interview segmentation

Analysing the topics brought up during the 8 interviews conducted introduced a variety of crossovers that fit under the three primary themes of economic, environmental, and social/cultural sustainability. As some topics were mentioned by all 3 user groups others were inclusive of just one or two groups. The topics and their crossovers are presented in figure 20. Multivariate analysis of the specific topics explores the motivations and worries of individual groups and the primary worries for the medium. Of which should be considered the primary intervention points for design.

Film labs are the primary mentioners of issues that are environmentally related as they have the highest impact on that sector and subsequently have expenditures such as Labor costs, Chemical disposal & Emissions regulation to worry about.

Experienced developers are the ones most interested in emerging technologies and new sustainable methods as they attempt to find cheaper and exiting ways to explore Analog Photography.

Amateur Photographers are heavily focused on risk, perceived difficulty, and the information load as they currently experience or have recently experienced these traits.

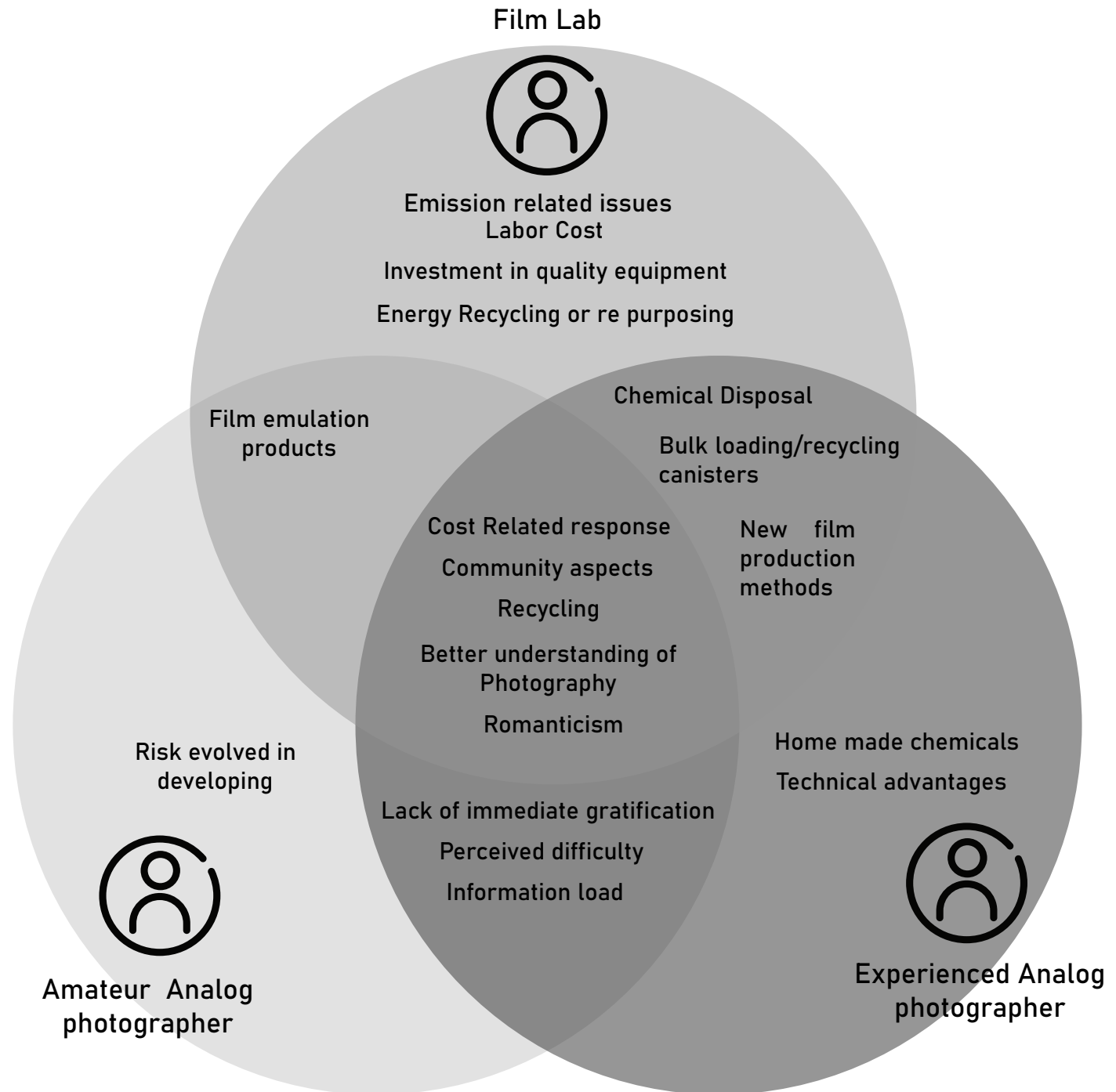


Figure 20. Grouping responses to interview questions.

Theme	Code	Sub-Code	Examples
Environmental Sustainability	Innovative practices or techniques	Home made/more responsible use of chemicals	(CB) "I make developers stop bath and Hypo clear year and Photo flow all myself" (DT) "I've recently been interested in less harmful chemicals, so I've tried caffenol yeah as a technique" (XS) "I try to use the least amount of chemicals I can. You actually achieve the same result you just need to let your film submerge inside the chemical and that's fine"
		Recycling	(GW) "So now I believe A lot Of disposable cameras are being disposed of in landfill. So basically, the challenge is one of the main challenges using disposable camera, how we can effectively recycle Them" (CB) "But Bulk loading film has been a very sustainable thing because I can reuse all my old, all my old canisters" (GW) "Yes. So with the canister, metal canister or plastic canister we're currently is giving them to film repackaging company or they make their own film" (KF) "So a lot of like reduction of impact. So I guess the reuse of the film canisters or the reuse of disposable cameras"
	Emissions	(KF) "The distribution and like the scope two, scope 3 emissions that come from film are pretty heavy"	
	Chemical waste	(DT) "The approach itself as a whole I think is pretty unsustainable currently. You're looking at chemicals, you're looking at time" (TB) "I know the way that we must dispose of our chemistry is really important, especially for environmental factors" (KF) "Any production processes has some sort of environmental impact" (XS) "Chemical, because for the film developing you need to use the developer fixer and the stopper and they all like environmentally, harmful, chemical and it's really hard to recycle them"	
Economic Sustainability	Labor cost		(KF) "I would put labor in there as another economic change"
	Barriers to entry	Rise in cost	(CB) "Including processing. But yeah, the, biggest hurdle and then yeah, it everything in photography requires Cost" (KF) "Economically. It's the supply chain volatility like the difficulty in film acquisition in equipment acquisition" (DT) "Definitely. The cost. Yeah, associated currently. It's definitely a very expensive hobby to get into at the moment" (TB) "Inflation and price hikes and raw mineral costs, which lead to higher film prices and higher development costs" (AFG) "I feel like it is so expensive compared to how it used to be" "Financial restriction because I feel like to get into film"
Social/Cultural Sustainability		Information Load	(CB) "There's not much. Accessibility or promotion in like just getting a point and shoot and. Like actually learning how to use them" (CB) "It's a lot of information and when you don't know what you're searching for" (PF) "Yeah, light and how much light you should let in the image"
	Lack of immediate gratification		(XS) "Because they need to get you familiar with the fact you cannot immediately see your results when you're shooting with film. and some people they really struggle with this"
	Perceived difficulty		(CB) "just the wealth of knowledge you need to even start or you think you need because you don't need a lot to start. I think that's the biggest off put" (XS) "Some people also don't know how to use very old cameras and they may make a mistake" (PF) "Just trying to capture that perfect moment. It's really hard knowing when to press the button, when not to press" (DT) "I think the largest barriers are. Learning the processes and patients as well takes a certain person to, slow down. Take the time"
	Significance and importance	Romanticism	(CB) "but there is something just romantic about the entire thing. Like being able to go in there and perform alchemy and turn silver halides into silver metal and scan it and like nothing looks quiet"
		Enhanced understanding	(CB) "It slows you down and makes you think whether you want to capture the photo or not, involves more of a creative process" (DT) "you can be really critical about the photos you're taking, improves your workflow"
Community		(PF) "We'd go and we'd just play around and mixing the chemicals and stuff like that. It's really fun" (GW) "How can I optimize and make sure that that's a good experience #1 how they come in and feel like they're being served" (AFG) "One class at South Bank developing film and I think the social aspects of also going to a lab and doing it with others" (KF) "When I think back in my time in the lab, it 100% came down to being able to talk to people who were passionate about film"	

Interview Findings

Home Vs Lab development. Which process is more sustainable?

Thematic analysis of the interviews suggests lab development is the more sustainable process for analog photography with labs and experienced photographers stating labs due to their large volumes of film can be more efficient in their chemical use and disposal. They are also better equipped to deal with the exposure of harmful chemicals. However, two of the responses were split stating that Labs processing is more sustainable for C41 (colour) and home is more sustainable for black and white due to the ease and cost saving involved with the black and white process.

Experienced photographers and Labs interviewed primarily mentioned the Film development tanks and the chemistry involved in developing when asked about the products they interact with as seen in Figure 22. The Film development tanks, and chemistry are outlined as points of improvement in the development process, however they were not entirely negative comments. The Dark bag only had positive comments even after 4 mentions.

Product/process	Mentions	Comments Negative (-)	Comments Positive (+)
Jobo Tanks /Patterson tanks	7	(XS) "For the tank, there are one thing I struggle with. Because when the fixer becomes more an more exhausted from the use of chemical you will need to (TB) With the Jobo process it's a bit slower, so I don't like that, (KF) what happens is those red seals, those lips can sometimes get a little bit. Loose and especially if you haven't set it properly while you're building it in the dark bag (PF) I thought the putting the canister in the thing in pitch black, that was probably something I struggle (CB) But Patterson reels can be quite annoying if you're if you're new to.	(TB) but it's the positive about it is you have more control and there's less scratches and less dirt and less filth that gets on your film (KF) I remember the Jobo itself. I was really impressed with how simple it was. (DT) I mean the Patterson tank itself, you know, it's only a few components. Yeah, they slot in one way. (CB) person reels unclipped and then you can have 120 and 35
Chemistry	7	(XS) once you pre-mix the chemical, they will expire really quick and you can only develop like 16 rolls per set of chemicals But You may not Shoot that much (TB) we used to use Kodak flexi color but there's been huge supply problems with the Kodak flexi color and now we've switched to champion	(XS) you can save lots of money there, yeah. Yeah. If you bring your film to the lab, it's so expensive then, like 30-40 dollars per roll.
Scanners	6	(TB) I would be nervous to running those products or those devices knowing that at any time they could go ****. And there's no one there to service them	(TB) But it's actually getting faster and faster with technology, so that's where I see AI doing a really good job with that.
Dark Bag	4		(DT) I'm still aware of what's going on around me. You know, I can check on other things while I'm, you know, in the process if necessary. I don't (DT) Two elastic things around the arms and then once you've put all the equipment in, there's also a zip. And there's also a Velcro flap as well to
Mini lab	2	(KF) it was the age of the machines that became a problem and then also finding the parts for it. (GW) So relying on all developing machine and scanner is definitely an issue because they don't have parts make new anymore, most of them the electronics. Definitely no ones making them new.	(GW) From checking and developing and scanning you can easily get it done within like half an hour or so

Figure 22. Table of Products mentioned during the interviews with the (+) & (-) responses

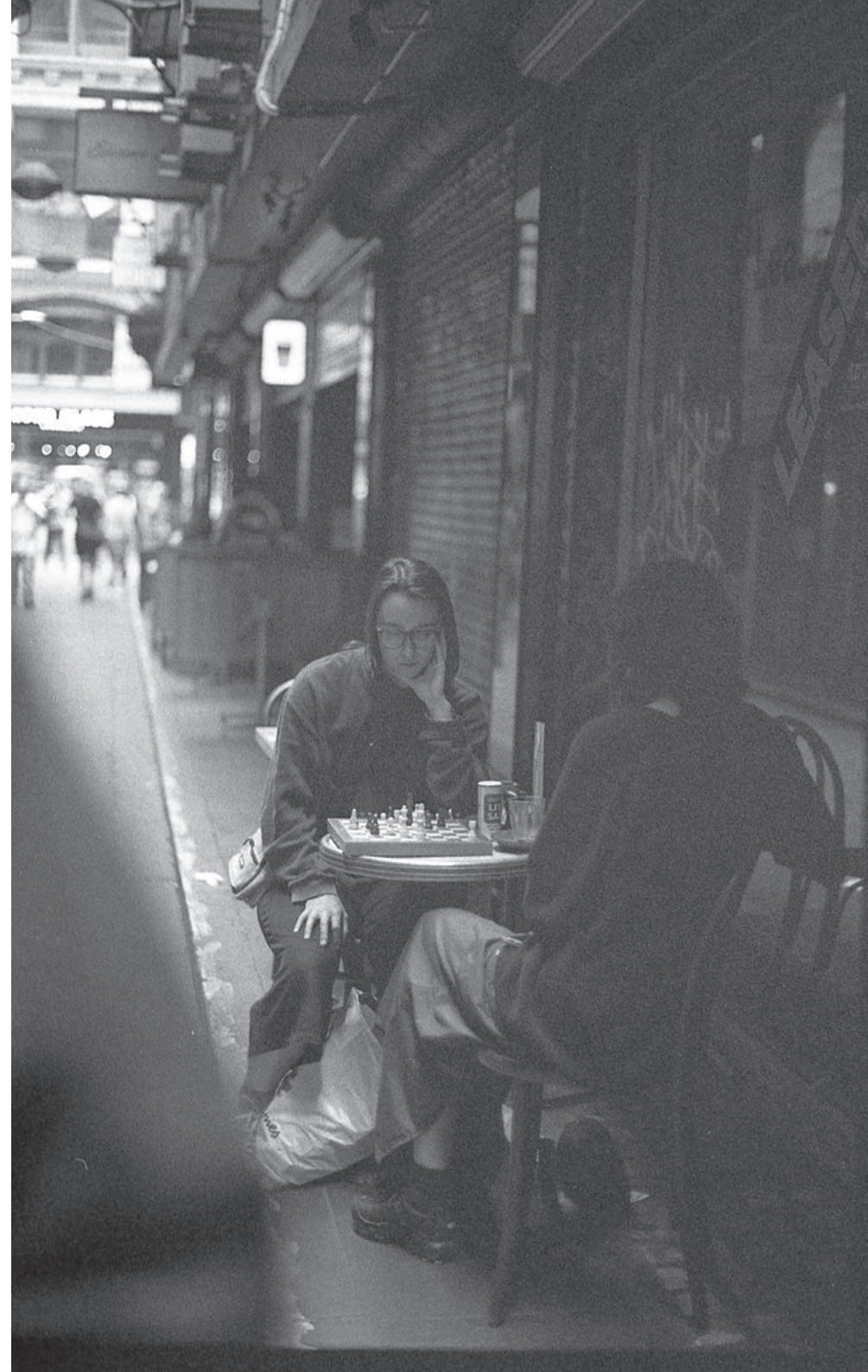
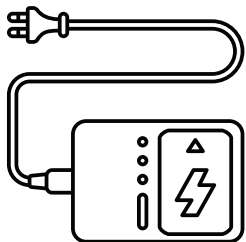
Analysis and Findings Summary

The Analysis of the Data from the research highlights an expansive coverage of all three primary user groups. Amateur photographers are analysed given their survey responses which dictate a cost related hesitance to home progressing. Combined with a lack of understanding of not just the photographic processes but of the level of difficulty in acquiring the knowledge to facilitate these processes. highlighted by Caleb Brian Figure 21.

A thematic analysis conducted of the topics discussed by these three groups highlights the primary barriers faced by all three groups is the cost of the medium.

The primary reasons for utilising the medium are the Romanticism surrounding it, the ability for the medium to better shape your skills as a photographer & the community associated around Analog photography and users' interaction with that community.

The primary focus area for innovation outlined in the interviews is the recycling of photographic products and chemicals.



Discussion

The Research conducted strongly supports the information acquired during the literature review. The responses from all three primary user groups as seen in figures 16, 17, & 20 highlights the cost related issue of analog photography. The Information surrounding the drive behind the use of the medium is concurrent with the literature review placing the aesthetics behind film as a primary driving force. The interviews also highlight how current labs dispose of their chemicals in accordance with the EPA's recommendations even 26 years after the conception of these recommendations (EPA, 1997).

A large gap left in the literature review was the analysis of the amateur photography market. Many of the prior surveys conducted by Ilford, Nugyen & Lomography had an emphasis on individuals who would be considered experienced photographers. However, research into the dynamics and characteristics of amateur photographers and their relationship with analog photography is important to discuss. This user group represents individuals on the cusp of becoming a strong foundation for the medium. The research phase highlights the problem of the perceived difficulty associated with this development process. Experienced photographers describe the process involve as easily actioned (However this may be a bias introduced as they have already overcome the challenges associated with learning) But Amateurs still lack confidence & the understanding of the level of commitment needed seen in figure 19. They lack the volume needed to make home development worth it and their preference of film becomes an issue as colour is dramatically more difficult to develop at home when compared to B&W.

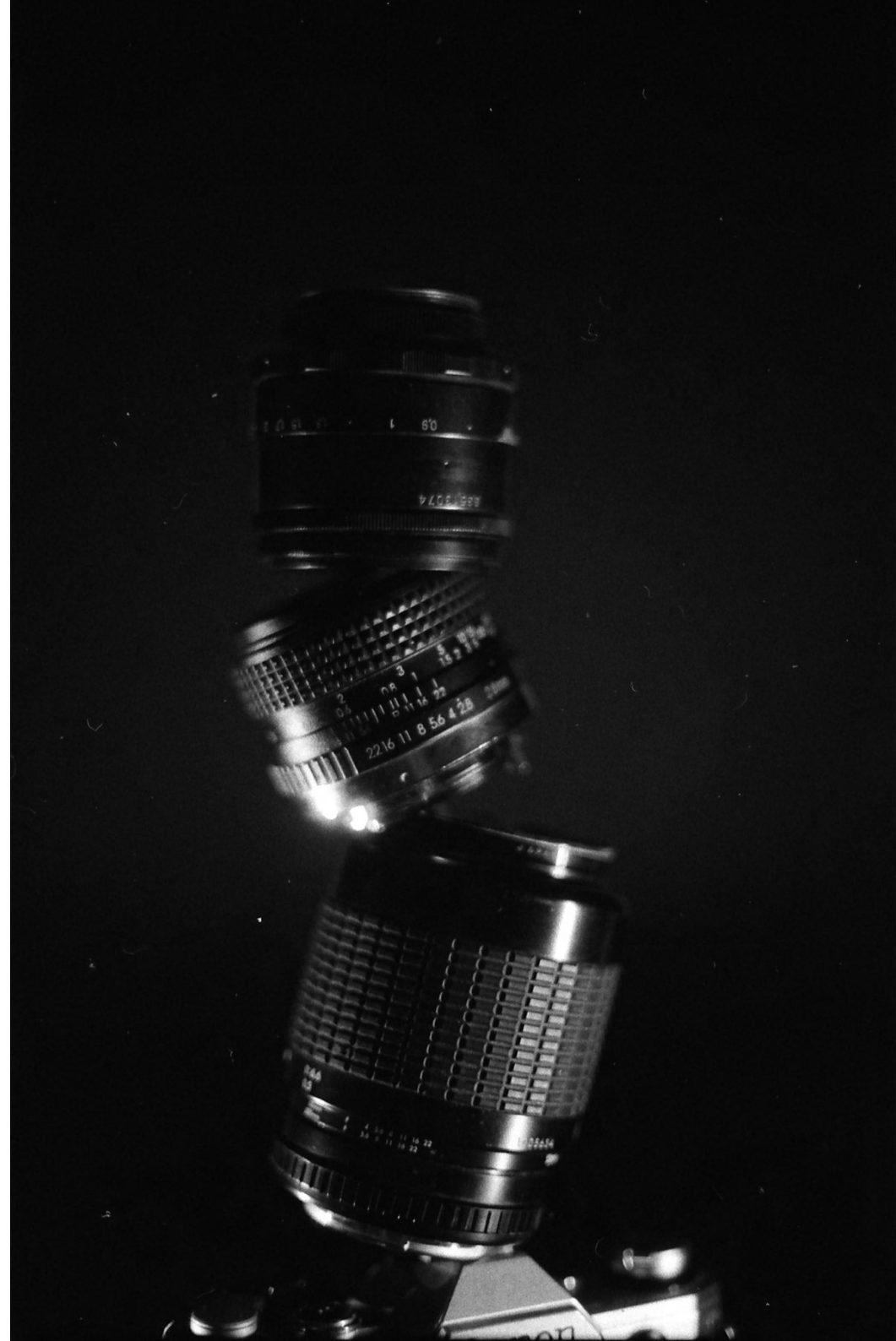
Pushing these individuals towards home development on a surface level appears to solve the cost issue related to photography, however it creates a myriad of other issues stemming from the barriers. The research outlines the need to make the development process so simple and affordable that these barriers are overlooked and to home in on the positive aspects of the home development process and allow them to drive the appeal.

The importance community aspect of analog photography was outlined by every user group during the interviews. The assistance and support experienced photographers can provide to amateur photographers guiding them through the difficulties associated with the medium is extremely important to consider as this collaboration can more efficiently pass on information as compared to other mediums such as data sheets. Physical interactions between the groups such as shooting together and developing together can foster a quick and effective step into the medium and link the positive emotional experience of socialisation with analog photography.

The Recycling analog photography was also highlighted as an important topic for the continuation of the medium – these spans from the recycling of disposable cameras, film canisters or camera components to the recycling of chemicals to minimise their environmental impact. The overall process must have a net zero outcome creating a closed cycle to become truly sustainable.

Design Implications

The Literature review and the research conducted provide a variety of design intervention points and strategies to be explored. 5 Concepts were selected due to their coverage of their user groups, coverage of problems associated with analog photography, intervention points & their possible design leverage points.



