



WHITE
PAPER

Television Content Discovery: The Need for Improved Usability and User Experience



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TiVo engaged an independent research firm to evaluate consumer behaviors and attitudes about video and television discovery solutions. Using focus groups, 1:1 interviews and online survey-based methodologies, the research examined current behaviors, usability preferences, user experience with existing products, as well as attitudes and preferences concerning possible future solutions.

CURRENT ASSESSMENT OF TELEVISION AND VIDEO CONSUMER EXPERIENCE

As media choices multiply, U.S. consumers are inundated with viewing options, including an increasing number of cable and satellite channels and on-demand services. The rapid penetration of connected devices and video-based apps (e.g., Netflix, Hulu, YouTube) has added to the abundance of content already available to viewers. While this profusion of digital entertainment is good, the fragmentation of sources and viewing devices makes it more complex for users to discover and manage the content they want to watch.

Content discovery in television services is not keeping pace with the needs and demands of today's evolved viewers, who already enjoy usability advances in other aspects of their connected lives. These include advanced discovery and navigation in web, mobile and social media services, as well as specialized app interfaces that offer fast, accurate and personalized user experiences.

Our research measured viewer perceptions and problem areas with current pay-TV systems; it also investigated consumer willingness to sample new discovery technologies and tested reactions to emerging solutions, including keyword search and voice control. The study used focus groups and 1:1 interviews to explore detailed, qualitative aspects of the television discovery experience. TiVo further used online surveys to quantitatively measure certain findings across a broader pay-TV user base. The survey results are published as a separate report.

Findings demonstrate that by adopting such new technologies, content owners and service providers can benefit from better engagement with their audiences and potentially increase customer satisfaction and content consumption, thereby resulting in higher customer loyalty and revenues.

RESEARCH FINDINGS

Users Are Generally Dissatisfied With Current Search and Recommendations Options

Focus group participants were asked about their attitudes toward content discovery – specifically in the context of search and recommendations – on their television service (as opposed to using a web search engine, for example).

Overall, a majority – three out of four participants– reported dissatisfaction with their existing pay-TV content discovery experience for the following main reasons:

- Inability to search using keywords
- Length of time required to scroll through the electronic program guide (EPG)
- Inability to search by genre or by actor names
- They forgot what they were initially looking for in the EPG
- “Excessive” time necessary to enter search terms
- Misspelled search terms
- Inability to recall the name of the movie/show to search
- Recommendations seemed irrelevant
- Lack of understanding why a piece of content was recommended

Inadequate Search Functionality Results in Lost Viewership

Disappointment with current search capabilities adversely affects viewer behaviors. A vast majority of users reported turning off their TVs without watching anything because they could not find suitable content to watch. A full 85 percent of online survey respondents said they had turned off their TVs for this reason, with 63 percent turning off their TVs more than 20 percent of the time without watching anything. More than 20 percent also said they did so half the time or more. Furthermore, 67 percent expressed a need for improved TV content navigation.

This research identified the following challenges with existing search solutions:

Poor Discoverability of Search Within a Television Service

Overall, participants felt search is not as prominently featured or easy to access on their systems as it should be.

Difficulty Inputting Search Terms

Using virtual on-screen keyboards to input search terms was perceived as challenging. T9-based search input was generally considered better, but only if the system had predictive capabilities that minimized the number of required keystrokes and also accommodated spelling errors.

Mismatch With User Thought Patterns

Viewers' thought processes and patterns do not translate easily into current search capabilities. For example, in order to use search on their systems, users needed to be precise in what they were searching for; otherwise they said the search system was incapable of returning accurate results. Consumers compared this to other search engines such as Google, which allows users to search using multiple, associative keywords.

Poor Presentation of Results, Need for Personalization

The other area of dissatisfaction was with search results. Most current systems present results in a priority order that does not make sense to users (e.g., alphabetically) and contains listings that are perceived as irrelevant. Focus group participants indicated the ordering of results should have a notion of relevance or importance to the user.

