

Consumer Opinions on Short-Interval Charging for Pay-TV over IPTV

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Abstract—The short-interval charging model is a customer-oriented charging model for pay-TV over Internet Protocol Television (IPTV). In contrast to conventional pay-TV models such as subscription-based pay-TV, pay-per-view and video on demand, this model allows charging for very short viewing intervals in the range of seconds. This paper presents the results of a survey in order to assess the acceptance of this charging model. About 33% of the survey participants favor short-interval charging over traditional models such as subscription, video on demand, and pay-per-view.

Keywords—IPTV, pay-TV, charging model, survey

I. INTRODUCTION

With the ever-expanding high-speed connectivity, television and Internet are converging and the Internet Protocol Television (IPTV) is gaining in importance increasingly. Enabled by its return channel, IPTV is characterized by several developments such as time-, device- and place-shifted viewing.

Similarly to conventional television, the IPTV standard supports pay-TV which is a profitable market sharing more than 40% of the total TV industry worldwide [1]. Apart from general advantages of IPTV, paid television over IPTV, however, still follows primarily the conventional pay-TV model: Users need to take out a monthly or an annual subscription for some channel or channel package, in which they are interested. This subscription-based pricing model offers two main advantages for users regarding convenience and insurance. Specifically, subscribed members, on the one hand, do not need to deliberate upon cost and benefit each time they want to view some content. On the other, the fixed-price subscription model protects users from surprisingly high bills.

Nevertheless, subscription-based pay-TV has several drawbacks, which may deter many users from buying this service:

- 1) Users, who watch TV on occasion or infrequently, often regard long-term subscriptions as too cost-ineffective.
- 2) Users with a wide interest, e.g., a household with multiple members of different ages, would wish to subscribe to several channels or channel packages, e.g., for sports, movies, cartoons, documentaries, etc.

Such a solution, however, is associated with high expense.

- 3) The digital TV technology is experiencing a steady sophisticated evolution ranging from 3D high-definition TV, through Free Viewpoint TV and Ultra-smart TV, to television based on the 3D hologram technique. It is assumed that production costs and correspondingly subscription prices for content using such novel techniques will be extremely high.
- 4) The convergent TV technology assumes viewing IPTV on mobile devices. It is however questionable, whether long-term subscriptions will be appropriate in this use case where subscribers are used to pay for services in time- or volume-based billing units.

Pay-Per-View (PPV) is another business model for paid media content, where the user notifies the pay-TV operator in order to be entitled for a single event, for instance a concert or a box match. However, PPV is intended for live events of short duration with many users watching the same event. Since the process of notifying the operator requires a back-channel, which is not available for previous transmission paths such as terrestrial, cable, and satellite transmissions, methods like automated telephone systems, live phone customer services, and analog modems are used to start the purchase. Also, these methods account for the drawbacks of this scheme. The user has to inform the operator about the purchase intention a certain period of time before the event starts (latency of the back-channel). Although this constraint is weakened by Impulse-Pay-Per-View (IPPV) systems in contrast to Ordered-Pay-Per-View (OPPV), the operator still needs some time to compute and distribute the entitlement information to the users. Consequently, in most cases the entitlement is not possible after the start of some event.

Unlike PPV, VoD is a business model for IPTV, where users can choose among individual pre-recorded movies and are able to consume the content at individual times allowing them even to pause viewing and to continue within a certain period of time. Nevertheless, this model offers low *after-sale* flexibility: users have to pay for the ordered content entirely, even if they did not consume it completely for any reason.

In this paper, we investigate the acceptance of a new

charging model for linear pay-TV over IPTV, which can overcome the barriers of the most common charging models described above. In the style of pricing models for conventional telephony [2], the proposed model relies on time-based charging for pay-TV. By this means, users may register to the pay-TV service without paying any subscription fees. After this registration, these users may view any of the provided channels and need only to pay for the viewed minutes or seconds. As the users know the viewing time they can easily estimate the amount they have to pay for each view. We, therefore, denote the proposed model as *short-interval charging model*.

The paper is organized as follows. Section II starts with an overview about related work. Section III first provides the context of the German media provision market and then presents the details and the evaluation of the conducted survey. Section IV concludes the paper.