Design implication framework





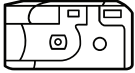





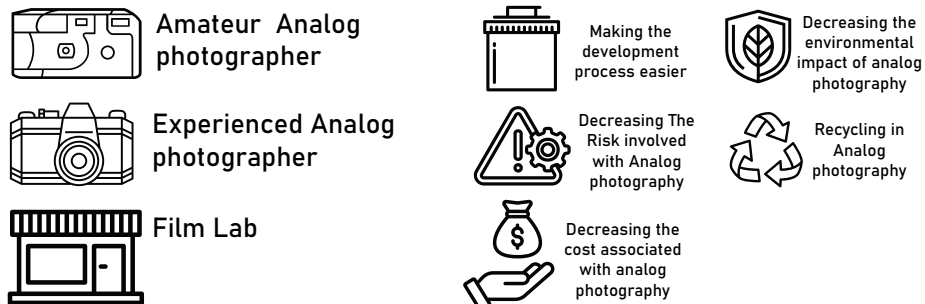
Designs	User Focus	Problem focus	Intervention Point	Design Leverage
Design 1			The Lab Development Process	Exploring the romanticism surrounding the development process and promoting the community aspect.
Design 2			The Reloading of film canisters	Leveraging the reduced cost of bulk film by reloading used canisters.
Design 3			The Reusable Camera	Use of preference of photographic subject to inform design
Design 4			The Home development process	Creating a safe pathway further into the medium
Design 5			Disposable Cameras	bringing the recycling process to the film lab.

Figure 23. Design implication framework.



Design #1

The Roaming Reel Studio

The Roaming reel studio is a portable film lab with open access to the public. Placed outside of a film lab or camera store individuals who need film developed can attempt to do it themselves. The small lab contains all the equipment required to develop film with detailed instructions on the inside of the door which can create a perfect light seal for unloading. The Lab also contains A dark box in which all developing equipment/film can be placed in just in case the user feels uncomfortable - in which someone more experienced can take over and assist. The Lab contains all the chemicals required that can be topped up regularly. A drying box is also available outside the lab. This concept hopes to decrease the cost of developing for photographers as the charge is simply for the chemicals and the time spent, which is minimal. Acting as a connection point within the broader photographic community individuals of different skills levels can use this as a point of social interaction whilst promoting a deeper understanding of the photographic processes involve within analog photography fostering a community which is more involved in the dynamics of the developing process.

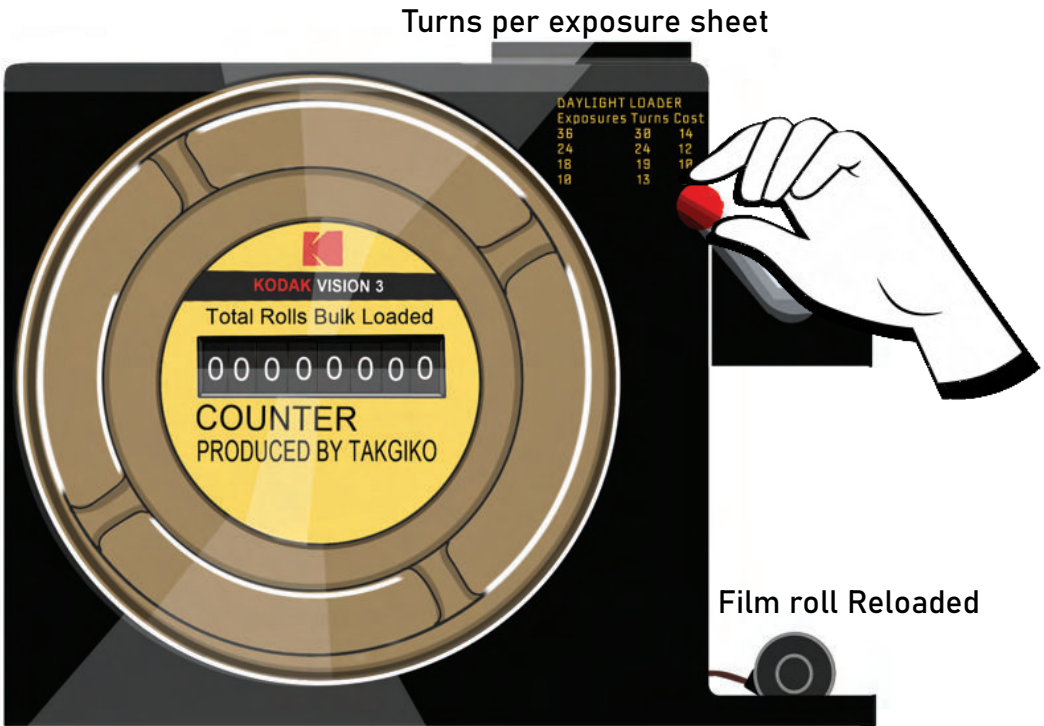
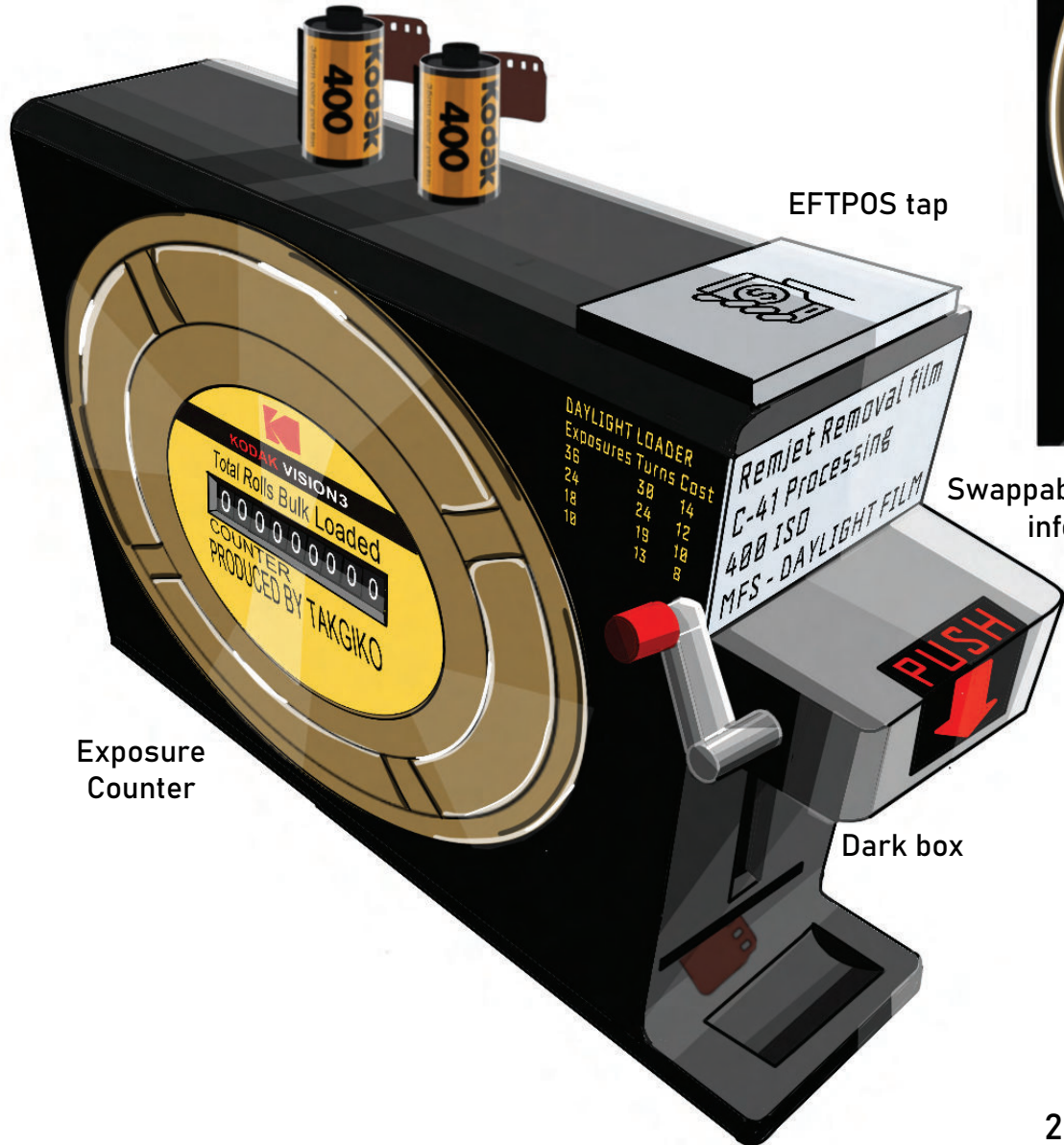


Film Canister inspired design

28. Drains to Chemical tank

Design #2

The Tap and Load



Turns per exposure sheet

EFTPOS tap

Film roll Reloaded

Kodak Vision-3 Reel inspired design

Swappable film info

Exposure Counter

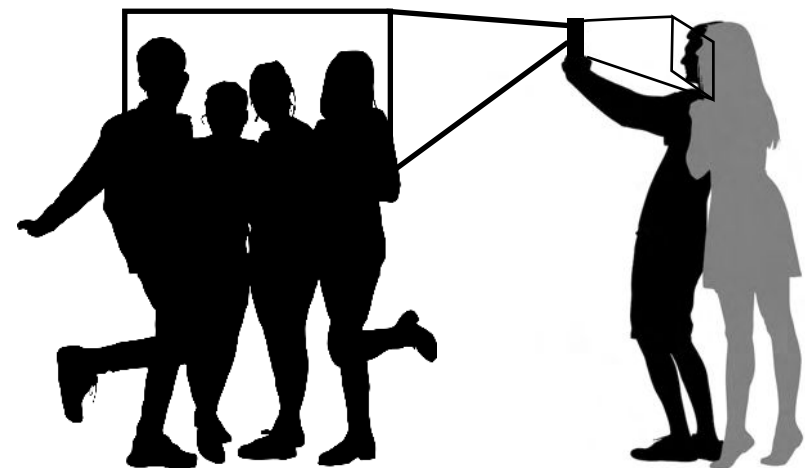
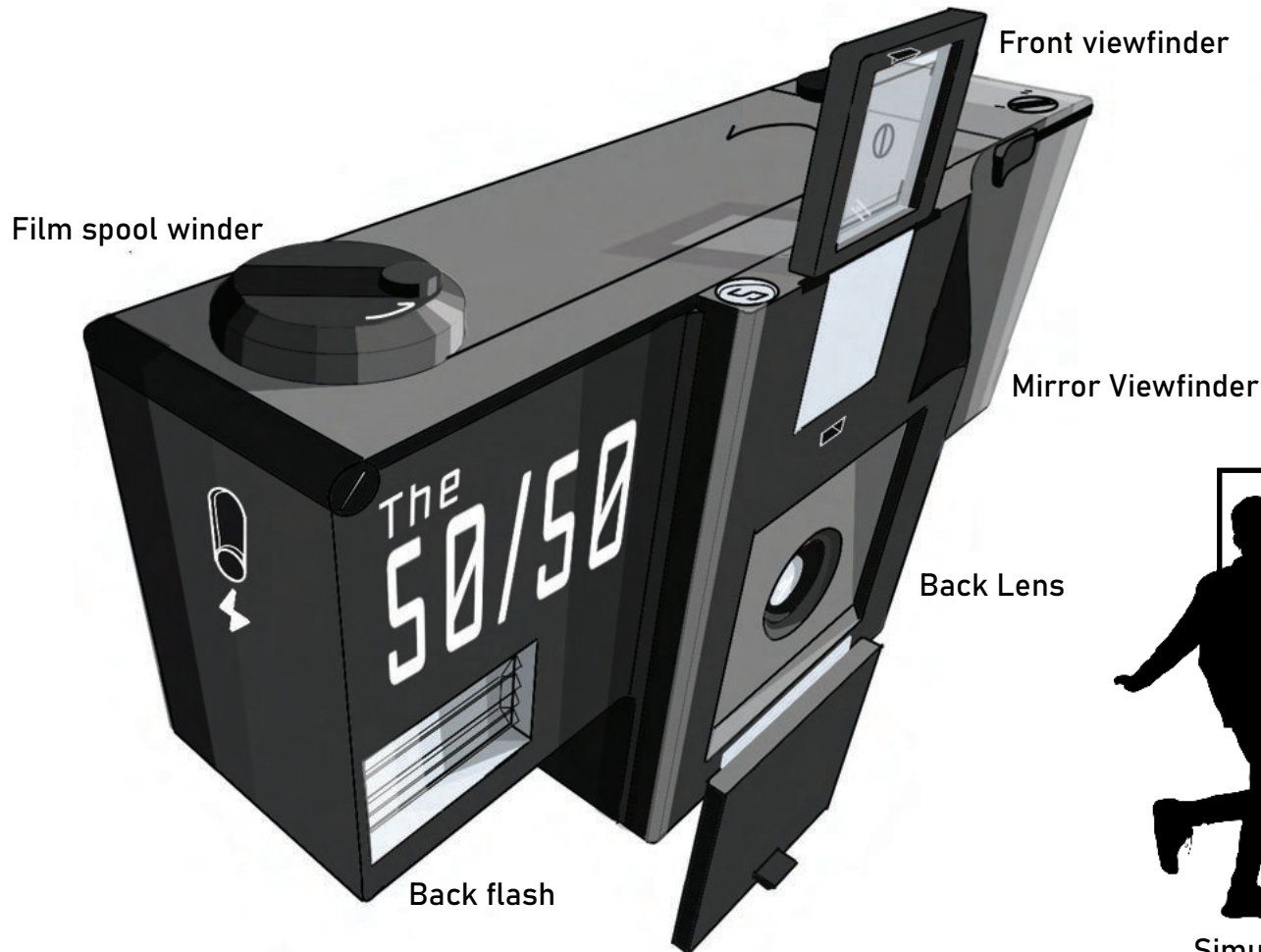
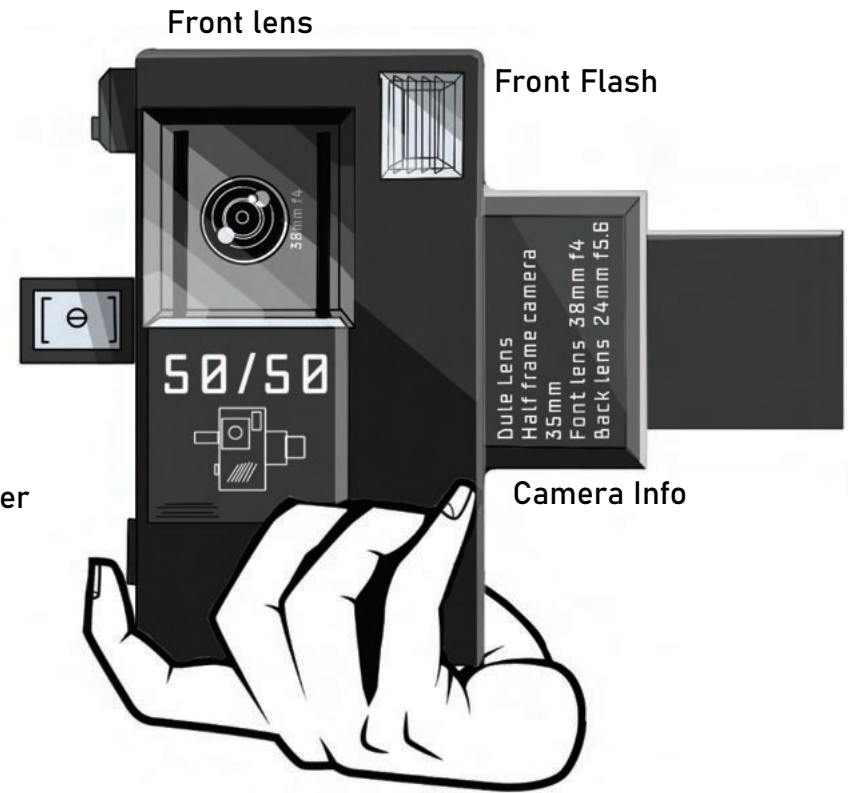
Dark box

Tap and Load is a new way for individuals who shoot film to cut costs by reloading their previously used film canisters. This self-service reloader holds a 1000ft roll of bulk film that can be used to reload 180x36exp rolls of film. Placed in a film lab the Tap and load works via simply tapping a phone or card on the top and loading up to 36 exposures into an empty canister of film. This recycling of film canisters will cut down on waste, decrease the cost per film photo and allow labs to sell film more efficiently. Tap and Load uses a full cover Dark box around the film along with a winder to allow users to reload without worry of damaging their film. The Tap and load uses an indicator on the side for versatile loading of different quantities of photos and also indicates when the spool is running low.

Design #3

The 50/50

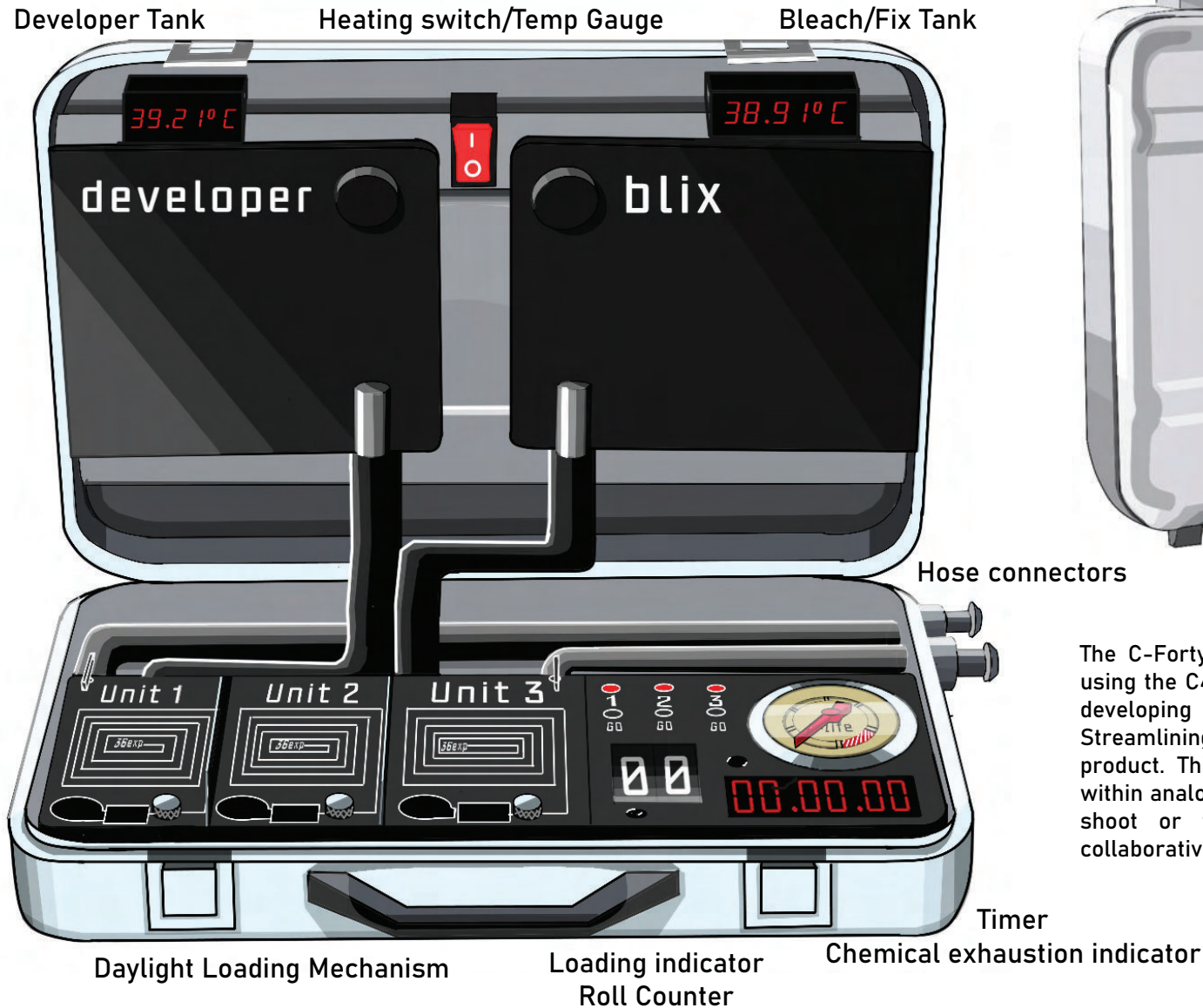
The 50/50 is a reloadable film camera that utilises the shooting habits of amateur analog photographers to more effectively use the resource that is photographic film. With the primary subject matter of analog photography for amateurs being Friends & Family, Holidays & Events/Festivals/Parties. The 50/50 acts as the perfect camera for shooting these subjects as it captures the photographer in the moment as well as the subject. Using a Dual lens mirrored design, the 50/50 Allows the photographer to be included in the "group photo" By simultaneously taking two half frame photos of the subject and photographer. On Holidays when looking back through photos individuals will be able to look back on their expressions of joy and happiness paired the subject re-enforcing a stronger feeling of nostalgia.



Simultaneous Multiple Subject Photography

Design #4

The C - FortyWonder

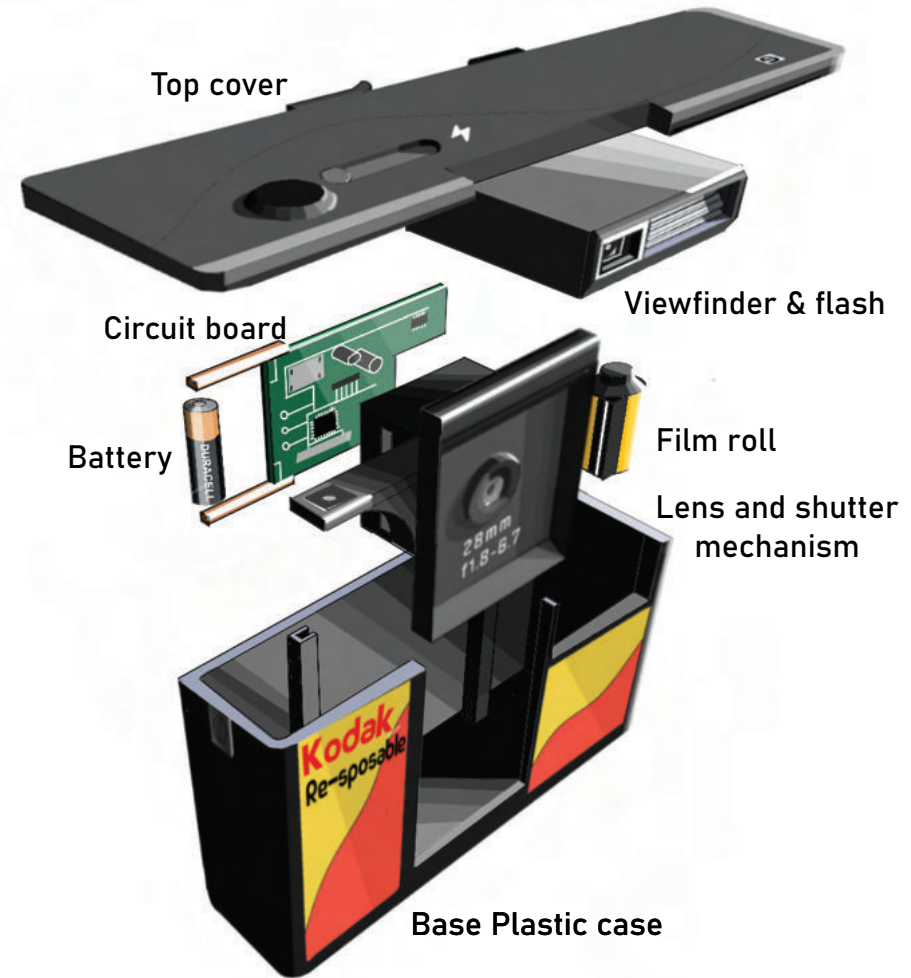


The C-FortyWonder is a portable developing case for colour film using the C41 process. This single purchase kit aims to make home developing more accessible for amateur photographers by Streamlining the process so that can be accomplished using a single product. This Case Will also incentivise community relationships within analog photography as this product can be brought along to a shoot or to a shared location to partake in the process collaboratively.

