



DIGITISATION, INNOVATION AND TERRITORIAL FORMS: COMMERCIAL SEXUAL ACTIVITIES BETWEEN SOLICITING AND LIVECAM

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Abstract

The livecam, a form of commercial sexual activity (CSA) emblematic of the digitisation of society, has been developing rapidly since the mid-2010s. This boom is explained in this article by the spatial forms that this digitization allows, notably a new spatial division of labour and consumption. In addition, compared to other traditional and more concrete forms of ASM, the livecam is also transforming the content of the service. Mobilising Adams' (2010) approach to the relationship between media and space, this article discusses the impacts of digitisation and the economics of platforms on market activities, both in terms of production and consumption.

Key words

Commercial sexual activity

Digitisation

Livecam

Spatial Division

Platform Economics

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1. Introduction

Digitisation affects increasingly numerous and intimate aspects of our daily life and is often accompanied by an individualisation and commodification of activities. Sexuality is an appropriate context for studying these changes because, since the arrival of the very first online services at the beginning of the eighties, it has formed a significant proportion of online activities, and, paradoxically, represents the ultimate physical contact activity.

Profound changes related to digitisation can be observed in the field of commercial sexual activity (CSA), both from the perspective of the general organisation of the competing industries and customer practices. On the one hand, tangible, direct activities (street prostitution, brothels, cabarets, etc.) are experiencing a variety of changes due to the new opportunities for making contact via specialised sites which are both discrete and widely accessible. On the other hand, indirect online activities, such as the porn film industry, which has grown considerably over the last thirty years thanks to the Internet, are experiencing a sharp decline. The main hypothesis of this work is that these changes can be explained to a large extent by the new spatial and temporal forms made possible by technologies such as the Internet and high definition videoconferencing. In particular, we will examine the livecam innovation, an activity that has experienced significant development since 2014.

From a territorial perspective, this paper seeks to understand how and why this replacement is taking place, in connection with the digitisation of these activities. On the theoretical side, Adams (2010, 2017, 2019) approaches digitisation as the increased presence of media, facilitating both a change in the spatial organisation (new relationships between places across space) and a reorganisation of the various places due to the presence of these media (a modification both of the content of the activities and the way in which they are performed). The aim of this paper is to capture the economic effects of digitisation through the dialogic between digital and tangible spaces/places.

In line with this approach, an initial hypothesis is that the spread of online visualisation technologies and infrastructures has made it possible to connect different places more directly across space. This spatial organisation is characterised by a new spatial division of labour (SDL) and of consumption (SDC). The shift from contiguous (co-presence in one location) to connected (online) contact results in a significant decrease in labour costs and costs associated with the places in which the CSA occurs. A second hypothesis is that the technical possibility of creating synchronous shows, but without direct physical contact, requires methods of constructing the value of sexual transactions which are different from both tangible CSA and the pornographic film industry. These shows are characterised by engagement on the part of both the performer and the customer, a characteristic feature of the economy experience (Pine and Gilmore 1999, Lorentzen and Jeannerat 2013). However, in the case of Livecam, this engagement occurs in two separate places, united within the digital space of the platform. We will show that the temporal progression of the transaction and its components, as well as the diversity of the offer, ease of access, pricing methods and ranking, lead to a reinvigorated experience and original ways of constructing value. The experience is characterised by a bypassing of public space, minimising certain costs and inconveniences, both for performers and the industry, and for customers and local authorities.

In the first section, we will position livecam in the context of commercial sexual activity. We will describe the methods used to carry out a case study which is both multiscalar, in order to simultaneously capture the local, national and international changes in the

organisation of these activities, and multilocal, in order to identify what is happening at both ends of the livecam transaction.

The second section will describe the ideal-type territorial form of the livecam market and will detail the economic benefits generated by this new organisation. The concept of global production networks (Coe, Dicken and Hess, 2008, Narouzilame 2014) will be used, while adapting them to the needs of an activity which is not related to conventional manufacturing production, but rather to the experience economy (Pine and Gilmore 1999, 2013), where consumer engagement is decisive, especially within the digital space. Then, the ideal-type transaction between the performer and the customer will allow us to understand how economic value is constructed across time and space during a show.

Finally, in the last section, these services will be compared against established forms of commercial sexual activity.

2. Emergence and characteristics of Livecam

By livecam, webcamming, online webcam, or Peep Show 2.0, we mean erotic or pornographic services, offered via videoconferencing as a live show, co-constructed synchronously and bilaterally between, in general, a paying customer and an artist providing the performance. The artists are usually called performers, camgirls or models. Throughout this paper, we will use the terms *livecam* and *performers*, to underline both the performed (with reference to all aspects of the service) and digital dimensions of our case study.

2.1. History and economic importance of Livecam

Livecam practices first appeared on the Internet in the early 2000s, led by professionals whose business activities required advanced technologies for the time. Although it is difficult to date the beginnings of this industry precisely, it is possible to situate its most significant period of growth between 2014 and 2015, followed by a certain stability (Figure 1). This occurs in parallel with the expansion of high-speed Internet (broadband). Indeed, according to one of our sources, "free content is multiplying, the wide availability of WIFI networks is greatly expanding... [in this area], even the consumption of pornographic channels in hotels has dropped!" (Terpon Corp.)

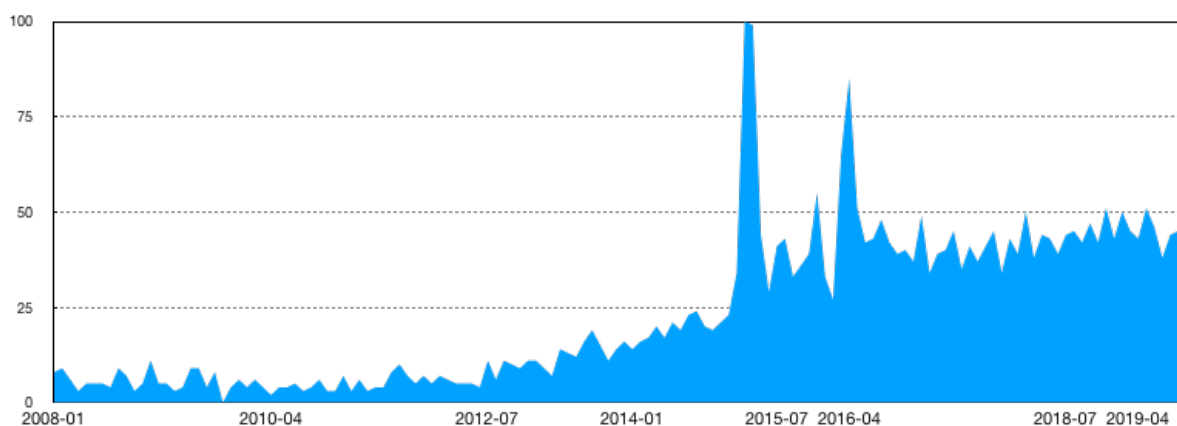


Figure 1 Number of searches on Google for the terms "livecam" and "camgirls" between 2009 and 2019. Source: Google Tools