II. RELATED WORK

Defining an appropriate pricing policy is a critical task in business as it influences the sales volume, the revenue, the market share, the competitive position, the company image and the profitability. Pricing models for communication and information goods have been addressed in the literature for a long time [3], [4]. Several proposals relate to pricing models for Internet sessions [5], for IP telephony [6], for software distribution [7], and for video-on-demand (VoD) [8]. The short-interval model, depending on the implementation, can be classified either as a linear pay-per-use model or as a component of a non-linear static n-part model (see Figure 1).

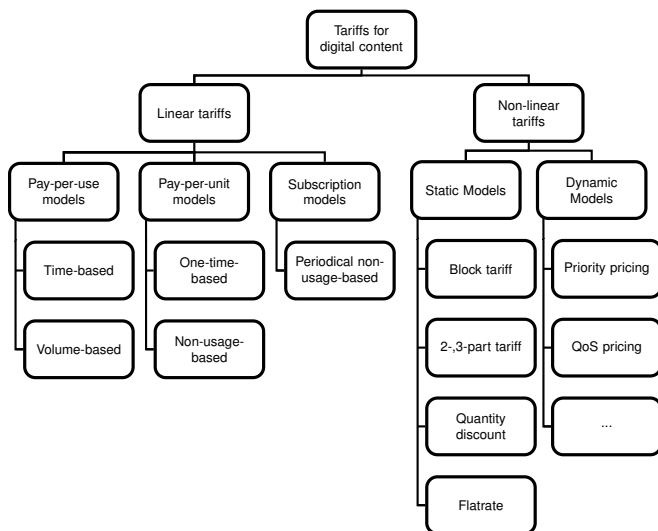


Figure 1. Classification of tariff designs according to [9]

Since IPTV is a new technology, related studies and surveys have mainly focussed more on the adoption of the IPTV service rather than on diverse charging models, that

could be used in combination with IPTV technology [10], [11]. In [12] for instance, the familiarity of consumers with the concept of IPTV and their willingness to purchase IPTV services is surveyed. In [13], the adoption of IPTV is investigated considering the role of a user gratification model. Further studies assess the interest of consumers in advanced features of IPTV [14] involving Tele-Commerce [15] and the vision of *connected home* [16]. Regarding charging models and especially the willingness to pay depending on different models, the work of [17] surveys consumer opinions for mobile TV services. As for the proposed short-interval charging model for pay-TV over IPTV, we are not aware of any relating study up to now.

III. SURVEY

We assessed the acceptance of the short-interval charging model in an actual market by conducting a survey and determining the fraction of users willing to accept this model. Since our survey has been conducted in Germany, we first give a brief introduction into the German IPTV and pay-TV market situation in order to rate the following results accordingly.

A. Market background

Currently, 35.5 [18] to 37.5 million TV [19] households receive an average of 73 channels in Germany. The typical German watches TV for 212 minutes on average per day [18] and 53% of all TV households receive TV signals over cable connections, 42.2% via satellite, 10.7% over terrestrial free-to-air transmission, and 3.5% over IPTV (multiple forms of reception are possible) [19]. In total, 3.8 million subscribers obtain pay-TV services [20], which equates to a market share of about 10%. Sky Deutschland having about 2.48 million subscribers is the current market leader [21]. The total number of broadband households in Germany is estimated around 26.5 million [22]. About 23.8 million thereof are supplied with DSL lines. Providing a bandwidth of 6 Mbit/s and more, a portion of 52.4% of these DSL lines is capable of transmitting IPTV [23]. This corresponds to ca. 12.5 million potential IPTV subscribers. Currently two IPTV operators are active in Germany: T-Com (the German Telecom) and Alice, an affiliated company of Telefonica. T-Com has approximately 13.87 million active DSL lines with 1.3 million subscribers using their triple play service (voice, Internet, IPTV), called Entertain TV, [24]. Alice, in contrast, has around 2.09 million DSL customers with 0.06 million subscribers for IPTV [25]. Thus, 1.36 million IPTV customers are currently recorded in Germany.

