Rethinking digital copyright law for a culturally diverse, accessible, creative Europe

Grant Agreement No. 870626

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Abbreviations

Abbreviation	Full name
CAD	Computer-aided-design
CH	chapter
EC	European Commission
EUIPO	European Union Intellectual Property Office
ICT	Information and Communications Technology
IP	intellectual property
IPR	intellectual property rights
LRQ	lead research question
RQ	research question
SME	small and medium sized company
WIPO	World Intellectual Property Organization

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Executive Summary

Digitalisation has and continues to transform the value chains and operating modes within the creative industries (Betzler & Leuschen, 2020). Despite the fears that digitalisation could endanger creative industries, the cultural economy is connected to the digital economy ever more closely, and facilitating new business models (Ernst & Young, 2016). While some parts of the industry have taken up digitalisation due to external pressure (we call it digital-by-need, e.g., fashion-related SMEs introducing digital pre-orders and remote deliveries), many sub-sections of creative industries are born digital. Among the latter, we also see those that operate in a highly digitalised mode (e.g. gaming industry, influencers, free-sharing platforms, etc.). As the core of every creative enterprise's product and service is their uniqueness, operating in the digital mode also means that the enterprises need to develop a solid mechanism for protecting their rights (incl. intellectual property rights, IPRs) and the rights of others online.

The main focus of the current study is to provide an overview of emerging new business models in three different sectors of creative industries (influencer economy, circular fashion economy and maker economy). While describing the business models, we are not only interested in how the new business models and their IPR related concerns differ across the sectors but also in how the business models are related to cultural diversity, namely how they leverage the opportunities for the production, consumption, and preservation of cultural diversity offered by digitalisation in the creative industries. Studying digitalisation across the business models, this subtask focuses on the following leading research question: *How does the awareness of IPRs change depending on the relationship between the creator and the product?* The study is structured around two research sub-questions: (1) *What is the role of IP in shaping the competitive landscape of SMEs in creative industries (RQ1), and (2) How might the linguistic and cultural background influence SMEs' competitiveness in creative industries (RQ2)?*

The report delivers rich descriptions of three case studies that reveal unique contextual settings in terms of IPRs and digitalisation. The cases focus on influencers, circular fashion SMEs, and free computer-aided-design (CAD) sharing platforms users. The data for the case studies were collected via qualitative interviews and document analysis. The case studies reveal how the role of digitalisation differs greatly across the creative industries. For many, Covid-19 was an accelerator for their digitalisation. In parallel with noticing the impact and change in digitalisation, it is worth noticing that the role of IPR is vastly different in new emerging business models. Furthermore, even within the same business model, some enterprises are heavily affected by the IPR violations, whilst others perceive no need for IPR whatsoever. This tends to depend on the background and the sector of the users. The study leads to practical policy recommendations that point out the need for a customized approach to the IPRs in case of emerging business models in creative industries.

This interim report is divided into the following chapters. **Chapter 1** presents our conceptual framework and methodology; we provide a short theoretical introduction and state the research problem. In **chapters 2-4,** we deliver in-depth case studies that represent three selected emerging business models or operation modes and their IP related challenges. Each of the chapters starts with an evidence-based problem statement and is followed by the descriptions and discussion of the case, the summarised key takeaways, and the main policy recommendations.

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1. Methodology

1.1. Research problem and relation to existing scholarly knowledge

The methodology used for the study helps to explore the challenges SMEs using new business models in the digital market face in order to describe the context of potential regulation of digitalised creative industries. Albeit the term "business model" bears a great share of conceptual heterogeneity in academic literature (Massa et al., 2017), studies tend to confirm that a business model is a set of means or operation modes that compete in the economic market. In other words, the business model paints a picture of how the company creates and captures value (Da Silva & Trkman, 2014; Massa, Tucci, & Afuah, 2017). The current study investigates emerging business models (see Figure 1), i.e., the models that are relatively new or greatly triggered by or built on digitalisation. Field wise, it focuses on a selection of emerging business models in creative industries: the influencer economy (influencers), the circular economy (upcycling SMEs), and the maker economy (CAD sharing platforms).

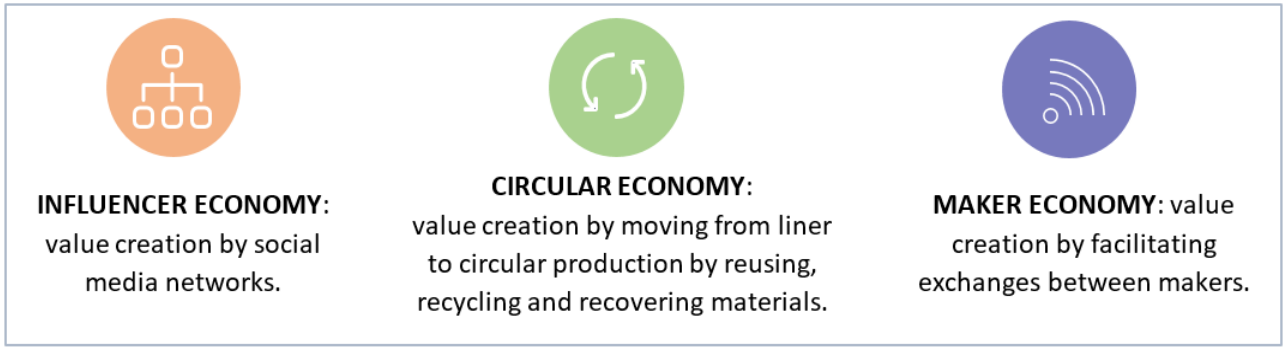

Figure 1. Three emerging business models. Author: Eneli Kindsiko

1.1.1. Influencer economy

The influencer economy has become a multibillion-dollar industry (Hund & McGuigan, 2019) that builds value through social media networks. Influencers as brand ambassadors help to promote services and products. **Influencers** are born digital, and at the same time, they build their value by branding themselves. In other words, the "product" is the creator. The need to investigate influencers is triggered by the growing market they have created via the use of social media platforms:

> "One of the most interesting revolutions powered by social media platforms is the appearance of a new market, by which people dedicate most of their time to produce digital content in order to obtain revenues from engaging in advertisement activities in favour of commercial actors: the economy of the Social Media Influencers" (Perez, 2019, p. 152).

In many ways, influencers are brand advocates and influencer marketing is a rapidly growing segment in marketing (IPO, 2021). They represent the case of shared IP – influencers themselves are a brand, yet they promote other brands at the same time (IPO, 2021). Studies have found how social media influencers have profound impact on the buying decisions of some consumers (Wielki, 2020), most vulnerable being the young cohort of consumers, e.g. the danger that social media influencers may also convince their followers to buy counterfeits (IPO, 2021).

1.1.2. Circular economy

Circular economy is "an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes"

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(Kirchherr, *et al*., 2017, p. 229). Circular economy is a multifaceted phenomenon, where we may differentiate micro, meso, and macro levels:

> "It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations" (Kirchherr, *et al*., 2017, p. 229)

In the current study we will focus on the micro level – the inner life of circular fashion SMEs. **Circular fashion SMEs** are greatly built on the creator or the brand, and due to the small size of typical enterprises as well as particular elements involved in their operation, they need to digitalise their business process. For example, for limiting the waste and stock of products, they tend to digitise their distribution channel by facilitating pre-orders and un-connecting themselves from physical selling points or selling their products in large retail shops. The investigation of circular fashion SMEs aligns well with many EU initiatives, e.g. Green Deal (EC, n.d) or EU Directive on Waste (EC, 2018), with a focus on creating a more sustainable production and responsible products, and moving away from linear to circular production model. Moreover, fashion has been declared as being one of the most IP-intensive industries due to complex copyright environment (Härkönen, 2020). The problem becomes even more acute when we talk about reusing materials that may be protected by trademark.

1.1.3. Maker economy

Maker economy, also referred as maker movement, reflects value creation by collaborative production (Deloitte, 2014). Maker movement is built on digitalisation and collaboration, where makers "learn from others, socially construct their own projects, and contribute to the projects of others" (Browder, *et al.,* 2019, p. 462). In most cases, platforms facilitate and accelerate the spread of maker economy. For example, many platforms allow maker communities to access free cloud-based collaboration environments that used to be only available to companies due to high cost. A good example of the latter is the growth of CAD sharing platforms like Thingiverse or GrabCAD, where people with engineering skills across the world are able to collaborate with each other in solving various engineering design related challenges.

Current report investigates the makers that contribute to **CAD sharing platforms**, i.e., platforms that allow sharing of user-created CAD files. Platforms facilitate exchanges between two or more parties (Hoyles, 2021). Often, such platforms are based on harnessing the network effects in creating value (Deloitte, 2019; Hoyles, 2021). The more users a platform has, the higher the potential value it creates. The rise of the platform economy is clearly witnessed not only by the creative industries, but also by WIPO in terms of the challenges it poses to IPR protection (Jewell, 2018). Platforms represent a collective and fully born-digital operating mode, where the success and value creation of the platform depends on the uptake by users, and the number of users providing and sharing content.

In case of CAD making, the creation of the files depends on specific skills, and the files themselves serve as an input for 3D printers. In addition, the demand for such files has increased due to the spread of 3D printers sold to household consumers. In connection with this, the practices on and around CAD sharing platforms trigger numerous questions that relate not only to awareness about IPR, but also bring up a multitude of contextual layers, e.g., matters related to the territoriality of IPR in face of cross-jurisdictional operation of CAD sharing platforms.

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1.1.5. A need for a IPR protection: the challenge triggered by the digitalisation

According to the World Intellectual Property Organization (WIPO), "novelty is an intrinsic characteristic of the products of creative enterprises" (WIPO, 2006, p. 61). That said, an important part of emerging business models within creative industries is not only the awareness and protection of IPR, but also the balance between too strict and too weak IP protection. IPR is a diverse arena:

> "Intellectual property is often described as either 'industrial property', comprising patents, utility models, industrial designs, trademarks, service marks, trade names, indications of source or appellations of origin, and the repression of unfair competition, and/or 'copyright', which refers to literary and artistic works. In fact, the correct use of the term 'intellectual property' comprises both industrial property and copyright." (WIPO, 2014, p. 7)

Just as the spread of digitalisation makes it fast and easy to copy something, it also makes it fast and easy to infringe the IPRs of the rights holders in creative industries. With the increasing speed of digitalisation, companies operating within creative industries need a rather good knowledge about the applicable IP regulations to protect their "products", and to know when they are violating the IPRs of other rights holders. In terms of protecting digitally revealed and shared products, WIPO (2014) has signposted a need to use and promote technical devices that help to restrict the use of the product where needed, and to prevent its unauthorised use. WIPO also recognises that the detailed methods in IPR protection ought to be determined by a combination of the nature of the product itself, and its market value:

> "Copyright is the 'currency' of creative artists as well as many creative enterprises. Negotiating the transfer of the use of copyright is therefore a crucial management decision for a creative artist. The crux of the contract is the choice of a risk-sharing system that can change depending on the nature of the product and market prospects." (WIPO, 2014, p. 133)

Building on the WIPO mapping of creative industries in relation to copyright issues, the following schema (Figure 2) reveals which subsections of cultural industries are most copyright-intensive.

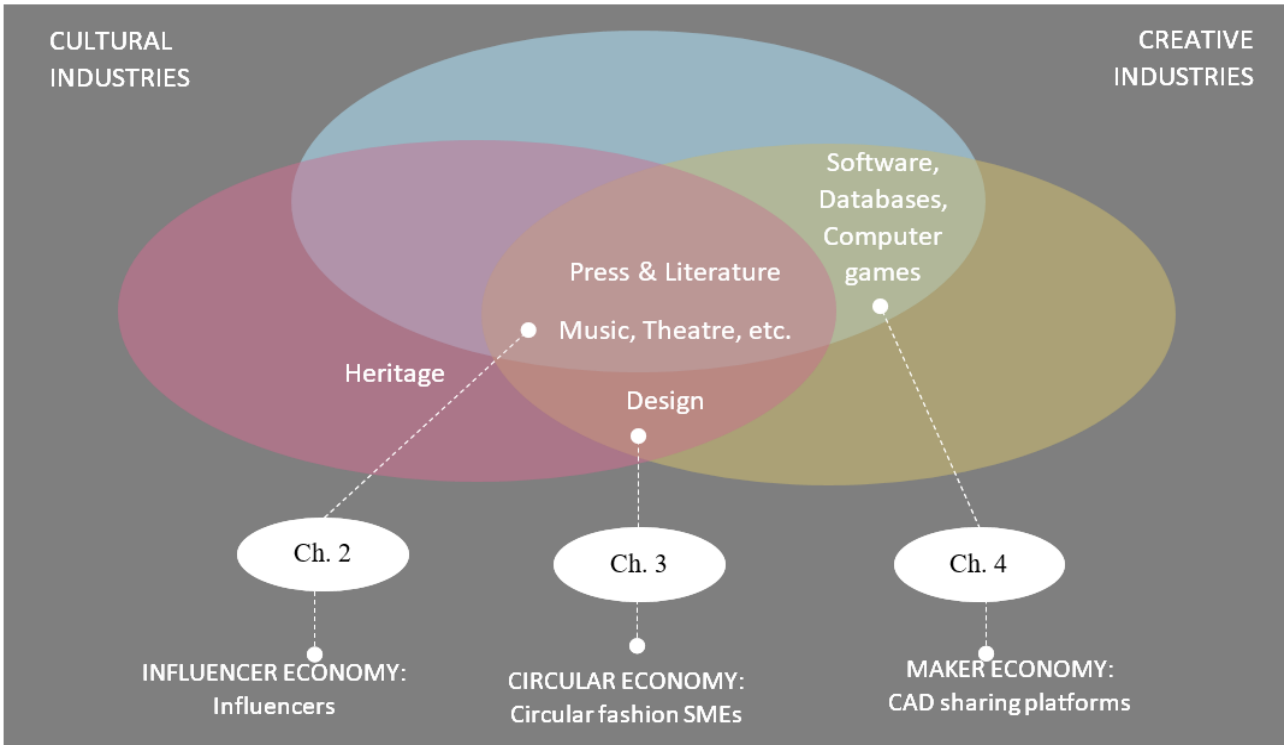

Figure 2. Mapping the creative industries and case studies of this report. Source: WIPO, 2017, p. 8.

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How the nature of "the product" and the relationship between the product and the creator determines the need for the IPR protection?

In this report, we bring forward how in case of creative industries, it is not only the nature of the product, but sometimes also the (in)ability to distract the creator from the product that makes the question of copyright even more challenging. For example, in case of influencers the person itself is the brand. Influencers make a living by "producing advertisement content in their social media accounts", where the content posted by the creator to the social media from one side is unique, yet from the other side is often making use of already copyrighted works (Perez, 2019, p. 149). To bring a different example, numerous content sharing platforms like CAD file sharing platforms may also work as distracting the content from the user, without no way to trace what happens to the original work of the creator. In this case, the creator is not part of the design, he or she merely creates it. Considering the controversies discussed above, we will propose the following lead research question that will ground this study: *How does the awareness of IPR change depending on the relationship between the creator and the product?*

This question will be investigated both from the horizontal and vertical level. From the horizontal level, it seeks to delineate the competitive landscape and emerging new business models specific to small and medium sized companies (SMEs). In terms of creative industries, small (often run by freelancers) companies struggle to find sustainable demand and funding for their production. This sub-task will map and measure how national (and especially small) creative companies face and respond to such challenges, and how digitalisation helps or hinders them. That said, our horizontal research question addresses *what is the role of IP in shaping the competitive landscape of SMEs in creative industries?*

From the vertical level, across Europe, countries differ by their unique linguistic and cultural background, which make the whole creative industries sector even more rich. From the vertical level, we seek to study the needs and expectations of several creative industries belonging to smaller cultural and linguistic environments, explaining how their use of digitalisation and globalization differs. As our case country is Estonia, with only around 1.3 mln inhabitants, it is relevant to ask what is the state of competitiveness of SMEs from such a small country? This leads to formulating our vertical research question: *how the linguistic and cultural background might influence the competitiveness of SMEs in creative industries?* Figure 3 illustrates the overall T-shaped logical framework of current study.