Figures from industry players reveal the same trend. In 2018, according to Terpon Corp. Holding, there were 500 million livecam users spending around 20 minutes per day online, and between 300,000 and 500,000 active performers.

"The Livecam business has evolved and constantly grown over the last two decades to become one of the largest segments in Adult Entertainment (...), bigger even than all tube sites put together (PornHub, YouPorn, Xhasmter, etc.), (...). As a sign of this evolution, before 2013 there were no industry conferences or summits specifically focused on the Livecam market, but this year [2018] there are at least 10 conferences specifically for the Livecam industry." (Terpon Corp.)

These services are provided mainly by females. According to Terpon Corp., women account for 80% of online performers, with the remaining 20% composed of 15% men, 3% couples and 2% transgender. This distribution is due to the "fact that most customers are men. Women are less willing to pay for online adult entertainment." (Interview R.¹). For these reasons, we will use generalist female forms when writing about performers and male forms when talking about customers.

The livecam industry brings together a large number of online platforms and models to provide a service, that of an erotic and/or pornographic show, for a fee. Currently, there are two main types of livecam sites: Premium and Freemium. Although the sites offer more or less the same services, in terms of choice of category, available technologies and types of payment, the configuration is not the same; with the former, there is the intermediary of a studio, but this is not the case for the second group. Furthermore, "with Premium sites any nudity used as live content is only accessible once the visitor has paid by entering into a private chat room or in rare cases (...) if he has subscribed for a monthly fee" (Terpon Corp.), while on Freemium sites, the models screen their show directly. Payment is optional and made in the form of tips. This central difference leads to many specificities related to each of these two types of platform. Historically, Premium sites were the first to exist, since advanced techniques (image, sound, Internet, etc.) were only available to specialists. It is the democratisation of the Internet and high-speed broadband connections that have allowed the expansion of livecam and, subsequently, the emergence of Freemium platforms.

Concerning the standard livecam service, there are three specific spaces: two tangible spaces – the *places* (Adams 2009) of production and consumption – over which a third synchronous *digital space* is superimposed. Focusing on these different types of spaces allows us to understand this new form of synchronous sexual interaction in its non-contact dimension. Indeed, as in many other fields which are undergoing a digital transformation. "The Internet (...) as a synchronisation technique (...) profoundly transforms the relative place of things" (Beaude 2013). Thus, in our case, the digital communication channel influences the service itself, which is carried out without the physical co-presence of the customers and service providers.

2.2. *The tangible/digital and direct/indirect continuum of CSA*

In order to specifically capture the transformations brought about by digitisation in the field of CSA, it is necessary to compare this fully digital specific form with other forms.

¹ In order to preserve the anonymity of my respondents, only the first letter of their first name is mentioned.

Spatially, there is a continuum of forms of CSA ranging from full co-presence to a fully digital form with no physical co-presence (Figure 2).

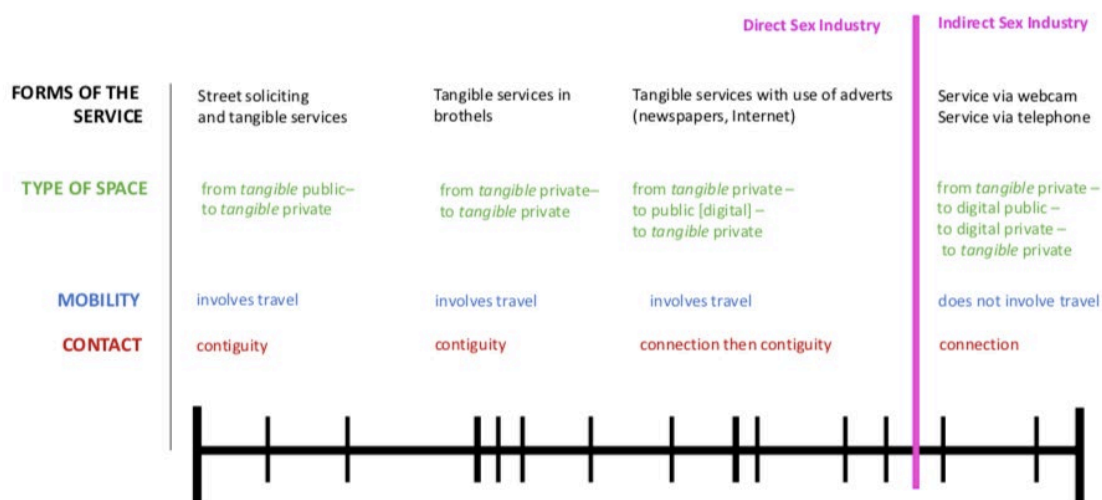


Figure 2 Continuum of forms of paid sexual activity. Source: own work

Harcourt and Donovan (2005) propose a typology which defines two categories: the "direct sex industry" and the "indirect sex industry". This classification enables us to divide our continuum into two sections: those activities which relate "to direct genital contact (as when an escort has penetrative sex for a fee)" and those which relate "to sex work where there is no genital contact. Therefore, adult webcamming is a new form of indirect sex work (...)". These two categories can also be directly related to dimensions of contact and spatial forms. Within the meaning assigned by Beauce (2015), we can identify two types of place. The first type is territorial, where contact is established contiguously. The services established in this way fall within Harcourt's and Donovan's (2005) *direct* category, while those established via an Internet connection represent indirect CSA and occur within a second type of place, which Beauce calls *reticular* (Beauce 2015). Based on these categories, the same continuum can encompass a tangible service, such as street solicitation, a hybrid service, such as the use of online advertising for a tangible sexual service, and a fully digital service, such as livecam. This makes it possible to enter different forms of CSA depending on the type of service, the type of media used or not used, and the spatial dimension. We can observe that digitisation changes the spatial division of service production and of consumption, as well as the way in which transactions are organised in space. We will see that these elements can explain the growth of this industry in comparison with more "traditional" CSA due to the costs and qualities of these new services. Livecam is a striking example of how digitisation transforms everyday activities, including activities where it was once difficult to imagine how contiguity could be replaced by connectivity.