Compared with other countries, the IPTV market penetration in Germany can still be described as relatively low. One of the main reasons for this situation is the competition with many well-established transmission paths including terrestrial free-to-air transmission, cable lines, and satellite transmission. The digital terrestrial television signal

is being made available by public broadcasters and provides a considerable number of TV channels for free. Digital cable TV is also very widespread in Germany and records high growth rates. Additionally, Germany is located in a favourable geographical position concerning the coverage zones of several satellites. Thus, hundreds of unencrypted TV channels can be received with a low-cost receiver and a satellite dish with a small diameter.

Despite the fierce competition of transmission paths and the slow start of IPTV, the pay-TV over IPTV market in Germany undergoes growth correspondingly to the world market. One important driving factor for this growth is the high and increasing broadband penetration in Germany. Another reason is that IPTV, unlike the other transmission paths, increasingly attracts customers with its unique technical properties like time-, place- and device-shifting. We believe that Germany is a suitable place for the research of consumer opinions on short-interval charging for IPTV since it has a very competitive market and a high and increasing broadband penetration.

B. Methodology

The survey was conducted online using a dedicated Web site during a period of six weeks. For the creation and management of the web-based questionnaire the LimeSurvey application [26] was used. The participants were asked by e-mail to take part in and to recommend the survey. As an incentive all participants, who completed the survey and submitted their e-mail address, entered a prize draw for a voucher of an online store. Out of total 337 responses, incomplete responses were excluded leaving 315 complete responses for evaluation.

C. Questions, Options and Results

The online questionnaire was very simple in design. At first, some demographic information regarding the gender, the age and the occupation of the participants were requested. The proportion of female attendees approached 33%. More than 83% of the attendees are between 18 and 39 years old, see Figure 2. The majority of the participants consists of persons with high payment ability or payment potential such as employees, self-employed, employers, and students. Only a minimal part of 3.17% and 0.95% is retired or unemployed, respectively.

Towards its main target in estimating the acceptance of the short-interval charging model by customers, the survey tries to collect various information about the familiarity of the respondents with IPTV and about their behavior with regard to the consumption of TV and pay-TV. Depending on this information, some questions are skipped or considered. For instance, a participant, who does not watch any TV, is not asked about the type of TV reception in her or his household. This is because the probability that this participant does not have a TV at home is relatively high. By this means, we

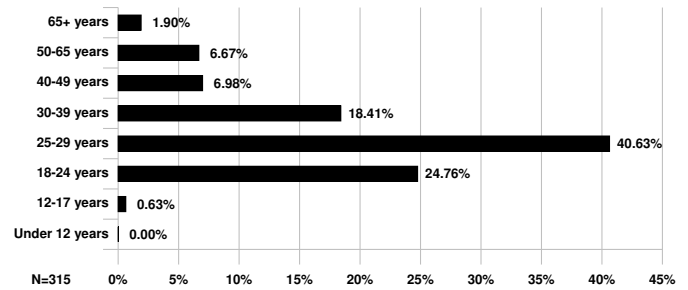


Figure 2. To which age group do you belong?

tried to increase the informative value of each answer. The fact that IPTV is still in its infancy in Germany has been confirmed by the answers to the basic question: Are you aware of the term IPTV? See Figure 3.

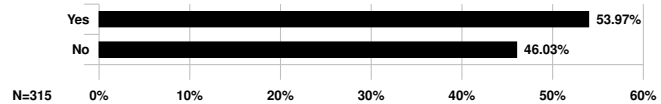


Figure 3. Are you aware of the term IPTV?

Note that the high percentage of respondents, who are not aware of IPTV, does not have a negative impact on the final result of the survey. Remember that we aim at finding out how attendees think about charging models for pay-TV in general. It is well-known that IPTV is often confused with other video content provided in the Internet. To be more specific, therefore, we asked the respondents, who regarded themselves as aware of IPTV, to specify what they understand under this concept, see Figure 4. Fortunately, most participants could assign IPTV as television over DSL, which is the correct definition of IPTV.

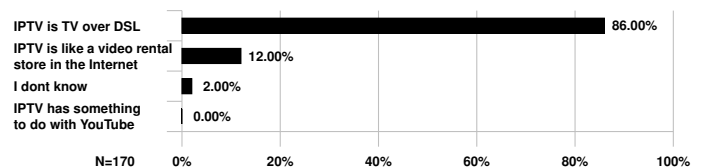


Figure 4. What exactly does IPTV mean for you?