Design #5

The Re-Sposable Camera

The Re-Sposable Camera is a new way at looking at the disposable market within analog photography. The Recycling of disposable cameras is currently difficult and costly. Cameras need to be shipped off to recycling facilities or other countries to be re-used. The Re-Sposable Camera's Modular design allows independent film labs to test, reload, and resell the camera multiple times. The camera has the versatility to use any 35mm cartridge thus whatever stock is currently available can be prioritised. The Tough injection moulded plastic case can be imprinted by different photographers over the cycles of use passing on character and the history of the camera. Damage components can be easily replaced due to the modularity and the non-reloadable nature of the camera still captures the essence of the disposable camera - Easy to operate, tough and durable and Low cost. Different modules can be custom made for specific circumstances such as a brighter flash for dark environments.



Leaving stickers/keyrings after mutiple use cycles

Conclusion

In conclusion this report has informed us of the importance of the focus on the collaboration of different sects of the analog photography community. The dynamics and interactions involved between these individuals are the core to the growth and continuation of the medium as individuals with higher levels of experience take up teaching and guiding rolls acting as the most effective avenues for entry into the medium for new-comers and amateurs. The importance of this community aspect of analog photography cannot be understated as it cements itself as the primary avenue for design intervention.

The report has also highlighted the aspects of the medium that exist as surface level issues with far larger more complex driving forces behind them. The Paradoxical nature of home developing vs cost is highlighted. Many amateur photographers explain cost is the largest issue associated with analog photography, yet they do not develop their own film which should allow them to save on cost and offer a solution. However, a deeper analysis of the psychology behind these decisions highlights the comparative simplicity of lab development, the lack of support for the preferred medium - which is colour, the volumes of which are required to sustain the process & the preference of a service that makes up many small purchases compared to a single large one.

This report provides insight into the current issues the industry leaders face as they attempt to keep analog photography relevant. Using a Thematic framework, the primary goals of the industry were the simplification of the development process, Decreasing the risk involved in the development process, Decreasing the cost associated with analog photography, decreasing the environmental impact of analog photography & recycling within analog photography.



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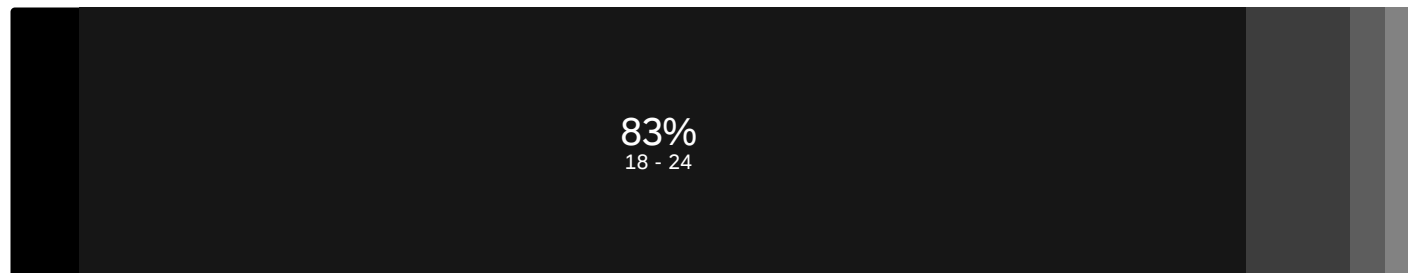
Appendix

Default Report

Analysis of the sustainability of analog photography.

10 September 2023 18:42 AEST

Age - Please select age



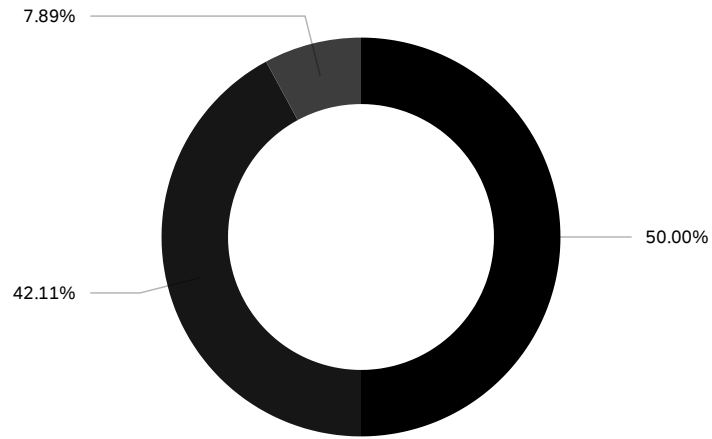
Legend: Under 18, 18 - 24, 25 - 34, 35 - 44, 45 - 54, 55 - 64, 65 - 74, 75 - 84, 85 or older

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Please select age	9.00	13.00	10.15	0.65	0.42	41

#	Field	Choice Count
17	85 or older	0.00% 0
9	Under 18	4.88% 2
16	75 - 84	0.00% 0
15	65 - 74	0.00% 0
14	55 - 64	0.00% 0
13	45 - 54	2.44% 1
12	35 - 44	2.44% 1
11	25 - 34	7.32% 3
10	18 - 24	82.93% 34
		41

Showing rows 1 - 10 of 10

Gender - Please select gender



Male
 Female
 Non-binary / third gender
 Prefer not to say

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Please select gender	1.00	3.00	1.58	0.63	0.40	38

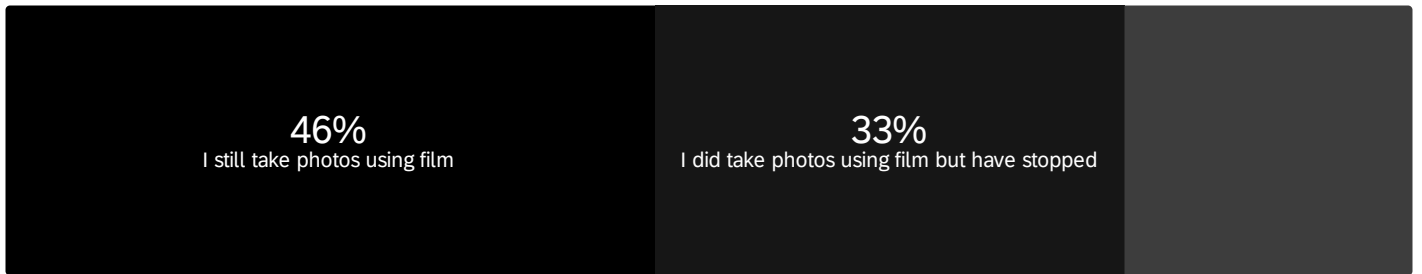
#	Field	Choice Count
1	Male	50.00% 19
2	Female	42.11% 16
3	Non-binary / third gender	7.89% 3
4	Prefer not to say	0.00% 0

38

Showing rows 1 - 5 of 5

still/did/never Init - Please select the option that describes you most. (Film being photography formats such as 35mm rolls, 120 rolls, disposable cameras)

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Please select the option that describes you most. (Film being photography formats such as 35mm rolls, 120 rolls, disposable cameras)	1.00	3.00	1.74	0.78	0.60	39



I still take photos using film
 I did take photos using film but have stopped
 I have never taken photos using film

#	Field	Choice Count
1	I still take photos using film	46.15% 18
2	I did take photos using film but have stopped	33.33% 13
3	I have never taken photos using film	20.51% 8
		39

Showing rows 1 - 4 of 4

Still 1.1 - How do you get your film developed and scanned/printed?



I developed my film myself. I take my film to a lab or photo processing centre where it is processed for me.

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How do you get your film developed and scanned/printed?	1.00	2.00	1.93	0.25	0.06	29

#	Field	Choice Count
1	I developed my film myself.	6.90% 2
2	I take my film to a lab or photo processing centre where it is processed for me.	93.10% 27

29

Showing rows 1 - 3 of 3

Still 2.1 - Which format do you use?

#	Field	Choice Count
1	Color	46.67% 7
2	Black and white	0.00% 0
3	Both	53.33% 8
		15

Showing rows 1 - 4 of 4

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Which format do you use?	1.00	3.00	2.07	1.00	1.00	15



■ Color ■ Black and white ■ Both

Still 2.2 - How many rolls of film/disposable cameras do you go through per year?

How many rolls of film/disposable cameras do you go through per year?

Use to go through about 20 a year, probably only 4/5 now

6-12

6

4

4

3

18

15-20

12

12

10-15

10

10

10

Still 2.3 - On Average how much do you spend per roll of film or disposable camera?

On Average how much do you spend per roll of film or disposable camera?

\$13

\$15

\$15

\$15

\$18

\$23

\$25-\$30

\$30

\$30

\$30

20

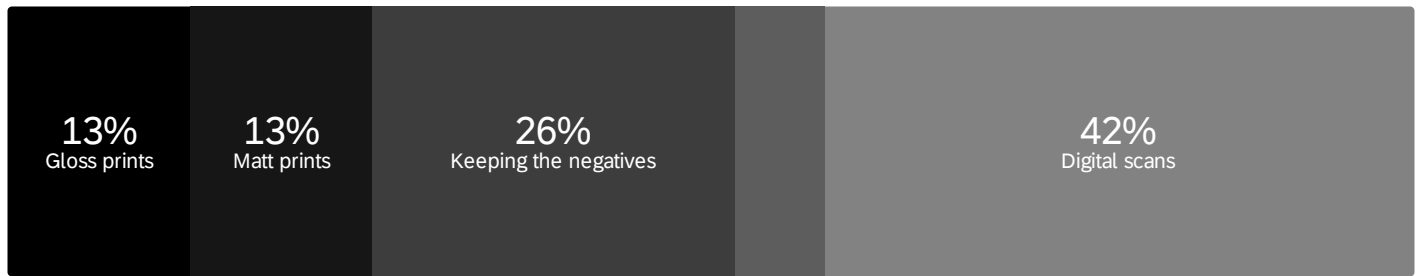
22

25

35

Still 3.1 - When you go to get your film developed what option extras do you select?

(Select all that apply)



Gloss prints
 Matt prints
 Keeping the negatives
 Rush service
 Digital scans

#	Field	Choice Count
1	Gloss prints	12.90% 4
2	Matt prints	12.90% 4
3	Keeping the negatives	25.81% 8
4	Rush service	6.45% 2
5	Digital scans	41.94% 13
		31

Showing rows 1 - 6 of 6

Still 3.2 - When you get your film developed what is the average turnaround time?

When you get your film developed what is the average turnaround time?

1 week

1 day

Like 2-3 days

4 days

2 weeks

2 weeks

3 days

7 days

3-4 weeks

4 days

Same day

2 days to a week

2 weeks

3 days to a week

Still 3.3 - How much do you spend when you develop a roll? (Including the cost of optional extras)

How much do you spend when you develop a roll? (Including the cost of optio...

25

\$25

\$25

\$7

\$20

\$18

\$25

\$15

18

\$30

approximately \$20

\$40

\$20-\$30 each

Still 4.1 - How long do you think it would take you to develop a roll of film yourself?

How long do you think it would take you to develop a roll of film yourself?

2 days

I wouldn't know where to start

No clue I'd guess a week

Several Hours

A few days

15mins

2 weeks

7 days

Maybe 3 hours if I had the equipment?

A week

72hours

40 minutes

2 days

1 day excluding getting the materials, included probably a month

Hella time

Still 4.2 - How much do you think the film processing equipment would cost to purchase?

How much do you think the film processing equipment would cost to purchase?

\$300

A lot

About 200?

\$200 ish

\$120

\$200

\$2500

\$500

200

\$1000+ including a good scanner and I think chemicals cost a bit, too.

Very expensive

\$1000

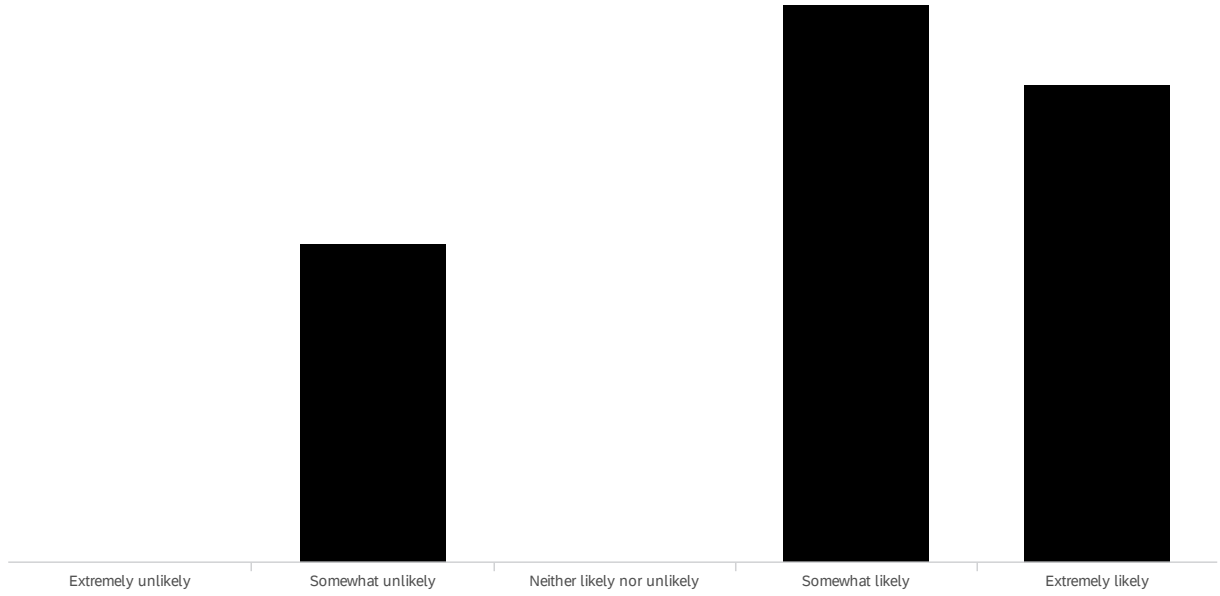
\$300

400

\$500

At least a dollar

Still 4.3 - If you were to develop your own film how likely do you think you would be to damage it?



#	Field	Choice Count
1	Extremely unlikely	0.00% 0
2	Somewhat unlikely	23.53% 4
3	Neither likely nor unlikely	0.00% 0
4	Somewhat likely	41.18% 7
5	Extremely likely	35.29% 6
		17

Showing rows 1 - 6 of 6

Still - Reasons - What are the Main Reasons you haven't developed your own film?

(Select all that apply)



The cost investment associated with development equipment Ease and convenience of lab development

A lack of a space to develop film (I.E darkroom) I don't shoot regularly enough to justify it The risk involved with home development

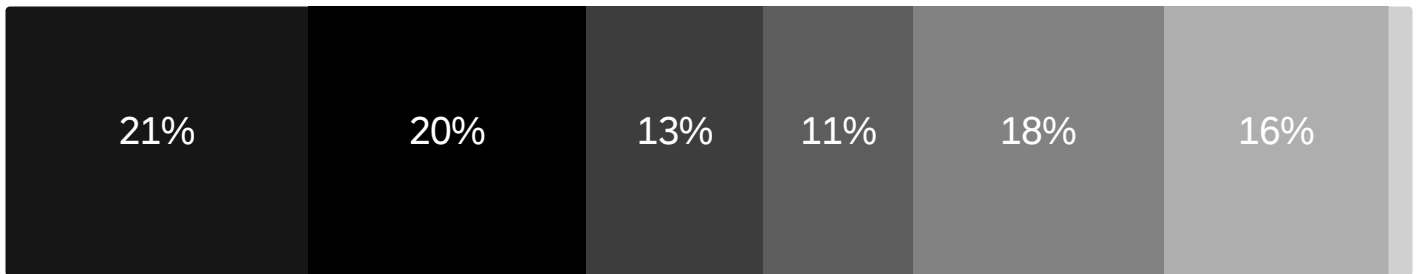
The time investment associated with learning/developing Other

Still - Reasons _7_ TEXT - Other

Other



I do develop film myself sometimes

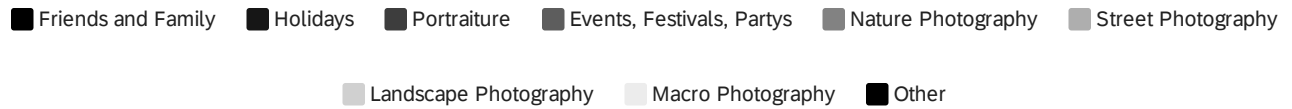
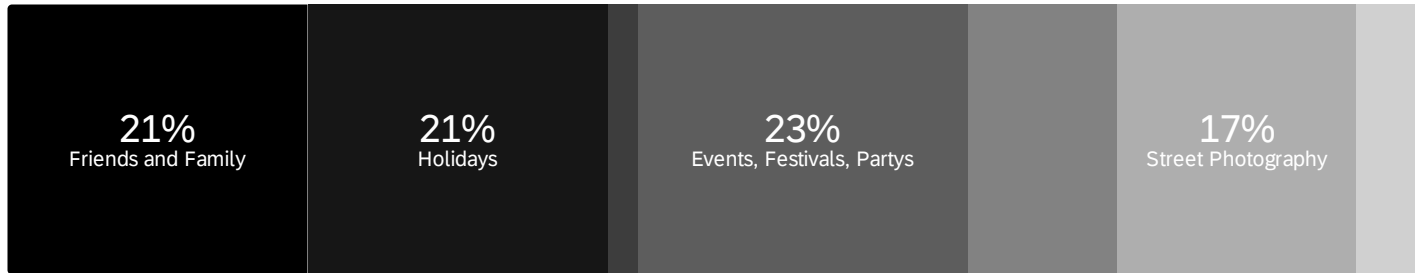


The cost investment associated with development equipment Ease and convenience of lab development

The risk involved with home development The time investment associated with learning/developing

A lack of a space to develop film (I.E darkroom) I don't shoot regularly enough to justify it Other

Still 5.1 - What do you primarily take photos of? (select all that apply)



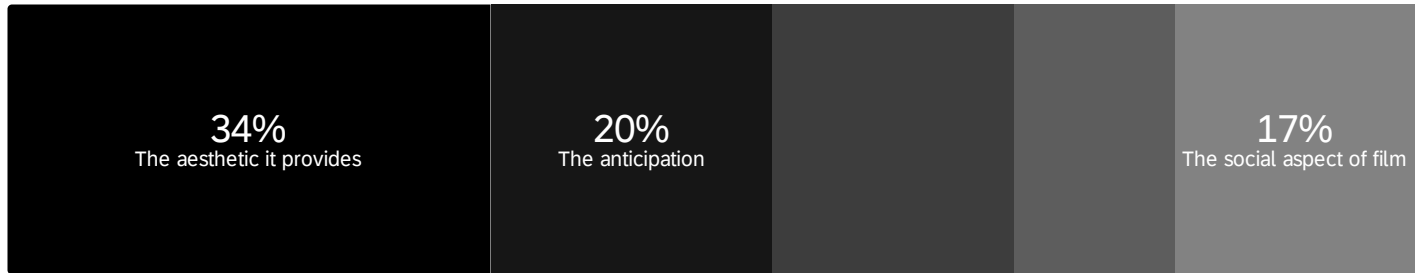
#	Field	Choice Count
1	Friends and Family	21.28% 10
2	Holidays	21.28% 10
3	Portraiture	2.13% 1
4	Events, Festivals, Partys	23.40% 11
5	Nature Photography	10.64% 5
6	Street Photography	17.02% 8
7	Landscape Photography	4.26% 2
8	Macro Photography	0.00% 0
9	Other	0.00% 0
		47

Showing rows 1 - 10 of 10

Q23_9_TEXT - Other

Other

Still 5.2 - Why do you enjoy shooting with film? (please select all that apply)



- The aesthetic it provides
- The anticipation
- The mechanical/analog process of taking the photo
- The physical negatives
- The social aspect of film
- Other

#	Field	Choice Count
1	The aesthetic it provides	34.29% 12
2	The anticipation	20.00% 7
3	The mechanical/analog process of taking the photo	17.14% 6
4	The physical negatives	11.43% 4
5	The social aspect of film	17.14% 6
6	Other	0.00% 0

35

Showing rows 1 - 7 of 7

Q24_6_TEXT - Other

Other

Still 5.3 - Is there anything else you would like to touch on or clarify regarding these questions and your answers?

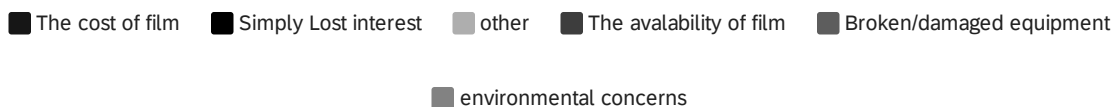
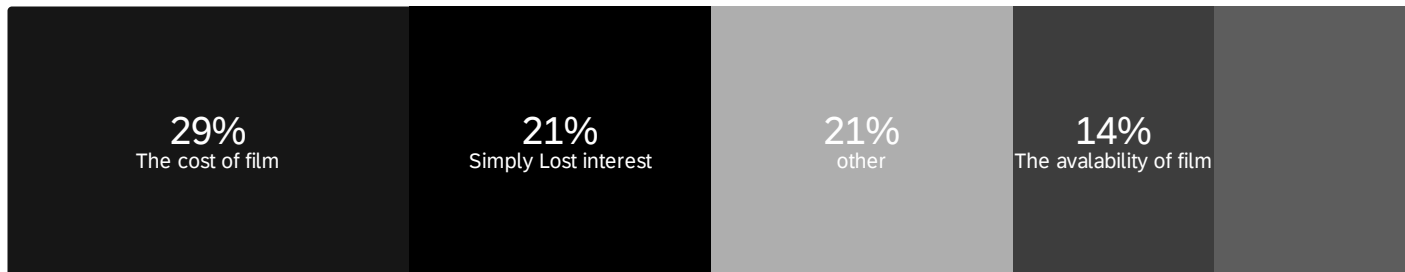
Is there anything else you would like to touch on or clarify regarding thes...