3. The spatio-temporal forms and tangible territories of livecam

This section is a structured case study in three parts. First, we will describe the new spatial organisation that has been made possible thanks to the development of videoconferencing, enabling a spatial division of both production and consumption. We will see that new technical possibilities have made it possible to link together countries and regions, though disparate spatially and economically, into one Global Production

Network (GPN). Secondly, we will focus on what changes this innovation has made to the content of the transaction, including exploring what is happening in each of the places connected by the digital platform. Finally, we will compare this new form of livecam CSA with the more traditional forms of CSA to help explain its current success.

The changes caused to CSA by digitisation are discussed here by way of a case study. A mixed qualitative methodology is used that takes shape on different scales. Within the meaning used by Hine (2017, IN: Fielding 2019: 408), we will make use of "multi-modal and multi-sited designs", as well as a "connective [approach in which the researcher] moves between different modes of communication and locations (online or offline) according to a set of theoretically driven interests focusing on the contingent connections that emerge as people appropriate and make sense of online activities' offline and vice versa." This will allow us to link numerical data relating to the analysis of livecam platforms and online chats (particularly on forums), but also qualitative data obtained through exploratory and semi-structured interviews or the study of secondary data, such as documents provided by companies in the field.

We will first look at the livecam industry as a whole, and then focus on a particular platform, LiveJasmin. This approach will enable us to understand the changes brought about by digitisation on two inextricably linked scales. First, the spatial organisation of this market on the international scale makes it possible to understand the economic benefits resulting from new spatial relationships between distant countries; second, the analysis of a typical transaction will illustrate what happens in each of the locations where videoconferencing terminals have been put in place, and how the activities are specifically transformed for consumers and performers. Therefore, from a territorial economy perspective, data will be superimposed on different scales, in order to appreciate the global shape of this industry and highlight the elements which explain the transformation brought about by digitisation in comparison with tangible sexual services.

In this paper, we will focus on Premium services, the original form of livecam, and, more specifically, on the LiveJasmin platform. The latter has a total of 50 millions unique visitors per month and an average monthly income of USD 35 millions, with more than 100,000 active performer accounts, of which more than 2,000 are live at any one time (Docler Holding 2019). In 2018, the site ranked third in the Top 10 sites with the most registered performers (Terpon Corp.) and an average price of \$3.69 per minute "for an exclusive private chat" (*Idem*). Through the specific study of this type of platform, we will show what changes digitisation has brought about not only within the spatial division of labour and consumption at the macro level, but also at the meso-micro level within dedicated transaction spaces.

3.1. *Spatial organisation and digitisation of CSA*

To do this, it is necessary to be able to grasp the way in which our tangible world is captured, conditioned and transformed by mediated interactions (Adams, 2010: 38). The reduction in transaction costs, change in mobility and bypassing of certain public spaces appear to be central elements of the changes brought about by digitisation.

Adams (2009; 2010; 2018) distinguishes *places*, as physically delimited spaces, from the *spaces* resulting from links between places. Adams' argument contrasts these spaces and places not only with the media², but also with the content and context. In the case of livecam, we can distinguish three specific spaces, the first two of which are tangible – those of production and consumption – and the third of which is a digital space created by the coming together of the first two spaces, broadcast synchronously via an online

² *Media* in the broad sense of a conduit for communications

platform. Using Adams' model, we will compare these elements against tangible CSA. This territorial approach involves characterising the changes in the spatialities and temporalities of these activities, allowing us to construct a global overview of livecam and infer a certain number of broader conclusions concerning the effects of digitisation in this area.

3.1.1. Spatial division of production

Digitisation changes the spatial division of CSA firstly by its synchronicity, and secondly through the relaxation of contiguity constraints with respect to direct forms of CSA. It thus allows contiguity constraints to be relaxed. This results in a significant reduction in the costs of both production and consumption.

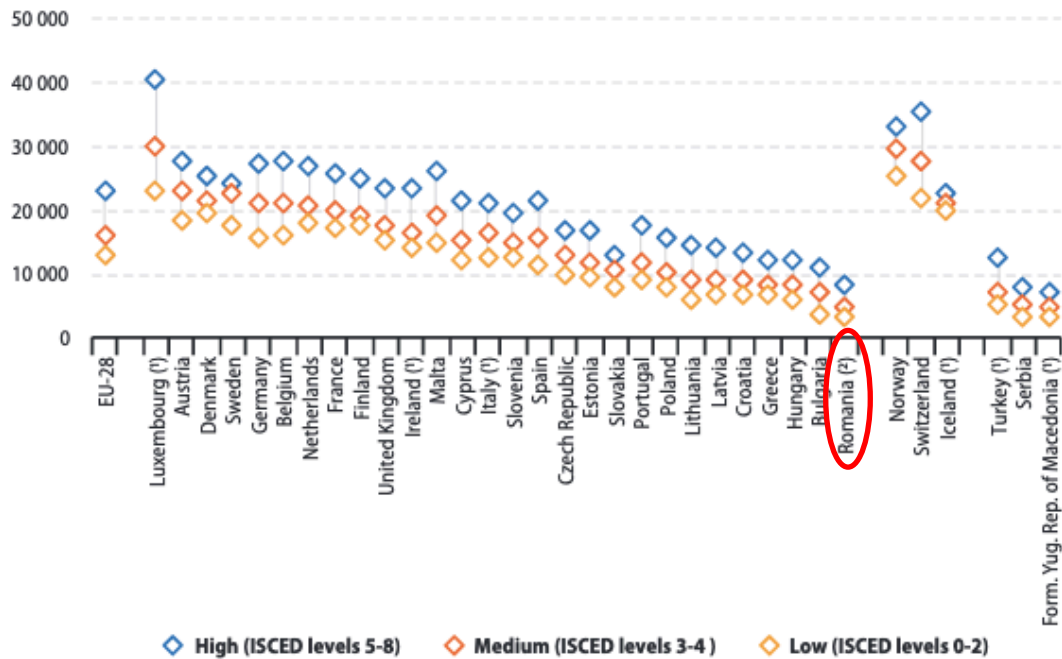
We will start by analysing the production costs and how they are connected by this spatial organisation. The main production site for livecam is the place in which the models perform. In the case of Premium sites and, more specifically, the LiveJasmin site, this is a professional studio. On a global scale, the industry's largest concentration of studios is in Bucharest, Romania, and the majority of shows produced within these studios are broadcast on the LiveJasmin platform (Terpon Corp.: 10). "Romania is considered the world's #1 content supplier for the livecam industry. (...). Some country experts have said it has up to 5,000 studios." There is therefore a very significant clustering that can be explained in various ways. "The lower per-capita income a country has, the more attractive it is for an individual to operate a livecam business." (Terpon Corp.).