The next questions relate to the respondents' behaviour regarding the consumption of TV, pay-TV, and video content in general. First we questioned the attendees about their form of TV reception, see Figure 5. The answers to this question reflect the general situation of the current market situation for TV reception in Germany. The most common form of reception is cable TV (digital and analog) followed by satellite and terrestrial reception. About 9% of the participants do not watch any television.

Again, the lower IPTV reception in Germany does not worsen the main survey objective, as our purpose is to learn

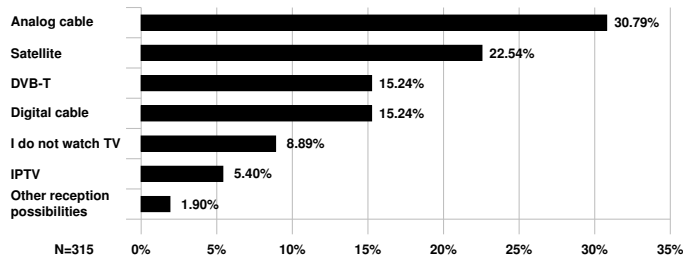


Figure 5. How do you receive your TV?

about the participants' behavior and attitude regarding pay-TV and other paid video data in general. In the next question, we found out that only 9% of the participants with TV reception watches pay-TV such as Arena or Sky see Figure 6. However, more than 72% of all attendees pay for video content such as DVD purchase, video rental, or visits to the cinema, see Figure 7.

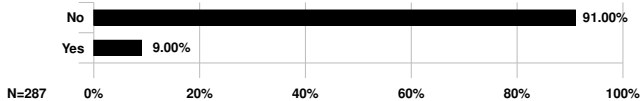


Figure 6. Do you use pay-TV services such as Arena or Sky?

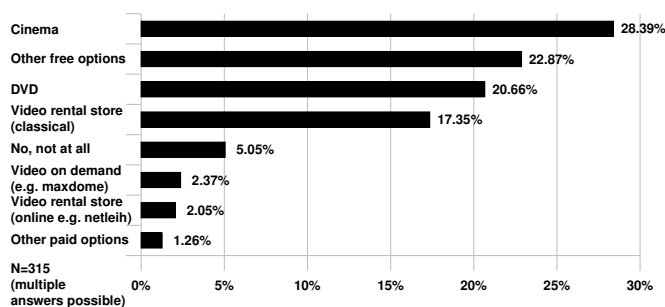


Figure 7. Do you pay for video content in one or more of the following forms?

Combining the answers to the last two questions it can be assumed that the lower interest in pay-TV is not attributed to a low willingness of the participants to pay for media content. Rather, there must be other reasons, which make pay-TV less attractive and deter people from buying this service. The next point, therefore, was to ask the respondents, who do not access pay-TV, what would attract them to buy pay-TV content, see Figure 8. Surprisingly, the answers to this question confirm our assumption, that it is the way of pay-TV offering, which hinders its wide acceptance. More than 83% of respondents would buy pay-TV under some conditions. Most of these conditions relate to the price and to the contract, i.e. subscription. Obviously, more than 35% find that pay-TV prices are too high and a total of about 38% has difficulties with the subscription-based model itself or

with long subscription periods.

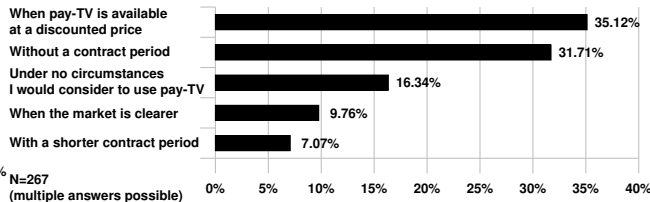


Figure 8. Under which conditions would you be willing to use pay-TV?