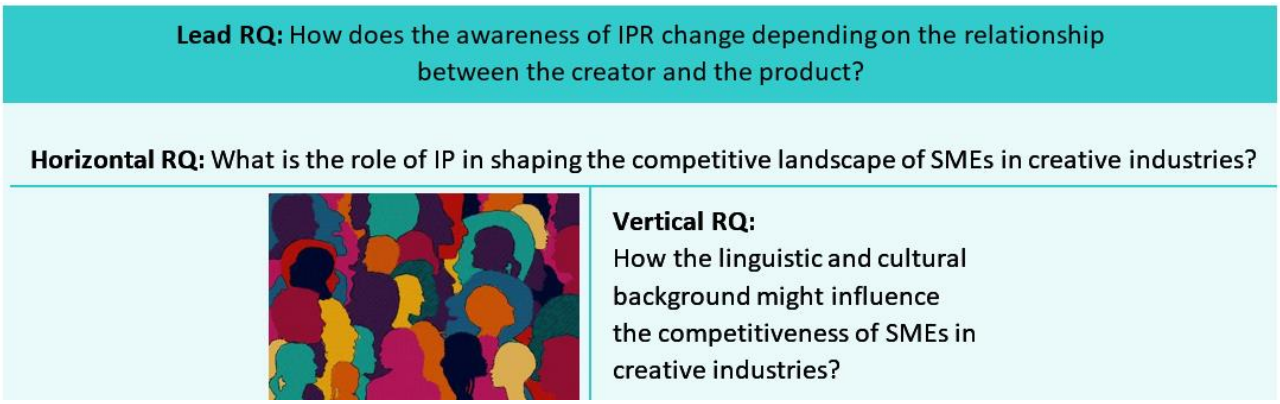

Figure 3. Logical framework of current study. Author: Eneli Kindsiko

Topicality of IPR in creative industries due to the digitalisation increase triggered by Covid-19

The Covid-19 pandemic hit the creative industries harsh, especially the part of industry that relied on audience being at physical proximity (Harper, 2020). Yet, restrictions on in-person encounters and consumption of creative products and services have triggered companies from this sector to find new ways of operating their business. At the same time, some parts of the creative industries bloomed due to people spending more time in front of screens – a demand grew for television viewing, video games, news browsing,

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and so on. A thorough analysis of the trends across creative industries around the world has revealed three major trends that continue to shape this industry: creative supply chains, shared IP, and the spread of creative technology (Deloitte, 2021, p. 26).

Creative supply chains are built on finding novel ways to cooperate with other companies, both inside and outside the creative industry. For example, a great share of recycling-oriented design SMEs in creative industries make use of various leftovers from other industries, e.g. tires for producing boot soles, retired parachutes redesigned for making hammocks and swings. Another dimension accelerated by Covid-19 is the adoption of technology to lessen the losses from physical interaction with the client or the audience. A good example is the spread of remote delivery of cultural industry products and services during the pandemic – a trend most likely to stay (Harper, 2020).

As digital space is often a shared space, the notion of **shared IP** will increase in relevance. Shared IP signposts a situation "when IP created in one segment is deployed in other creative industries" (Deloitte, 2021, p. 27). The most common example would be books used as inspirational source for movies or TV shows, and at the same time it boosts the book sales. Another example of such symbiotic relationship is the case from 2021, when Spanish luxury fashion house Balenciaga collaborated with The Simpsons series to show a 10-minute long catwalk in The Simpsons (Testa, 2021). Another example is the synergies created by cooperation between film and video games industry, where some successful video games (e.g. Alice in Wonderland, Die Hard, Disney`s Beauty and the Beast, The Godfather, *etc.)* are based on screenplays. A way to foster mutual benefits both for the industry that bases on linear structure (film) and industries that build on interactive structure (video games) (Betzler & Leuschen, 2020).

Technological developments have also affected the life of creative workers – fostering a demand for **creative technology**. An increasing overlap between the digital and creative is expected (Deloitte, 2021). Good example is the world of 3D printing: the rapid spread of affordable 3D printers has facilitated a demand for people with CAD making skills, but the development of technology has also allowed using scanning of real life physical objects to transform them into CAD files – with this, fostering a room for IPR related debates.

Creative supply chains	Businesses within the creative industries are suppliers to and from each other, fostering novel supply chain linkages. For example, up-cycling fashion SMEs make use of textile wastes, created by other creative SMEs.
Shared IP	Different parts of the creative economy use common designs, stories, characters and worlds. Creation may be often collective and the synergy created will promote all parties. E.g. Harry Potter book turned into movies, increased the sales of the book, and *vice versa*. But also influencers are a good example of shared IP – they are the brand that often promotes other brands – social media influencers as brand advocates.
Creative technology	Increasing overlap between the digital and creative industries creates synergy and fuels overall growth of the economy. A vivid example here would be Google's Street View feature used to offer virtual tours to museums worldwide, e.g. British Museum in London, Guggenheim Museum in New York, Rijksmuseum in Amsterdam.

Table 1. Major trends influencing creative industries Source: Deloitte, 2021.

All in all, from one side, Covid-19 created a great share of insecurity and loss of income (e.g. sharp decrease in advertise money), together with loss of jobs in those parts of creative industries that relied on in-person contact with the consumer. From the other side, the pandemic triggered new ways of doing business for those who managed to be resilient. Above all, it increased the digitalisation across the sector, and thus fostered and intensified a great share of emerging controversies around IPR – some of them will be discussed in next chapter, across multiple case studies.

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1.2. Research design and data collection

We have differentiated our cases by two focus points (see Figure 4). First, how easy is it to separate the creation from the creator? For example, influencers run a person-specific operating model, where it is impossible to separate the creation from the creator, whilst in case of CAD makers, separating CADs without giving credit to the creator is relatively easy. Second, what is the degree of digitalisation? Is it born digital, where the core operating mode is digital from start; or digitalisation is by need, e.g digital solutions are an addition, a support to the core operating mode? For the fashion SMEs, the need to build digital distribution channels is most evident. Due to their size, they are not able to hold a great stock of ready-made products, but go more according to the "production-by-demand", where the majority of distribution channels has been digitalised.

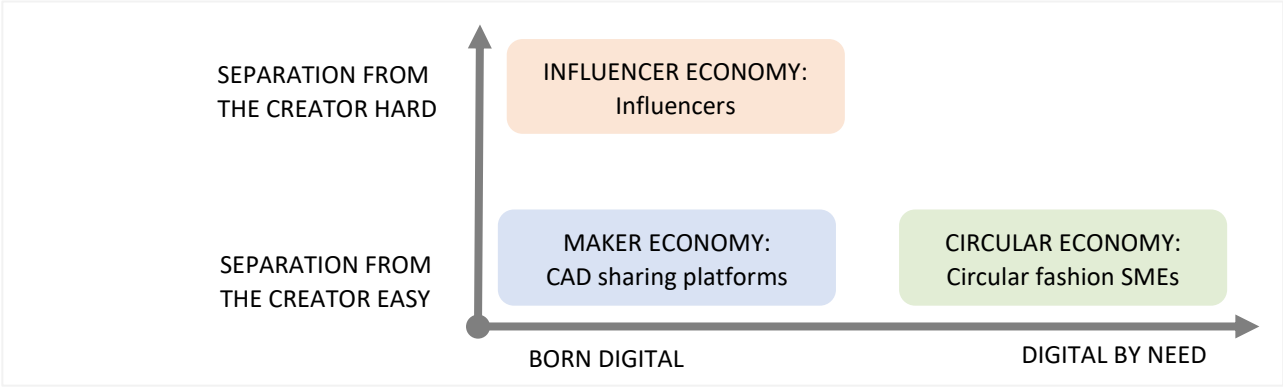

Figure 4. Methodological framework and rationale for case studies. Author: Eneli Kindsiko

The primary data collection method was qualitative interviewing, supplemented by document analysis for explaining the contextual background. The interviews (see Table 2) were conducted face-to-face or via digital means (e.g. Skype) with open-ended questions regarding the opinion of the interviewees on the role of IPR (RQ1), and how IPR benefit or hinder their specific field and operation mode, whilst considering the unique cultural and linguistic setting (RQ2).

Case category (chapter)	Data collection	Sum of audio data
INFLUENCER ECONOMY: Influencers (ch 2)	6 interviews with influencers	334 minutes
CIRCULAR ECONOMY: Circular fashion SMEs (ch 3)	2 interviews with founders Analysis of media coverage	85 minutes
MAKER ECONOMY: CAD sharing platforms (ch 4)	19 interviews with CAD makers Analysis of user profiles	397 minutes

Table 2. Summarised overview of study informants. Source: Authors of the report.

All the interviewees were recruited by applying purposive strategy – each informant was chosen because of his/her specific characters. Interviews were audio recorded and transcribed verbatim, data was analysed by content analysis. Next subchapters will zoom in to reveal how contextual factors could influence creative industries operating in each group. How the size of the local market and the linguistic part of the creation may influence the need and possibility to go digital. If the local creative industries go digital, what is their awareness and experience with IPR, and so on. Thus, the following subchapters will lay down rich case studies.

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2. Influencer economy: Social media influencers

2.1. Contextual background: Problem statement

Social media influencers represent a new and rapidly growing part of the creative industries. It has been said how influencer is the most wanted job of the 21st century among the young generations. A study from 2019 revealed how the top three career aspirations of teens aged 11 to 16 years old in the United Kingdom are the following: doctor (18%), social media influencer (17%), and YouTuber (14%) (Statista, 2021). That said, around 1/3 of teenagers dream of becoming an influencer.

Social media influencers have found followers usually by their exclusive and personified appearance in social media. They attract audiences due to the specific content they produce – lifestyle (Choi & Behm-Morawitz, 2017), gaming (Sjöblum, *et al*., 2017), vlogging (Bakioglu, 2016), political content (May, 2010), etc. For example, the YouTubers with global audience (like VanossGaming or PewDiePie) produce gaming videos, use humour, produce music videos or make web shows, some of them produce how-to tutorials. The most popular YouTubers in Europe (like JackSepticEye, DanTDM, KSI and W2S) mix in their production gaming with lifestyle topics (Himma-Kadakas, *et al*., 2018). Their phenomenon will be grasped under the term 'authenticity' - "to be real and to be themselves" is stressed as the main value of their appearance for the audiences (Jun & Yi, 2020; Ki, *et al*., 2020). Authenticity is a vague concept, but indicates the importance of analysing the influencers as brands themselves where there is no clear boundary between themselves and their "product" - as human brands (Erz & Christensen, 2018).

Influencers are widely used as "brand ambassadors", they market the products and services of other producers (Sussman, 2015). Their business models lay on their success in communicating with audiences and building up a community of loyal followers. Goanta and Ranchordás (2020, pp. 10–11) distinguish four business models of social media influencers related to advertising: affiliate marketing, exchange of goods and/or services, endorsement deals, and producer/ provider of goods or services. Each of them builds upon the different model of monetization of the content created by the influencers and may present a complicated set of legal and contractual nuances.

Not every influencer acts as an advertiser (e.g. gamers, citizen activists) - in addition, content creators can make money by engaging with platforms or directly with followers (Goanta & Ranchordás, 2020). To find followers, it presupposes for the social media influencers constant self-marketing – "a set of practices and a mindset, a way of thinking about the self as a saleable commodity" (Marwick, 2017, p. 2028). As single players, the social media influencers have sole responsibility in the IP production and protection processes. Research among particular groups of influencers have revealed that by analysing the self-efficacy of the influencers in four areas – technological, economic, social and legal – the legal self-efficacy is the most problematic, since the awareness of the regulations about the related fields is rather modest among the influencers (De Veirman, *et al.*, 2020). Even more, their activity is characterised by the liminality:

> "They must navigate expectations of authenticity while addressing to brand, agency, platform, and personal demands. They must cultivate a lifestyle and aesthetic deserving of attention and ambition while simultaneously having products that are often banal and quotidian. Influencers also operate at the boundaries of professional identity, working neither in standard employment nor traditional freelancing." (Newlands & Fiesler, 2020, p. 183)

The controversial demands for influencer economy raise several questions, including a question about the legal aspects of the relationships between the creator and the "product". In the context of the ReCreating project, we are interested in two aspects in social media influencers business models – how is the IP awareness and how is their cultural-linguistic scope shaping their competitiveness and operating opportunities.

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2.2. Case study: Estonian social media influencers

Research process: Data and methods

To get information about the specifics of influencers' business models acting in smaller linguistic and cultural environments, we have approached the influencers operating in Estonian language and on Instagram mainly. Instagram is a social media environment that enables users to express their creativity; based on the former studies it suits well for advertising purposes due of the dominance of visual content (Caliandro & Graham, 2020). We approached different Estonian influencers having the highest numbers of followers on Instagram, trying to get some balance in gender and age. While Instagram influencers are mostly younger and female, we purposefully searched contact with slightly older and male influencers. We conducted in-depth interviews with 6 influencers – 3 female and 3 male, 3 of them in the age group in 20s and 3 in 30s (Table 3).