To highlight the savings opportunities made possible by videoconferencing, we have compared two extreme cases. First, we look at the production of Livecam services in Romania, with customers located in Switzerland; second, we consider direct CSA (for example, prostitution in brothels) carried out exclusively in Switzerland, with performers coming from abroad, as is almost always the case:

[Translation: The sex market is thus a highly ethnicised and gendered economic sector: it is characterised on the one hand by its almost exclusively female population and, on the other hand, by an overrepresentation of foreigners from a few specific regions (Russian-speaking and Latin American countries, in particular, then West and North Africa and Thailand). The Swiss represent a tiny group and, even then, it can be assumed that some of these people are of foreign origin.]

(Bugnon, Chimienti, Chiquet & Eberhart 2009: 27)

Performers' pay levels can vary greatly for two reasons, which are partially interdependent: the general level of pay in each country, and the cost of living (including mobility costs) in the country where they perform. Furthermore, it is important to note that a larger ratio between the country's standards of living (salary, rent, etc.) and the final earnings obtained from livecam services benefits the performers. According to European statistics, the minimum wage in Romania is among the lowest in Europe (Figure 3)



Note: refers to the population aged 18-64. Ranked on the median equivalised net income for the population aged 18-64.

(*) 2015.

(?) Provisional.

Source: Eurostat (online data codes: *ilc_di03* and *ilc_di08*)

Figure 3 Median equivalised net income by educational level, 2016, PPS. Source : <https://ec.europa.eu/eurostat/documents/3217494/9079352/KS-DZ-18-001-EN-N.pdf/884f6fec-2450-430a-b68d-f12c3012f4d0>

As for rent in Bucharest, "you can find a one-room apartment for 200 to 320 euros a month."³ In general, the platform offers a flat rate, which can decrease depending on the time spent online and earnings, and then the studio does the same. Finally, the models receive a percentage that can vary considerably depending on the hours worked and payments received. For example, "If a customer spends \$100 on the [LiveJasmin] site, \$70 is taken by the platform as commission, but it can go down to \$20 depending on the earnings and time spent online by the model. (...). The platform then sends the rest of the money to the studio, which pays the model. Finally, the camgirl receives a variable percentage according to her earnings and hours. Here [at Best Studios], you have to work at least 160 hours/month to get half of your earnings." (Maria Boroghina, Best Studios Director)⁴. Models can easily earn an income above national averages, although the platform and the studio retain a substantial share of their remuneration. The goal is to find their "top spender", who will spend a lot of time online each day, ensuring a consistently high level of payment.⁵

Moreover, livecam activities are not taxed in Romania, which allows the industries to flourish. Indeed, as Maria Boroghina, Director of Best Studios in Bucharest, says, "The studios have tried to be legal. We said, "Look here we are, everyone knows, so legalise us! We want to pay our taxes. But they don't do it. (...). It's pornographic, so they don't want to legalise it. [Even though] our turnover is around twenty million dollars per year"⁶.

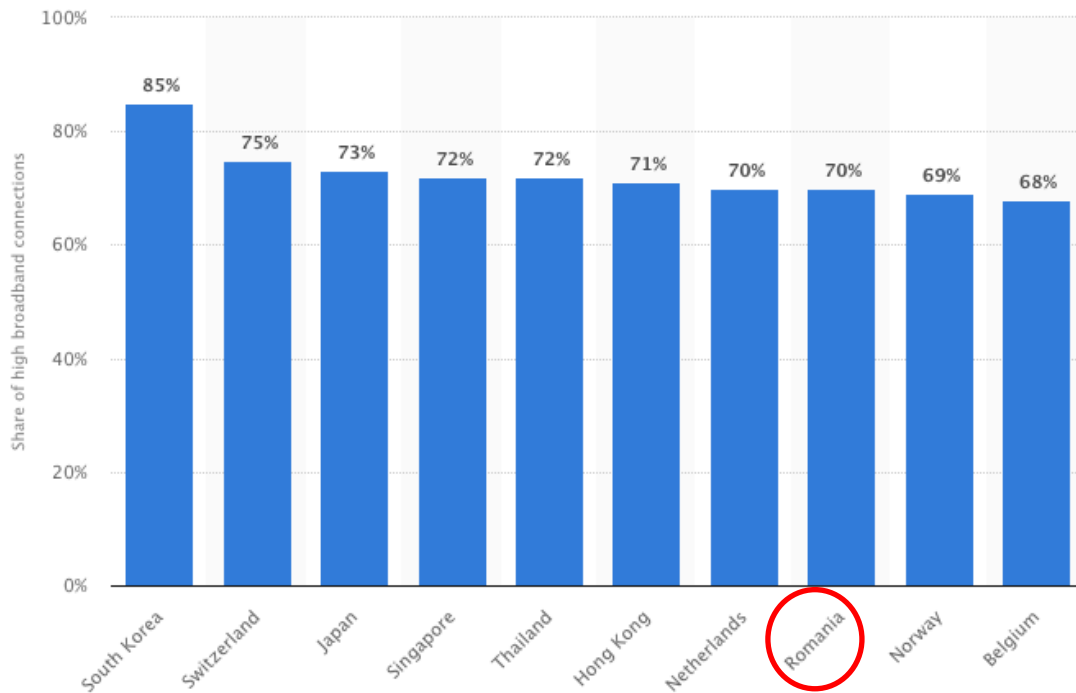
³ Taken from [Internet]: https://www.rrr.ro/fr_fr/montants_des_loyers_en_roumanie-2554063

⁴ Taken from [Internet]: <https://www.arte.tv/fr/videos/091987-000-A/camgirls-l-uberisation-du-porno-vox-pop/>

⁵ Defined as the main, regular customer who provides the biggest income share

⁶ Ibid.