No

I cant use development chemicals at home because family members with asthma are affected by volatile organic compounds

Fantastic

Did 1.1 - Why did you stop shooting on film? (select all that apply)



#	Field	Choice Count
1	Simply Lost interest	21.43% 3
2	The cost of film	28.57% 4
3	The availability of film	14.29% 2
4	Broken/damaged equipment	14.29% 2
5	environmental concerns	0.00% 0
6	other	21.43% 3

14

Showing rows 1 - 7 of 7

Q37_6_TEXT - other

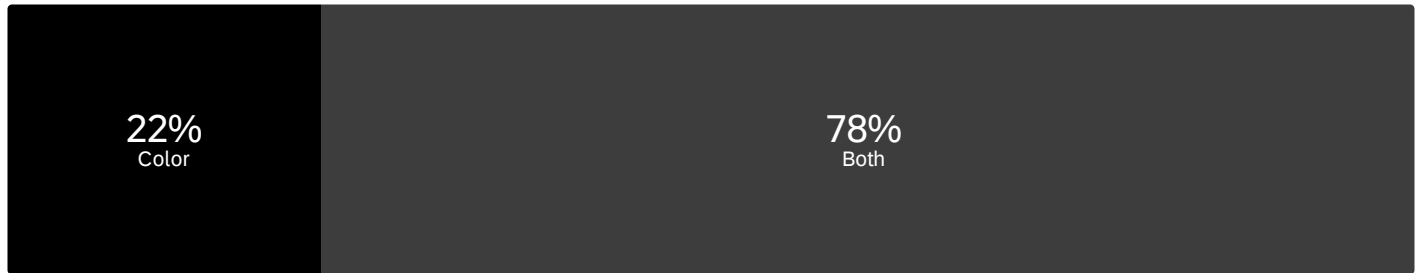
other

Used someone's equipment

Digital

Life concerns stopped me but I do plan on continuing once I'm in a position to

Did 2.1 - Which format did you use?



Color Black and white Both

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Which format did you use?	1.00	3.00	2.56	0.83	0.69	9

#	Field	Choice Count
1	Color	22.22% 2
2	Black and white	0.00% 0
3	Both	77.78% 7
		9

Showing rows 1 - 4 of 4

Did 2.1 - How many rolls of film/disposable cameras did you go through per year?

How many rolls of film/disposable cameras did you go through per year?

5

1

1

3/4

Not sure

5

1

4

Yolo

How many rolls of film/disposable cameras did you go through per year?

5

1

1

3/4

Not sure

5

1

4

Yolo

Did 2.3 - On Average how much did you spend per roll of film or disposable camera?

On Average how much did you spend per roll of film or disposable camera?

Around AUD\$10.00 (Early 2000's)

40

\$25

\$15/20

Not sure

10

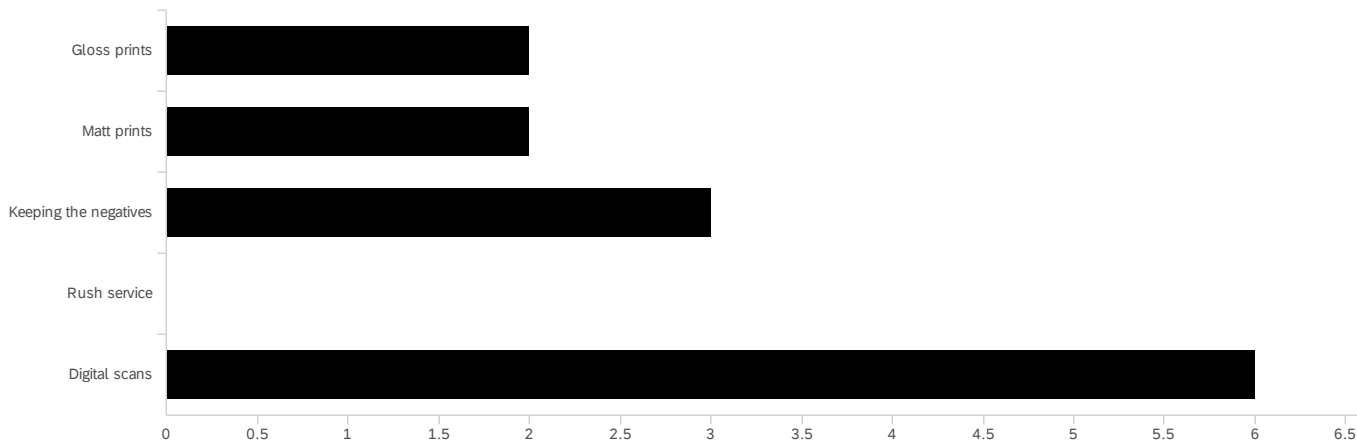
50

20-25

Yolo

Did 3.1 - When you went to get your film developed what option extras did you select?

(Select all that apply)



#	Field	Choice Count
1	Gloss prints	15.38% 2
2	Matt prints	15.38% 2
3	Keeping the negatives	23.08% 3
4	Rush service	0.00% 0
5	Digital scans	46.15% 6
		13

Showing rows 1 - 6 of 6

Did 3.2 - When you did get your film developed what is the average turnaround time?

When you did get your film developed what is the average turnaround time?

1-2 hr

1 week

1 week

24 hours

5 days/week

1 hour

1 week

1 day

A really really really really really really long time

Did 3.3 - How much did you spend when you had a roll developed? (Including the cost of optional extras)

How much did you spend when you had a roll developed? (Including the cost o...

Around AUD\$16 (Early 2000's)

20

\$30

\$30

Not sure

25

70

\$20

Like a lot a lot

Q47 - How long do you think it would take you to develop a roll of film yourself?

How long do you think it would take you to develop a roll of film yourself?

4-6 hrs

couple weeks

2 hours

I would never be able to

Long

1 day

Q48 - How much do you think the film processing equipment would cost to purchase?

How much do you think the film processing equipment would cost to purchase?

\$600

1000

\$150+, but maybe \$10-15/roll

Unlimited money

Lots and lots

500

Q49 - If you were to develop your own film how likely do you think you would be to damage it?



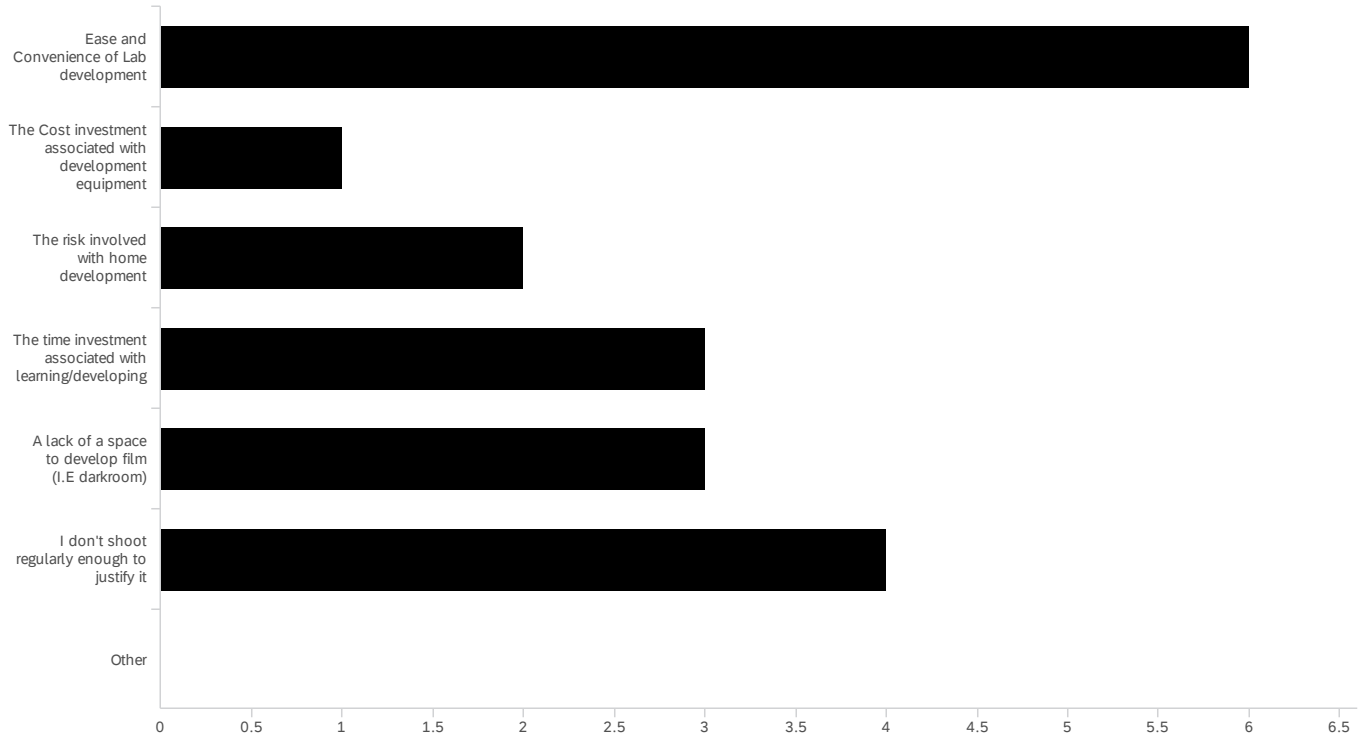
Extremely unlikely
 Somewhat unlikely
 Neither likely nor unlikely
 Somewhat likely
 Extremely likely

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If you were to develop your own film how likely do you think you would be to damage it?	2.00	5.00	4.33	1.11	1.22	6

#	Field	Choice Count
1	Extremely unlikely	0.00% 0
2	Somewhat unlikely	16.67% 1
3	Neither likely nor unlikely	0.00% 0
4	Somewhat likely	16.67% 1
5	Extremely likely	66.67% 4
		6

Showing rows 1 - 6 of 6

Q46 - What are the Main Reasons you haven't developed your own film? (Select all that apply)



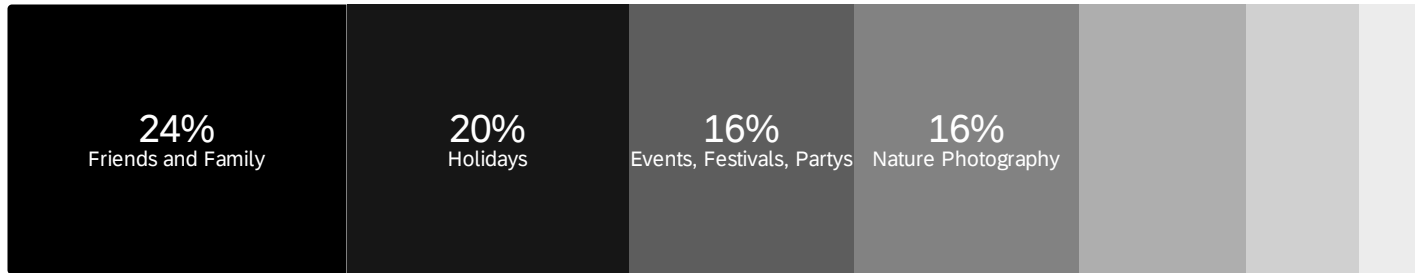
#	Field	Choice Count
1	Ease and Convenience of Lab development	31.58% 6
2	The Cost investment associated with development equipment	5.26% 1
3	The risk involved with home development	10.53% 2
4	The time investment associated with learning/developing	15.79% 3
5	A lack of a space to develop film (I.E darkroom)	15.79% 3
6	I don't shoot regularly enough to justify it	21.05% 4
7	Other	0.00% 0
		19

Showing rows 1 - 8 of 8

Q46_7_TEXT - Other

Other

Did 5.1 - What did you primarily take photos of? (select all that apply)



Friends and Family
 Holidays
 Portraiture
 Events, Festivals, Partys
 Nature Photography
 Street Photography
 Landscape Photography
 Macro Photography
 Other

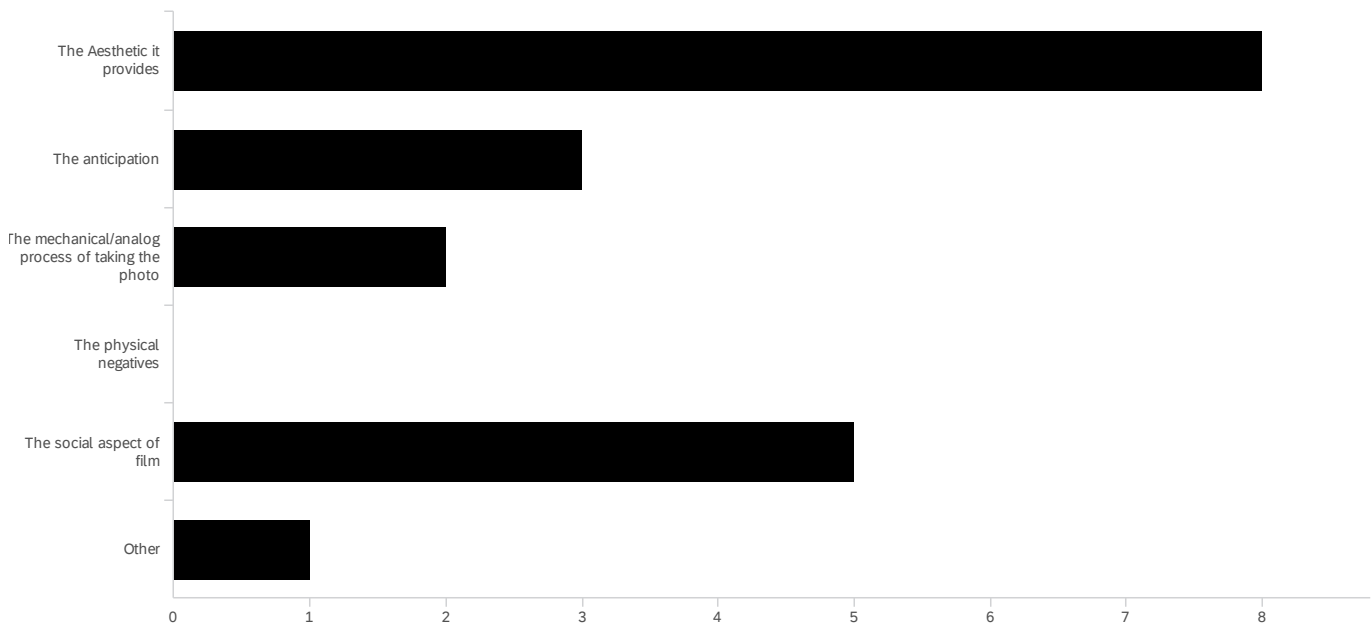
#	Field	Choice Count
1	Friends and Family	24.00% 6
2	Holidays	20.00% 5
3	Portraiture	0.00% 0
4	Events, Festivals, Partys	16.00% 4
5	Nature Photography	16.00% 4
6	Street Photography	12.00% 3
7	Landscape Photography	8.00% 2
8	Macro Photography	4.00% 1
9	Other	0.00% 0
		25

Showing rows 1 - 10 of 10

Q31_9_TEXT - Other

Other

Did 5.2 - Why did you enjoy shooting with film? (please select all that apply)



#	Field	Choice Count
1	The Aesthetic it provides	42.11% 8
2	The anticipation	15.79% 3
3	The mechanical/analog process of taking the photo	10.53% 2
4	The physical negatives	0.00% 0
5	The social aspect of film	26.32% 5
6	Other	5.26% 1

19

Showing rows 1 - 7 of 7

Q32_6_TEXT - Other

Other

I was doing it before and during the transition to digital

Did 5.3 - Is there anything else you would like to touch on or clarify regarding these questions and your answers?

Is there anything else you would like to touch on or clarify regarding thes...

I have experience developing my own film and also used lab services. I found that developing film myself was most useful if you wanted to enlarge an image and have creative control over its aspects for presentation purposes. This process otherwise is too labour & time intensive for regular photography.

Holidays is misspelled ;)

Nice survey

Q7 - Are there any reasons you could highlight as to why you haven't taken photos using film.

Are there any reasons you could highlight as to why you haven't taken photos...

I only did in primary school before I had a phone, otherwise the only reasons I can think of are cost and lack of knowledge about them

Interest

Never been interested

35 dollar roll

Lack of knowledge regarding film, not owning the equipment.

not a photograph fan

I don't tend to take a lot of photos

I've always viewed film as an outdated format which is less viable than digital

End of Report

Capstone Interview – Home Film processor

- (1) From your perspective what are some of the key environmental & economic challenges associated with Analog Photographical practices?
- (2) Are there any innovative practices or techniques you have come across or have implemented in your Analog processes to make Analog Photography more sustainable?
- (3) Are there any trends or emerging technologies in the industry that you believe will significantly impact the sustainability of Analog Photography in the future?
- (4) Could you briefly describe your experience with Analog Photography as a medium?
- (5) What are some of the products, processes, and objects you interact with when you shoot with and develop film.

Could you paint me a detailed timeline of this process.

Could you tell me more about these products, processes, and objects?

- (6) What difficulties or benefits have you come across when using these products, processes, and objects?
- (7) If you were to compare Lab development with the home development process, which one would you consider to be more sustainable and why?
- (8) What aspects of Analog Photography do you enjoy or dislike the most?
- (9) What are your thoughts on the significance or importance of Analog Photography as a medium?
- (10) What do you think the largest barriers are for beginners as they learn to shoot and process film?
- (11) Is there anything else you would like to discuss regarding analogue photography and its processes?

Capstone Interview – Film Lab

- (1) From your perspective what are some of the key environmental & economic challenges associated with Analog Photographical practices?
- (2) Are there any innovative practices or techniques you have come across or have implemented in the Lab to make Analog Photography more sustainable?
- (3) Are there any trends or emerging technologies in the industry that you believe will significantly impact the sustainability of Analog Photography in the future?
- (4) Could you briefly describe your experience with Analog Photography as a medium?
- (5) In the Lab, what are some of the products, processes, and objects you interact with in your everyday work?

Could you paint me a detailed timeline of this process.

Could you tell me more about these products, processes, and objects?

- (6) What difficulties or benefits have you come across when using these products, processes, and objects?
- (7) If you were to compare Lab development with the home development process, which one would you consider to be more sustainable and why?
- (8) What aspects of Analog Photography do you enjoy or dislike the most?
- (9) What are your thoughts on the significance or importance of Analog Photography as a medium?
- (10) What do you think the largest barriers are for beginners as they learn to shoot and process film?
- (11) Is there anything else you would like to discuss regarding analogue photography and its processes?

Audio Transcription analysis Guide

Probing for more

(1) From your perspective what are some of the key environmental & economic challenges associated with Analog Photographical practices?

Cost Related Answer (CB) (KF) (DT) (TB) (AFG)
Chemicals/Chemical disposal/process (XS) (KF) (DT) (TB)
Recycling of Disposable Cameras (GW) (DT) (AFG)
Emissions (KF)
Labour Cost (KF) (TB) Investment in quality equipment

(2) Are there any innovative practices or techniques you have come across or have implemented in your Analog processes to make Analog Photography more sustainable?

Bulk Loading/reloading canisters/Recycling (CB) (GW) (KF)
Home Made chemicals. (CB) (XS)
Pushing people towards investing in equipment (KF) (KF)
Film Emulation Products and technology (KF)
Energy Recycling/Multi Purpose (KF)

(3) Are there any trends or emerging technologies in the industry that you believe will significantly impact the sustainability of Analog Photography in the future?

New Film cameras/film camera recovery (CB)
New film production facilities and companies (CB) (TB)
Recycling (GW)

(4) Could you briefly describe your experience with Analog Photography as a medium?

(5) What are some of the products, processes, and objects you interact with when you shoot with and develop film.

Products/process/object

(6) What difficulties or benefits have you come across when using these products, processes, and objects?

>Benefits > Difficulties

(7) If you were to compare Lab development with the home development process, which one would you consider to be more sustainable and why?

>Lab (CB) (GW) (XS) (KF) (TB) >Home (CB) (KF) (AFG)

(8) What aspects of Analog Photography do you enjoy or dislike the most?

(9) What are your thoughts on the significance or importance of Analog Photography as a medium?

Better Understanding of photography in general (CB) (GW) (DT) (TB)
Beauty or Romantasm (CB) (GW) (TB)
Technical Reasons (XS)

(10) What do you think the largest barriers are for beginners as they learn to shoot and process film?

Large amount of information to learn (CB) (XS) (PF) (AFG)

The perceived difficulty of Film (CB) (XS) (PF) (DT)

Lack of immediate gratification (XS) (AFG)

Risk involved (PD) (DT) (AFG)

Comments on Guidance/importance of community. (CB) (GW) (AFG)

(11) Is there anything else you would like to discuss regarding analogue photography and its processes?

Other Important Comments

Audio file

[audio1855473109.m4a](#)

Transcript

Kentaro Mikami,(1)what are some of the key environmental and economic challenges associated with? Analogue photography in general, or maybe some of the well, some of the problems that you face.

Aubany Fraser Grant

I'd say with my experience in film like the. Biggest challenges would probably be like, yeah, economic like price. I feel like it is so expensive compared to how it probably used to be and like accessibility as well to film like it's been sold out and so scarce like I have. Film that I got I ordered from overseas was something crazy like six months ago, and it still has not come because it's just. Yeah, it's crazy environmentally as well. I found, especially when I started with because I started like every other person usually with just like those Kodak disposable check out. Ones and then I realised that that's kind of bad, but you can just get a point and shoot or something because it's plastic waste. And I've heard chemicals when developing film as well can be quite bad or harsh if they're not used or disposed of correctly, but I personally haven't done it much myself, so no firsthand. But yeah, I've. Been around that sort. Of thing, yeah.

Kentaro Mikami

(2) given your experience with analogue photography, have you come across any innovative practises that anyone's doing or that you think will have a really large impact on the overall sustainability of analogue photography now or in the future?

Aubany Fraser Grant

Nothing innovative that I can think of. I think most people go straight towards. Just dropping off film to get developed, unless it's unless you're doing it really frequently, I guess you'd feel more of a need. The only thing that I've seen that's remotely innovative is those like film scanners that you can use with your negatives and stuff like that. But yeah, nothing in terms. Of developing or shooting film, I don't think no.