No and name of influencer	Age group	Gender	No of followers in Instagram (March 2022)	Other social media he/she is actively using	Length of interview (in minutes)
1 Adamson	35	F	29 000	Facebook	32
2 Vaino	35	M	6000	Facebook, blog	90
3 Rannaväli	19	F	60 000	YouTube, Facebook	72
4 Kurn	19	M	19 000	YouTube, Facebook, TikTok	54
5 Lind	24	F	40 500	Blog, Facebook, TikTok	40
6 Hallik	31	M	47 000	Blog, Facebook, YouTube, tumbler, Twitter	46

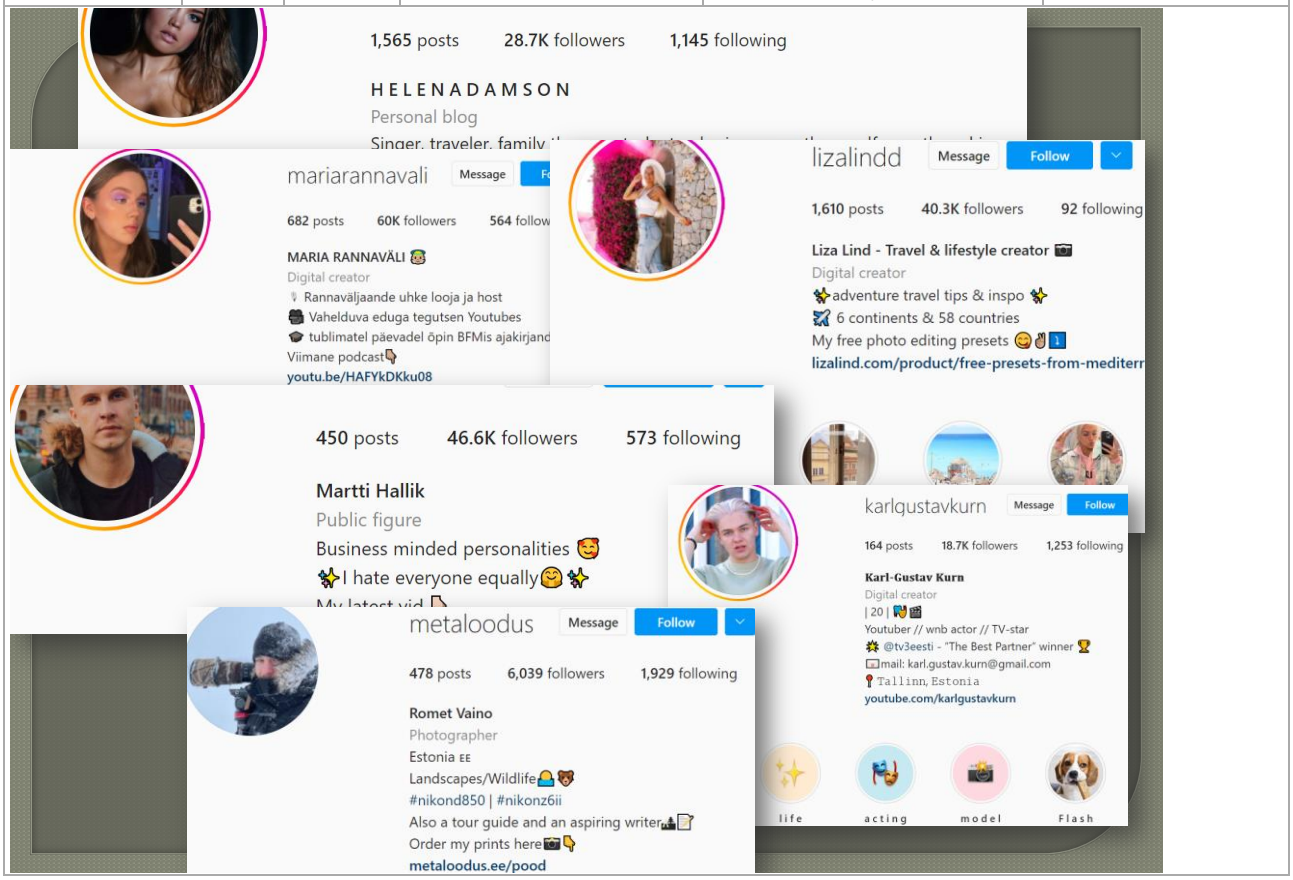

Table 3. Interviewed influencers active in Instagram & self-presentation profiles of interviewed influencers on Instagram (source: Instagram). Author: Ragne Kõuts-Klemm

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The interviews were recorded using Zoom and transcribed for the study purposes. The interviews covered different topics, starting with an interviewee's first experiences in some social media network, information about his/her knowledgeability creating their brand and about the business model, and ending with the questions about their knowledge of IPR and respective experiences. The last topic in interview covered their plans for the future.

We have analysed the interviews according to two research questions specifically about the impact of IP and of linguistic and cultural background to the competitiveness of influencers (see Figure 5).

Figure 5. The structure of case study: social media influencers. Author: Ragne-Kõuts-Klemm

Role of digitization & IPR in shaping competitive landscape

The role of IPR in case of influencers may be approached from two different perspectives. From one side, influencers create unique content, from another side, influencers often share unique and third-party copyrighted content. To bring an example of the latter, according to the European Union Intellectual Property Office, "social media influencers actively encourage followers to buy cheap copies of high-end products, accompanying their product reviews with certain hashtags to increase the views of their posts" (EUIPO, 2021, p. 14). For example, in 2020 Amazon filled a lawsuit against two influencers who had teamed up with some third-party sellers to promote and facilitate the sale of counterfeit luxury goods (e.g. fake Gucci belts) on Amazon (Little, 2020).

All interviewed influencers state that they make collabs – i.e. they have collaboration with enterprises to sell their goods or services. The collaboration with enterprises and brands is for the interviewed influencers a changing undertaking – the number of collaborations and amount of income depends on the season. The months differ greatly in income possibilities, starting from zero to maximum 10 000 euro – the latter number is rather extremely exceptional in Estonian context. Most common income is rather 1500-3000 euro per month. All interviewed influencers state that Estonian market is limited, the number of potential clients is usually less than a million skilled in Estonian language.

The influencers say that the collaborations are rather contract-based and if they have not enough juridical knowledge to understand properly the content of the contract, they use support from their family (Rannaväli, who started social media work as a teenager) or from an agency (Kurn, represented by a Finnish agency). They do not mention the problems with contracts; they claim that the bigger the company the less problems one can face with contract and payment. They do not mention in interviews problematic experiences with IP, regarding the products they are advertising. Interviews show that IP and contracting are not the main concerns for influencers.

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The interviewed influencers claim that the problems can derive from the "third parties" who re-use their content or refer to it. The relations to (traditional) media seem to be a grey area for the influencers; they raise the question of whether a media enterprise is allowed to refer to their content/ appearance, when they themselves do not search for publicity in (traditional) media.

> *I have experienced that media have used my pictures that I have posted by myself in my Instagram account. Earlier I had a big question is it allowed. Anyway, while everyone get inspired by someone, it is even hard to notice when someone try to steal your idea or your content. (Rannaväli).*

Every interviewee mentioned at least one experience of misuse of their content. Nevertheless, they perceive it as a minor problem. The problem with using their content without permission has been easily solved when an interviewee communicated with the "mis-user" and as a result the content was removed (Hallik, Vaino)

> *If someone likes to share my photos, they usually ask for permission. I know that some other photographers have had surprises when they find their photos somewhere they did not know. I haven't had such experiences (Vaino).*

> *Pictures have been used, in different ways and contexts. For me it is not the problem if the usage is not for profit and not malicious. I have sent messages or wrote a comment to the user and have got quick reactions. (Lind)*

> *Once someone used my text in his/her wall and then I intervened (Adamsoo)*

> *I have experience where a guy created an identical copy of my profile. I have sent a report to the platform, but usually it takes a lot of time they react to the report. In this case it was one of my followers who created an account and a person was not malicious. A person removed the pictures immediately (Rannaväli).*

Interviewed influencers feel themselves detached when someone uses their name or face in a wrong or misleading context; they tell that it can harm their "good name", i.e. their brand. They are building their brand carefully and they are sensible to every intervention outside the social media stream.

> *I have written it in Instagram stories, when someone uses my photo for example in Tinder and I say that it is not me. Then I communicate it more broadly. Even more illegal experience has been – a case when someone scribbled my Instagram name on the Eckeroline's ferry. It shows me in a bad light. (Kurn)*

The interviews show that the knowledge of IPR among interviewed influencers is moderate, it covers the main situations they face in their activity. They know that they have IPR to their photos (Adamsoo, Vaino), to the music created by them (Vaino) and that they need to ask for permission if they use the music by other creators (Vaino, Kurn).

> *The whole content I am creating is copyrighted. Nobody can use it without my permission. I have sold the biggest rights to one TV station when I am producing a TV-series. And beyond social media I have intellectual property rights to the video projects – I sell my rights. (Kurn)*

> *I have copyright to the content I am creating. I can authorize someone who can get right, but I am not usually doing that, because the enterprises in Estonia do not understand it. For example that the produced content can be used with time limits. It is not usually a problem with enterprises from abroad, their awareness is higher (Lind).*

> *I have studied about the IP at school recently. It raised a lot of questions for me. When I was younger, I have never-ever even thought about that. Now I am more aware. But I would like to be even more aware – how much someone and in what context can use my content or refer to it. I know that these rights exist, but it is still pretty blurry for me. Even if we had discussion about that in school, many questions remained*

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open; we did not agree in some aspects even with teachers how to classify some activities and content. (Rannaväli)

The lack of specific IP knowledge can derive from the novelty of the area – there are some grey areas without agreed norms or regulations.

Linguistic, cultural background & competitive landscape

First of all, we analyse the question, does the interviewed influencers see something as limitations to their business models in social media. After that, we introduce the strategies they use to overcome the identified barriers.

Limiting factors

All interviewed influencers use mainly Estonian to express themselves verbally (e.g. if they are commenting on their photos) or to communicate with their followers. Two of them have experiences of using other languages too – Kurn in Finnish due of his residency period in Finland and Lind in English due of her study years in Australia. All interviewees state that the **market in Estonian language is limited**. It limits their number of followers and thus their earning opportunities.

We are such a small market. Colleagues in America can earn from a single post tens, several tens of thousands, but for us here a ten thousand is a roof. Even this has been for single ones. Already 5000 euro is a good maximum. In operating in different platforms one can with two years reach a roof and fell (Hallik).

I think that the smallness of the language space is an obstacle. You are facing a barrier in particular moment, you cannot earn more than is the limit set in the market for collabs. It would be highly extreme to get rich as influencer acting only in Estonia (Adamsoo).

The audience could be broadened in other language social media environments too, but only some of interviewed influencers are considering moving into English-language social media (Vaino). They claim that the main barrier for doing that is the fear to lose their authenticity.

It is much more natural when I am posting in Estonian language. In other languages it would be strange for me and myself. (Adamsoo).

In Estonian I can be real me. (Vaino).

I like to be the best in things I am doing here, to be relevant for people in Estonia. I cannot imagine how to find my place in global English language world. (Rannaväli).

The serious limitation related to the size of market is the **logic of social media** embodied in the logic of algorithms. An interviewee who has experiences from followers in different languages, claims that the low engagement by Estonian-language audiences is in controversy with Instagram logic – when the Estonian followers are less active in commenting and liking, Instagram do not facilitate the influencers content (Lind). An interviewee thinks that lower engagement in social media is a cultural trait – appealing to the stereotype of "cold Nordic people in Estonia":

The feedback from Estonians and international followers differ 100%. Estonians do not talk and express their thoughts in real life and the same is true on Instagram. Estonians don't tell if they like something. But if I posted in Mexico, they reacted and commented my post, they commented each other's comments. It means that the algorithms of Instagram start work for you. The posts will be viral. I think that when Estonians would be more open and comment everywhere, Instagram would look notably different. (Lind)

The Instagram algorithms are extremely important to get engagement by the audiences and it is necessary to use them properly.

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In the meantime, I have got stuck in algorithms. When I am posting less or in wrong time, Instagram doesn't show my next post. Engagement drops automatically. The same is true about collabs – e.g. if the brand I am advertising is not the best one. Then the next photo by me will not be shown to the Instagram users. It is hard to reach the former engagement again. You have to use different tricks consciously to get back the engagement. (Hallik)

The number of followers will not increase so easily currently. If I do not sponsor my content, i.e. I do not pay for my posts like they would be ads – and that is favored by Instagram – then they do not support the organic increase of followers. (Adamsoo)

The interviewed influencers see as a problem that the logic of algorithms changes constantly and thus prohibits to build up a concrete and long-term strategy (Vaino, Lind).

Operating strategies in limited market

To overcome the obstacles of social media market in Estonia, the interviewed influencers use different strategies: appearance in different platforms, cross-platform posting and advertising, and acting outside of social media. The appearance in different social media environments was visible already when we introduced the characteristics of interviewed influencers (see table 3). Many interviewees started with a blog or YouTube channel, or were moving from another social media platform to Instagram. They adapt to new popular platforms and move from platform to platform where they find the most followers.

Instagram and TikTok are hard competitors. I am not using TikTok officially [meaning that she hasn't an account with her influencer-name]. I do not post as a content creator in TikTok, but I am following it every day. I cannot understand yet what is attracting people on TikTok. (Rannaväli).

Cross-platform posting and advertising strategy is based on the interconnections between their accounts in different platforms. They advertise their new Instagram posts on Facebook or link their YouTube videos to Instagram posts.

You cannot use one channel only. I have started to make vlogs, sketches and parody. Mainly on YouTube and on Instagram, and additionally a bit of TikTok too. People liked it and now I have made it for several years. Then I moved to the short films. These worked again. Currently I am even doing video projects for the firms. Social media has been a springboard to the future; it helped to open so many doors. (Kurn).

I had 1,5 years rather low numbers on Instagram. Then I was invited in a radio show and it was a breakthrough. It was seen in a number of followers too, on both – Facebook and Instagram. After that I have got more and more invitations as a guest in radio or in a TV shows about nature, hiking and healthy lifestyles. (Vaino)

The activity on social media can be seen supported by offline-activities. Thanks to their social media reputation, influencers get offers by other media or for other cultural activities, e.g. to participate in TV shows, in castings and for other events. The limits of social media are compensated by other opportunities.

I have done almost everything possible. I have participated in TV show, gave voice to the animation as the main figure, had a radio show. Thanks to the social media I have had an opportunity to try a lot of different things. I have nothing to do in Estonia anymore. (Hallik).

I would like to break out from Estonia. I am not sure how much it can be done with Instagram, probably the main platform will be YouTube and videos produced for it. I try to attract people from other countries with presenting the Estonian nature. (Vaino)

In a limited linguistic context, a social media platform can be seen as *"a springboard to the future"*, like an interviewee said, *"it helped to open so many doors"* (Kurn).

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I think that in the next moment I will not be active on Instagram anymore – since I am leaving to the work in therapy. I am not sure is it comfortable to be a therapist and a public person on Instagram at the same time. My clients find it probably inconvenient. I do not know about me yet. (Adamsoo)

I am producing currently content I like. But I will move on with other things as well. I cannot see my future as a social media content creator. I am already filming and assembling, performing, writing, and producing. I have produced a youth series in the end of 2019 and this got nice attention. (Kurn).

A significant aspect about their self-awareness and identity is the concept of "content producer" they use instead of "influencer" when talking about their activities. It indicates that their area of activities is broader than social media only.

The interviewed influencers make use from their popularity in social media and get offers and contracts by traditional media, especially by the TV in Estonia, where new faces are constantly searched. And vice versa – if influencers are already doing something outside social media, social media is a good advertising platform to get attention to their offline activities. Thus, the strongest basis for the business model for Estonian influencers lays on the fame from social media that will be converted into the beneficial contracts in other sectors of culture industry.

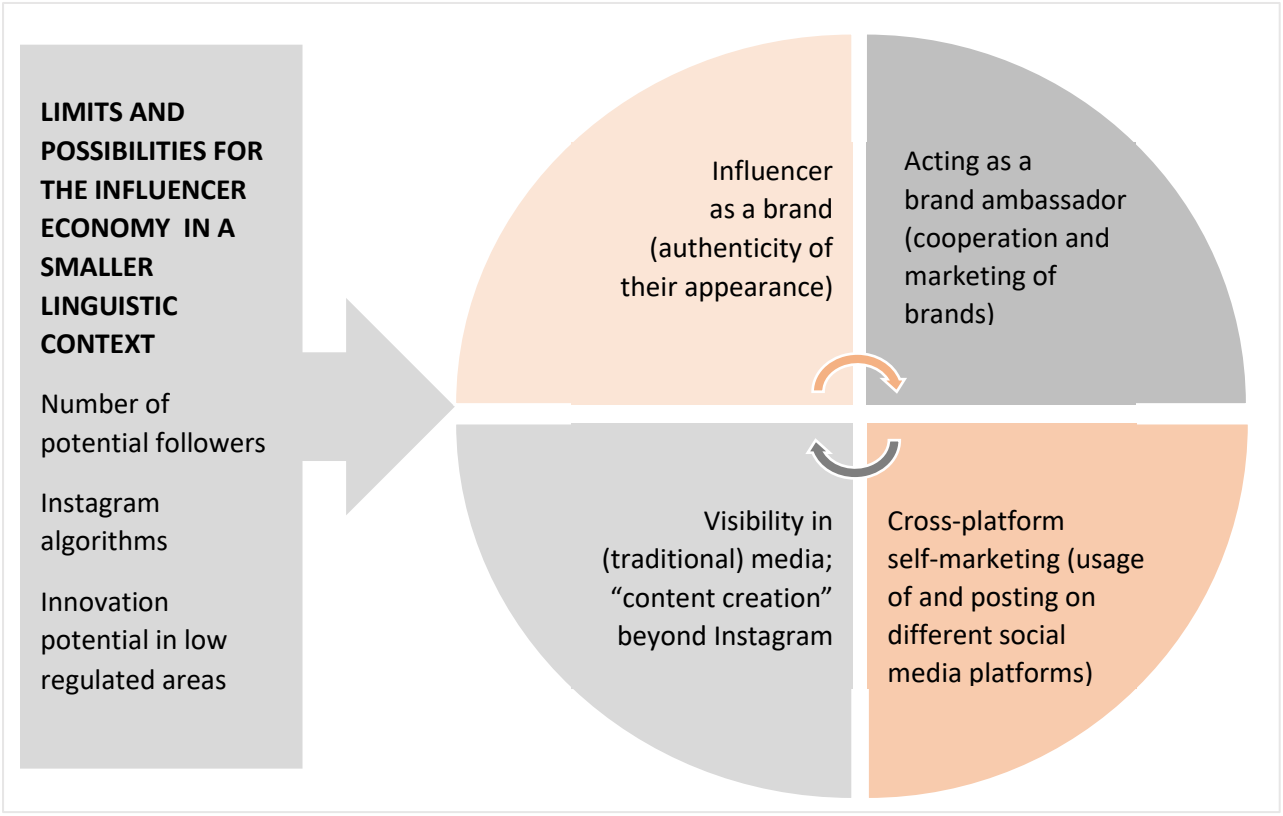

Figure 6. Business model of Instagram influencers operating in limited linguistic context. Author: Ragne Kõuts-Klemm

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2.3. Key takeaways and policy implications

Policy recommendation: The business model on social media in smaller linguistic and cultural contexts is a lab for testing new things, i.e. source for innovation. On the one hand, the regulation shouldn't intervene in the innovation. On the other hand, the situation needs to be constantly monitored. The asymmetries between platforms as more powerful agents who can make rules will not hinder the operation of less powerful agents, i.e. social media influencers.