What's more, a whole local economy is developing in Romania which revolves around these studios. Many artisans participate in this new industry through a variety of services, such as costume making, makeup and hairdressing techniques, etc. Coupled with that, a direct consequence of the presence of so many studios is that "Romania has the best and cheapest Internet infrastructure in the G20 countries." (*Ibid.*)



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[About this statistic](#)

Source: Akamai Technologies

Figure 4 Countries with the largest rate of high broadband connectivity as of 1st quarter 2017.
Source : <https://www.statista.com/statistics/417225/high-broadband-connectivity-countries/>

Compared to traditional forms of CSA, a lot of production costs seem to be diminished by digitisation and thus partly explain the growth of this market in terms of both performers and companies.

It seems equally important to consider the models' health and safety costs. Related issues are often mentioned favourably in performers' blogs (better safety, less violence thanks to the interface of the screen, the possibility of cutting the connection at any time, zero risk of sexually transmitted infection, etc.). Thus, these new forms of commercial sexual services not only reduce the costs associated with health risks, but also those related to the need for transnational mobility characterised by traditional CSA. In this case taking place in Switzerland, mobility is therefore costly, and in addition, the costs of living in a Western country are high, including rents in dedicated neighbourhoods, the level of consumer prices, and so on. Renting a room in a dedicated area can be up to "€90 per day during the week, and €140 per day at the weekend" (Interview J.), which is

a total of more than €2,800 for a month's rent, while the average rent for Switzerland in 2017 was €1200 to €1300 CHF⁷.

3.1.2. Spatial division of consumption

The costs of producing livecam CSA in comparison with standard CSA can also be analysed from the perspective of the customer. Maintaining a territorial perspective, we can observe on a macro scale that the majority of customers are in Western countries, such as England, Canada, Sweden, Australia and the Netherlands (Terpon Corp.). "In terms of livecam consumption, the customer base is very diverse, but it's a small proportion that consumes the most. Overall, out of a total of 500,000 people watching livecam, 100,000 are consuming \$3000-4000/month." (Terpon Corp.)

This contrasting of the spheres of production and consumption highlights the fact that this livecam spatial division reproduces a dichotomy which has already been identified in the field of so-called "traditional" commercial sexual activities. These differences in purchasing power, standards of living, etc. between the places of production and consumption thus illustrate the effect of optimising these new forms of CSA across time and space, which is made possible through digitisation. In parallel with the changes in costs, there is an increase in the available supply and ease of access for customers. In short, digitisation is changing the economic relationships between national territories. We will now look at how the places and content associated with livecam activities are organised.

3.2. The places and content associated with livecam

Our second hypothesis is that digitisation changes not only the spatial organisation by linking distant places, but also the content of the transactions due to the presence of terminals in the places where the tangible activities take place. Indeed, the new spatial organisation would not make sense if it did not rely on new types of services that take place in specific places dedicated to CSA. In the same way, these places are reorganised according to their connection with others, via the new spatial organisation.

3.2.1. Content of the transaction

The spatial and temporal progression of a livecam transaction can be broadly described as a market, as defined by White (1981). Livecam firstly requires the participation, through connection, of at least two people, a performer and a customer, in this case located in different tangible places, via a digital platform. Digitisation, however, makes it possible to reach far larger numbers of participants than is possible in direct CSA. Indeed, an unlimited number of tangible places can be connected live through a webcam. At any time of the day, more than 2,000 performers are online and offering their show on the LiveJasmin platform alone (Docler Holding 2019). Possibilities for the customer are also increased, due to the choice of platforms and wide range of categories. You can now choose the type of show you want (private, VIP, with a connected sex toy, etc.), the language you want, the price you want per minute, and the profile of the model according to different criteria (gender, origin, level of experience, age, etc.). It is estimated that there are currently around 5,000 platforms dedicated to livecam, for Freemium and Premium forms combined.

⁷ Taken from [Internet]: <https://www.bfs.admin.ch/bfs/it/home/statistiques/catalogues-banques-donnees/graphiques.assetdetail.7346306.html>