Kentaro Mikami

Yeah, that's all good. Fantastic. Could you briefly describe your experience with analogue photography as a medium?

Aubany Fraser Grant

Yeah, of course. Yeah. As I said, I got into film. Just stupid little Kodak. Cameras and then I. Started to fall in love with like. Seeing other people having point and shoots and like the just the like, the feeling of a lot of them like I found it fascinating that. It brought a whole new perspective to scenes and stuff like it's almost better than the naked eye. It's crazy. So I became, like, obsessed at finding, like, certain cameras with different lenses and stuff like that. And then before I knew it, I. Feel like I ended up. With like 6 digital ones that I've got like Depop and God knows where and. And just like going through real the meals of film and just like testing and getting better and and everything. Yeah, I've loved it. But yeah, the only thing is that it's. I definitely have to, like actively put aside money almost for buying film and stuff like that.

Kentaro Mikami

Yeah. (5) What are some of the products that you interact with to facilitate your use of analogue photography as a medium? So you mentioned that you bought a couple of cameras. Just run me through some of the products that you use.

Aubany Fraser Grant

Compared to digital. I've got. Oh, I've got an Olympus MJU double I one that's broken, and I've got it's. I know. It's like a specific where you have to use. It so annoying, but it's such a nice camera I've got. I can't remember the. Name of the one that I have. But I also have two of those little ones that you can kind of get from like reusable, but the like really low priced ones you can get from like Universal store and stuff. Let me just check the name of the. Other camera I have. That's in my bio, but I always forget. UM and I usually just use like in times of film. I only really use that. The normal, just like Kodak 400 that you can get from Big W and stuff, I don't know. Buy more expensive like nicer film just because it's so expensive. Oh yeah, Pentax P30 as well. Yeah, which is my fave. Yep.

Kentaro Mikami

Fantastic. So regarding your experiences with these products, could you point out maybe some positives or negatives that you have come across when interacting with them?

Aubany Fraser Grant

Film the film in general. I've never really had a negative experience just because that was pretty much the same and everything camera wise though, I think. Because when sourcing like the film cameras that they have, usually they are second-hand or something like that because they're more affordable to get second hand or nicer, usually like damage and like sense sensitivity and stuff like dropping them and like my like keeping them clean and everything is so important, especially because you can't see. Like the photos you're taking, so if you know you gotta make sure that it's all good before you start using like. A \$30 roll. Of film and then develop it and you get it back. And it's just like white photos or something like that. Like tragic. UM. Yeah, which has happened to me before because I dropped my Olympus and then I got all my photos back and they had, like, the the. Light ring around it and. Yeah, but yeah, that's pretty much been the downsides from it.

Kentaro Mikami

Any other like instances where you sort of thought, oh, that's a really great feature that they added to the camera or maybe like or I really don't like that like any any design aspects.

SLRS compared to. Like the smaller ones, I suppose, like any. Yes, yeah. Anything with. Like where you can change the aperture and like focus and stuff like that. I. Think is really cool.

Kentaro Mikami

Why do you like those more?

Aubany Fraser Grant

I think it just has a nicer like if you're using it for portrait photography or something like that. I feel like you can really shape the scene or like focus on certain things rather than just letting it use auto. I don't know more control I guess, over putting the vision in your head. Onto your film kind of thing.

Kentaro Mikami

Fantastic. Awesome. (7) So that's fantastic regarding, OK, so if you were to compare. UM lab development to home development. I understand that you haven't really stepped into that realm, but just given your your knowledge. If you were to compare both like taking it to a lab to develop or taking it or doing it yourself, which one would you consider to be more sustainable?

Aubany Fraser Grant

Uhm, I guess. Probably doing it at home, especially like sustainable in terms of environment or like personal.

Kentaro Mikami

Mental, economical, social, cultural with that like just. In general, yes.

Aubany Fraser Grant

Ever since. I think at home for sure. I like, it's funny because Pat Frazier and I all did. One class at South Bank developing film and I think the social aspects of also going to a lab and doing it with other photographers or pat like over exposed one roll of film of me. But it was cool because it came out nice and I didn't realise that you could kind of. Control that stuff when developing film. So, I think at home, especially if I had the option to like the resources, I feel like 100%. Be doing that? Yeah.

Kentaro Mikami

You briefly touched on the community aspect of like the class you did, could you? Could you elaborate further? On that for me.

Aubany Fraser Grant

Yeah, sure. We had, yeah. It was like a free little trial thing at the art school just at South Bank. And yeah, just having like other photographers. In the room. Like with you, everyone like helping each other out as well with questions because obviously it's not everyone has experienced. But yeah, it just kind of. Heightened, I don't know, like the creativity, like everyone's bouncing off each other like ohh guys. Look at this film like I did it or like ohh I ***** this up like kind of thing and it's nice. Like shared experience. I guess we found. Yeah.

Kentaro Mikami

Do you think that's an important part of, like the film process?

Aubany Fraser Grant

Yeah, I think. I think for sure. Especially well, yeah. Even socially social photography, like casual things. I think there should be way more of that if that was like an option. For me to just go down and do that like. Once a week or whenever I had to film, I think that would be great. Even if you must pay and stuff like that. Because yeah, I never really hear about it. He's dropping it off at photo fast. I feel like you've got like all this, like creative energy built up me like, oh, my God, these photos will be so cool. And then you go in. It's just like a. Little like lab. Room. And you're like, oh, I. Don't know and you're.

Kentaro Mikami

So you feel like you, you, you, you have all this. Energy and you? Like use it in like a social environment, but you can feel a bit restricted if you go to photo fast or just. A drop off area.

Aubany Fraser Grant

Yeah, it it feels a little bit like clinical, which I guess is fine because it is just like you're paying them just. To develop for you. But I think photography, I see it as quite a creative outlet. So, like saying I play music. If I go and jam with friends, it's way more fun than if I'm just sitting at home. My iron snares like you don't really have. The same experience, so yeah.

Kentaro Mikami

(8) Sure, that's that's fantastic. Awesome. So. What aspects of analogue photography do you enjoy, or just like the most?

Aubany Fraser Grant

I think. Like the surprise. Of getting them back is or like seeing them come out is honestly the best thing ever. And also the unpredictability sometimes of like how the lights gonna look and stuff like the colours. And stuff like that. And also like the satisfaction of like when you get it back or you develop it and it's like exactly how you wanted it to look and like better than the digital and. Like you just like. UM. And obviously, yeah, downsides and stuff like that is, but it doesn't come out well. And then it was only one photo. And you're like. Like I missed it. It's probably the main things that. Excite slash depressed me about it.

Kentaro Mikami

(10) Fantastic. What do you think? Some of the largest barriers are for beginners as they learn to shoot on film? Or maybe. Yeah. Take that first step.

Aubany Fraser Grant

I think for beginners and. Particularly people who. Don't have like a dying passion for it. They kind of just like testing it. Out and stuff. Financial restriction because I feel like to get into film, you have to feel like. You kind of know what you're doing. You must learn somehow and that's. Takes practise, which takes money on film because you have to go through a few reels or forgot which camera you want to use or how to use a camera, you have to yeah. Economically I think there's a massive barrier there. As well as knowledge, I think. Think film has come back into fashion as a bit of like a gimmick, and the fact that people have been promoting all companies' kind of have been promoting, like using those really easy auto reusable ones, which is cool, has kind of just let people who have stickiness or whatever just kind of like sit into that and not really. There's not much. Accessibility or promotion in like just getting a point and shoot and. Like actually learning how to use them properly. I suppose so. People really get so far and they're not getting the most amazing photos or. Whatever. And they are just. Kind of give up.

Kentaro Mikami

(9) Yeah, for sure. Fantastic. Just one last question, what are your thoughts on the significance of analytic graphy as a medium? There's a large argument for this is a dead format. Why shouldn't we just let it die? What what's your? What's your thoughts on that?

Aubany Fraser Grant

Oh yeah, that's so sad. I guess there is. A bit of like a personal preference. In there like. I guess depending on what you want out of your photo. Personally, which I guess would be very arguable. I think that no matter what philtre or like camera you have, I don't think. Like a proper film, photo is replicable. I think that there's something special about actually capturing something onto, like a

physical medium and being able to develop it and having that grain and that sort of, like authentic realness. And yeah, just all of that like, you just can't beat it. And I don't think. That it's ever fully gonna go out of fashion. It's always going to be around. Yeah, like, no, you just. Can't really replicate it personally.

Kentaro Mikami

Yeah, sure. Awesome. Well.

Audio file

[audio1733313363 1.m4a](#)

Transcript

Kentaro Mikami

OK, awesome. Now yeah, fantastic. Well, we'll get right into it. I don't wanna waste too much of your time. Umm, so I won't hold you for long. But anyway, could I just get you to introduce yourself for me quickly.

Caleb Brian

Sure. So my name is Caleb Bryan. I'm a photographer by Hobby and I only do the full analogue process really. So, I shoot predominantly black and white Film - probably 95% of which is black And white otherwise Slide. I process all of my film at home in my in my kitchen and I have a dark room in my garage and so I also do on my own physical printing as well.

Kentaro Mikami

Wow, that's awesome. Yeah, it sounds like you're perfect. This is great. OK, so just we'll start off with a bit of a broader question. (1) **From your perspective, what are some of the key environmental and economic challenges associated with the analogue photographic process?**

Caleb Brian

So, I mean the current. Big barrier to entry I think is just the **cost, especially to people who want to colour negative. You're looking at, you know, \$20.00 for a roll of film. It can be offset, you know, by doing bulk rolling and shooting black and white. We don't at least like, I mean, I'm down to like \$4.50 A roll of film. Including processing. But yeah, the, the biggest hurdle and then yeah, it everything in photography requires Cost, because if you want to start developing yourself and then you need to invest and a developing process and if you want to. Start printing yourself and you need an entire. Space, so yeah.**

Kentaro Mikami

Yeah, exactly. Fantastic. (2) **So, are there any innovative practises or techniques that you have come across or have implemented in your own analogue process regarding sustainability?**

Caleb Brian

I don't know. Well, I don't know if the if, if they're particularly innovative, but **Bulk loading film** has been a very sustainable thing because I can reuse all my old, all my old canisters and just be very frugal about it and making **my own chemicals.**

Kentaro Mikami

So could you. Could you tell me a little bit about that?

Caleb Brian

Sure. So. And make developers stop bath and Hypo clear year and Photo flow all myself. Very generally, very easy to do so for for a developer I use something called PaRodinal. Which is made out

of drain cleaner, sodium sulphide, sodium hydroxide and Panadol. Just over the car of the coast. Stop bath is just white vinegar. Really. And photo flow You can just. Get from just this was a rinse aid.

Kentaro Mikami

Ohh, fantastic. Well, you're just missing the fixer then, right? So do you have any plans to like figure that one out or?

Caleb Brian

No, it fixers cheap you can just Follow whatever fix is cheapest at the time. In the years that it's it. It isn't super economical to. Make fix yourself, especially if. They're right, rapid fixes or what not.

Kentaro Mikami

Have you, uh, have you had a lot of success when you've used your own chemicals?

Caleb Brian

Oh, yeah, absolutely. Yeah, yeah. So my primary developer is PaRodinal, which is Rodinal made, made out of Panadol and on the weekend I was developing using POTA, which is a phenidone based developer.

Kentaro Mikami

Fantastic. (3) Are there any trends or emerging technologies in the industry that you believe will have a significant impact. Maybe something that you're not using yet, but you're seeing other people use, is there anything that comes to mind?

Caleb Brian

Yeah. Well, well, I mean, I. I'm excited about Rico and Pentax announcing a new film camera like like like that, that that might get people into it. There's also just just a really good cottage industry, especially out of China of of places remaking old, desirable winters for A lot cheaper and there's the seagull TLR restoration and mod process being done by, I think when's light labs are doing that so. So there's a lot of. Like innovation coming out on the. New ways to make film photograph side of things which I think is really exciting and is going to be pretty. Pretty important for the continuation of the hobby because while. While there's still plenty. Of 1000 thousand cameras out there, because this was the only way we could take photos from. 1890 until sort of 1990. So there's there's plenty of cameras to go around, but they're they're all getting to the stage where they need work or they need servicing. And if you don't know someone who can work or service on them, just going to slide further and. Further into disrepair.

Kentaro Mikami

Yeah. Fantastic. OK. So. So you've briefly described your like, UM, like experience with analogue photography. (5) What are some of the products, processes or objects that you interact with to like interact with when you shoot or develop film? Essentially. So yeah, just run me through like your development process.

Caleb Brian

Yeah, sure. So my development process. Shooting shooting is nothing special. You're just out there with the camera. So off you go, my development process, I use a fairly long process just because I have all the chemicals and I like consistency. I do it all in the kitchen, so I'm starting off with a dark

bag and some Patterson tanks and just loading, loading up in a dark bag. My development. What I like to do is a 5 minute pre-rinse just to get everything. Up and ready developer for however long it takes stop. Bath or wash? A fix and I fixed my inspection, so I'll open it up and take a look at. The film to make sure. Because it's completing on time, then another wash, then a Hypo-clear, which is often skipped, which is to help clear out Fix the illicit fixing the Ilford Wash method, which is 5 inversions, and then version 20 inversions and fresh water each time. Then photo flow and then hang to dry processing afterwards is flatbed scanner using the V850 As my primary proofing step and then after that we'll be dark room printing. I'll select the images and and and that process is almost the same as the as the. Development process of film actually, it's just. Dev, stop, Fix a Hypo-clear if I'm printing with fibre and yeah, and all of the gear between the easels.

Kentaro Mikami

Yes. Could you tell me about some of that, some of that gear that you're using? So just like could you just like name some specific pieces of kit that you're using?

Caleb Brian

Yeah, sure. So in developing film upstairs, I'll use Patterson, Patterson Reels, Patterson tanks. We've got a few thermometers which are important to it, jugs for measuring our volumes of liquids and pipets and syringes for for getting chemicals out. Then in the dark room, Tongs and trays for developing paper and. Easels for doing borders and setting up prints. Enlarges of course. Yeah. The thing I think that's about it.

Kentaro Mikami

Fantastic. That's awesome. So, yeah, you've you've really mentioned you've said your partisan tanks, you've got your thermometers, jugs, pipette, syringes, dark room tongues and enlarges as well and like easels as well as like any anything else that has to do with print. So you've got this sort of two areas. There. (6) So regarding these products, processes and objects. That you interact with what are some of the benefits or issues that you come across when interacting with them, the ones that I just mentioned or the ones? That you just mentioned there.

Caleb Brian

Yeah, sure, sure. So. I haven't had these issues in a long time but but. But. But Patison reels can be quite annoying if you're if you're new to.

Caleb Brian

Them and trying to load them. Yeah, yeah, yeah. Yeah, they're acting ones. Unless you keep them really clean, they love to stick and bind and chew up film so so that can always be a pain, yeah. Yeah, it's hard. I've I've been doing it so long that you just sort of have to go with the flow when you learn how everything. Sort of works and you.

Kentaro Mikami

Yeah. Yeah. So when you were learning, was there anything specific that comes to mind that was a bit of an issue?

Caleb Brian

And you and you work around it. Yeah. Yeah, so. Yeah. So, so I mean stuff like like, like, like, like dark room changing bags are are, are, are annoying like a A. Tent would be preferable. To see have enough

room in there to to, to move around. Yeah, I I don't have anything that that's really outstanding. It's a sticking point.

Kentaro Mikami

OK. Well, anything that you really like about these products, something you're like, oh gosh, I love that they've included that. The design that's makes my life so much.

Caleb Brian

I mean, I do like the fact that the person reels unclip and then you can have 120 and 35. and all that at the. Same time. Yeah, yes. So the versatility there is really nice. In in the dark room, as far as my particular enlargers go, I always try to get glassless negative carriers and so having a negative carrier that actually has proper masks for 35 67 66 like that makes it a lot. Easier, because if you're not. Dealing with with. An additional for four services across two services of film and then also all your lenses. Trying to get. All those clean, so just minimising stuff between the actual image. Ohh the scanning the scanning. Yeah, I absolutely love the Lomography Digitalize. Here Negative. Have you seen them?

Kentaro Mikami

No, no, no. Could you? Tell me a little bit about that one.

Caleb Brian

I'll grab it.

Kentaro Mikami

Ohh fantastic yeah.

Caleb Brian

So the the. 120 carriers on the V850 are trash actually. That that, that is the one. Big pain point with with. Scanning. Yeah. Yeah, so. The negative carriers and the V850 are all trash. They don't have any real glass and it's all plastic. They attract as much. Cat hair, as they possibly can. On the 35 millimetre ones, it's OK because you can rip out the plastic and your your film still holds, but the 120 ones are. Are are, are. You can't modify them to actually hold the film plug without any additional plastic in there, so these are really handy, but it's a it's a Lomography product. I had to stick some coins in the back to get the actual height right for the scanner. Yeah, but the way it works is it flips open and then you have like these two bits of sandwich. Yeah. So all all magnets. So you don't your film and. Look it off. So it's all flat, close it and then you've got a.

Caleb Brian

Yeah, no, Newton rings my, my. Big problem is dust. It's trying to minimise dust when I'm doing my. Scanning. That's. That's probably one of the. Best things I've I'll I've I've. Purchased this whole workflow those because. I'm I'm I'm not spending all my time spotting.

Kentaro Mikami

That's awesome. So OK, that's that's great. Yeah. Is there anything else that comes to mind with your process that just triggers a little bit of like any emotions at all could be positive, could? Be negative any. Little little interactions with the development process, your scanning process or. Your photo processes.

Caleb Brian

The development process is made a lot easier by the existence of the massive dev chart. It's really good and and and and. The application as well just.

Caleb Brian

I think it's like 15 bucks. And does all your timing for any agitation schedules? So, so the, so the massive dev charts really useful. I'm. I'm super glad I have that as a. As a tool. In the tool bag. I've recently started shooting a bit of infrared. And I found that you can use your phone as an infrared camera, so if you if you have your IR, if you have your, if you have your IR filter out you can hold your phone up. Against your IR filter so you can get some previews for infrared. Which is really nice and handy, more of a trick than a product, but it works, yeah. Yeah, otherwise I developed. Last night I should know if that. Was good or bad about it? Yeah, yeah. I'm going to develop again today. Yeah. No, nothing really stands out other than like just making your space a good place to. Work in? Yeah, like. Especially for printing, if you don't go downstairs and you don't have like music and like not safe lights and like key points of your darkroom lit up so you. Can actually see properly. Yeah. No, nothing much. Coming to mind off of that, no.

Kentaro Mikami

Perfect. Well, that's awesome. OK, so this is just this is just like an open question. (7) If you were to compare lab development to home development, which one would you consider to be more sustainable and why?

Caleb Brian

So probably home development, if done properly, when you're talking about, well actually I'm splitting it into colour and black and white. If you're doing C41 an E6, I think the best way. To do it. At a lab. Because it was a process that was designed to be automated. And so they've got much tighter control of tolerances. They're probably replenishing all of their chemicals and whatnot. So, so and the disposal process of C41 is, is. Insane. Yeah, like. Having a separate bleach and fix in in a lab process makes handling chemical waste a lot easier. Than most people at home. Using blix? Yeah, and when you. When you use the. Blix you you bind up the silver chemically and it makes it really hard to to to to separate out black and white the complete inverse if you I I whenever I talk to someone who's doing black and white film, I'm like instead of buying a camera. Next, buy development kit in the scanner because you're going to save. Yourself so much time and money. Black and white like it was really designed for the home gamer like like the chemicals are easy to get. They're cheap. You can make it out of out of coffee and vitamin C if you're really struggling to find a developer. As far as the sustainability goes, your fix is really simple solution. You can just throw in steel wool. Take all the silver out, and then you've got that's pretty much a fairly neutral chemical that isn't going to. Damage any waterways your developers, depending on what you're using, are also very, very clean and very friendly, easy to use. They're saying that your stuff is just vinegar, so yeah, but for for for black and white definitely home & for colour. Definitely the lab.

Kentaro Mikami

Yeah, so. (9) What are your thoughts on the significance of analogue photography? Why is it an important medium? Why shouldn't we just let? It die essentially.

Caleb Brian

Yeah. OK. So. For, for. For me personally, the reason I was drawn to black and white love to analogue photography was I'm a software developer by trade and I didn't want my hobby to be sitting behind a computer at all. In saying that. Everyone will probably be talking about the way that Analog photography makes you slow down and makes you consider and makes you think about your composition, which is certainly true to an extent. I think dabbling in analogue photography and prime lenses and having to move yourself to get into position and to and to sort of understand you Gear it ultimately will make you a better photographer, even if you go and switch back to digital, but there is something just romantic about the entire thing. Like being able to go in there and perform alchemy and turn silver halides and just silver metal and scan it and like nothing looks quiet. Like proper black and white that's been printed in a dark room hung up somewhere it just it I just think it's a. It's incomparable. Thing, and especially for like, I wouldn't be touting Analog photography for like work, right? Like if you are out shooting weddings, unless you have a specific thing or you're out shooting for the paper or whatnot, digital is going to be far more convenient. And the end user isn't going to really care what they get. As photographers, we know that most people don't know what a good photograph is, but. Or from on the art side of things, I think it's important and really interesting to have that sort of physical connection to your output, especially if you're, you know, dodging and burning and down there and working on a piece. There's a lot, a lot more emotion that goes into it. I feel, which I think is what it's going to be worth.

Caleb Brian

There's no reason to do it. It would be so much easier if I just took a digital camera out and made photos. So you have to unless it's Art. You have to be poetic about it like it's. This one is, yeah.

Kentaro Mikami

Fantastic. (10) So what do you think? Some of the largest barriers, I think you briefly mentioned the cost, but what are what are the largest barriers you think are for beginners as they begin to shoot and start to develop their own film?

Caleb Brian

Yeah, cause. It's hard to it's. It's not hard to find good information. It's just. It's a lot of information and when you don't know what you're searching for, you don't know what to search for. So if you're a person and you're just getting your first film camera and you and you a lot of these people have never even shown digital before So you have to understand what your aperture and shutter speeds, and then what is your first camera. So maybe you want to point and shoot, but maybe you want a bit more control, so you're going to have to Learn about priority modes and so even just getting. The camera is a barrier in itself. Unless you have someone there that can guide you and Go. OK. Yeah, look. When I was starting, I would get. This camera for. These reasons, and you shouldn't like this, and if you should like this then you. Can learn the rest. You go along. Development. Not not by design, but a lot of people see it as a dark, scary art. Where oh, if I mess it up and my film will be ruined and whatnot and. There's there is a lot of messaging out there. About actually it's. Really easy, and even if you mix everything all wrong, you probably stick the photos out at the end. But there is that trepidation to going into it. it's mostly all knowledge based. This was this was once all. Common household knowledge where you know if your father was into shooting film, he would have had everything set up. People knew it but, but now it's sort of a little bit more lost. And so for the younger generation, getting into it just, just the wealth of knowledge you need to even start or you think you need because you don't need a lot to start. I think that's the biggest off put.