The core value for the influencers is authenticity. This derives from three sources: influencers as unique personalities, specific topics they are concentrating on (e.g. travelling, nature, fashion), and their belonging to the smaller linguistic community. The IPR issues are only moderately actualized for the influencers. They do not perceive that the authenticity can be seriously threatened and needs to be protected.

Policy recommendation: The diversity of social media platforms allows users to develop their specific operating strategies that are cross-media strategies, where the influencers combine operating in different platforms with offline cultural and creative work. Thus, the regulations need support and guarantee competition between social media platform providers and avoid monopoly**.**

Influencers from smaller linguistic communities operate in particular niches in the global social media market. Their content is attractive for the followers from the same linguistic community. Influencers from Estonia perceive the limits of the market (in Estonia for an influencer up to 60 000 followers is reachable, thus their incomes are limited too); growth opportunities are perceived as unrealistic.

Social media influencers acting in a limited linguistic or cultural context use the platform to get to some extent famous, to make things they love and to earn some income, but after that move to other platforms or self-fulfilment activities. Social media will be seen as a specific period in dynamic individual lives.

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3. Circular economy: Circular fashion SMEs

3.1. Contextual background: Problem statement

The core economic model is linear, only 8.6% of the economy is circular (Circularity Gap Report, 2021), thus we can claim how circular business model is still at the emerging stages. Circular model is the business model that moves away from "take, make, waste" approach in favour of keeping products and materials "within productive use for as long as possible, and when they reach end of use, they are effectively cycled (or looped) back into the system" (Lacy, *et al.*, 2020, p. 5). In other words, circular fashion "aims to minimize waste and keep materials within the production and consumption loop as long as possible" (Jacometti, 2019, p. 5).

In this case study, we will look closer into one of the most waste intense sectors – textile and fashion industry. EU textile and clothing industry scales up to 162 billion euro in turnover, comprises of around 160 000 enterprises, and employs 1 500 000 employees (EURATEX, 2021). Close to 100 million tons of clothing become waste every year (Dory, 2018), and less than 1% is recycled at the end-of-use (Ellen MacArthur Foundation, 2017). Studies reveal how also the consumers' interest towards recycling and sustainable solutions has increased (Vehmas, *et al.*, 2018). That said, there is also a demand for circular fashion solutions (Blum, 2021).

There are four main different circular business models (see Figure 7): repair, remake, resale, and rental.

Figure 7. Four circular business models. Source: Ellen MacArthur Foundation, 2021, p. 14.

Although in reality the four business models should be taken as a combination to unleash their full power (Lacy, *et al.*, 2020), the current case study will focus on the production side of the business model – the remake model, with a focus on upcycling (using existing materials to make a product that is of higher quality than the original - Figure 8).

Today, there are numerous bottlenecks that hinder the wide-scale adoption of circular fashion production, e.g. organizational inertia, as new business model has poor fit with the circular economy logic (Kant Hvass & Pedersen, 2019; Pedersen, *et al.*, 2019); technological un-readiness in terms of lack of technology for separating blends or recycling (Sandvik & Stubbs, 2019); the ineffectiveness of the reverse supply chain as

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there is lack of information on stock availability and quality, but also size of used textiles (Henninger, *et al*., 2019; Paras, *et al*., 2019; Pedersen, *et al*., 2019), and finally, IPR related challenges as reusing existing materials may clash with IPR of the original creator of the materials and spread of fashion piracy (Härkönen, 2020). This case study initially sought to build on the latter aspect – the right to reuse and what kind of IPR challenges do SMEs from circular fashion face here. According to Peduti (2021), "the legal world does not have much knowledge about the practice and how to regulate" upcycling. Furthermore, to what extent should it be regulated at all so that overregulation would not harness the overall move towards the circular business models in sustainable fashion. Just to name a few examples of how IPR might be violated in case of upcycling (Peduti, 2021):

- *Trademark violation* by using a part of the fabric or a button that has a registered trademark – selling it with its own trademark.
- *Unfair competition* by modifying the product or material with a trademark, consumer may be confused about the quality and characteristics of the products.
- *Unjust enrichment* by getting undeserved credit and enrichment by the usage of trademarked material or products (enrichment thanks to the investment that was done by the original trademark owner) in upcycled new product.
- *Tarnishment*, when upcycled product might dilute the reputation of the original trademark.

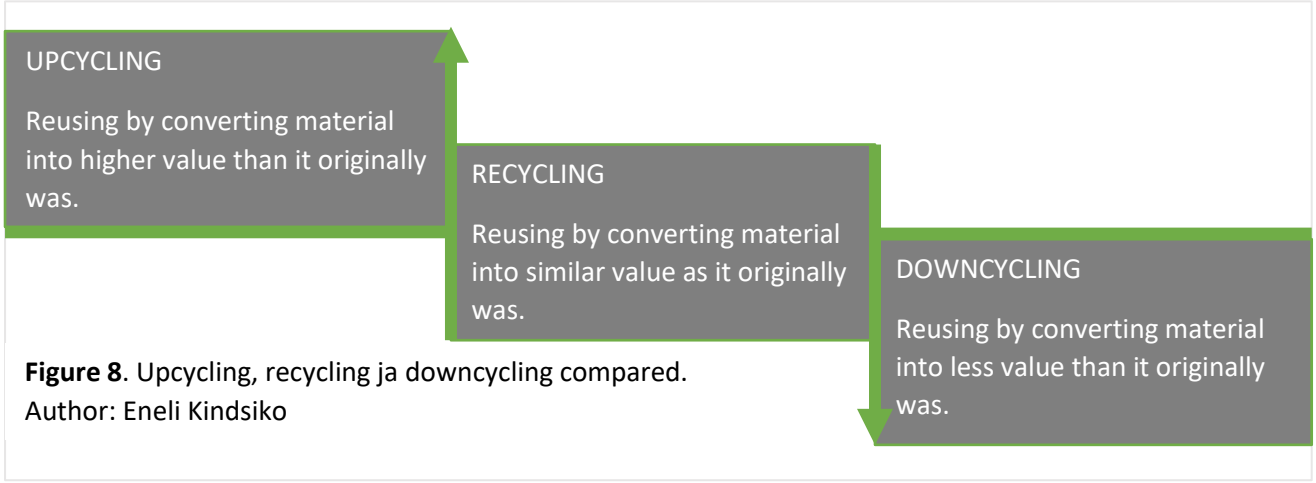

Figure 8. Upcycling, recycling ja downcycling compared.
Author: Eneli Kindsiko

Our case study will focus on upcycling textile waste because of the EU Waste Directive that urges member states to "encourage the re-use of products and the setting up of systems promoting repair and re-use activities", including textiles (EC, 2018). Furthermore, the EU adopted a circular economy package that states how all member states should collect textile waste separately from other waste by January 1, 2025. How, and even more importantly, what will be done with all the textile waste, has been left unanswered. Each European country has to respond to the EU Waste Directive, yet many are far from being ready for it.

Today, 99,8% of the EU textile sector is composed of SMEs, incl. 88,8% being micro sized companies with 0-9 employees, and only 11% medium sized companies, employing 10-249 employees (EURATEX, 2020). That said, the potential of circular fashion is clearly led by small companies. Markedly, circular fashion SMEs are crucial in leading the sustainability aspect within the creative industry sector. Moreover, these European circular fashion SMEs come from vastly rich linguistic and cultural backgrounds, yet competing at the single

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digital European market side by side with global fashion companies. Current case studies will examine the case of two of such micro-sized circular fashion companies.

Considering previously mentioned points, the upcycling case study will be based on the following research questions:

RQ1: What is the role of digitalisation and IPR in shaping the competitive landscape of circular fashion SMEs in upcycling business model?

RQ2: Considering that the majority of circular fashion companies are SMEs, how the linguistic and cultural background might influence their competitiveness?

Research process: Data and methods

We interviewed two of the founders of Estonian upcycling SMEs. Sirli Ratasepp, the Head of Design and co-founder of KIRA, and Kristi Toiger, the founder of New Rustic. Interview data is supplemented by media articles, and photos capturing the circular production process.

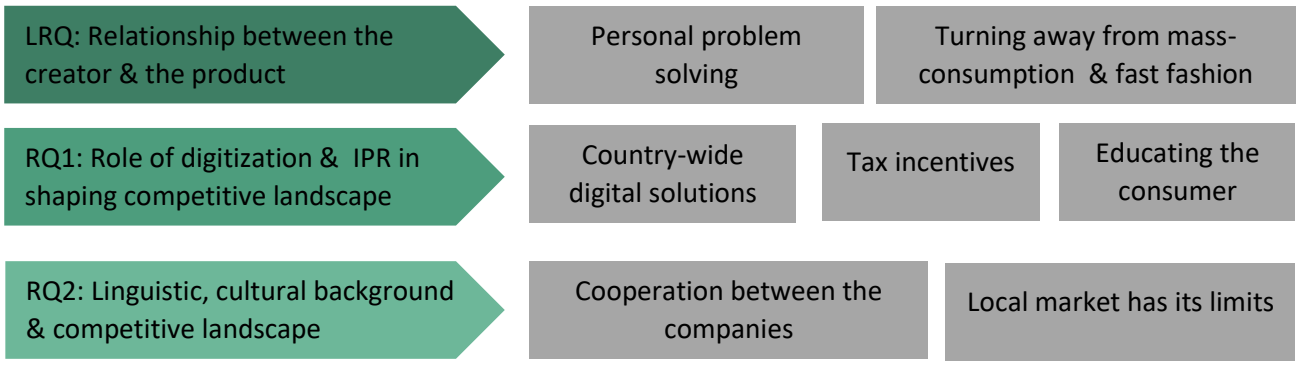

Figure 9. The structure of case studies: KIRA & New Rustic. Author: Eneli Kindsiko

3.2. Case study: New Rustic

In terms of environmental impact, textile production accounts for 10% of the world's carbon emissions, and is the second most polluting sector in the world (Conca, 2015). As the textile industry is a global industry, so is the textile waste a global problem (EEA, 2021). Each year, the average European citizen generates around 11 kg of textile waste (EEA, 2021). According to the European Environmental Agency,

> "each year EU households purchase over 2.6 million tonnes (6 kg per capita) of coats, jackets, suits, shirts and trousers, which are often discarded before the end of their technical lifespan (e.g. because of fashion trends, the desire for new clothes or a lack of repair skills)." (EEA, 2021, p. 34)

Average lifespan of a garment falls between 2-6 years (Cooper, *et al.,* 2014; Gwozdz, *et al.,* 2017), yet due to fashion trends, people tend to dispose clothes already before the end of their natural life. The European Union obliges all its member states to collect its textile waste separately by 2025 (EC, 2018), which could possibly enhance the growth of various circular fashion SMEs that give new value to the collected textile waste, e.g. upcycling companies like New Rustic.

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New Rustic (https://www.newrustic.ee/en) is an Estonian upcycling company founded in 2014 by a female entrepreneur Kristi Toiger. The company creates totes and backpacks: the material for the bags is woven from leftover textile, and the leather details (e.g. bag handles) are made from leather leftovers from furniture industry.

Relationship between the creator & the product: turning away from the fast fashion

Why does one start a business, and furthermore, start a circular business model? Having an education in design and work experience in retail, the founder of New Rustic wanted to switch from the linear to the circular economic model:

> *I knew that I do not want to create new materials, because having a background in retail I know what it means when you get delivered a series of defected blouses. You send them back to the company that sold them. They send it back to the company who produced them. And then what happens to the blouses? Where will the producer put them? That's the waste piles you see in National Geographic, right. (Kristi Toiger, founder of New Rustic)*

What seems to be also important is the timing. Estonia has a rather generous maternity/parental benefit system where women have the right to receive up to around 1,5 years of paid maternity leave and parental benefit equalling to the earnings before pregnancy (RESIB, 2022). For the founder of New Rustic it was the maternity leave that gave the needed nudge:

> *In Estonia, we have very good parental benefit system, which gave me a feeling that I will try, now or never! I do have this 1,5 years as a guarantee that I can test whether it works*. (Kristi Toiger, founder of New Rustic)

Figure 10. Upcycled bags. Author: New Rustic.

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Role of digitalisation & IPR in shaping competitive landscape: need for digital solutions and tax incentives

Upcycling companies take reuse by converting material into higher value than it originally was. New Rustic makes use of various textile and leather waste from other companies. In that sense, upcycling companies help to solve the textile waste problem:

> *When a factory receives an order for a let`s say 30 hotel armchairs, they need to stock the material with a backup, as to guarantee that all the chairs will be exactly in the same green colour. They need the backup as also the leather may have scars or holes in it, leather they can not use. We can but these leftovers from different factories or sometimes they just say that please take it, it has been standing here for years. (Kristi Toiger, founder of New Rustic)*

The challenge lies in the fact that there is no universal system for mapping who has what leftovers and how much, and linking this information with companies who might be interested in these leftovers. So far, small upcycling companies work through personal contacts:

> *It has been through personal contacts. I have called and asked do you happen to have [textile leftovers] and under what terms would you be willing to give them away?* (*Kristi Toiger, founder of New Rustic)*

Yet, this custom-made connection is not sustainable: *„It is very much dependent on specific people. When that person changes his/her job, I will lose that contact." (Kristi Toiger, founder of New Rustic)*

That said, **the need for country-wide digitalised solutions** that map the textile waste and connect various parties interested in giving away or receiving the leftovers would not only help to fuel new circular business models, but also help to lessen the challenges that might emerge in countries from the Waste Directive as of January 2025 (EC, 2018). So far, these circular business model SMEs lack resources to build such digital platforms, most connection is done by case by case, based on personal contacts. Also, the system of textile waste collection tends to be less accessible for rural areas (Kivisoo, 2020). For the companies, taking textile waste into recycling places is more expensive than taking the waste into the use again (Kivisoo, 2020). Even more useful would be to build up a well functioning textile waste ecosystem, where waste is taken by companies that use it for upcycling.