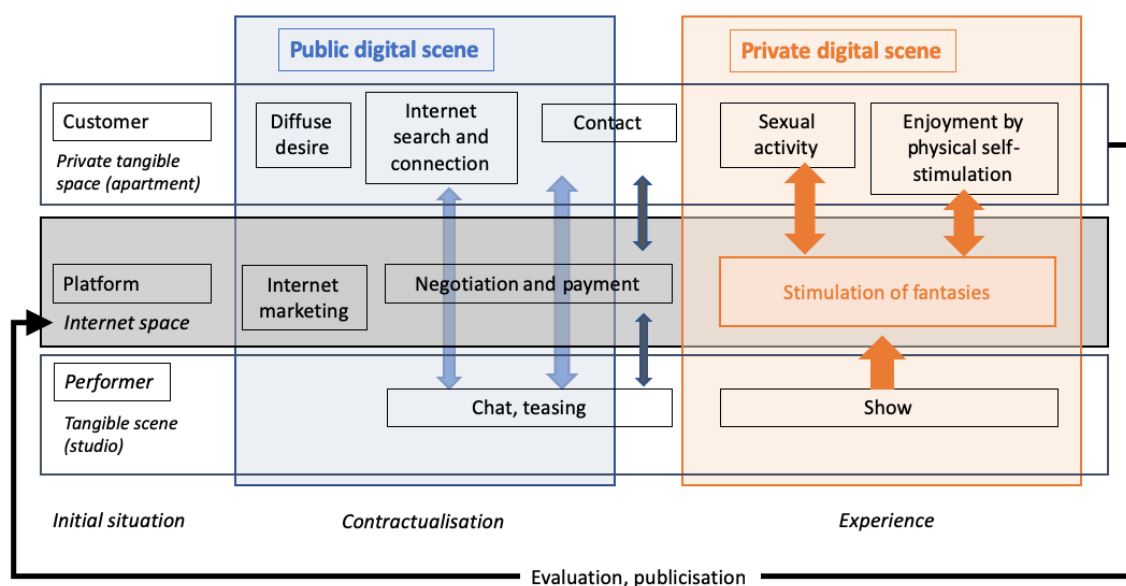


Figure 5 : Spatiality and temporality of the livecam transaction. Source : Own work.

This set of platforms in general, and each of them in particular, are comparable to public market places: they bring together both supply and demand without obligation to contract. Customers browse digitally and choose first a site, and then one or more available offers. As in a tangible commercial space, this digital *space in media* (Adams 2009) is a catchment, staging and *teasing* space. This first phase is a discovery space, in which the goal for the performers is to attract customers. In the second phase, we switch from this public digital commercial space to a private digital space, usually restricted to one performer and one customer. This switch signals the move to pay-per-minute mode. Another configuration is a public digital space where certain customers, called “tippers”, pay using tips. This chargeable part of the service may also be subject to specific monetary incrementation, in the form of tips, in line with the customer's wishes or in order to operate a connected sex toy.

Livecam is not a “service delivery” in the strict sense, where only the provider is active in the value creation process. Rather, it is part of the experience economy (Pine and Gilmore 1999, 2013, Lorentzen *et al.*, 2015), where the consumer is intensely engaged and plays a central role in building value (Hippel 2005, 2007, 2008). The show takes place between the performer and the audience in a synchronous manner. During the show, it is possible to interact – mostly via chat⁸ – in order to signal requests, expectations, etc. The experience can therefore take the form of an individualised and personally tailored mode. Even if the consumer remains passive, the performance is nonetheless measured based on the consumer's attention span, both in monetary terms and with regard to the content of the service.

It is important to note that the end of the show does not determine the end of the transaction. Indeed, there is a third phase which is crucial to the construction of the value of the performance: rating, where the customer can evaluate the performance, give points, etc. Depending on the platform, there are different approaches, but the result is the same: a ranking⁹ of performers emerges, which is accessible to all customers – both

⁸ Online chat in instant messenger form

⁹ Hierarchy internal to the platform, based on ratings and time spent online.

frequent visitors and novices – who enter the site. We then come full circle, back from the private digital space to the public space of the platform: new customers access information from customers who are already initiated, and the selection criteria are therefore both personal (fantasies and specific desires) and shared, in the sense that other people's assessments can also be used as criteria for making a choice. These assessments are also found on other types of website, such as specialised platforms, forums, etc. In short, while the value is built in the private digital space, the public digital space is central to the choice, social assessment and monetary valuation of the service. Livecam therefore needs to be analysed according to valuation theories (Dewey 1939, 2011; Vatin 2013; Starck 2011; Aspers and Beckert 2011), which give full scope to the individual and social processes of constructing value, with consumer engagement, rather than seen as a traditional service delivery, for which content (knowledge embodied in the service) is central. Digitisation, in that it allows for bilateral and wider interaction, promotes an experience economy and allows the creation of extra value by playing on the individualisation of the experience and on its social valuation. The knowledge that is brought into play by both the performer and the consumer is partly publicised and shared, both directly on platforms via comments and ratings, and indirectly on specialised performer blogs. This knowledge is thus embedded in the community (Crevoisier 2015).

With regard to the LiveJasmin platform, it is important to note that the digital place, as it appears to the customer, is carefully staged with atmospheric effects, lighting, costumes, etc. The framing varies and is driven by the performer. For example, Studio 20 in Bucharest invests between \$3,000 and \$5,000 in electronic equipment in each studio room, "computer, large screens, latest generation Pan-Tilt-Zoom Cameras, lighting systems, etc." and about \$3,000 "per room for the home staging" (Terpon Corp.). These significant investments in staging can enrich the experience considerably.

The consumer, on the other hand, is usually located in their own home during the transaction. It is much easier therefore to access livecam than direct CSA, which requires co-presence in a place that is usually outside the home, such as a brothel, apartment or dedicated hotel.

Thinking of these monetary transactions in spatial terms, it is interesting to note that within the synchronous space of the transaction, it is the time that is paid for and not the act. This time is calculated proportionally to the presence of the customer in the private digital space. The goal of the performer is to make the performance last as long as possible. Premium site models talk about specific customers known as "Top Spenders" (Interview BC.), who spend a lot of time online each day, and sometimes very long periods of time. By comparison, in the context of tangible sexual services, the time spent with customers must be optimised, in order to increase the number of customers during a working day. Digitisation therefore causes a fundamental change in the relationship with time.

3.2.2. Comparison between different CSA

What are the differences and similarities between the territorial forms of livecam and tangible sexual services. How do these two groups influence each other? Figure 6 allows us to compare different CSA in terms of spaces and specific temporal sequences that are required for them to be performed. We compare the private and public dimensions related to the spaces used, as well as their digital and tangible dimensions.

Three important elements concerning the transformations brought about by digitisation emerge. The first lies in the totally private dimension of the sexual pleasure and sexual

activity space. We will see in the following paragraph how this private–public dichotomy, used by all forms of CSA, plays an important role and is far from insignificant. The second lies in the fact that digitisation has enabled the creation of hybrid forms, in the contact-making, teasing/advertising and payment phases. Firstly, some concret CSA use media during the primary advertising and contact-making phases. Platforms such as Sex4u, Sexup or Anibis, are widely used media for this (Interview J.). Secondly, the livecam industry mobilises various types of digital platform to offer a variety of payment options (tokens¹⁰, PayPal, etc.) or to advertise via highly visited sites such as PornHub, YouPorn, etc., on certain online forums or via social networks such as OnlyFans or Facebook. The third and last element lies in the fact that livecam is the first form of sexual performance with sounds and images whose activity takes place in a totally digital synchronous space.