The result of the previous question confirms the analysis given in Section I about the problems of current pay-TV pricing models and that a new model is overdue. The last and most relevant question aims at the specific information on whether the proposed short-interval charging model would attract more customers, see Figure 9. The attendees are confronted with three pricing models and asked for the preferred one. To avoid any misunderstanding, each of these models was clarified shortly in the survey:

- 1) **PPV/VoD:** You pay for a selected film.
- 2) **Monthly Subscription:** You pay a monthly fee.
- 3) **Accurate Deduction:** You only pay for the seconds or minutes you watch.

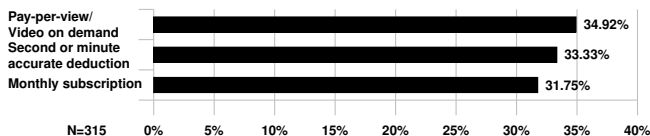


Figure 9. Which pricing model for pay-TV would you prefer?

In summary, the survey provides the following main information:

- 1) More than 72% of the survey respondents already pay for video content in one way or another. Even the attendees, who do not watch any TV (ca. 9% according to Figure 6), seem to consume paid video in several ways. By analyzing the answers of this group to the question of Figure 7, we found out, for instance, that 71% of these attendees go to the cinema, 46% buy DVDs, and 32% utilize the services of video rental stores. In total, 90% of all the respondents pay for video content.
- 2) Although pay-TV is very well-known, it still lacks a wide attractiveness for most people. Only 9% of the respondents with TV reception make use of this service (Figure 6). Even if there may be other reasons for this situation, most respondents identify the price and the charging model (subscription-based charging) as the most important obstacles of today's pay-TV (Figure 8), which is comprehensible considering the market situation described in Section III-A.

3) A short-interval charging model for pay-TV is preferred by 33% of the survey participants. 39% of this group were attendees, who are not aware of the term IPTV. Also the respondents, who do not pay any money for video content (ca. 10% of all respondents), seem to be most attracted by the new model. Their voice for the model reaches 44%.

D. Evaluation

In the following we assess the validity of the outcome of our survey by setting its particular results into relation to market analysis and studies, which addressed similar questions.

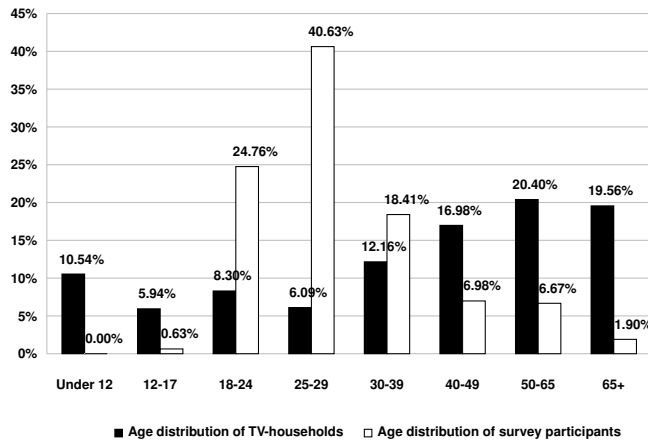


Figure 10. Comparison of age distribution of survey participants and TV households in Germany

In Figure 10 the age distribution of the TV households is compared to the age distribution of the survey participants. We can see that the age group of 18-39 is disproportionately overemphasized in our sample [27]. Additionally the gender ratio in our sample is 67% (male) to 33% (female) whereas the gender ratio of all TV households is 49% (male) to 51% (female) [28]. Relating to the IPTV awareness the ratio is 46% (aware) to 54% (unaware) in our sample. This result matches exactly with results of a representative study [29], where the participants have the same ratio of 46% (aware) to 54% (unaware).

A comparison between the distribution of transmission paths of all TV households [30] and our sample is depicted in Figure 11. It shows that viewers receiving their TV broadcast over satellite are underrepresented whereas such receiving their TV broadcast over IPTV and terrestrial digital video broadcast (DVB-T) are overrepresented. Also there is a minor shift in the ratio of pay-TV subscribers. The ratio is 9% subscribers to 91% non-subscribers in our sample and 12% subscribers to 88% non-subscribers in the german market [19].