Another thing that greatly affects the ability for the circular business model and slow fashion SMEs to be competitive is **the lack of tax incentives** for companies that have small environmental footprint. A study mapping a state of textile waste in Estonia has shown how Estonia is in severe need for subsidiaries and tax incentives for companies that seek to solve the textile waste challenge (Kivisoo, 2020). This is strongly confirmed also by the founder of New Rustic: *"Taxes are harsh. You manage with small turnover, and still, huge part of it is taken away just by taxes." (Kristi Toiger, founder of New Rustic)*

During the interview it appeared how it is not IPR that is the most acute challenge (as input material is cut into narrow ribbons for weaving the bag base material), but instead the poor usage of digitalisation for building up the circular economy ecosystem.

Linguistic, cultural background & competitive landscape: Uniqueness sells, but local market has its limits

In case of New Rustic, the production of the woven material out from textile leftovers takes place in Karksi-Nuia, a small town near Latvian border and with a population of only around 1 500 inhabitants. As the founder was born and raised in that small town, she saw an opportunity to work with the community in establishing this upcycling company: „*I have always had a wish to engage the community into this process*" *(Kristi Toiger,*

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founder of New Rustic). The elderly (both female and men) are engaged in the production of the materials of the bags - woven on looms.

Figure 11. Elderly woman weaving bag material from textile leftovers. Author: New Rustic.

As vividly described by the founder of New Rustic, the weaving of material follows the annual lifecycles of these people, and keeps them occupied during the winter times:

> *The production takes place so that during the winter months they weave the material, because when the spring comes, they disappear to work in their gardens. Why they do it? What does it give to them? I have asked this question from them and the answer is typically that they need a reason to get out from the home. They have something to do and they earn a little extra to their pension. Yet there is also a great moment when they look up from the internet how beautiful bags are made out from their woven material. Time-after time they also get a call to give an interview to the local newspaper. This is what they feel happy about. /…/ If you think, they are 70+ aged people and they come from different backgrounds. When they see how this bag was shopped to U.S, second one to Japan, it is mind blowing for them. (Kristi Toiger, founder of New Rustic)*

Figure 12. The upcycling process of New Rustic: textile leftovers woven into higher value material. Author: New Rustic

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It is **uniqueness** that sells in case of upcycling companies, and this also entails linguistic and cultural background. The products these companies make are never meant to be mass-produced, each one is different, often handmade and unique: *„I feel that it matters to people – the fact that the bag has been made in Estonia and the fact that it has been produced in an environmentally friendly way.“ (Kristi Toiger, founder of New Rustic).*

It is even woven into the circular business model that *“you work with the existing material/…/ And just look what you can make out of this./…/It has never been a thought of mine to start mass-produce!” (Kristi Toiger, founder of New Rustic).*

The core idea behind circular business model is not to stockpile huge quantities of products, but to upcycle mostly by demand: *“You will not own a storage, because this business model is built on the idea not to produce to the warehouse.” (Kristi Toiger, founder of New Rustic)* What is also a core of upcycling companies is that they build the product to last for as long as possible as to minimize the impact on the environment:

> *My message is always the following: when you buy this bag, please think carefully what tone fits you the best, because these bags last for long. (Kristi Toiger, founder of New Rustic).*

Considering the long lasting of these product, **the smallness of local market** may be a challenge. Slow fashion, compared to fast fashion is focused on quality and environmentally friendly production, which also makes the end product more costly. The core mission is to buy less, and use less. Studies reveal how age and income are the main factors that determine the typical client of slow fashion – income will directly impact the choices people make about the quality and price of the product (Randmäe, 2019). That said, to succeed and compete with big fast fashion companies at the small home market, one needs to have enough inhabitants that have a certain income level. As expressed by the founder of New Rustic: *“Currently I am thinking where to go. At least to try, because Estonian market is nice, but still, very limited.” (Kristi Toiger, founder of New Rustic).*

Lastly, it is interesting to note what has been the impact from Covid-19 years to these small upcycling companies. On the example of New Rustic, we may say how the regular customers kept them alive:

> *My clients did not disappear. Perhaps they felt how they want to support such a tiny company. This was also shared by some people I know and also run a small business – clients turned their eye even more on Estonian made products. (Kristi Toiger, founder of New Rustic)*

3.3. Case study: KIRA

In the footwear industry, we witness the overproduction of poor-quality shoes: many get never worn at all, most worn less than a year, and footwear end up in a landfill to decompose for decades. 79% of UK women have reported to own shoes in the wardrobe which they had never worn, 91% admit buying shoes on impulse, and on average women have 24 pairs of shoes, trainers and boots at home (Fletcher, 2017). Over 300 million shoes get thrown away every year, the average life of a shoe is around 8-12 months (SoleScience, 2020), yet quality shoes with proper care and repair could last for years or even a lifetime. Majority of footwear ends up in landfill, where it may take anywhere from 25-40 years to decompose (Waste Away Group, 2019). To sum it all, we are running out of time to solve our footwear problem (Concept 21, n.d.).

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Founded in 2019 by Estonians, **KIRA** (https://kirasustainable.com/) is a small Estonian company that focuses on upcycling, primarily on footwear. Their slogan "leave no trace" captures the mission behind their business model – to produce from recycled materials without leaving a trace on the environment. As shared by the co-founder, it is the respect toward the nature, but also towards the creator that is the core behind KIRA:

> *90 percent [of footwear] are made in Asia. Average life of footwear is 8 to12 months. As I have experience in sewing, I have made things with my hands, I know how much time and energy it takes to make a small thing. That said, I feel it is wrong how we do not respect the work of these people [who make footwear] – I just take ad throw away, take and throw away. It is sad! (Sirli Ratasepp, co-founder of KIRA)*

Figure 13. Upcycled activewear. Author: KIRA.

Relationship between the creator & the product: personal problem solving

The urge to take up upcycling emerged from personal problem solving and overall disgust towards mass-consumption. A reflection from the founder of KIRA, Sirli Ratasepp:

> *When I lived in the UK, over-consumption happened everywhere around me - buying low-quality stuff and disposing of it soon after was a harsh reality. I grew up in the countryside, caring about the environment and it was painful to witness over-consumption already back then while living in the big city. I realised myself that I don't want to buy new boots every autumn anymore because I had wet feet during the winter as the base of the shoe wore out in a couple of months. I didn't want to buy flip flops every summer holiday and dispose of them after the trip as they just fell apart. I didn't want to be the one who is also contributing to over-consumption and therefore to the climate crisis. (Limitless, n.d.)*

Figure 14. Upcycled boots. Author: KIRA.

Role of digitalisation & IPR in shaping competitive landscape: cooperation between the companies

Digitalisation during the planning process. Upcycling fashion companies compete with linear business model and better resourced larger companies, who are able to offer much cheaper prices. That said, they clearly need to differentiate themselves at the market and find ways to save costs. From one side, the key is in offering long-lasting and quality products (cost saving over time), on the other side, they save cost by integrating digitalisation into the circular business model. For example, it is natural to the circular business model company to be producing on demand. KIRA is encouraging customers to pre-order via their website, by offering a discount to those who choose to do it.

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In reality, pre-order is a rational thing to be offered. The fact that we do stockpile in warehouse. We produce exactly those sizes that people need. (Sirli Ratasepp, co-founder of KIRA)

All the production is local, based in Estonia. A great challenge is to find environmentally friendly and sustainable materials. Compared to the average footwear, the quality standards are much higher, so the material has not only to be eco-certified, but also locate close-by to leave as small environmental footprint as possible. As explained by the founder of Kira,

"all the materials we use are eco-certified and we are sourcing them as close as possible to our production so that the CO2 emissions we cause due to logistics would be minimal" (Limitless, n.d.).

As explained by the founder, it is often so that sometimes the labels promise to be eco-friendly, yet in reality it is not valid. Then again, when you do find something gentle towards the nature, it is not very durable or comfortable. Thus, "*The composition of input material is a great puzzle*." Here, digitalisation of textile waste could be highly useful - spread of knowledge of the quality of leftovers (composition of the material) are there, how much and where. Also, having a well-working country wide textile waste overview would also help to increase the competitiveness of such small circular fashion businesses it would be easier for them to acquire input materials.

Figure 15. Overview of production process of KIRA: tires turned into sneakers and boots. Source: KIRA, 2021. Note: click on the picture on the right to see the video.

Digitalisation at the end of life. Quality upcycled products last very long, but they would last even longer with care and repair. The notion of repair is woven into the circular business model, yet the message to the customer needs to have a louder voice. **Educating the customer** on the repair options would prolong the life of quality footwear.

"There will be more brands like KIRA and at some point big brands will start moving towards sustainability not only with marketing slogans but with real deeds. For this however, the customers must change first and paint a very clear picture for the industry with their consumption decisions and show that fast fashion is from the past." (Limitless, n.d.)

Digitalisation could help to enhance and integrate the repair mindset into the business model of upcycling companies. By creating a repair ecosystem around manufacturers, e.g. a digital platform that shows the closest repair shop for your footwear.

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Also, educating the customer is something that is much needed not only from the companies, but also from policy makers preparing circular economy policies. Much more attention ought to be put in fostering much stronger discourse on repair, and this should also translate into various support measures offered to creative economy circular business companies. As shared by the co-founder of KIRA, it is almost impossible to gain financial support for marketing and communication activities, e.g. about the usefulness of repair options. Yet, these marketing and communication activities would educate and nudge clients to adopt the repair mindset:

> *We can develop great repair system with KIRA, but when we are not backed by a communication and the repair mindset is not well spread, our activities have small impact. /…/ Just to let people know how much they would save the resources when they repair their footwear, instead of just buying a new one. (Sirli Ratasepp, co-founder of KIRA)*

Figure 16. Eco-certified & military level durability. Author: KIRA.

KIRA is encouraging clients to send back their used KIRA shoes to the manufacturer, when they need repairing, but also, when the footwear has reached the end of their life. KIRA will reuse as much as possible from returned footwear, and the leftover is recycled in an environmental manner.

A need for a change in mentality about repairing one`s clothes and footwear is clearly signposted also by previous studies (e.g. EEA, 2021). The textile waste problem will not solve until the communication manages to break the paradigm how clothes are treated as 'disposable' goods (Remy, *et al*., 2016). As fast fashion companies, following a linear business model, are able to offer even between 12- 24 new clothing collections each year (Remy, *et al*., 2016), the consumer is accustomed to buying a new clothing item instead of repairing the old one. To make an impact, the repair message has to compete with the dominating discourse on seasonal fashion trends that urge consumers to dispose and expect fast turnover from fashion companies (Fletcher, 2014).

The question of IPR in case of KIRA is twofold. From one side, KIRA has several patented eco-friendly materials developed solely for KIRA footwear. From the other side, as KIRA is still a very young company (started in 2019), they have not experienced the violation of IPR at the market (albeit they know well it may happen as it has happened to others). As well explained by the co-founder, one may seek to replicate, but it is very hard to replicate the products with the same level of quality. It is the quality and the promise of long-lasting footwear that creates the value for the customer.

Linguistic, cultural background & competitive landscape

As well expressed by previous studies, SMEs from creative industries have often great synergies across sectors (Betzler & Leuschen, 2020; Deloitte, 2021). The shoes designed under KIRA brand are produced in a factory that has a long experience in high-quality military boots. As explained by the founder of KIRA, they make use of tyres for producing footwear:

> *“There are billions of tyres which end up in the landfill every year. We, for example, are using those tyres to produce the base of our shoes as every recycled tyre saves 0.5kg of CO2 and is a great material for a long lasting shoe base.” (Limitless, n.d.)*

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Figure 17. The upcycling process of KIRA: synergy with a factory producing military boots. Author: KIRA

Estonia is a small country with only about 1.3 mln inhabitants. With this in mind, also the connections between the companies may be quicker. Circular fashion companies, who usually are too small to be considered as a viable partner to the larger factories, can have a voice in a small country. KIRA is a micro-company, cooperating with Samelin, an Estonian company with a tradition of long-term footwear production (https://www.samelin.ee/en/company/). Samelin has close to 100 employees. We see here a great learning point – as circular fashion micro-companies lack resources especially during the initial years, by **cooperation** they gain from their technology and decades long knowhow on how to produce quality footwear. Yet, due to the differences in business model (linear vs circular) and the size of production, these companies are not in direct competition with each other.

3.4. Key takeaways and policy implications

Policy recommendation: Tax incentives and subsidiaries

To make a product via circular business model, especially during the initial years of business is very costly (finding materials, etc.), yet existing tax systems do not differentiate this. Upcycling companies help to solve the textile waste problem, yet they pay the same share of taxes as the companies who produce this waste.

Policy recommendation: Accelerating digital ecosystem

Due to the waste directive, European countries will face in nearby years a sharp increase in separately collected textile waste. As a material, it has a great potential to be taken into a use again, yet there is a need for a country-wide digital ecosystem that creates an overview of textile waste within the country, allowing interested companies to acquire this material for circular production.

Policy recommendation: Educating the consumer on repairing options

Both previous studies and the current study have stressed how there is a need to educate the customers to adopt a repair mindset. Instead of throwing away old things and substitute them with new ones, people need to be knowledgeable about the usefulness of repair, and also the availability of repair options near them. Often various financial support mechanisms do not allocate funds for communication and marketing activities, yet in case of circular fashion, communication is as vital as the product itself.

Policy recommendation: Fostering cooperation between the companies to share the resources

One way to solve the lack of various resources in case of circular fashion companies is to foster cooperation between the older and more experienced and new companies – e.g. mixing the knowhow and resources of older and bigger companies with the new ideas from the novel and micro-sized companies. In our case study, circular business model company cooperated with linear business mode company, both working in the same sector.

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4. Maker economy: CAD sharing platforms

4.1. Contextual background: Problem statement

In 2015, several members of Thingiverse, a 3D print files sharing platform, raised a concern about an eBay seller, who used their design files and sold 3D printed objects out of these files. IPR of the creators were disregarded. When the members contacted the seller, this is the response they received (Loubie, 2016):

> "When you uploaded your items onto Thingiverse for mass distribution, you lost all rights to them whatsoever. They entered what is known in the legal world as "public domain". The single exception to public domain rules are "original works of art". No court in the USA has yet ruled a CAD model an original work or art. Therefore, you have no right to exclude others from utilizing the CAD models you have uploaded. Furthermore, if in the future we do get a precedent in the USA for establishing CAD models as "original works of art", we would still likely be just fine as we are not re-selling your CAD models, but rather "transformative" adaptations of them in the form of 3D printed objects.
>
> P.S. When you created these CAD files, did you really want to limit the amount of people who could enjoy them to the 0.01% of the USA with a 3D Printer? 100% of America can purchase the items from us at a reasonable cost and enjoy them-creating made in the USA jobs in the process as well."

Sharing economy platforms play an important role in fostering innovation, yet the example illustrated above is not an exception. These kinds of debates around intellectual property rights are often unnoticed, because they are settled (or given up as the case seems hopeless) between the parties themselves. Cases like the above emerge when a creator accidentally stumbles on his or her design being used for commercial purposes.

3D printing is radically changing the traditional slow manufacturing process, "as a digital model is fed into the printer, the machine can produce any feasible product without having to first create a costly production-grade mold or tool" (Ben-Ner & Siemsen, 2017). Thus, "3D printing enables the economic production of small batches, or even single customized units" (Garmulewicz, *et al*., 2018). 3D printing usually uses CAD files – digital file format of an object producing physical objects through a layer-upon-layer process. The creation of such files requires specific knowledge and expertise – a specific intellectual effort. For the CAD makers, having a possibility to see how other makers around the world have made their designs and allowing them to download files freely from platforms, not only enhances the spread of innovative ideas, but also shortens the time it takes to develop a CAD.