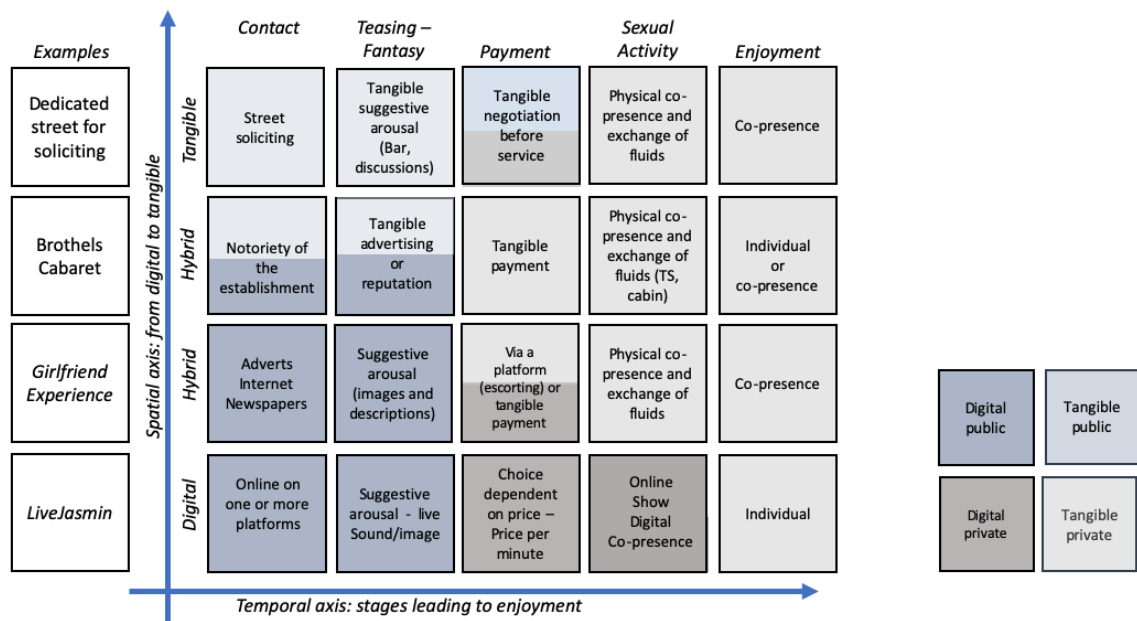


Figure 6 Comparison between tangible and digital forms of paid sexual services. Source: Own work

These differences in the temporalities and spaces between the different forms of CSA illustrate the changes brought about by digitisation, through new models. What impact do these changes have on tangible spaces?

3.2.3. Bypassing of public spaces

Our third hypothesis deals with the fact that livecam specifically facilitates the avoidance of the tangible public space by connecting private *places* via digital media across *spaces*. These new indirect sex industries seem to mobilise this avoidance at all levels. In fact, digitisation offers many alternatives to the use of dedicated, tangible spaces which are exposed to the public. While there are hybrid forms of tangible CSA which involve digital technologies, such as the use of online ads, they are increasingly replacing street solicitation or the windows of cabarets. In this sense, livecam seems to form the end of this continuum, completely removing any need to travel for the service. Thus, both the providers and customers benefit from the avoidance of stigma linked to travelling from concret public space to dedicated spaces. In the same vein, authorities in charge of

¹⁰ On average, 10 tokens are the equivalent of \$1.

public order seem to be benefitting from the same effects, through the gradual shift of CSA to private spaces which no longer require a framework of public concret spaces. Moreover, it seems that while livecam and other forms of fully or partially digital sexual services are experiencing a real boom, the dedicated public territories are decreasing.

Our last hypothesis lies in the fact that more and more tangible territories which host CSA (red light districts, streets dedicated to soliciting, etc.), are decreasing drastically and that they are slowly being replaced by digital – whether hybrid or otherwise – forms of CSA (Frame 1).

FRAME 1

CITY OF LAUSANNE, CANTON OF VAUD

"The street prostitution system in Lausanne came into effect on Sunday. The "activity zone" in the district of Sévelin has been resized from 1,700 linear metres to 700 metres for 40 to 70 people, from 10:00 p.m. until 5:00 a.m."

Taken from [Internet] URL: <https://www.rts.ch/info/regions/vaud/9486837-la-zone-reservee-aux-prostituees-a-lausanne-a-retreci.html>

CITY OF ZÜRICH, CANTON OF ZÜRICH

"In this context, the municipality has revised legislation relating to prostitution. By the end of August [2013], only two zones will remain for the sidewalk: one south of the city, and the other near the main station, in the district of Niederdorf."

Taken from [Internet], URL: <https://www.letemps.ch/suisse/prostitution-quitte-trottoirs-garages>

Frame 1: Examples of the reduction of concrete tangible spaces dedicated to CSA in Swiss cities. Source : Local Newspapers

While we cannot specifically affirm or refute this hypothesis, we can note that the significant growth of the livecam industry – which is estimated to be worth 9-10 billion dollars (Terpon Corp.) – is happening in parallel with the decrease in concret territories dedicated to CSA, in particular in Switzerland. These digital forms prevent problems in public spaces. At this point, it is important to keep in mind that while the dedicated territories are diminishing due to institutional issues, the move away from these public places allows actresses and actors in this field not only to avoid the stigma associated with CSA, but also the costs presented in the first part of this article, related to the use of these spaces. In short, everyone wins, despite the significant public policy issues raised in all areas relating exclusively to digital technology. In some countries, notably in Europe, some requirements and/or legislation are coming into force gradually, over time. "Activities on European territory are highly regulated and a total transparency in the field is necessary, because penalties for certain fraudulent companies can be as high as 20 million. Sites are obliged to keep the performers' personal data and contracts stating the precise rules" (Terpon Corp.). There are also sites, such as Webcamlaws, that provide information about the law in layman's terms, and offer advice on "live web cam best practices" for both platform operators and models.