Kentaro Mikami

Yeah, yeah, fantastic. You said like the importance of having like a guidance figure, someone that can point you in the right direction, they can give you a bit of insight into the world of photography. Do you think like could you touch on that a little bit more for me?

Caleb Brian

Yeah, so so I am, I'm very, very active in, in, in the analogue photography community here in Brisbane and I do try to be that guiding figure. So there's a lot of really good resources out there like as you found. Me on Facebook the. The Brisbane Film Photographers Group, the Australian Photography group. You see a lot of people who are sick of answering the same questions, but that is just sort of the nature of the beast. It's something that can be really combated by that level of community and then. I sort of. Go further in that myself by also teaching Darkroom printing. about once a month, I will get students in so I can teach them the ins and outs of developing, scanning, and printing. Their own film. And it isn't. It isn't going to Persist as a hobby (analogy photography) unless there are those educators who are interested in giving their own time, because right now it's a bit of a walled garden because if you want to learn analog photography are do you to Tafe or university or. You have to find someone who's willing to to, to sit down and teach you, or find a little community. And so yeah, that, that community building aspect is only getting more important.

Kentaro Mikami

(11) Fantastic. That is awesome. Yeah. Fantastic. Are there any questions you want to ask me before we finish up?

=Audio file

[David.m4a](#)

Transcript

Kentaro Mikami

first question is what aspects of analogue photography do you think are sustainable or unsustainable? (This Question Needs to be re-Phrased. It is not leading however it is far to broad)

David Thrum

I think in terms of sustainability, the approach itself as a whole I think is pretty unsustainable currently. You know, you're looking at chemicals, you're looking at time as well. It's probably not so how long it takes the process as well. Yeah, that's kind of my overall thoughts.

Kentaro Mikami

Is there any other any other areas of sustainability or unsustainability that you think kind of photography holds? (Had to ask follow up question or prompt)

David Thrum

In terms of. Packaging design so you look at your disposable film cameras. Seemed to have taken off again recently. Those things I try and tend to avoid, I've got a few of my own cameras, which I. You know, purchase my own film. Of course you've got the canisters. So a lot of single use plastics. Yeah, in that regard. So yeah, there's definitely things that could be improved.

Kentaro Mikami

Fantastic. So, yeah, following that. What needs to be done to enhance the sustainability analogue you briefly mentioned like the plastics and the canisters and the timeline as well as like. That is there anything, anything that you think needs? Like what are the main priorities (This question also needs to be rephrased as well Maybe asking them What they are currently doing to enhance the Sustainability of Analog photography – or what emerging technologies they see having the most impact – people may just divert to basic – especially if not provided with the questions before the interview)

David Thrum

I mean in in terms of timeline, I don't think much can be done. I think a lot of people are drawn to analogue photography for a few of those reasons. It slows down the process. It makes you think about your shots. However, in terms of materiality, I think it's probably more about bringing a lot. Of older processes into the future, so there's a lot of future technologies available now that have been applied on other things. Yeah, it's probably about kind of shifting, shifting the focus to, yeah, making material options more sustainable.

Kentaro Mikami

Fantastic. Could you briefly describe your experiences, your experience with analogue photography as a medium? (good to provide background – painting a picture of the experience of the interviewer and the credibility they can provide)

David Thrum

Well, I started out shooting digital. That's just the age I was brought up in. Mm-hmm. And I started to. Grow like a love for things that took me longer. Essentially, you yourself introduced me to film photography within the last couple of years. That's something I slowly picked up. I learned it over time and over money. And over mistakes, yeah. So yeah, it's a very unforgiving process in a lot of regards. But yeah, I really like the risk versus reward and it's, yeah, something I'm really addicted to.

Kentaro Mikami

Now perfect. What are some of the products, processes and objects that you use to facilitate your use of analogue photography? (This is good, attempting to point out the intervention points in design – this question will be followed by the pain / good points of these designed products, processes and objects painting a more detailed picture of interactions)

David Thrum

Still experimenting with. A lot of different options. I'm hooked on buying new cameras. Yeah, online second hand, OK, so. And try not to purchase anything. New except the film itself, yeah. In terms of equipment scanning equipment, I've tried a few different techniques as well. Different scanners, different software's. I've also started getting into developing film myself, which of course has a slew of different products you need to purchase. So yeah, I've got a Patterson's tank. I've got a film bag.

Kentaro Mikami

Could you describe your interaction with these products, especially the developing ones? (This comment needs to be more precise (Please describe the positive and negative emotions you have experience when using the aforementioned products or what were the high/low points when utilising these products, processes or objects) – Pain points vs pleasure points.

David Thrum

UM. So far so good. I would have to say in terms of the developing products, scarier first to use especially in the dark when you're going in completely blind as a novice. Yeah, definitely unforgiving in that regard. I haven't messed up. Any to a massive extent just yet.

Kentaro Mikami

OK. Did you face any difficulties when learning how to develop film? (Had to ask a follow up question to be more precise. And probe for more information)

David Thrum

Just in terms of figuring out where things go and where.

Kentaro Mikami

What? What do you mean by that? (necessary Follow up questions)

David Thrum

So like when you're putting film into a Patterson's tank, you know you've got the winding mechanisms, you've got very small grooves to slot your film in opening up the camera, making sure it's rewind, stress, stressful, little interactions there.

Kentaro Mikami

So like these little? Minute interactions? You'd say that they're probably your pain points. (Again clarification probably not needed)

David Thrum

My pain points definitely. Yeah, it requires a great deal of focus. Yeah, which is probably good. To I guess get into that mind frame of slowing down like I said.

Kentaro Mikami

Before perfect. Yeah, that's awesome. So have you. One of the good things about these products? Are there any parts aspects of these products that guide you in a specific way? (Again having to probe for answers – Just ask at the beginning that are the positives or negatives)

David Thrum

Guide me as in like physically? (Confusion in answer)

Kentaro Mikami

Well, like, yeah, make it easier, essentially. Well, what are what are the parts of these products that you look and you say, yeah, that's great. I'm so glad that they put that in, for example, the Pattersons tank or. The dark bag. (This type of question needs to be avoided. Questions need to be more clear and understandable)

David Thrum

I mean the Pattersons tank itself, you know, it's only a few components. Yeah, they slot in one way. Like you can kind of get a good feel physically for where things are meant to go. Yeah. Which is handy when you're going in blind with the dark bag. It just means that I don't have to isolate myself into a completely dark room. I'm still aware physically where I am. UM and it? Allows me to just focus on what my hands are.

Kentaro Mikami

Doing if you feel anxious at all using that that light bag, would you put if you have access to a dark room, would you prefer to use a dark room or would you still use the light bag? (I think This was abit of a leading question should probably ask how he feels about this experience)

David Thrum

I think I would still use the light bag. To be honest. Mm-hmm. I've tried in a dark room before, and yeah.

Kentaro Mikami

So yeah. So what are the? What are the main reasons for that? You said that? Like you're still aware of where you are is is. It's like like, is that a more pleasant experience than being completely in the dark? (Better however this is again another leading question, should of just asked Why do you feel this is? Or why do you feel this way?)

David Thrum

Yeah, like I'm. I'm still aware of what's going on around me. You know, I can check on other things while I'm, you know, in the process if necessary. I don't have to make a blackout room myself.

Kentaro Mikami

Either. So when you use the. The dark bag. Could you run me through the process of how that works? Is it? (This is good – Focusing on a specific interaction – Maybe ask a follow up question regarding What were the positive or negative aspects you had with these products processes or objects. This way I can note down the products they mentioned and cycle through them)

David Thrum

Like, yeah, so the dark bag, it kind of looks. Like a shirt? In a way, it has two arms sleeves. Yeah, with a couple of elastic straps. Double sealed. You put all of your equipment in, so you put the Pattersons tank in some scissors to cut your film. Your film canister opener. UM. And I try and place them in a position the same way every time, so I know what my hands are going into, yeah. And then yeah, once you kind of get a sense of what all of those products do. You kind of just have to really focus on what's happening, yeah.

Kentaro Mikami

Awesome. Yeah. And so you said that it's double like a double elastic. That means it's like 2 elastic things around your arms. (again this was OK? However this may not have been too necessary this is information i can find online – I should have asked how does this aspect of the product effect your experience)

David Thrum

Two elastic things around the arms and then once you've put all the equipment in, there's also a zip. And there's also a Velcro flap as well to double sear. No chance any lights going to get in.

Kentaro Mikami

Yeah. So there's no chance that anyone. Can die, yeah. So, have you ever been anxious about using that at all? (This feels like im Fishing for an answer – again this is a leading question) I obviously want a specific answer and need to adjust my strategy to prevent my participants from giving me false answers.

David Thrum

The first couple of times? Definitely. Hmm. You know, you have a few fumbles here and there, and you never really sure if the films wound up properly. Yeah. And you want to avoid touching it with your fingers and stuff as well. So

Kentaro Mikami

Fantastic. That's awesome. So what aspects of photography do you enjoy the most, or just like? The most. (This is good however this may be able to be rephased to make it less leading – What aspect of photography do you enjoy or dislike the most – Maybe revise so the question runs more along the lines of What are your thoughts of the significance of Analog photography) This would be good to find out more about why they enjoy it along with more detailed descriptions of why the medium is important – culturally, socially and economically.

David Thrum

Analogue photography specifically.

Kentaro Mikami

Yeah, just in general.

David Thrum

UM. I think capturing moments is something that I'll never get sick of. I've drawn myself to film photography recently because it's allowed me to. Focus on lining up my shots. Yeah. Capturing a memory in a specific way. That's really intentional. And it also gives me the opportunity to actually purposely look back on the photos that I have taken in a more critical sense as well, helps me develop my skills. You know through mistakes, essentially.

Kentaro Mikami

Anything that you dislike about analogue photography. This needs to be combined into the question above – this is good however it does not need to be asked in two segment.

David Thrum

Dislikes about analogue photography. Definitely. The cost. Yeah, associated currently. It's definitely a very expensive hobby to get into at the moment. Aside from that, it allows me to really focus in on my craft. Those yeah, risk versus reward. Occasionally there's a few really good shots that come out of it that just look way better than. Any digital photo will perfect.

Kentaro Mikami

UM, can you can you give me some insight as to why you think the cost of films going up? I ALREADY KNOW THIS – I CAN PROVE THIS VIA MY RESEARCH I DON'T NEED TO ASK THIS.

David Thrum

I mean equipment as well. I guess there's probably more of a demand on the second hand market. I think a lot of people are seeing that the trends kind of taking. Off again, yeah. They can hike their prices up if they've still got cameras in decent working condition. Mm-hmm. There's also a lot of people who are putting old cameras. Online for, you know, decent amounts of money, and they're still unsure if it's working or not, so. Yeah, costs associated, everything's kind of expensive, but. If you're addicted, you're addicted.

Kentaro Mikami

Yeah, exactly. Fantastic. So what do you think the largest barriers are for beginners when they learn to shoot using the analogue process? (This is a good question – providing more insight into the problems they may have faced successfully taking those first steps into analog photography)

David Thrum

For people like myself who have grown up around digital technology, everything is there. The click of a button. I think the largest barriers are. Learning the processes and patients as well takes a certain person to, you know, slow down. Take the time. It'd be completely understandable for beginners to just give up after a couple of goes, especially if you know didn't pan out so well. Mm-hmm. Because if you lose something, you lose it. Like you can't recover that.

Kentaro Mikami

Perfect. Awesome. So what are your thoughts on the significance of analogue photography as a medium compared to digital? Should not say compared to digital – this report is not about comparing analog Photography to digital photography they are actually so far apart that it doesn't

make sense to compare them in many cases. This question should largely focus on the Cultural and social significance of the medium and justifying why we shouldn't just let it die – by doing this you will be able to not only justify your project but also find out the aspects of analog photography that should be focal points due to their significance. Essentially figuring out what the essence of film photography is.

David Thrum

Yeah. So I think again in terms of digital, people are just trigger happy in my opinion. Yeah, it's probably the difference between being Objective and subjective in your craft as well. You know you can be really critical about the photos you're taking, improves your workflow. You know just. You're you're framing your shots and your memories in a completely different way and purposeful. Yeah, there's a difference in it. And I think it's just also quality over quantity.

Kentaro Mikami

Yeah. Yeah. So do you think when you take film photos, you have less but you think the overall quality is better because you're putting more effort in? Correct. Yeah. Fantastic. Yeah. Is there anything else you'd like to touch on and discuss regarding these questions and and blog photography in general before we conclude the interview? (first part of this question is unnecessary I probably didn't need to clarify them, The second part is necessary however)

David Thrum

Ohh, the only other thing I will mention in terms of sustainability. I've recently been interested in less harmful chemicals, so I've tried caffanol yeah as a technique.

Kentaro Mikami

So what? What led you to doing that? Why did you decide to? Use caffanol. (this question is a good follow up question More like this)

David Thrum

I think it's. Just cost is one thing, definitely. So the ingredients in a cafe and or recipe are cheaper. You can do it, you know, have batches in bulk ready to go. The chemistry aspects. A lot of fun mixing in all the right amounts and I guess it's just that spirit of experimentation, which is kind. Of already there. If you are taking film photos so.

Kentaro Mikami

What do you find are the hard parts of caffanol nowhere? (Maybe should have said – Could you tell me more about your interactions with Caffanol)

David Thrum

Making sure you're getting all of the measurements correct. It's a bit of trial and error. Yeah. You know, there's no hard or fast rules. You're kind of relying on other people's recipes that are posted on the Internet. Mm-hmm. You know, making sure you're getting it developed to the right time. And the ones that I have developed, they worked, but I wouldn't. Say they were great.

Kentaro Mikami

Do you think that you would return to in this? This is a good follow up question

David Thrum

I think if I'm doing something more experimental and artsy, I'd probably and if I had the time to I would but. When you're buying rolls of film that you know \$20 A roll and you're risking it on a recipe that you're not sure on, then you know it's difficult.

Kentaro Mikami

Fantastic. So just regarding when you develop film, is there any other little anything that comes to mind with regarding the process regarding the products that you use that points out any points that you've thought to yourself? That's a little bit. Annoying. Or maybe any products that have made you a little bit anxious. In their point of use. (This is leading – This type of follow up question will be necessary in these sense they push for more answers however it should be worded what were the positives or negatives – Let them mention what first comes to mind, keep it open)

David Thrum

I think definitely the developing side of things. Yes, if you're a beginner like myself. Getting it right is tricky. The first few times. Yeah, I think if there were. Products on the market that. Allowed you less risk, you know.

Kentaro Mikami

So where do you think this risk is coming from? Good follow up

David Thrum

Light exposure is one thing. Definitely accidental light exposure, because if you do that then you lose your whole.

Kentaro Mikami

Yeah. So accident exposure, yeah.

David Thrum

Your whole roll of film, essentially. Yeah. Think there could be easier products that take out some of the guesswork. Yep. In that products that just allow a bit more of a seamless flow of exchanging the film from the camera to the. The dark room or the dark bag into the tank.

Audio file

[audio1193353458.m4a](#)

Transcript

Kentaro Mikami

(4) Please start the recording. Fantastic. OK. So could I just get you to introduce yourself quickly for me?

Gary Wong

I am Gary, the cofounder of. Film never die. And we've been in the film industry for about 10 years now, developing a scanning film and selling second hand cameras, new cameras, film and their classes.

Kentaro Mikami

Fantastic. Thank you very much, Gary. OK. So just beginning with the general question. (1) Well, in your perspective, what are some of the key environmental and economic challenges associated with analogue photography?

Gary Wong

So obviously the main one that comes to mind is the use of disposable camera or single use cameras. They are very popular because they are affordable. They come with the roll film which is really amazing given the film price today. And it's just a good, fun thing. To bring around to shoot. And you don't have to worry about losing it during a big trip. It's a fun great way to capture. Memories. However, as you probably know, back in the days where they can recycle them. Developed film in a very large scale. So now I believe a lot of disposable cameras are being disposed of in landfill. So basically, the challenge is one of the main challenges using disposable camera, how we can effectively recycle them. As of today, what we've been trying to do is actually to ship them back to Hong Kong, where there's a company that recycled the flash unit and remove the polystyrene and. I currently if I'm wrong, I think we are one of the first one or the only one in Australia that. Does it? Yeah, the way that. Is sustainable because the cost of recycling, as you know, I think we need to shift the focus of seeing recycling as a cost and actually having that as an investment. If you know what I mean, yeah.

Kentaro Mikami

Yeah, yeah, yeah, for sure. That's some fantastic insight. Awesome. Yeah, so. Besides that, you're you shipping back. There's some some parts of the disposable cameras to Hong Kong to be recycled and reused. (2) Are there any other innovative practises or techniques that you have come across or have implemented in the lab to make your processes more sustainable?

Gary Wong

Yes. So with the canister, metal canister or plastic canister we're currently is giving them to film repackaging company or they make their own film. They're launching their own full movie film soon. So that's exciting. Uh, with the plastic case that comes the film comes in the plastic canister, so we are recycling them with precious plastic. So that's really cool as well. And then I guess just overall, we're trying to always make sure that the this the batteries are being recycled properly. And just all

the basic stuff making sure. Our waste is separated properly as well as, as you know, running a small business, getting practises in place and getting people to do them with such a limited team is. Always a challenge. So yeah, we try our best, but yeah.

Kentaro Mikami

Fantastic. That's awesome. Yeah. (4) Could you briefly describe in your like, could you briefly describe to me like a timeline of your experience with online photography just from beginning to end, quick, like one minute snapshot of your experience?

Gary Wong

Yeah, yeah. So we I started actually started from my girlfriend back then, so she bought a I bought her Polaroid camera, Polaroid Spectra camera, but we couldn't find any film because the polar factory was shutting down. So impossible project took over but they did something good for consumer where you can buy as many film as you want and only pay \$60.00 in shipping. So I bought. Just enough to be under the GST threshold back then. And then I gave her 10 packs and then resells the 50 packs on eBay. And they sold. So that's why we started getting a taste of uh, there's actually a market for this. And then I just kept doing that and slowly realised, hey, besides film, there's also cameras and a lot of the film cameras are so well made with their metal body, metal chassis and. Mechanism or sorry manual mechanism or analogue mechanism. Without electronics they can last a lifetime and the glasses on them are just so amazing. So actually this is actually quite interesting. Hobby and or some people even say investment where you can potentially invest in. The camera and. See the value of. It grows in years.

Kentaro Mikami

Yeah. Fantastic. That's awesome. OK. (5) So, Gary, in the lab, what are some of the products, processes or objects that you use to facilitate your use of analogy? So essentially, what do you use to run your lab like developing equipment? You mentioned that you briefly resell cameras, anything that comes to mind? Just products in general that you use.

Gary Wong

So obviously we have a developing machine pull through a developing machine. We have a film scanner which is the two main equipment that we use to deliver our product and services. We have Patterson tank our own CP800 film developer as. Well, and one of the innovative ways that we make sure our system more effective is we actually twin check, we create our own twin check bar codes where we can lock and we can, we can track our orders to see where they are. So that's quiet, quite exciting as well. I think with the only one that does it. So yeah it. Does it in the world. So that's one way that we can keep how we move more efficiently. I guess overall in general using automation and computer system as much as we can and relying on new services and new technology out there to make sure that we can. Process efficiently from customer so. What I look at is end to end so when the customer Walks in until the customer Gets the scans on the product services. How can I optimise and make sure that that's a good experience #1 how they come in and feel like they're being served and added value to and also having. And be able to spend at a rate that feels like it's valuable to.

Kentaro Mikami

Yeah. Fantastic. (6) So, with like all the products and all the products that you use, can you describe to me any efficiencies or inefficiencies that you experience when using them? So what are, what are the

aspects that you really enjoy when using these products and? What are some of? The aspects that kind of annoy you or might be frustrating.

Gary Wong

Yeah, 100%. So relying on all developing machine and scanner is definitely an issue because they don't have parts make new anymore, most of them the electronics. Definitely no ones making them new. So you pretty much have to salvage from machine to get the parts to fix the. We're running the scanners as well. What we use right now is a lot of practises is moving to use running VM virtual machine computers, so we're basically emulating Windows XP on the newer hardware to make sure you can run more efficiently. So that's just some of the nuances of using old technology.

Kentaro Mikami

Fantastic. That's anything that jumps out that you do enjoy about using these old processes, something that you really like.

Gary Wong

Yeah, definitely. Uh, when they run. And they. Are running well. They're actually a breeze, so easy to use and. Effective as well, yeah. From checking and developing and scanning you can easily get it done within like half an hour or so arrow. So, it's actually very effective when everything's working together obviously. Yeah, that's always ups and downs and trying to make sure we maintain it, fix it and just keep it going and stuff like that, yeah.

Kentaro Mikami

Yeah. Fantastic. (7) So, Gary, if you were to compare the lab development process to say an amateur photographer home development process, yeah, which one would you consider to be more sustainable and why?

Gary Wong

I think on the left point of view it's just more volume. Make sure which means that we are able to really scale up and reduce the waste. So as you know, every time we develop film that's waste in terms of chemicals, in terms of the waste products and just for us because we really are at a scale we can recycle the chemicals more efficiently. So, on that one that point of view, definitely running a lab would make sure things that's more streamlined and being able to recycle and be more sustainable, yeah.

Kentaro Mikami

Fantastic. Yeah. Awesome. (8/9) So, what are some of the aspects of Analog Photography that you personally enjoy or just like the most? what Brought out your love for Analog photography.

Gary Wong

Yeah. Yeah. I think in in today's age, day and age, I think the main thing is because so many technologies, digital camera, phone is so it accessible, but yet we use and abuse them, meaning that we take thousands of photos and just they just stay on our, our, our phone, they're not being deleted, we don't move them on. Now with having a thousands or millions of photos on a phone and then move on to the new phone. But when I should film, I'm more conscious about what I want to capture, and I see as more art form, so meaning that actually slows you down and to make you think whether you want to capture the photo or not, and basically that that involves much more of a

creative process and more fine tuning process and also more awareness as well and I feel like that's definitely more enjoyable experience than should digital or just shooting. On your phone.