Lawyers debate whether, in a context where technologies develop and are adopted at an ever faster speed, the law is able to meet the challenge thanks to its open texture or needs to be re-thought and re-written to respond to the new phenomena (Mendis, *et al.,* 2017). As explained by Craig (2017), "the rise of disruptive technologies poses particular challenges for copyright law", especially in the case of platforms that share CAD files globally, and often without any compensation to the creator. Platforms like GrabCAD and Thingiverse, "act as CAD file repositories, permitting internet users to access, download, modify, redistribute, and ultimately print out the physical objects digitally represented in the CAD" (Ballardini, *et al.,* 2016).

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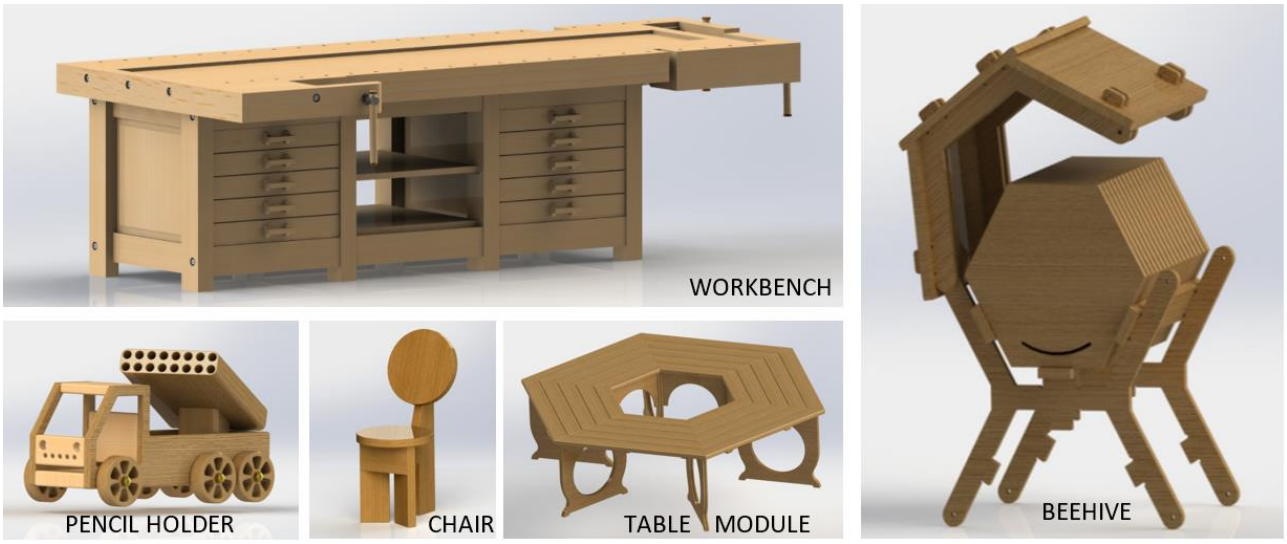

Figure 18. Examples of a CAD file artwork. Author: GrabCAD user Renno Lainevool.

The problem of unauthorized copying has been well known in the music industry, and has required recent attention also in the complex case of 3D printing where one needs to address not only copying but also the production of physical objects that did not exist before (Craig, 2017). As 3D printing provides opportunities for designing, sharing, and producing physical objects across markets, some even think that as a result "intellectual property law will be brought to its knees" (Lipson & Kurman, 2013). Relevant for this discussion, Osborne and Holbrook draw our attention to the fact that the difficulty in distinguishing between a CAD file and the item produced as a result of having the CAD file might be legally significant:

> "The simplicity of converting a CAD file to the actual object should lead us to ask whether someone selling or offering to sell the CAD file has effectively sold the item itself. Given that the line between the intangible CAD file and the tangible item now is so thin, one could easily argue that the sale of the file should be effectively an infringing sale of the item itself. The interest in the purchaser is not the CAD file itself, but instead in the item to be produced by the CAD file." (Osborn & Holbrook, 2015, p. 1356)

Considering all of the above, we can formulate the problem through our lead research question for the current case: *how does the awareness of IPR change depending on the relationship between the CAD creator and the CAD when the CAD is uploaded to the CAD sharing platforms?*

4.2. Case study: CAD makers

Although CAD sharing platforms are mushrooming, we will investigate users of the two biggest platforms: GrabCAD (founded in 2009), and Thingiverse (founded in 2008). Both have millions of users and CAD files uploaded to their platforms, but they also share two very important commonalities. First, users can share and download the CAD files for free, mostly under a Creative Commons license. Figure 19 illustrates the visual appearance of these CAD repositories.

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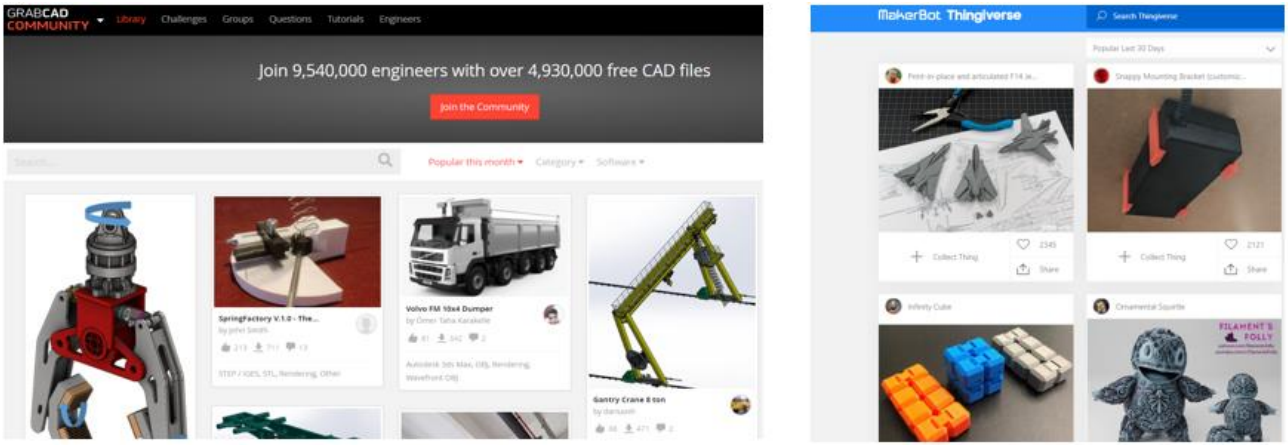

Figure 19. Snapshots of GrabCad and Thingiverse CAD galleries. Source: GrabCad (https://grabcad.com/library) and Thingiverse (https://www.thingiverse.com).

Second, these platforms can operate in such a free mode because they both belong to the largest 3D printer manufacturing companies in the world – Stratasys, Ltd. These free CAD file-sharing platforms are part of a 3D printing ecosystem, where the users foster the creation of positive externalities to the 3D printer manufacturer. As well expressed by Hein *et al*. (2020), platform ownership is tightly connected to the distribution of power in the ecosystem, one that can be centralized or decentralized.

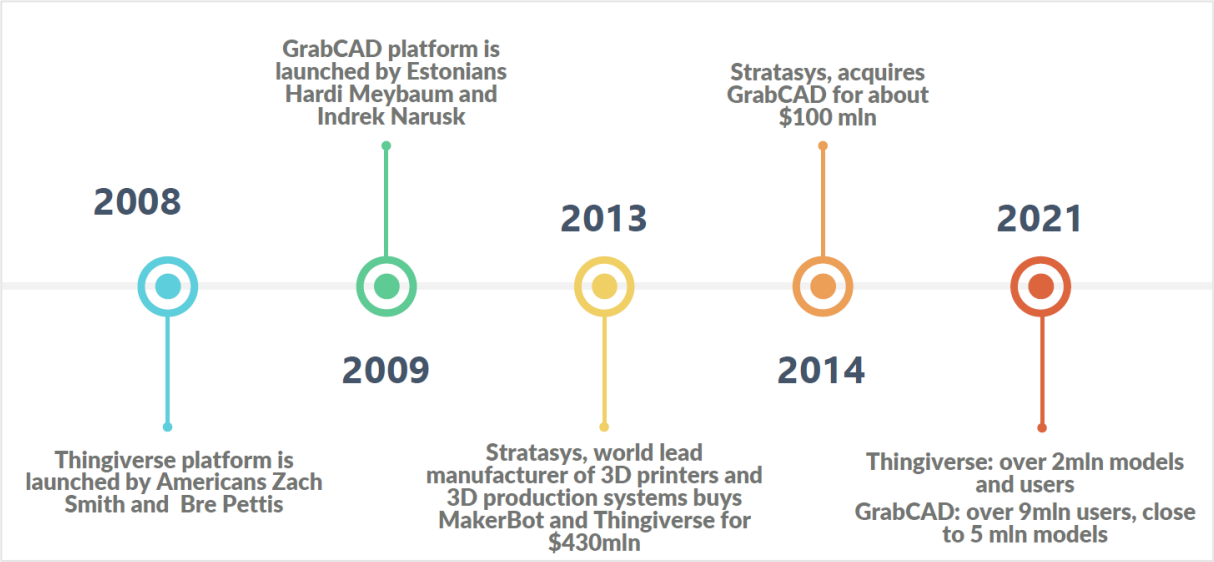

Figure 20. The milestones of Thingiverse and GrabCAD. Source: GrabCAD and Thingiverse websites.

GrabCAD and Thingiverse were both SMEs that scaled very fast due to digitalisation. That said, the case below reveals the scaling effects of digitalisation that lies behind the maker economy.

Research process: Data and methods

The current study builds on 19 interviews from 14 different countries (Estonia, Turkey, U.S, India, Iran, Latvia, Denmark, Australia, Canada, Ukraine, Cyprus, Romania, Germany, and Austria), and an analysis of over 200 user profiles to find the interview informants. The primary focus of our data collection is on interviews with CAD makers as they are the core of such CAD sharing communities. We focused on CAD makers who have

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published CADs themselves on the platforms and had been users of Thingiverse or GrabCAD for a longer time. The interview data comprises 397 minutes of audio data from oral interviews and 30 pages of text from email interviews. As we worked through over 200 user profiles to find informants, we also added extracts from some of the profiles to confirm the patterns found from the interviews.

The current case study will be structured around three emerging themes from the interviews: types of users by their objectives, role of IP in case of CAD sharing platforms (the competitive landscape), and strategies of how users have combated IP violations (see Figure 21).

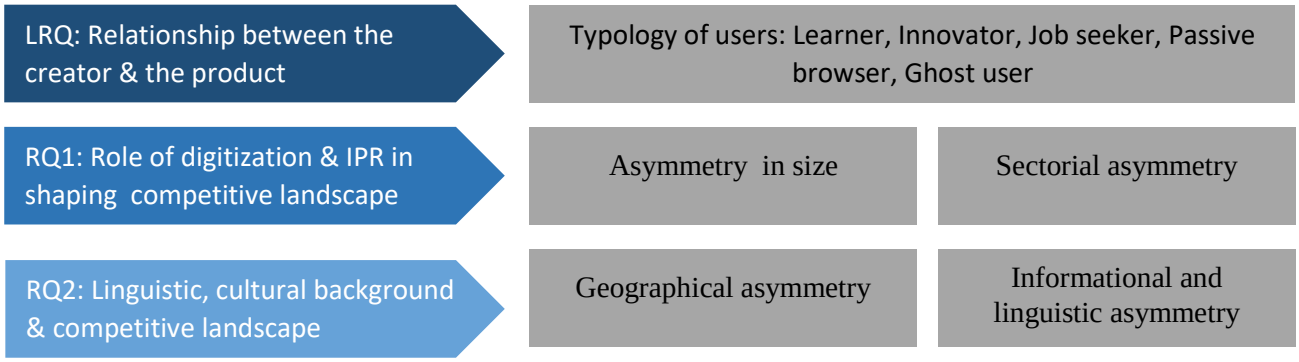

Figure 21. The structure of case study: CAD makers. Author: Eneli Kindsiko.

Relationship between the creator & the product: Different aims, different users

Differentiating user groups by their objectives (mentioned by informants themselves) reveals how the awareness of IPR changes depending on the relationship between the creator and the product (the lead question of the current report). Users differ by their contribution and awareness of IPR in case of CAD platforms. Also, initial objectives may change when active contributors (CAD makers) have encountered a series of their CADs being stolen. To add, we see how the relationship between the CAD maker and the CAD itself may vary not only by user groups, but also by the level of CAD itself – the amount of time it took to create it and the overall valuation of the CAD by the creator.

User: Learner. Learners are makers who take CAD sharing most of all as an intellectual hobby. The learners group comprises users who share designs to educate others (e.g., adding tutorials on how exactly they made a specific model), but also to learn themselves from existing models end tutorials. They tend to share a wide spectrum of designs, which are not often even related to their main field of activity. That said, they seem to be not so sensitive when somebody uses the files without giving credit, or even taking over the files and claiming the ownership. They perceive how the mission of open sharing platforms like GrabCAD or Thingiverse should not be commercial, but educational.

> *I have the time and motivation to create some new model. I expect no returns from this, I don't need that. /…/ We really need free places in the society, where people can turn their ideas into reality, without any restrictions, so that out of these places some ideas will become real things for the benefit of everybody. (Interview 15, Romania)*

Learners are also the advocates of open culture and CAD community. Overall, learners value the educational dimension of sharing platforms highly and it seems to override the possible costs from the violation of IPR For them, sharing platforms help to lessen the time that it takes to solve design-related problems and dead ends by offering a community of experts, who are ready to help: "*GrabCAD is a school. There are both learners and teachers here. No copyright at school.*" (Interview 2, Turkey) Even if unauthorised copying happens, this should not lessen the value of open sharing: "*I think it is so important that we share and build on each other's knowledge, and I cannot stop it because some people use it in a wrong way*." (Interview 9, Denmark)

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User: Innovator. Innovators are initially active members, who put a lot of work hours into making high-level CADs. It can be said how this effort is fuelled by the recognition from the community – novel and high-level CADs gain more likes, downloads, and comments. Some of our informants even told how thanks to the platforms they have established a second career, where people know them not by their real name, but by the username they have on the platform.

CAD sharing tends to take place in waves, where innovators start intensively and with passion, but after time these high achievers start to calculate the time it takes to make these files and slowly stop contributing: "*I feel like there's a pinch point to where users may decide to no longer upload, and I've considered quitting GC a couple times*." (Interview 13, U.S.) It can be seen how CAD users may have started with a goal to do CADs as a hobby, but across time, this hobby has become a profession – then the work hours gain a monetary label:

> *I just started to realize that I was putting a lot of work and effort up for free, I did it for years and didn't really care at first because I did the models out of passion and it was more a hobby, to get practice and learn, but when you start to earn a living doing CAD modelling, billing clients, etc. it brings into perspective the value of time/money, especially when CAD can eat up A LOT of time. So, I value my time more now and I don't upload things for free as much. (Interview 11, Canada)*

Innovators who have been with the platform since their start are the pioneers, CAD enthusiasts, who contributed a lot during the first few years with high-level CADs, but due to the systematic negative experience (unauthorised copying by other users) they have minimized uploading new designs, moved to passive status, or closed their accounts for good. That said, their risk awareness changes over time: "*The reason why I am not uploading as frequently as I can is because GrabCAD, they don't want to deal with this stealing issue*." (Interview 7, U.S.)