4. Conclusion

Adams (2019, 2018, 2017) posits that digitisation must be understood as a process of spatial reorganisation – a new linking of places thanks to the media – which plays dialectically with the content and activities which are developed within these media. In this paper, we have adopted this concept by coupling it with the territorial dynamics of innovation.

In territorial terms, livecam corresponds to a space in media, i.e., "topologies of communication, social networks, virtual places, surveillance, and 'code-space'. These various concepts converge around the idea that communications are a kind of space – that is, a structured realm of interaction that both enables and constrains occupants in particular ways." (Adams 2010: 46). This "virtual place" is made up of the connection across space, through a digital platform, of at least two concrete places – in principle the customer's home and the performer's studio – for an erotic show. It is the result of entrepreneurial action on the part of a multitude of actors, including many amateurs or independent performers, but also some major international platforms which are listed on the stock market.

From a territorial perspective, the economic dimension of this innovation can be explained by its spatio-temporal form, and vice versa. Compared to tangible CSA – street prostitution or brothels – livecam saves on a number of costs (migration of performers, rents, costs of living in the countries in question, etc.) while facilitating an experience, which may include access to interactive erotic games. Compared to the pornographic industry, it has the advantage of being, in principle, not reproducible, because it is the experience that gives value to the activity. If the consumer wants to experience it, he is obliged to pay. On a larger scale, platforms can be domiciled where it is most advantageous for them, regardless of the location of the production and consumption activities, at least for as long as the rules on taxing digital activities remain as they are today.

These economic characteristics are explained by the spatio-temporal form of livecam. First, the remote connection makes it possible to mobilise low-cost work and high-income consumers. Thus, the advantages of a spatial division of labour and consumption can now be brought into play in the field of CSA, where this had not previously been possible for all interactive activities between customer and performer. The construction of an experience value is possible thanks to the remote synchronicity facilitated by videoconferencing. This spatial organisation also makes it possible to reduce mobility for both performers and consumers, whether this be international migration or trips into the city to dedicated streets or brothels. Finally, we have seen that livecam makes it possible to bypass tangible public spaces, avoiding stigma at the municipal level, although the problems associated with easy access to digital public spaces – and specifically platforms – remain, in particular for minors.

While this research has focused on a case study of a premium website, the reality of the industry is much more diverse, with independent performer platforms, as well as amateur platforms, operating alongside large, publicly traded companies. Like many post-industrial activities based on consumer engagement (sports, cooking, music, makeup, etc.), livecam incorporates non-monetarised activities, commercial and monetarised activities, and large capitalist companies. What is striking is the speed with which this sector has developed. A trajectory has been initiated, with technological innovations already announced in the form of remotely activated sex toys, specific cameras, etc.

Ultimately, the big question is whether digitisation will lead to a replacement of tangible activities, or whether it will evolve and enrich them. While it can be said that livecam has

replaced pornographic movies, its impact on other CSA is not easy to pin down. There is a general decline in street spaces dedicated to soliciting, but it is likely that these activities have simply moved to dispersed private spaces. The experience enabled by livecam has probably led to an increase in the monetarisation of the population's sexual activities. Indeed, it encompasses increasingly individualised services that facilitate the avoidance of social control. In this, they are emblematic of the development of "capitalisme libidinal" [libidinal capitalism] (Dufour 2012), which is both transgressive and increasingly penetrates the private spheres and even the flesh of the protagonists. Digitisation cannot be understood independently of the current mercantile, capitalist and liberal system (Srnicek 2018).

We have been able to demonstrate how the phenomenon of digitisation is modifying CSA through the specific case study of the Premium LiveJasmin livecam. While we don't want to talk about the complete replacement or substitution of tangible CSA, it is imperative to study the changes brought about by digitalisation on two levels. Dialectically speaking, the content/context of Adams' (2010) spatial organisation parallels our analysis of the spatial division of labour/production and consumption in terms of the level of the transaction related to the construction of the places and contents – the coding and representations (*Ibid.*) of livecam.

On a first level, the content refers to the spatial changes brought about by digitisation, and by extension leads to questions of mobility and institutions. Indeed, the limits of physical spaces are being modified, while new digital *spaces* (Adams 2010) are created that facilitate the development of new types of commercial sexual activity. As a result, places will be lived and experienced in different ways depending on the available media, and these new technologies will, by creating new spaces, generate new social discourses, rules, practices and representations. These elements are intimately linked to the forms of mobility as well as to institutions. Indeed, a request for online synchronous interaction (Beaude 2018) can remove the need for mobility in space. This new opportunity, in the case of CSA, then leads to a total modification of the meeting space, as well as the performance space, whereas in tangible or hybrid cases of CSA only one or the other of these spaces are modified. For hybrid cases, it is the meeting place that can be digitised – through online ads, for example – while, in cases involving only tangible spaces, we witness a decrease of perimeter. Digitisation therefore not only offers new spaces and new practices, but also modifies the tangible spaces. These references to the structuring of spaces through digitisation highlight the institutional issues around it, both generally, in view of the issues regarding the taxation of GAFAs¹¹, and specifically, by holding the stigma attached to commercial sexual activity at bay. The growth of new CSA offerings which are partially or totally digitised seems understandable, since they benefit a wide range of institutional, economic and private actors. On a second level, changes to the spatial organisation have brought about an openness to the construction of new content in the form of synchronous online shows. This is an early form of innovation and learning, which itself allows a dialectic with spatial organisation, since elements such as connected sex toys or 360° cameras are the subject of research and innovation. This causal evidence demonstrates that, while spatial organisation influences content, the reverse is also true.

Our results are nuanced by the study of others platforms and by the analysis of the spatial effects of digitisation in other domains. Indeed, the current growth of Freemium livecam sites raises other spatial and economic questions, because from the point of view of production, they offer an individual and private opportunity to create shows – and a much wider offer – which can be assimilated to a low-cost livecam offer.

¹¹ GAFA: Acronym meaning the web giants, primarily referring to Google, Apple, Facebook and Amazon

Is the future of physical mobility challenged by these innovations? Nothing is less certain, but while the case of CSA leads us to consider the replacement of physical mobility by digital mobility, this is not the case in many other areas, such as tourism where digitalisation seems to lead to an increased mobility (Guex and Crevoisier 2015).

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