Figure 12 shows the revenues for video content in Germany compared to the spendings of the survey participants

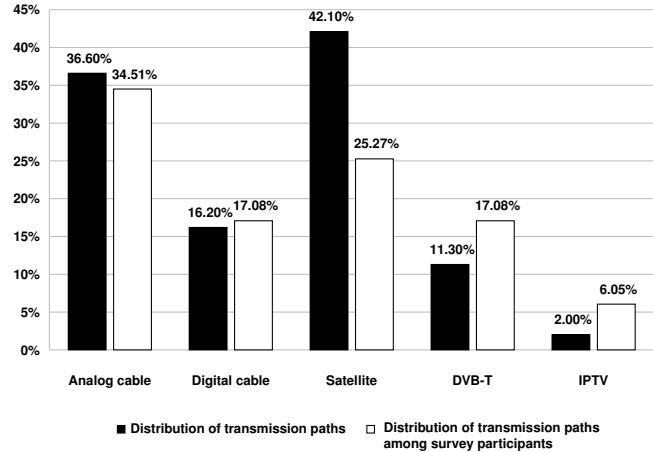


Figure 11. Comparison of transmission paths of survey participants and TV households in Germany

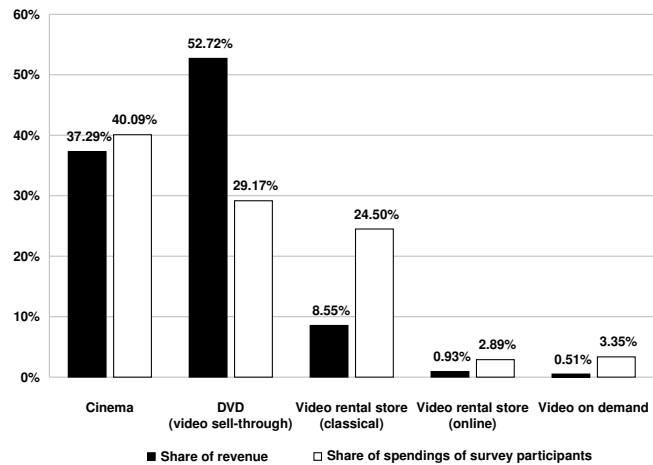


Figure 12. Comparison of revenues for video content and spendings of survey participants

[31], [32]. The share of customers, who provide video content from video rental stores (classical and online) as well as video on demand customers are clearly overrepresented in our sample, whereas customers of home video products (video sell-through) are represented in smaller extend.

When asked for the conditions for taking pay-TV into consideration, the two highest rated options in our sample were relating to discounted prize and the omission of a contract period. Interestingly, when participants of a similar study [29] have been asked about the reasons for their reservation for switching to IPTV, identically, the highest rated reasons were the prize and the deterrent effect of the subscription period. This reveals at least two insights. On the one hand price, is a strong indicator for user acceptance of a new product or model in the context of IPTV and pay-TV. On the other hand, obviously the subscription period as well as the prize are the main factors discouraging customers

from using IPTV and pay-TV.

In the last question the respondents have been asked for an abstract tendency towards our short-interval model by stating a general preference. Since this model is new, it is clear, that no respondent has ever experienced it. In order to avoid any bias during the process of forming their opinion, we provide the respondents only with the main merit of our model: You only pay for the seconds or minutes you watch. Thus, we assume that the respondents associate the proposed model with the next related model in their everyday life, which is short-interval charging for (mobile) phone calls or Internet usage. As we expect that all respondents have experienced the short-interval charging model in such context, we regard their assessment of this model as valid. Based on this, the perceived benefits of our model is independent from the knowledge of the term IPTV or the properties of the content (genre, duration etc.). So, all participants of the survey have been asked the last question, since their opinions are of equal value for us.

IV. CONCLUSION

In this paper, we surveyed the acceptance of a novel customer-oriented charging model for pay-TV over IPTV, which allows charging for very short viewing intervals in the range of seconds. The results of an online survey, which we conducted with 315 respondents in Germany, show that 33% of the survey participants prefer short-interval charging to traditional models. Thus, the proposed model seems to be able to meet open demands on the IPTV market. Once implemented particularly in segmented markets, this new charging model suggests to account for a relevant share of the total pay-TV market besides VoD/PPV and subscription-based pay-TV.

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