Kentaro Mikami

(10) Fantastic. Gary, what do you think some of the largest barriers are for beginners as they begin to shoot on film? Maybe emerging, maybe transferring from digital or just picking up film in general?

Gary Wong

Yeah, I think the main challenge is getting to know how film works, like how to load up the film into a camera, how to unload them and understand their basic exposure. So that's some of the basics. Because you don't. Really need to worry about shutter speed, ISO or. On your phone. So all these are basically going back to basic, which is good as well. So that's some of the barriers I see people coming in and having roads that are burned or blank because they didn't wind up properly or don't understand exposure properly.

Kentaro Mikami

Fantastic. Yeah, that's awesome. And just one final question for you, Gary, (3) are there any trends or emerging technologies in the industry, the film industry that you believe will significantly impact the sustainability of film photography in the future? So what are some of the emerging techs that you see as will have a huge impact on? The analogue community.

Gary Wong

Interesting. I think there's a lot of. I guess more so is actually about trying to pool the resources together so we can make sure that we recycle more effectively. I think that's a conscious effort we need to come together as labs to band to get our resources, to make sure, let's say, instead of me just shipping one shipment of disposable, maybe we can do it together or see or something like that. We recently went to the Waste Expo as well in Melbourne recently and it's quite amazing how many machine there is to sort out different materials and using mono materials as much as we can. Obviously, it's very important as well. For example, just using. Steel for canister with without much plastic that could help recycling stuff properly, but also, I think what Apple has done very well at a very high level is having a robot to dismantle phones. So, if we can create some system to dismantle our. Or disposable camera or plastic cameras or even like film canister to effectively some of those parts and make them just a mono material. Then I believe you can write the recycle. Them more effectively.

Gary Wong

Yeah, yeah. Yeah, all good. I'm happy for you to add this last thing as well. I I guess I've been, I became more environmentally conscious after having my daughter because I'm like, oh, we need to make sure that we leave the world that's less polluted and obviously with the industrial revolution up to baby boomers, that's always a mentality of use and abuse and. They can want to have resources and not give. So, I guess that's very important, and I guess what encourage people to think about seeing the environment impact as investment not as a cost that's going to shift our mindset into how we deal with that issue or how we can come together to work more effectively.

Kentaro Mikami

SILVER HALIDE just one last thing. Do you how do you guys? Like, do you take your chemicals to like a like a disposal facility or do you do it yourself? I know silver reclamation. It's like a huge thing still like

silver in silver. And like Chris has been one of the largest environmental issues for Emma. Perfect. How do you approach? Yeah, that.

Gary Wong

So from the get go, we have a guy called Andy Recovery that recovers our or collect our chemical and it's not cheap. I think everyone we did about about three - \$400.00 and they recover the silver and dispose of them in, in the conditions That's according to the EPA. So that's. We've been trying to do and obviously that's a bit harder when you're developing at home with the fixes. Even if you have stuff that any personal developer wants to collect, some chemistry we would be happy to collect them as well for the public, and then we can recycle them effectively. That'd be quite cool as well, so I'm happy for you put that out there and then, yeah. And then yeah.

Audio file

[audio1834520701.m4a](#)

Transcript

Kentaro Mikami

(1) So from your perspective, what are some of the key environmental and economic challenges associated with analogue photography and analogue photographic processes?

Kilian Frunz

It kind of depends a little bit on what your definition of sustainability is. I think the actual like the product of the film itself, I haven't had a look into it, but I would assume any production processes have some sort of environmental impact. And also I think the distribution and like the scope two, scope 3 emissions that come from film are pretty heavy. And the fact that you're shipping a physical product around the world from places that have like only limited production facilities. Economically, it's the supply chain volatility like the difficulty in film acquisition in equipment acquisition and maintenance, all of those sort of things are really big challenges that we faced when we were doing our lab as well, so. It really came down to that. I would put labour in there as another economic change. Because there's a an interesting tipping point between having expensive equipment and not needing as much labour on the business side of things versus the other way around, which is I guess less expensive equipment but much higher input of labour required. So we go around those couple of things I would say. For me when I consider sustainability on the development side of analogue photography, I would think about the impact of the chemicals. Everything around there, I know there's a lot of conversations happening around that. Guess the single use nature of a lot of products that happen in film. So I guess disposal cameras, single use and multi-use cameras as well as the film kind of says themselves, those are our challenges, absolutely and. And then, uh, yeah, on the economic thing, it all comes down to volatility in that supply chain.

Kentaro Mikami

Thank you so much for that. (2) Next question. So are there any innovative practises or techniques you've come across or have implemented in your lab work to make analogue photography more sustainable?

Kilian Frunz

It's an interesting question too, I think. Given how? I was actually I was trying to make the comparison between I guess the. Healthcare system and like lab work as well, right? Because you get similar kind of challenges, right? It's a chemical process. It's pretty rigid in what you can and can't do. You need sort of elements of sterilisation. So there's kind of a bit of a framework that you have to work within. As you develop things when you develop film. That being said. There are a couple of interesting avenues. So it depends. This is a bit of an interesting question. I remember we went when we were doing the. Lab, we started saving our spent chemicals from the black and white processors because it stripped silver from the film itself. So you can actually get a silver sediment from some of the chemicals and I forget. Exactly which step to the process it was. I think it was the fixer. I'm not 100% certain, so it'd be an interesting one to look up, but I know you can kind of capture some of those things which I thought was pretty interesting. Which kind of addresses I suppose the chemical side of? Of however, a lot of the sustainable practises are kind of they're not. Inherently sustainable

to try and make the best of kind of bad situation, if that makes sense. Yeah. So a lot of like reduction of impact. So I guess the reuse of the film canisters or the reuse of disposable cameras, anything like that becoming a bigger conversation. A few years ago, so moving away from disposable cameras into the multi use cameras maybe not quite the right step, but still a step I guess. It doesn't seem like much, but we always try to push people to step away from disposable cameras or plastic cameras in and of itself. And sort of spend a little bit more on a more reliable point and shoot or something like that. So definitely I guess in the choices that consumers make, there are some levers there. But as far as innovative, I'm not too sure. I think there are a couple of interesting initiatives. Actually now I'm happening around disposable cameras and the reuse. So even stepping away from analogue photography and tile and sort of emulating the film process using digital cameras and not only the look of film but also the feeling of shooting. There's some interesting projects that are happening. I think you could also look at the energy consumption stuff because there were some pretty energy intensive processes including like the running the processor itself as well as drying the film out. But kind of takes a lot so. Looking at energy cycles in the way that they could be implemented. To make that whole process a little bit more efficient was an interesting Ave for Example after you developed the film, obviously you need to dry it and depending on what machine you use, you can vent the heat from that towards your drying cabinet and and reduce energy consumption a little bit in that way as well. So perfect, it's yeah, there are some levers, but to be honest that was. One of the harder things to try and address when the first problem was trying to make it economically viable and to get your hands on equipment and chemicals.

Kentaro Mikami

Fantastic. So you briefly touched on saving use like spent chemicals. Were you reclaiming the silver from the? Because silver halide, it's one of the largest byproducts of the film process where you reclaim it yourself or were you sending off to a offsite reclaimer? Or just like bulking, bulking it up.

Kilian Frunz

That's a good question. At that point, we were doing it more of a as a side project in the the lab itself. So I'm not actually sure what the next steps from that were. I know we were just saving the silver halide, so I can't recall if we. Did the next step or if we just were, we're saving it so.

Kentaro Mikami

Awesome. (4) So Kilian could you briefly describe? You'll experience with analogue photography as a medium

Kilian Frunz

Yeah, so I started shooting analogue photography. I think when I was about 16. So that gives us maybe 8 ish years ago something like that. And I really stepped into it as a way to sort of learn a little bit more about photography and sort of. Resist skills based decision for me as well as really liking the idea of. Just stepping away from digital and sort of a little bit more into process. I'm sure anyone who shoots film intentionally is probably going to give you a similar answer. But from there, the more I learned about it, the more I began to really, really enjoy it. And then I was offered an internship at this lab. From there, I started developing film in house. I sort of focused a little bit more of my work. I was involved. In a couple of exhibitions. And then transitioned after the internship. Into a I think a part time employee. The lab where I mainly handled, I was essentially a lab technician, so I've developed everything from colour film through like C41 all the way through most of the black and white chemical processes and E6 as well, all the way from doing it completely by hand into sort of

the semi-automated. So like the. Mechanical agitation, if you like the jobs and things like that all the way through to the fully automated with like a mini lab as well. Through that, because it was a small business, I think it was about three or four of us, maybe five of us at some points. Got to experience all the way through the rest of the business processes as well. So or the customer management processes, the scanning, the, the post processing that happens and then sales as well as marketing and events and all of those sort of things too. So fairly broad experience in the business space. Love it. Analogue photography wise has just always been something I've really enjoyed. I've been very lucky to be involved in, I suppose for the last 8 ish years.

Kentaro Mikami

Fantastic. (5) Touching on your lab work, especially your time in the film lab. Can you tell me about some of the products, processes, and objects that you interact with on a daily basis in these labs?

Kilian Frunz

Absolutely. I guess would be a couple of ways we can answer this to make it a little bit. More coherent on. My side, so if we're talking specifically about the development process for us, it obviously starts with receiving the film from customers. So it depends how we did that. If it was through post or if customers dropped off and if it's helpful. But generally we had the highest amount of roles come from people come physically to the store and interact with us. So from there, we'd obviously be pulling the film tongue or the leader out of the canister, little leader Puller Thing. Which is my favourite thing ever, and then we were pretty much put it through. We had like a physical wall and like a bucket system as far as what development process needed to go where and what sort of timeline everything was on. So we had a like a big pinboard with little buckets on that, if that helps. That was the process side. But that was a really interesting challenge to figure out. From there when we like, I mainly did black and white. After we got a mini lab, so a mini lab absolutely was something that we used. What I believe it was a. Oh goodness. I can't remember the model. Of it. we then divert our film into the mini lab, which is pretty easy, and we just put it on like the big plastic cards taped it up and fed it into the machine. Then I generally did most of the black and white work, so that was using. A jobo. I was using the dark bag to pull the film leader spool into the tanks. The tanks on the machine. We would have already generally mixed the chemicals, so from there obviously go through the development process. Pull it out of the tanks. We're hanging in a drying cabinet, which was like a sealed off cabinet, but generally, was it a little bit of a higher temperature than room temperature? However, the lab was generally pretty hot anyway, so they tended to dry reasonably regardless from there. We would obviously take the film and put it into our scanning section of the lab. And run that through our scanners. So we I believe we were running an Epson flatbed. As well as I a frontier. And then I think we almost had two frontiers, and I believe in the Ritsu towards the end as well. So we had the. Two there and then from there and a pack on as well. And we took the digital files from that, put them through. I believe Lightroom was our process at the time for the batch processing and general dust correction on the black and white. And then from there we uploaded it to our distribution platform, which I believe was Dropbox and then sent it off to the customers. Is that kind of what you're looking for?

Kentaro Mikami

(6) That is exactly what I'm looking for. That's fantastic. It's an awesome timeline you've painted before there now regarding all the products, processes you've just mentioned, you've got like your jobos, you put it on like an auto rotator you've got like your like auto developer, you've got your drying section, out of all the things that you would interact with. Could you tell me more about some

of the things that you really liked or disliked about these interactions. Was at times that you were frustrated were the times that you were like ohh that's designed really well. What are your pain points and what are your high points when interacting with these development products?

Kilian Frunz

That's a good question. You'll get the ones that were really the pain points because I've probably been thinking about them for the last two years. So it's probably not a bad thing that I've had a little bit of time to settle out of it. I remember the Jobo itself. I was really impressed with how simple it was. However it was not exactly designed for large scale batch processing either was very much. We had like the I think it was the eight real tanks on it. So we had the big one. I forget what one number it is. Again I can find it. Or if you'd like to know. So I was impressed with how simple they made that and the process of heating the tanks and everything like that. However, it was also a bit of a pain to maintain when we were running it almost, you know, 8 hours a day, five days a week. But it wasn't exactly designed for, you know, a lot of roles, essentially for high volume, but that was a bit of a pain, I remember. Actually, the drying cabinet and the drying cabinet process, so that was a bit of a pain, making sure we didn't have any dust on anything. Sort of. The actual physical throughput of the films themselves and making sure that they were all in there. Right spots. Which could be a bit of a pain depending on how we designed our heating cabinet, which was going to be our next big project before I moved on would be to design A heating cabinet that essentially was like a bit of a, you know it just went through the heating cabinet instead of into it. And then back it up. So everything would get tangled and it was a bit ****. Those were kind of the big ones for me, I think. And I know people struggled a fair bit with the seals on those tanks. I'm gonna just bring up some trauma from the jobo days because that was the sort of the main thing that I was interacting with and absolutely probably the main thing that could go wrong. So the seals on those tanks. Which again super well designed, maybe not designed for super high volume. Which is OK, so I would say those I never had any problems with the like the schooling or pulling the leader out of the canisters. That was all fine. Using the dark bag was all fine. It's just kind of like practise, which is another conversation. Scanning was fine process wise but very, very, very difficult to acquire the equipment to maintain the equipment and to get spare parts for. It was just one of our biggest. Killers and that goes as well for the mini lab itself. The chemicals themselves sometimes are really, really difficult to acquire, so definitely more on the business process side. But the supply chain was one of our biggest challenges. One of the biggest barriers for us economically as well to make sure that we could offer our services in a in a cost effective way. So a little bit. Of physical product stuff as far as refining, I guess the development process and the process that happens regardless, but. Definitely. I would emphasise that all of the peripheral stuff when you're working with really old, really hard to find equipment was difficult, OK, definitely be painful.

Kentaro Mikami

Perfect. You briefly mentioned you had some difficulties with the JOBOS and the seals. What do you mean? By that.

Kilian Frunz

And it's also because it's kind of probably gonna expose a a little bit, some flaws in process, but. We'll do it anyway. So with Jobos we had I think I. Said it was an 8 reel tank. When you've got eight reels and it could even be 12. I'm not 100% sure when you've got that that biggest capacity and there's I think one roller that sits sort of in the middle on the machine itself and what happens over time when. You've especially when you've got the tank full and there's a fair bit of weight in there. And

what happens is those red seals, those lips can sometimes get a little bit. Loose and especially if you haven't set it properly while you're building it in the dark bag, so there's definitely some usability challenges of making sure that you've referenced all the like the little rings correctly. Because then once you put on the driver itself, if you haven't, it will kind of find those weak points and open up a little bit and you can see that it starts draining chemicals out of it. So that was a bit of a bit of a challenge too. I think the whole. Seal from almost where you put the chemicals in all the way through to the tank itself was reasonably well designed, but there were some pretty major flaws as far as where the stresses were in the pipes as well as sort of replacing and getting to the seals themselves. I know we were doing a lot of. Maintenance on that pretty regularly. But yeah, the sealing of the tank themselves. So when they would sort of bend a little bit, sometimes you. Would find a a little. Crack and it would some of the chemicals would. Come out. But then also in the actual like they're pouring in mechanism too had some weird stress points as well.

Kentaro Mikami

Perfect. OK. So with the mini lab as. Well, this was this. You used the mini lab for C41 and the Jobs for black and white. Is that correct? Yeah. Fantastic. So any like issues with the mini lab that you had besides trying to source chemicals and maintenance? Supplies for it.

Kilian Frunz

Ohh let me recall now. I believe we were pretty damn lucky and I say lucky because it is luck with the mini lab that we found. It was through, I think some really good like industry connections that we managed to source, one that was in really good condition. The challenge, the huge challenge, sourcing it, sourcing, getting it shipped, that was by far and away the biggest. Problem that we found, apart from that, I think the. I mean, it's a big complicated machine, right? It's complex and has a lot of things going on. Changing the chemicals was never a huge problem. There, I mean, they're well designed for what they do, right? They were industry standard for years and years and years. Really, for us, it was the age of the machines that became a problem and then also finding the parts for it. Like, yeah, that was fundamentally it. But they did. It absolutely did its job. Yeah.

Kentaro Mikami

Awesome. So, UM, (7) Kilian, if you were to compare lab development with home development, which process would you consider to be more sustainable and why?

Kilian Frunz

Again, I think it's this comes back on what we consider to be sustainable in in this sense. Inherently, both have flaws and I'm not exactly 100% sure how it will come out. I've got a couple of thoughts of things to consider. I don't know who, if any of them are more or less inherently sustainable, so I was thinking about where I write down. I wrote down. I mean, yeah, right. It's fundamentally both are using consumable products, both are like you know consuming energy, all those sort of things. It's a challenge right in that sense. But all things being equal across those things. I'm not exactly sure how it would stack out right? The labs and commercial labs have the I guess the economies of scale in this sense, so we can really push the efficiency for chemical efficiency or those sort of things. Which I guess might have an impact on sustainability, whereas home labs in the same conversation, while they have much smaller volume, you can really define how much chemicals you want to use and you can be really efficient in that sense as well with small batch processing. So I'm not 100% sure I would think potentially there could be an argument for saying that. Because Commercial labs have higher volume, they potentially have. Maybe a little more impact on the scope. One side obviously given the

amount of activities that are happening there. And the amount of chemicals that are being used. However, assuming that that's replacing home like home development, I don't know 100% if you want to look into the emissions happening in the distribution space, you can make an argument the commercial labs are better because you're only moving one big order around rather than, let's say 50 small ones. Maybe that's a conversation it's worthwhile having, but I don't know exactly how it compare. From my perspective, I don't know is kind of the question.

Kentaro Mikami

Yeah, yeah, that. That's that's a great answer. I like that fantastic. So just wanted to return to some of the processes that you've you had in the lab as well, just as a final question. what's the first thing that jumps into your head regarding the processes, products and objects you interacted with in the lab? What was something that you viewed? As very important, something that you viewed that had a large impact on your day, maybe something that. Like was a real problem or something that you really loved about the Lab that you always could rely on. Something along the lines. What's this like, the big thing that you could you could you could remember and you think about all the time.

Kilian Frunz

When I think back in my time in the lab, it 100% came down to being able to talk to people who were passionate about film. I think developing and doing the whole process. Off and shooting. Absolutely, that was amazing. You know, learning all the technical side of stuff, that was great, but it was, weirdly enough, almost the sales and customer relationship stuff that I remember most fondly just being able to talk to people who are like, **** yeah, I'm shooting film. There's best thing ever. I want to learn stuff. I want to ask questions. All of that, I think by far that was the coolest thing about that. That being said, pulling out a roll of black and white out of a canister, and it's just perfect. It's like. That was, like, craziest perfectly DX codes too, so.

Audio file

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Transcript

Kentaro Mikami

So what? I'll just get you to do for me is just give me a little quick introduction for of yourself. Tell me a little bit about yourself.

Patrick Franco

Well, my name is Pat. So I've always been interested in photography, but my main passion is video and film. I've got a YouTube channel which I'm trying to grow. I like to, you know, make documentaries about travel and life and stuff like that. But yeah, I sort of stumbled on a film for photography when my uncle, he noticed I was taking photos. It's like a little disposable camera. It's like, ohh. I've got all these old cameras. I never used, you know, so why don't you have a crack at them? And sort of just went from there. And yeah, I got really fascinated with the art form. I thought like with social media, it's, you know how sometimes which nowadays is sort of like a rapid fire machine gun just, you know, film photography really just makes you slow down and think about what you're shooting. So like films for, like, a sniper rifle. But yeah, so. I got into that and then I'm like, you know, this is make for a really good video. Why film cameras become so popular. And I did that. And I'm like, yeah. Well, might get like 100 views. Maybe it actually did pretty well. It got something like nearly 30,000 views at the moment. I've gotten all these comments from people all around the world telling me, like, how with their perspectives on film is and you know how similar things have happened to them, they've stumbled upon the medium nowadays. And how it's really changed the idea of photography and stuff like that. So yeah, I've had the opportunity to travel the whole world, but I'm definitely going to bring a film camera with me just to capture those small moments, you know?

Kentaro Mikami

(4) Fantastic. Could you briefly describe your experience with analogue photography in general, so you briefly mentioned that you've like you like shot on film a little bit. Could you go into that a little? Bit further for.

Patrick Franco

Me. Yeah. So I've played around with shooting and developing film as well. I went to the Griffith when I was at film school for a semester. They had a black. And White film. Room in the. Dark room and on like a Wednesday. Sometimes I brought Albany along and We'd go and we'd just play around and mixing the chemicals and stuff like that. It's really fun. And it was really like there's so much like. Process of developing film is so like methodical and it's like an art form. You know, like it's there's so much more to it, which makes it more special than just like. Taking one photo on your iPhone. and yeah, it was really cool because I sort of I messed up. I like I opened up the canister and a lot of light linked. In so some of the photos were completely shot, but some of the other photos I think was really cool sort of light streaks through them and I got. One of my favourite. I've taken as a photo of Albany reading my grandma's copy of The Hobbit from like it's like a 1930 copy of The Hobbit against the tree, and there's like. This light leak just. Sort of making it look very angelic and I just thought, you know, this is something so special that like. What I love about film, you know? And what? Like, I

think, yeah, it's something authentic and real. And, you know, like having that human error sort of made it something more beautiful. You know what I mean? Yeah. So that would be my experience. Yeah, the company reach out to me, they make the. It they turned people's footage to make them look like they've been shot on film and it's not, not really a film, but what they've done is they've sampled all these film profiles and like my own personal work, I try to. I use that emulation to if I'm trying to tell a story that's, you know, maybe set in the 1800 or something like that to just bring out that. That sort of like old nostalgic. Feeling you know that you get. Through film, but that's probably about my experience, yeah.

Kentaro Mikami

(5) Yeah, for sure. That's great. Well, you briefly mentioned that you. You did like a class at unit or like which had access to a dark room. What were some of the products, processes or objects that you interacted with in the dark room or during that time at university or TAFE?

Patrick Franco

So I it was like about two years ago now. So memory is a little faded. But yeah, I do remember we interacted with this old just point and shoot you. Know we just. Put it on. Our on still surface and we'd hold it. Hold the camera, right? And down for like 8 seconds. Very old. And then I remember we. We had to. Go into a pitch black room and put the film into a little canister, which was really hard. That was my hardest part, I think. I just said it like. In someone else do it for me, but then I remember. Like sinking it in different chemicals, but particular amounts of time, and like shaking it and pouring water through it. Remember doing that process a few times and then I remember putting it in an oven and letting it bake. And that's actually all as far as I got it. I don't think I actually made it.