User: Job seeker. For a third user group, *job seekers,* platforms operate as a place where to show their skills, thus for them it is not important to share a lot of designs. In fact, they tend to have few designs up in the platform, yet they are top-level so as to convince possible employers. When asked why they joined MSPs, many would explain it in the following words: "*To present myself and get job offers for permanent jobs or as a freelancer*" (Interview 6, Iran); "*To show off my skills, build a portfolio and to earn a reputation in the community*" (Interview 10, Australia); "*Almost every single work/job/contract and project has come from people seeing my portfolio on GrabCAD, and they reach out and contact me. It's my main portfolio of CAD work that I can share*." (Interview 11, Canada)

Job seekers seem to carefully pick what and how they share on the platform. As they want to show off their CAD-making skills and enhance their employability, CAD sharing comes down to building an optimized portfolio: *"I already have models on my platform that I can use as my portfolio. So, once an engineer reaches that level of models for portfolio purposes, they would stop uploading." (Interview 7, U.S.)*

For the job seekers, the CAD acts as a currency. As high-level models are proof of the technical competencies of a CAD maker, interviewees have also encountered how some users download high-level designs and upload them as their own – in order to build up their professional CV. Metaphorically, open sharing platforms like GrabCAD or Thingiverse operate as social media for CAD makers, where a person uploads 3D designs, others rate it, download it, and comment on it. In the end, CAD makers gain a rating. The ability to gain ratings is also one of the possible reasons why some users copy the designs. They download designs and upload them under their own name just to gain the recognition: "*I've had cases where other users have downloaded my files and then uploaded as if they were their own*." (Interview 12, Ukraine); "*I have seen new GrabCAD members upload famous models that are already available on GrabCAD and claim them as their own. Some people will do anything for underserved acknowledgement*." (Interview 10, Australia)

User: Passive browser. A great number of users are in fact passive users, who have just a few or no designs uploaded to the platform, but time after time go to browse for ideas. For them, these platforms are as

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repositories of ideas: "*I don't use it [GrabCAD] that often. [...] I just go there time after time to get inspiration, to see what others have done*." (Interview 5, Estonia)

When browsing the CADs at the platform, one can see the statistics behind the CAD (how many have liked and how many have downloaded), but also the statistics on how many designs do other users have. Many informants mentioned how passive users seem to be the majority – a great share of users who have no filed uploaded to the platform, yet they download from there. Thus, this kind of professional open sharing platform may in fact be kept up by a rather small group of enthusiastic uploaders and a vastly bigger group of browsers and downloaders.

> *Engagement from people who are just taking stuff is orders of magnitude larger than in engagement of people who are putting stuff onto the platform. Like, if a million people like something, then 1/10 of that will actually click the like button. But they download it. (Interview 16, U.S.)*

User: Ghost user. Although we were not able to interview representatives from this group, "ghost users" were mentioned a lot by other interviewees. Ghost users are people who have made the account, yet do not use is – they contribute to the overall number of users that the platform has, yet no activity from their side. One could see from both GrabCAD and Thingiverse gallery of CAD makers how at the end of the list there is a remarkable amount of users without a single download or upload. Just an empty account. This group also consists of users who never upload, but may use these platforms for unauthorised copying of other people`s designs for commercial purposes.

> *I think that GrabCAD should only accept users that provide their real name, address, etc. This way they could (in theory) be held responsible for abusing the community guidelines. But they would also much more likely be paying customers (purchasing 3D prints, etc.). I mean, who would like to do business with user 'ff ff' from Antigua and Barbuda anyway? Fake profiles do not inspire confidence and there are millions of them on GrabCAD. (Interview 10, member since 2011, Australia).*

Although these user types sometimes overlap (e.g., a person both learning and seeking a job), and the initial aim may change over time (e.g., innovators, after experiencing intellectual theft, become passive browser), they still reveal the heterogeneity in what CAD makers take part of in open sharing platforms (see Figure 21).

LEARNERS seek to educate others, to learn and be part of global CAD community. What is shared, should be for common good, enhancing the 3D printing ecosystem.

INNOVATORS are highly skilled top specialists in CAD making, often first users of these platforms. Everyday work is about CAD making. As platforms grow, and after series of encounters to IP violations, they tend to go into a passive mode.

JOB SEEKERS are uploading to show off their best CADs (yet not too many) to build a solid CV, to get noticed and receive job offers.

PASSIVE BROWSERS are mostly scanning for ideas time after time, not uploading their own CADs.

GHOST USERS represent mostly empty accounts, people who have made an account, yet never use it. Also people who go to platforms without their real names, to download hundreds or thousands of models for making profit out of it.

Figure 22. Five types of users based on their goals. Author: Eneli Kindsiko

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Role of digitalisation & IPR in shaping the competitive landscape of CAD makers contributing at CAD sharing platforms

The aim of copyright law is to protect "the owner of rights in artistic works against those who "copy", that is to say those who take and use the form in which the original work was expressed by the author" (WIPO, 2004, p. 40). Copyright does not entail that the work has to be novel itself, the aim of the copyright is to protect the rights of the person who is the author of the intellectual creation or owner of the rights to the product. Platforms provide an interesting case in terms of copyright – due to the poorly traceable network effect (once shared, difficult to trace). That said, platforms facilitate the asymmetrical dimension of IPRs. While the protection of IPR has generally been in pace with disruptive technological solutions, the asymmetries that characterize platforms make it difficult for CAD makers to reach optimal protection: asymmetry in size, informational asymmetry, geographical, and sectorial asymmetry.

Asymmetry in size: Too small to protect yourself. Digitalisation as a whole has brought a radical change to the consumer patterns of services and products. From one side, individuals today access a much larger amount of cultural content, but from another side, it leads to "ATAWAD" type of consumption – "anytime, anywhere and on any device" (Ernst & Young, 2016, p. 12). Customers today can choose what kind of content they prefer to "see", instead of being passive recipients. Especially in case of platform economy, the visibility of the creative content may depend heavily on the bargain power of the content creator. For example, platforms may offer special price models for getting one`s creation to be listed on the top of the search results, top of the page or even into the category "popular this month", "most liked", "most commented", "most downloaded". Also, larger platforms gain power at the market by merely having a bigger pool of data about the end users. This allows them to get better insights of the needs of the end user, which in turn provides a possibility to target and manipulate its customer`s behaviour (e.g. targeted advertising).

Platform economy is rather heterogeneous in terms of the size of platforms. Some have grown enormously, and gained monopoly at the global market. This, in turn, fosters great asymmetry at the market, and the market entry for new players is very difficult. Although 3D file sharing platforms are mushrooming, we listed 3D related platforms that have the highest number of members (see Table 4).

Platform	Members	Number of CAD files	Origin	Additional information
GrabCAD www.grabcad.com	Over 9,5 mln	Over 4,9 mln	2009 Estonia	Belongs to Stratasys (3D printer manufacturer). Designs free of charge.
Thingiverse www.thingiverse.com	Over 2 mln	Over 2 mln	2008 USA	Belongs to MakerBot Industries (3D printer manufacturer). Free designs.
CGTrader www.cgtrader.com	Over 4,7 mln	Over 1,3 mln	2011 Lithuania	Independent, a startup. Designs both paid and free of charge.
Cults 3D www.cults3d.com	Over 4 mln	Around 0,5 mln	2014 France	Independent, does not belong to a group. Designs both paid and free of charge.

Table 4. Overview of 3D printing related online platforms with most users. Source: Data based on the homepages of listed platforms (information collected in October 2021).

Asymmetry in size emerges from two perspectives. First, larger platforms, especially the older ones, seem to dominate. This size effect is 'coded' into the business model of platforms because platforms operate on the basis of network effects (Gawer, 2014). To be successful, platforms should strive to attract a critical mass of users; the more users are active on the platform, the better as the platform becomes more valuable for its

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users (Abdelkafi, *et al*., 2019). That (quantity over quality), in turn, 'fuels' the looseness of setting IP protection measures.

As one of the interviewed CAD makers points out, there are a lot of specialized platforms that allow only very specific engineers to join (e.g. medical engineers), but the heterogeneity of engineering fields that GrabCAD offers has its value.

> *GrabCAD is very diverse – you have people who design 3D flowers and etc. I do technical work, I will never design flowers, but when I need a flower to be added to some of my designs, I can get it easily from GrabCAD. It is so easy! (Interview 1, member since 2014, Estonia)*

> *GrabCAD is the #1 resource for CAD and engineering design, once you've established that level, it's hard for others to compete. Why would I go anywhere else, especially when the storage space is free and it's free from advertisement. (Interview 11, member since 2013, Canada)*

From a second perspective – asymmetry in size manifests in how solo creators are always at the weaker legal position than platforms or companies as users. From the experience of CAD makers, they feel how the overall question of protecting one's intellectual property rights comes down to whether you are a small or big player. In other words, individual engineers have rarely resources or knowledge to protect their rights even when they are severely violated – this applies to copyrights, but also to patents. Moreover, patenting is seen as strongly harming innovation, as in manufacturing it diminishes the pool of possible ways you can design something. Patenting is most of all used by larger companies, thus establishing a competitive advantage against the smaller players. That said, the protection of IPRs comes down to the size – whether you have enough resources and knowledge to protect yourself. Engineers perceive how copyrights, patents and other means for protecting IPR benefit most of all large players at the market:

> *Copyright is important for people who want to benefit from their work and don't feel to share freely with someone else, it's okay, but again balance is needed, some people, under the protection of copyright or patent, tend to become greedy and want to earn much more than they really deserve. This is how some become very very rich and others very poor, because the balance is lost. I hope we will not find out one day that we can no longer use the word "apple" to call for a great fruit that exists since... who knows when, just because a huge company decided to copyright its brand name and nobody else can use it for free. (Interview 15, member since 2019, Romania)*

Also, as explained by an engineer from Canada, *"There's only a certain number of ways you can design something so…..also, the strength of your patent is related to how much money you have to spend fighting it in court."*

Users that have experienced their models being stolen, used without giving credit to the original creator, reflect how not only other engineers are to be blamed, but sometimes even companies that use these files for commercial purposes:

> *They use your design as a part of advertising without telling you, and claim as if it is part of their work. /…/ Sometimes other design firms, studios use your designs, to claim that is their work. For me, I cannot stand that. (Interview 7, member since 2012, U.S)*

> *Personally, I know that a company called X used my watch mechanism model in their marketing material without giving credit and Y used my Garden Chair to promote their simulation software without giving credit. I find it more interesting that professional organizations sometimes use content from GrabCAD without acknowledging the creator. (Interview 10, member since 2011, Australia)*

That said, for an individual engineer to go and fight for his/her intellectual rights against the company is a challenge.

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Sectorial Asymmetry: Military & healthcare. With the growing digitalisation, original creation has moved out from their fields to create cross-sectorial value. A good example is a GrabCAD open innovation platform, where engineers share their CAD files, more known as 3D artwork. This artwork is printable in 3D printers and has the ability to affect all the sectors. These unique drawings already today benefit the medical sector (e.g. creating 3d printed medical limbs), manufacturing (e.g. helping space industry in developing new technological prototypes or offering new toy designs to the toy manufacturers), architecture (e.g. create new architectural solutions), construction (e.g. printing out full houses), art and design (e.g. making jewelry or customized gifts), advertising (e.g. developing 3D holograms), and even in fashion (e.g. Karl Lagerfeld applied 3D printing in fashion).

Although the 3D design file has always potential to materialize, some materializations differ in terms of IPR. Depending on what industry gains the most from 3D printing, the borders of IPR may vary (e.g. 3D drawings in fashion vs in medical fields). There have been even suggestions that regulatory measures concerning online platforms should be differentiated by sector (EC, 2016, p. 251). Some fields are more sensitive in terms of intellectual property rights and due to two main reasons. First, because of the safety of human beings, and second, for the sake of gaining and keeping competitive advantage. The safety issue seems to be most of all related to the military and medicine.

Figure 23. Examples of most downloaded military and medical CADs: Colt 1911-A1 Model Government Pistol (left, downloaded 51 060 times by 20.04.2022) and 3D print Covid-19 mask (right, downloaded 3675 times by 20.04.2022). Source: GrabCAD CAD gallery.

GrabCAD and other open sharing platforms also contain a military section, where one can share, view and download models to various guns and other military related products. Engineers related to this field have stopped sharing certain kinds of models due to ethical reasons – they feel that sharing too much information about military related models may possibly cause misconduct. For example, on April 18, 2021, the Spanish police released pictures of a 3D-printed gun factory situated in Tenerife (Churm, 2021). These 3D-printed firearms and explosives were sold over the internet, and the main problem behind 3D-printed guns boils

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down to the fact that when buying a gun through official means, "buyers receive an instant background check using a national database. But with this new technology, gun owners can print and assemble their own firearms, without a serial number or background check." (Prasad, 2018) This case illustrates well how some sectors should be more sensitive in terms of IPR and due to two main reasons. In the case of military CADs, there is a need for access control, because of the safety of human beings. As a CAD maker reveals, "*there are also models of machine guns. For me, designing [gun models] is merely a hobby, but there are people who could use them in bad ways*." (Interview 4, Estonia)

The medical field is also sensitive in terms of protecting human health. During the Covid-19 pandemic, there was a great increase in uploads of facial masks. Soon after the pandemic began, GrabCAD published a notice on their site, declaring the following:

> "There has been a recent increase in the number of accounts taking advantage of the COVID-19 crisis and uploading incomplete models of N95 face-mask machines, soliciting our members for their email addresses and charging money for the complete content. Not only will these pages be removed, but accounts participating in this will be immediately blocked from GrabCAD without further notice." (https://grabcad.com/library/tag/mask)

Although there is a growing stock of research literature appraising the use of 3D printing to combat the lack of facial masks (Belhouideg, 2020), medical sections in GrabCAD and other similar sites are full of designs that have not gone through the quality check by medical professionals, and this may cause a risk if these models get spread and taken into any use.

> *There are hundreds of facial [mask] designs, but only a handful are meaningful designs. /…/ „You can 3D print medical things, but do you know the materials, the weights, the settings, the use? /…/ If there is no people who have commented that this suits, then you are always playing Russian roulette. (Interview 8, member since 2015, Latvia)*

In this sense, medical designs would benefit from quality assurance, which could be achieved by commenting, validation from medical experts, etc. In sum, a factory can download the models, put them into production and sell them to the public, without any security that these masks actually protect from the possible infection. In a similar way, 3D printing has been spread among individual users, and during the pandemic, the spread of unqualified masks has been problematic.

Linguistic, cultural background & competitive landscape

Geographical asymmetry: Global sharing, local laws. Geographical asymmetry relates to the fact that online platforms have a global reach, as the internet has no territorial limits, but legal regulation is strictly related to the legislation of the country where they operate. This may lead "to complex geographical combinations and jurisdiction questions" (Martens, 2016, p. 35). For example, copyright is a territorial right, but the exterritorial nature of online platforms may lead to severe obstacles to the single digital market (Mendis, 2014). As stated by WIPO (2004, p. 50):

> "The owner of the copyright in a work is protected by the law of a country against acts restricted by copyright which are done in that country. For protection against such acts done in another country, he must refer to the law of that other country. If both countries are members of one of the international conventions on copyright, the practical problems arising from this geographical limitation are very much eased."

Companies that own the platforms may restrict the access to their platform from countries that have not a favourable legal regime or the costs from the legal side are too high, as judged against the potential profit. Yet, territorial differences, especially in terms of regulatory barriers may benefit large and well-resourced

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companies (e.g. Google) as the direct cost of the regulation outweighs the potential profit due to very low competition. Small players just do not have enough resources (e.g. legal advice and power, but also financial resources) to enter countries with high legislative barriers (Hinze, 2019). A good example of the above mentioned case could be broadcasting platforms that strictly limit their users access to content based on their geographical location (geo-blocking). The restriction is primarily applied because of territorial copyright and licensing reasons. All in all, territorial asymmetries may fuel asymmetry on power, as large platforms gain a strong advantage as compared to the small players.

Interviewed engineers that work in manufacturing mentioned geographical asymmetry when dealing with production partners from Asia. They told that when a company in Europe designs innovative products, and wishes to use Chinese factories to save on production costs, there is a great chance that files shared with a Chinese factory will end up being stolen. In some cases, Chinese colleagues upload the European files as if they were their own, back at the GrabCAD platform. These things tend to come out accidentally.

> *It is the case when we outsource some of our products from India or China. /…/ Then you see how someone tries to shine with your CAD models. I send them my CAD models to them as an order from our company, and then you see how they have uploaded these files to GrabCAD as if they were their own. (Interview 1, member since 2014, Estonia)*

> *One time someone noticed one of my models on a Chinese website. (Interview 11, member since 2013, Canada)*

> *Many of my design are to be found on Chinese websites. (Interview 10, member since 2011, Australia)*

In China they have similar open sharing platforms, yet many users unauthorised copy from GrabCAD and just upload the files as if their own onto the Chinese platform: „*Those people are like uploading 20 000 models*." (Interview 7, member since 2012, U.S) In addition, individual unauthorised copying is not considered as bad as when companies do it and use the models for the sake of mass production:

> *There are people who are downloading from GrabCAD. Engineering models. To upload onto the engineering sharing platforms in China. That is what I am scared of. Those platforms are actually linked to various factories, by different manufacturers in China. If they get their hands on the model, they could actually make it. It is not like some person had a 3D printer, and sells your 3D models printed on Ebay, I am talking about mass production. And this does happen. /…/ That is what I am scared of, and that is what a lot of designers are scared of. (Interview 7, member since 2012, U.S)*

Informational and linguistic asymmetry: Untraceable downloaders. Informational asymmetry represents a situation where one party of the transaction process has a knowledge gap in terms of copyrights. Studies show that most users do not know or do not care about their intellectual rights. For example, a study by Mendis *et al*. (2015, pp. 5-6) revealed how 65% of CAD related platform users do not license their work. As concluded by Gans and Stern (2003), intellectual property protection in case of platforms is highly imperfect, as idea sellers and sharers are vulnerable in terms of lack of copyright related information. Artistic people tend to be passionate about their creation, but tend to dismiss the need to protect themselves from unauthorised copying.

To lessen the informational asymmetry, European Commission (2017, p. 13), has recommended "a better application, recognition and control of metadata for identifying online copyrighted content" -metadata is the data about the data (e.g. date, title or the name of the creator). The core of intellectual violations in the web relate to "metadata-stripping", where original work is left as "an orphanage" - metadata is removed by the downloader or the platform itself (Ginsburg, 2016). The challenge in case of digital creation is the need to have not only sufficient ICT, but also IP protection related knowhow.

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Open sharing platforms like GrabCAD operate as social media for engineers, where a person uploads 3D designs, others rate it, download it, and comment on it. In the end, engineers gain a rating. The ability to gain rating is also one of the possible reasons why some users steal designs. They download designs and upload them under their own name just to gain the rating:

> *I've had cases where other users have downloaded my files and then uploaded as if they were their own. (Interview 12, member since 2014, Ukraine)*

> *I have seen new GrabCAD members upload famous models that are already available on GrabCAD and claim them as their own. Some people will do anything for underserved acknowledgement. (Interview 10, member since 2011, Australia)*

It is traceable that someone notices that this design has been created much earlier and by someone else. Simply put, active users tend to have a good overview of who the actual owner of the model is, and when witnessing intellectual theft, they take action and inform the original author. Thus, some kind of internal screening and surveillance is present, yet it is more of an accident than a systematic activity.

At the moment the informational asymmetry is strongly inclined in favour of the downloader. Commonality across all interviews is that engineers upload the designs with a reconciliation that when it is out there, it is lost:

> *I don't upload the full file package unless I'm willing to have it copied, stolen and sold etc. /…/ You have to remember that once it's up there, it's gone, out there forever, for free. (Interview 11, member since 2013, Canada)*

> *My take on copyright is that when I upload something to GrabCAD I have lost control over the model/idea. Anything can happen. So I will not upload something that I feel could be valuable. (Interview 10, member since 2011, Australia).*

Most sensitive CAD makers would like platforms to provide more detailed information on the users as to reduce the ghost users: *„I dont have any feedback on who downloaded my model"* (Interview 7, member since 2012, U.S); *„I cannot see who downloaded. I can see who liked it."* (Interview 9, member since 2015, Denmark) If contributors knew who is downloading their models, current informational asymmetry would not only lessen remarkably, but most of all, users would gain more trust within the system.

> *Every time someone downloads a model, they should have a small pop-up model asking how they are going to use that model. Just to get some feedback information where my 3D models will go. (Interview 7, member since 2012, U.S)*

An obligation to make such user statistics public, could possibly also reveal hidden traffic patterns on copyright violations from the users of some countries. Platforms could therefore apply geo-blocking to the users from the mentioned regions. Just by providing users with preliminary data on who downloads their models, engineers could do their own tracking as they wish. Analysing whether someone downloads all their models systematically, what is their country of origin, etc.

Since there is no well-established global protection mechanism, especially the group of engineers have individually developed their own strategies on how to protect their files: showing only some parts of their models, watermarking their project images, up to putting passwords on ZIPs:

> *I am willing to upload everything, but I usually upload 'dumb-solid-models' rather than models with the full feature tree. This way I can still 'prove' that I have built a model by showing the original files. (Interview 10, member since 2011, Australia)*

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There is still no "protection" for any model you upload, once you upload it, you have to assume it's out there in the public for public consumption. Even if you try to apply a CC license to it, that doesn't really work anyway, because it's not a patent. (Interview 11, member since 2013, Canada)

Many change the format of files or the amount of detailing they show:

Don't upload the full file package. Oftentimes, if it's a multiple part assembly, I'll just upload one part of the assembly so it's not like I'm giving everything away. I usually will just put up the simplest part so it's not like it cost me a lot of time. People complain about this but so far GrabCAD seems to be ok with that. (Interview 11, member since 2013, Canada)

The problem of untraceable downloaders is the core to the case of protecting one`s IPR. How should such tracking be done? Many would like to see metadata about the downloaders: IP address, country, how many files has the person downloaded, how often, etc. Others feel how tracking after one has downloaded your designs does not prevent unauthorised copying:

It is no good to gain this track on who took your designs retrospectively. It would be much more beneficial if you know beforehand who would like to get your designs. Who is he/she? Why does he/she want these designs? It is the same case as your home would fall under theft. You do not care so much about the fact that it happened, you would prefer that it would not happen at all. There modest use of information." (Interview 4, member since 2010, Estonia)

Have members sign up using their real name and address. Make them responsible for their actions. There is no need to provide anonymous access! (Interview 10, member since 2011, Australia)

In the current study we were able to see the linguistic and cultural background from two different perspectives: focus on skills, and diverse perceptions of copyright by countries.

Focus on skills. First, CAD platforms remove linguistic and cultural barriers and give equal chance to CAD makers from small places in Estonia to CAD makers from megacities like New York. That said, it is not your background, but skills what matter – what you are able to create. It is also the reason why many joined the platform in the first place, and started to upload their designs:

To present myself and get job offers for permanent jobs or as a freelancer. (Interview 6, member since 2018, Iran).

Believe it or not I found my first Job (my first employer saw my profile in GrabCAD and send me an email for a job offer.) (Interview 14, member since 2012, Cyprus)

To show off my skills, build a portfolio and to earn a reputation in the community. (Interview 10, member since 2011, Australia)

Diverse perceptions of copyright by countries. In case of digital creative products and services that have crossed languages, studies have found how "copyright-infringing consumers are not simply ignorant of copyright, but base their actions on their own reasoning and rationale", which is often part of "their constant navigation of morally permissible behaviors of accessing and consuming cultural contents" (Lee, 2011, p. 249). Interviews with CAD makers also revealed how the importance and practical acceptance of intellectual property rights seems to vary by countries and cultures:

In my country, copyright is only for people doing Marketing. (Interview 3, member since 2012, India)

In my adopted country, Australia, it is fully legal to sell copies of design classics (chairs, tables, etc.). In my native country, Denmark, it is pretty much very illegal to do the same. Before discrepancies like these are

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ironed out, I do not believe that there will be clear rules on intellectual property for CAD models. (Interview 10, member since 2011, Australia)

China steals designs all the time, it's impossible to sue them because the legal systems are so different. (Interview 11, member since 2013, Canada)

Figure 24 summarises all the mentioned copyright related asymmetries. In reality, they are often interconnected. For example, the importance of screening the production of 3D printed guns (sectorial asymmetry) from users from some specific countries or regions (geographical asymmetry).

Figure 24. Copyright related asymmetries in case of CAD sharing platforms. Author: Eneli Kindsiko

The current study revealed IP asymmetries that hinder innovation, related to the operating of platforms in order to thematise the opportunities for more equal and innovation-supportive and creative environment for single users. Ideally, the protection of intellectual property should be strategically integrated into the operating model of a business, yet, as our study revealed, integrated IP management becomes of great challenge in case of platforms. The case study provides a good understanding of asymmetries that emerge when an original creation is shared via platforms. In sum, considering the amount of models and users that large platforms have, taking care of violations of intellectual rights is not an easy task.

To conclude, we will bring out solutions, offered by informants, on how to overcome or lessen the amount of IP violations emerging from the asymmetries. The least used, but considering the speed of digitalisation, most sought approach to the protection of IPR would be greater adoption of artificial intelligence where potential violation attempts would be treated proactively. This entails the strategic integration of IPR protection to the whole operating model of the platform: real-time tracking of users who wish to download online content, automatic generation of statistics on who has downloaded your creation, and so on. This automated approach would help to lessen the problem of informational asymmetry - untraceable downloaders. Integrating artificial intelligence into the protection of intellectual rights of your users would demand great investment from the platforms, one that they often are not just able to embark upon. Thus, we see AI approach as something that could be better supported and enhanced by the governmental or even national policy making institutions (e.g. when making proactive screening obligatory, also giving resources for developing, applying and administering it). Such automated screening could take some fields under more detailed protection. For example, our study signposted how medical and military fields have great potential

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for innovation, yet free spread of 3D medical and military designs 3D printed and taken into use may harm people's health or even lives.

The most used approach by the CAD makers is to contact the platform administration (complaints centre) when they notice severe violations of IPR. It works the same way as a typical problem centre in offline economy - a separate unit deals with user related problems and questions, including the problems with intellectual property rights. It is a handcrafted solution, as the problem will be treated reactively and case by case, with minimal or no automatisation. Considering the speed of digitalisation and growth in the number of open sharing platforms, it seems not reasonable to grow customer service units or complaints centres, but to move towards automatisation and a more proactive approach. Our study revealed how especially the innovation seeker group of users are active in communication with the customer service units.

From the proactive side of users trying to protect their IPR is the direct contact with the violators. Our interviews revealed how users, when they see someone using their designs, especially when companies use the designs for commercial purposes, they try to contact them. Similar to the complaints centre approach, also this approach is strongly case-by-case reaction to the violations, thus also highly time consuming.

As from the side of the platforms, there is less universal and well-working protection of IPR that work globally, active users apply their ICT knowhow to proactively develop strategies for keeping others from unauthorised copying their creation once it is shared online. A good example here is uploading only dumb solid models (a model with a loss of design intelligence), instead of a parametric model, where you can manipulate surface and features of the model, and actually see the detailed intelligence behind the creation of this model. To illustrate the difference, you see an image of an engine model, but not the detailed parts of it. Another way how especially the innovation seeker group engineers have protected their designs proactively is adding watermarks or uploading their files in zip and with a password. All these strategies operate by flashing your knowhow (e.g. showing only dumb solid model) without giving out the detailed intelligence. A commonality across all user groups was that in case of CAD sharing platforms it is not the outcome that is the most valuable, but the process, how something has been done. So, what users seem to want to protect is the process of the design, not the design itself.

4.3. Key takeaways and policy implications

Policy recommendation: Evidence based policy making, with no “one-size-fits-all” solutions

Policy development across Europe should consider asymmetries signposted in this study. The asymmetries will severely challenge the landscape for IPR. Current Creative Commons licensing does not work in case of CAD platforms, much due to the asymmetries and differences in global awareness and attitude towards the IPR of the creator. CAD sharing platforms facilitate asymmetries: asymmetry of size, informational asymmetry, sectorial asymmetry and geographical asymmetry. Most critical of these asymmetries seems to be the informational and sectorial asymmetry.

Policy recommendation: Making user statistics public and restricting the number of downloads

Information asymmetry is much fuelled by the growing heterogeneity of user objectives. The current study signposted five types of users: learners, innovators, job seekers, passive browsers, and ghost users. Most troublesome are the ghost users, as they tend to represent users without any contribution to the global CAD community, yet tend to be the ones that violate the IPR most often. Also, the growing share of ghost users decreases the overall motivation of other user groups to contribute to the CAD community.

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Platforms should openly reveal the user statistics (how many downloads per person, share of active users and passive users, etc. Also, setting a restriction to how many CAD files may one user download (overall or per day/month) would be beneficial to build trust among the CAD community. Ghost users downloading thousands of files do not enhance the trust in platform administration and community building.

Policy recommendation: Sector based IPR protection

Sectorial asymmetry signposts a focus on military and healthcare related CADs. During the Covid-19 pandemic, these platforms mushroomed with self-protection designs (facial masks, visor), that one could simply print out via 3D printer at home or even for commercial purposes. In a similar vein, media coverage shows how also 3D printed guns is a new normality that should not be underestimated. IPR should be regulated based on sectors, where the military and healthcare sectors need a quality and usage control. As 3D printing accuracy is getting better each year, 3D printed guns will place a threat to untraceable production and usage of home-made guns.

Policy recommendation: The spread of 3D printing monopolies

The largest CAD sharing platforms belong to the largest 3D manufacturers in the world – fostering the ecosystem around the 3D printing manufacturing. For this reason, CAD sharing platforms are free, with no compensation to the creator. Despite the growth in smaller, specialized CAD platforms with subscriptions and allowing creators to make money out from selling their CADs, Thingiverse and GrabCAD remain to keep the monopoly. Similar to other industries (e.g. social media, music), there is a need to arrange better overview of user traffic. A good example here is YouTube, which makes use of AI in tracking and policing the copyright violations – the Content ID.

Similar to other digital spheres, also in 3D printing, size matters. 3D ecosystems are centred around few large companies (e.g. Stratasys), that have created an appealing ecosystem that supports the overall promotion of 3D printers. Large CAD sharing platforms like GrabCAD and Thingiverse have also the first comer advantage – having both the largest pool of users and CADs, newcomers have difficulties to step into the game.

Policy recommendation: Locating the control to the creator, diversification of downloads

The active-passive side of protecting IPR (proactive or reactive approach), juxtaposed with whose responsibility it is to lessen the threat of copyright violations, revealed how in case of CAD sharing platforms the reactive and user-centric approach dominates. Today, much of the violations seem to be approached case by case, yet WIPO has already long time ago signposted a need for a more collective approach. According to WIPO (WIPO, 2014, p. 133), new digital technologies increase the need for collective management of copyright “since new opportunities and threats are emerging at the same pace in the digital environment“. As the volumes in user numbers and content (number of CADs) is growing fast, proactive approach is needed to deal with IPR violations. Platforms are not able to handle the magnitude of violations. Downloads could even be linked to the creator, where the creator should accept the inquiry from the user. Fostering interaction between the users. An alternative way would be to allow uploaders to differentiate which files they make free to be downloaded by all, and others are accessible via request.

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5. Conclusions

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