Kentaro Mikami

So what's like was that the negatives or was that? Prints that you. Ohh OK. OK, cool.

Patrick Franco

The negatives. Yeah. Yeah. I didn't actually get to the stage of putting it into the it's the liquid. I think I sent it off to photo fast during other day that they say, can you can you? Convert this into an actual film stock, but that was there. That was my little bit of experience with it, but it was really fun and I wish Brisbane had a colour film lab that, you know students could use.

Kentaro Mikami

Yeah, for sure. They only have black and white processing there (At griffith).

Patrick Franco

Yeah. So from my understanding there is, I'm not sure if it's 100% true, but there's only one. In film Processing Lab in Brisbane, Taringa, like if you ever go to like a shopping centre like in Carindale and give them to like Big W, They literally just send it to Taringa and they just sent it back and for like students at South Bank at the film school campus, they have a black and white processing Film Lab there as well, but they only do. Black and white. They don't. Really anything else?

Kentaro Mikami

Fantastic. (6) Regarding some of the products process objects that you interacted during your time at the black and White Lab could you tell me some of the things that you liked. Or disliked about these products that you interacted with.

Patrick Franco

I thought the putting the canister in the thing in pitch black, that was probably something I struggle with. Obviously, I couldn't see what was going on. And then something I liked was probably like the burning stage, the negatives when you put it in the oven, I found that really fascinating. And, you know, if you're talking about. General photography. Something I did find interesting, is all the chemicals that were used to create it, you know? And then I'm. I'm not entirely sure what sort of environmental impacts they have, From my from my limited experience that that's what I can remember. I found that like there was a complexity to it as well. Like with the chemicals and how long. You had to put. Them in the chemicals for and rinse them off the water and stuff. Like that, yeah.

Kentaro Mikami

Yeah. Fantastic. So regarding. So like when you did develop it yourself, did you, would you say you would return to developing it yourself, or would you prefer just to take it to a lab? Do you think that like, which one would you would you straight towards?

Patrick Franco

Well, I reckon I would if I had the opportunity to. I'd return to development myself. You know, I think that's the whole point is because film is rare in itself. But to be able to develop your own films, even rarer, and the one time I did do it, it resulted in some really, really beautiful photos that I really liked. So no, I'd definitely returned to it.

Kentaro Mikami

(10) Yeah. Fantastic. So what are some of the largest barriers you see like the, what are the largest barriers for beginners as they learn to shoot on film that you see?

Patrick Franco

Yeah, light and how much light you should let in the image. You know, you can always, like get the digital prints and put them in the into Lightroom and stuff like That but trying to hold the camera for just the right amount of time just for my understanding. You want films, film photography to be a little bit more exposed so you can sort of darken it out in the developing process. While digital photography a little bit less underexposed so you can bring up the highlights and the shadows in Lightroom and stuff like that. So I'd say like exposure, it was probably one of the big things also like. In terms of what to take photos of, you know. I feel like. Just trying to capture that perfect moment. It's really hard. And yeah, knowing when to press, knowing when to press the button, when not to press the. Button, you know? Sometimes you might think, oh, this photo is not going to be that good, but it might turn out really, really well, like you never really know. Yeah, sort of. The beauty of it, you know, and I think that comes through experience, but. And yeah, I'd say like sometimes like. I've learned things the hard way, like I took some really good photos and then I've bought them through an X ray at the airport and they all got they all turned. Out horrible. This is some really good photos from like Melbourne and Sydney and I just can't use any of them, you know so, but I have learned my lesson and I carry like a lead. I got a little lead case, so go me too if I'm going through airports. Ohh like I will to get it developed in that country. I'm going to and then.

Come back, you know, because just bringing a film. That thing is a risky business, so I don't often just ask the security guards. Hey, he said. OK, if this film doesn't go through there and normally it's like. OK. Yeah.

Kentaro Mikami

Yeah, for sure. Fantastic. That is awesome. So just one last question, so you briefly mentioned that you are really interested in cinematography and like the film, the film area. What are your thoughts on the significance of analogue photography? Maybe having an impact on how you film? Has it taught you any lessons has it like? Influenced your sort of aesthetic vibe? I you also briefly mentioned that you had that like analogue like filter pack. Does there any of these aspects of analogue photography influence your process in other areas, not just. Photography but also in like film and your other art.

Patrick Franco

Ohh 100% you know I. I really love some of the old films and how they've been shot in the processes that have been developed in there. I don't know if you've seen the movie Vertigo by Alfred Hitchcock. That's one of my all-time favourite movies and I watched it recently and so I did. I did a little video about like shooting different shots of Brisbane, but I went into. I watched Vertigo and I studied it and I looked at like the colour processes and what film they shot it on and like, how can I recreate this best and trying to capture. I'm like, is that a movie was just so gorgeous. And I think in terms of the aesthetic vibe 100%, you know, I mean, like, I'm trying to get in the documentary. Scene and I don't know if you watch a lot of YouTube videos. I like to have like film burns and flashes and like the little Super 8 sort of philtre on. Yeah. I mean I I'm. I'm guilty of charge. I use that all the time in. My work. So yeah, that would be definitely a big thing, but. Also in terms. I think what I like in my video about why film cameras are so popular. I made three points. One of them was authenticity, old memories and craftsmanship, and I think it's like in that craftsmanship section. It's like, you know, when you're shooting on film, you really have to slow down. And think about what you're shooting, you know, cause you only get limited time. Like, say you're shooting on my say, I'm shooting my digital camera. I'm like alright, this is building now. I've only got limited time. You know, let's really be careful about what we're going to. And I feel like that whole experience from film photography has definitely transferred over to cinematography. Whenever I'm shooting my DSLR so totally it's made of a really big impact on how I approach. I approached my work and yeah, like I love I love the. Idea that like. Film seems to be like memories. You know, there's like, I feel like that whole Ideas also made like that's why I wanna make movies so I can look back on all of them one day. You know, they have a highlight reel of film reel of my life. You know, so totally. It's been very.

Audio file

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Transcript

Kentaro Mikami

(4) OK. So what, I'll just get you to do for me is introduce yourself just to get a little idea of your work and everything you've done.

Tim barretto

Hi, my names. Tim barretto. I'm the owner. Of lab West film. I own it with my wife, Melanie Filler. We have three staff. I also work in the film and television industry, and I also shoot and do productions on celluloid as well. Motion picture film. So, I had. Two strings where I do stills photography as well as motion picture.

Kentaro Mikami

(1) Awesome. Fantastic. OK, we'll get right into the questions, Tim. From your perspective, what are some of the like the key economic and environmental challenges associated with analogue photography as a medium?

Tim barretto

Well, economic is definitely. Inflation and price hikes and raw mineral costs, which lead to higher film prices and higher development costs. I think this is more problematic for colour development as there's only one. There are two manufacturers of colour in the industry, it's Fuji and Kodak and. Going producing less film now, so Kodak could kind of monopolised the industry a bit, which is problematic for having that healthy competition, but. Yeah, the economic challenges are the price per role for someone to shoot some photos. And how do we keep that as a special niche thing that he's going to live on forever? So, I do fear for colour film, but I think black and white will live for hundreds of years.

Kentaro Mikami

Fantastic. Uh. Could you touch on any of the environmental challenges associated with?

Tim barretto

So definitely environmental challenges is it is we are using chemistry. You know what is natural? What is unnatural? I know the way that we must dispose of our chemistry is really important, especially for environmental factors. We try and do everything sustainably here, but I would still say that shooting film has an environmental impact. I don't really know what. How to quantify that or how to know what that cost is but? There is a cost. There's a cost to everything you do, but when you do something like create an artwork using canvas and paint and everything like that, it's sort of the same thing is that you do it, but you do it carefully and you do it when it's warranted and if it has value. So it always in art is, is you're making something and if you use. Photos as that as art. Then you you're making something at a cost. Everything you do is at a cost. It's just what are? You accepting it? As a consumer and as a as a lab, but I think high volume labs will be on the decline. Because high volume will be on the decline with The cost problem. And we're a real low volume lab, meaning that we don't seek out. Hundreds and hundreds of rows a week. We keep it really tight and we do other

services to help make our business sustainable, so we like. The idea of. It being sustainable and in smaller quantities.

Kentaro Mikami

Could you touch on that a little bit further for me? Like you favour maybe quality over quantity in that sense, how do you how do you achieve that?

Tim barretto

Yes, yes. We achieve it in one the way we develop it, so we develop it in like basically by hand like I call it like, you know, you buy a loaf of bread. Is it baked in house or is it a machine that's doing it all for you? So we keep a real personal touch to it which adds a unique factor. And the point of difference for our lab, it means we can be very versatile. In how we develop it as. Well, and what we use to develop it. Where the majority? Of labs in the country use, like what's called a mini lab, which is just like feed it in and it. Comes out which. Is fine and perfectly great machines, but one they don't make them anymore. Well, there is one company that makes it. An Italian company makes new mini labs, but other than that most people are using old mini labs and old technology that is breaking down and requiring a lot of servicing and maintenance. Is maintain them, so everything that we use in our lab. From the developing to the scanning, we can buy brand new and we can get it made and. Sent to us here.

Kentaro Mikami

(3) Fantastic. That's awesome. Are there any emerging trends technologies in the industry or in your work that you believe will have a significant impact on the sustainability of analogue photography?

Tim barretto

Well, if you're looking at colour because I think colour is where the sustainability issue lies with black and white people can do at home a lot simpler colour. What's the trend at the moment is to shoot motion picture film, so I'm not sure if you're aware. That it's it's. Yeah. Film that's cut down from film motion picture rolls. So when they shoot in Hollywood, they shoot on 35 millimetre, the same size film that fits inside your stills camera. But it comes in big 1000 foot rolls or 400 foot rolls. Which is, you know, 10 minutes or 15 minutes of a take in of a of a camera in in Hollywood. And it gets cut down to put in a smaller canister. So then you can shoot it in your. Steels camera, so I think that's one of the biggest trends at the moment is people doing that one because the cost of the role is less. And and to the technology in motion Picture, film is always improving where the R&D for stills film. Has sort of stopped in about 2010 or something like that. Don't quote me on that, but around that time. But where vision films are still evolving like I think Vision 500 T. Is was is still improved. As of two. 1016 or 17 so, and I think they're still looking at that and because it's still widely used in in Hollywood. So to be honest, I think if Hollywood wasn't shooting well not I'd say Hollywood, but I mean just film makers. In general. But the big players like the Nolan and Tarantino, and all of those are still and Scorsese, who still only want to shoot on film. They're sort of saving the colour product. I feel like it's out there, but we would have lost. We would have lost stills. Photography as well. Still's film. Yeah, I think they're even though people don't realise because it's just about keeping the machines on because they're pretty probably the same machines that they use to produce the film.

Kentaro Mikami

Yeah, yeah.

Tim barretto

And they'll do batches of portra, and they'll do batches of ECN 2. I mean, not ECN 2 batches of Vision three. Stop.

Kentaro Mikami

(5) Yeah, fantastic. It's really insightful regarding your lab. What are some of the products, processes, objects that you may interact with in your everyday work?

Tim barretto

So we use what's called **jobo**, which is a German company that produces Rotary processing. We have two jobo processors. We also do **camera scan**. Thing which we use lots of negative supply products, which is a new company, but Joe Berg going back to Joe Bojo is a three generation family business. So they've been around for a really long time and they are have a real emphasis on like making quality products that are sustainable that last more than a lifetime. Yeah. The things that interact. **With the dark Bag you know to load and unload**. We also use **inkjet printer** to do Our prints. What else? Lots of things. Just knickknacks. ^{Thermometer} Any like they're the main things that we. Use. **Obviously, chemistry itself**, we handle that on a daily basis and that has to be mixed and. And mix correctly in the rack quantities.

Kentaro Mikami

What chemistry do you use?

Tim barretto

At the moment, so we've had a real problem with getting because we used to for colour. Again, we used to use **Kodak flexi colour** but there's been **huge supply problems** with the Kodak flexi colour and now we've switched to **champion** which is a Malaysian brand. And they yeah, I don't think. I don't know what's happening with the manufacturing of the Kodak flexi colour. I know that the company may have gone bankrupt and based out of China because Kodak sold a lot of their. A lot of their services stuff. To other companies. So Kodak still makes the film in New York, in Rochester, Rochester. I can't say that, but yeah, they make they just make the film now, so they don't make any of the chemistry in. America anymore, which is. Problem because without the chemistry he got developed the film, but there is one other company called Champion that has sort of filled that gap. **The results are pretty indistinguishable**. Like they're pretty much the same. Yeah, slight difference, but who knows? Like once they once if raw chemical, you know, raw materials become problematic or expensive. Then yeah, that goes up. Yeah, goes up.

Kentaro Mikami

Yeah, for sure. Fantastic. (6) So regarding some of these products, processes and objects that you use in your everyday process, could you? Describe some of the positives or negatives when working with them. Some things that. You really like about. These products, some things that you might not like so much about them.

Tim barretto

Well, with the jobo process it's a bit **slower**, so I don't like that, but it's the **positive about it is you, you have more control and there's less scratches and less dirt and less filth that gets on your film**. So, it's clean. But it requires a man maintaining a man standing there and actually interacting with the machine rather than the machine doing itself.

Kentaro Mikami

Yeah, for sure. Any other. Anything else come to mind when using the myriad of products?

Tim barretto

Yeah. And then like our scanning again, again is pretty quick. What I like about well, it could be considered slower, but I don't think it is and it's only improving. So because we do digital scans, we get a raw. Negative. That goes. Into Lightroom, where then it gets in. Like AI technologies and and improving software will make that inversion process a lot quicker. At the moment it could be seen as. A little bit slow. But it's actually getting faster and faster with technology, so that's where I see like doing a really good job with that, yeah.

Kentaro Mikami

Yeah, for sure with the actual scanning and processing.

Tim barretto

But the actual scanning of the inverting of the images, because it's a subjective to inverter negative is pretty subjective. Yeah, subjective operator. Yeah. Process where? Yeah, you need to your colour balancing and you're choosing the contrast and.

Kentaro Mikami

Yeah, for sure. Fantastic. Anything else come to mind when, uh, thinking of some of the products you interact with? Anything good, anything bad?

Tim barretto

I am. That's probably pretty much. It in terms of those like. We use modern computers and modern screens which you know a lot of other labs. They're stuck on old screens and old tech and old software. So our software is up to date where other labs have this problem where they have To run. You know Windows XP or something like that. Yes, the product that's obsolete now. Yeah. Yeah. And I think that I think I would be nervous to running those products or those devices knowing that at any time they could go ****. And there's no one there to service them. You know, back in the day, you'd have technicians that come and check him in the lab and. Check your you know chemistry and make sure your scanner focus plane was good and all. Of that stuff. So.

Kentaro Mikami

(7) Yeah, for sure. Fantastic. That's awesome stuff. If you were to compare home development to lab development, which process would you consider to be more sustain?

Tim barretto

And lab development probably be more sustainable because you do it in bigger batches.

Tim barretto

And you ended up using less chemistry because of that. Home development can be, but I would also say they're OHSU would be a lot less, you know. Like that lot lot more caution in a. Lab, where people were handling chemistry and and handling film. They do it in a way where it's, yeah, a bit more safer where it development. Maybe you're more exposed to to chemistry, but in terms of sustainability, yeah, I would say. And just generally on sustainability for the industry. It feels like, yeah, without labs,

then film would die a lot. Black and white, black and white would Always survive because it's a bit easier to make, so they would always manufacturers that hang around and you can develop it in caffeine. So you can, you know, you don't need, you don't need special tools. You can mix your own developers and that sort of thing. But colour is definitely something that without the bigger players it will just die.

Kentaro Mikami

(10) Yeah, for sure for certain. That's awesome. So just one final question. What do you think some of the largest barriers are for beginners as they learn to shoot film?

Tim barretto

Well, it's the the cost of the error. You know the. The bell bell? Yeah, it's that's that's the biggest barrier. It's getting past those. Two or three rolls. The barrier of them not having the education of how the actual camera works and how film interacts with light. I think people that have grown up in a digital only environment then that are going to analogue. Don't are used to cameras seeing more than the human eye, so seeing. Seeing more than what a film can actually capture, so film just loves that. And that understanding of lat is the most important thing for any new film shooter. And that's where I see them fail the most. Also, just understanding how all the film is exposed and. The relationship between the technical side of the camera that people don't really have generally don't really have a. Good understanding of that. Yeah. And just exposure in general.

Kentaro Mikami

For sure. Yeah. Fantastic. Well, Tim, thank you so much for this interview. It has been so incredibly insightful.

Tim barretto

Alright, problem. Yeah.

Audio file

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Transcript

Xinshuo

OK. Yeah, yeah. I'm the film photographer, and yeah, I'm. I'm doing that for like, like 8 years. And I developed all my film by myself. And. And yeah, I'm just enjoy it. Yeah.

Kentaro Mikami

Awesome. That's fantastic. (1) OK, so let's start off with my first question for you. From your perspective, what are the some of the key environmental and economic challenges associated with analogue photography or developing film?

Xinshuo

I think the most important issue going to be the chemical, because for the film developing you need to use the developer fixer and the stopper and they all like environmentally, harmful, chemical and it's really hard to recycle them. and you need to use a large amount and after use you need to pour them down the kitchen sink and it's not really environmental friendly. It's a huge struggling to recycle these chemicals and the film itself is also environmentally harmful and you can only take like 36 image per roll or medium format only 10 images.

Kentaro Mikami

Yeah, fantastic. (2) Are there any like trends or emerging technologies in the industry that you believe will have a significant impact on the sustainability of analogue photography?

Xinshuo

For now. I try to use the least amount of chemicals I can. You actually achieve the same result you just need to let your film submerge inside the chemical and that's fine. On the instruction you need like 500 ml per roll, but. You actually don't need that much.

Kentaro Mikami

(5) Mean. So OK, So what are some of the like things objects, products that you use to shoot with film. So this could be cameras that you use for example, it could be developing equipment, etc

Xinshuo

I'm currently shooting the 6x7 Medium format and the Mamia R367 and for the developing I'm using the Jobo developing tank. I got two of them. One Jobo or one Patterson, they are basically the same. You develop one roll per tank, but apparently the Patterson needs more chemical.

Kentaro Mikami

OK, fantastic. Anything else? Any other products? Processes that you use?

Xinshuo

For the chemical itself, I'm using the C41 and the Tentanal kid.

Kentaro Mikami

OK, you said. Yeah. Fantastic. (6) So what can you describe to me? Some of the difficulties or benefits that you experience when using these set of products? So you mentioned your use of the Jobo tanks and you mentioned the Tentanal chemicals. Do you have any insight into some of the problems that arise or some of the benefits that arise when using these?

Xinshuo

For the chemical itself, you know, once you pre mix the chemical, they will expire really quick and you can only develop like 16 rolls per set of chemicals But You may not Shoot that much. For example sometimes you may shoot 16 rolls in a month a month. But the chemical going to expire in two days So you have to rush yourself to shoot more of the film.

Kentaro Mikami

And do you find that's frustrating because it sort of forces you to shoot more or maybe like you want to be more meticulous with your film.

Xinshuo

I don't feel frustrating about it cause. Sometimes I shoot just one roll away, but sometimes not. So if i process the chemicals I just push myself to shoot another roll. And for the camera itself it's a kind of old camera. I'm just so worried about it. I feel it could break at any time!

Kentaro Mikami

Yeah. Awesome. Yeah. Anything else you want to touch on?

Xinshuo

For the tank, there are one thing I struggle with. Because when the fixer becomes more an more exhausted from the use of chemical you will need to release gas from the tank. Every time you turn around the tank there. So if you forgot the CAP for the tank can blow off and chemicals can spill everywhere.

Kentaro Mikami

I see. Fantastic. Awesome. That's. That's some really great insight. Are there any other products, processes or objects that you interact with that you could give me some further insight into during your process? Anything else you can think of?

Xinshuo

You also need **thermometer**, then for the chemical, because you need to keep it at 38 degrees.

Kentaro Mikami

How do you do that? How do you keep it 38 degrees?

Xinshuo

There one product called **Cinestill to TCS 1000** you pre set up the temperature and you put it into the water and it warms up the water.

Kentaro Mikami

Yeah, perfect. How do you scan your film?

Xinshuo

I have Scanner at home the Epson V850.

Kentaro Mikami

Fantastic. Do you have any problems with that?

Xinshuo

Yeah, it's uh, it's actually a very new product and it's just the Epson scanner. But they can be very unreliable.

Kentaro Mikami

Do you have anything that you like really enjoy about these products, things that you really like when you use them?

Xinshuo

Uh yes, you can save lots of money there, yeah. Yeah. If you bring your film to the lab, it's so expensive then, like 30-40 dollars per roll.

Kentaro Mikami

Fantastic. OK, so fantastic. (7) If you want to compare home development with lab development, which one would you consider to be more sustainable?

Xinshuo

I think probably the lab development going to be more sustainable because they have the amount of film to process so they will not waste your chemicals there. But for the home development, people always pour your chemical in the bathroom or in the kitchen after use. And its difficult for individuals as they don't have the equipment to recycle or collect the chemical. Individuals just don't have enough supplies to deal with the whole process.

Kentaro Mikami

Fantastic. Yeah. Awesome. (9), So what are your thoughts on the significance of analogue photography as a medium?

Xinshuo

Yeah, because for digital photography, if you want to get an accurate exposure on the bright side, you're going to get a lack of exposure at the dark. And yeah, it's the same for colour - If you shoot prioritising purple for your exposure in the dark the light side of the overexposed for the film. However with film you don't have that issue. and I also think the film can capture very real and vivid colours. Yeah,

Kentaro Mikami

(10) So what do you, what do you think? Some of the largest barriers are for beginners when they learn to shoot on film?

Xinshuo

Because they need to get you familiar with the fact you cannot immediately see your results when you're shooting with film. and some people they really struggle with this. Some people also don't know how to use very old cameras and they may make a mistake. Film is kind of expensive and if they make a mistake, it can be a waste of money. Also, if you want to develop the film at Home. You are probably going to like mess it up or and you're going to expose your film into light.

Kentaro Mikami

(5/6) Just one more question, just coming back to the products and processes that you use to facilitate your photography, is there anything else you want to touch on like anything else that comes to mind when you develop film that sort of annoys you? Like what, what are the pain points that? That fit like that you find when you develop your own film.

Xinshuo

If the chemical get on your hands, you feel your skin burn. Yeah. Also for. I think for the temperature control. If you keep it as a 38 degree, it's going to be the best result, but it's actually very hard to do so it takes one hour to make sure the chemical and the water the all the same temperature.