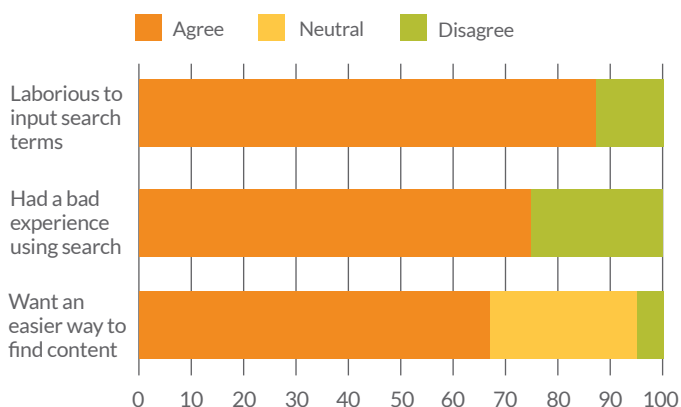
For example, search results should:

- Prioritize live shows, as viewers typically look for shows that are available to watch now
- Prioritize the most popular shows, characters or actors
- Prioritize primetime networks (i.e., those most likely to be broadcasting new episodes)
- Offer a form of prediction that allows users to see quickly if they have made inputting mistakes
- Tag episodes previously viewed by users to ensure they do not receive priority placement; this is particularly important as binge-viewing increases
- Learn from users' current viewing behaviors and sort results accordingly to match individual preferences (i.e., offer personalization)

Second-Screen Applications

While second-screen applications (when available with a participant's service) improved some input limitations, they exposed yet other limitations where users could type in more information – but the system could not necessarily interpret the information correctly. For example, users were likely to input multiple keyword queries similar to a web search and receive inaccurate results from the pay-TV system.

Figure 1: Behaviors and attitudes of users toward their current pay-TV search features



New Technologies Can Dramatically Improve Viewer Experience

Among new technologies that can overcome the above-mentioned limitations, participants were exposed to specific search functionality with capabilities such as advanced keyword search using multiple keywords, acronyms, abbreviated terms and combinations thereof. They also explored voice-based input to overcome tactile input challenges experienced with existing pay-TV systems. Technologies such as advanced keyword search and voice-enabled search are designed to be intuitive, easy to use and able to overcome the content discovery problems exposed in this study.

As expressed in online surveys, most participants had a positive outlook on voice-enabled search and its potential to overcome the current limitations of TV search and navigation. This was also based on their experience with voice-based interfaces on smartphones, automobile telematics and other types of connected devices. While only 42 percent of survey respondents used voice on their mobile devices, more than half stated a desire to use voice for television viewing. Sixty-one percent of surveyed pay-TV subscribers watching more than three hours of TV per day stated interest in using voice, and 20 percent of such users responded that they would use voice most or every time they used their TVs. Most participants also stated that voice-enabled search would be their ideal way to find content on TV. It was perceived as being intuitive, fast, accurate and easy to use.

User Attitudes Toward Advanced Keyword Searching

Advanced keyword searching allows users to find content using words other than the title of a program or movie, as well as combinations of key terms and phrases (e.g., genre + actor, mood + genre, etc.). Title search is prevalent today, but users are expecting more, given the advanced search experiences possible on web and mobile. In contrast, the ability to use multiple associative keywords to identify a title was perceived as a natural, efficient way to translate how users think of a title and render it as a search result. Such keyword combinations are used by viewers to explain what TV shows and movies they are thinking of in normal conversation, particularly when they are unsure of the name. Such keyword searching was explicitly expressed as a desired feature by participants in this study.

Advanced keyword search offers an intuitive model that aligns with users' thought processes. This research tested the keyword search interface provided by TiVo to evaluate its actual ability to overcome identified shortcomings of existing search systems.

The specific features presented in TiVo's solution included:

- Incremental (predictive) search: Search results are generated with each keystroke, incrementally. The system does not wait for an entire word to be input, but rather tries to predict what the user wants. This can be achieved using acronyms and partial-word inputs.
- Keyword combinations: Users can type two or more words associated with a title to have the system match their intent with the title of a video program or movie. These keywords can be any combination of title, cast, characters, genre, mood and other associations (e.g., Oscar-winning).
- Relevance: Search results are not alphabetically prioritized, but have relevancy based on relative weights prioritized by popularity, topical interest, trending data, user preferences and various other criteria.

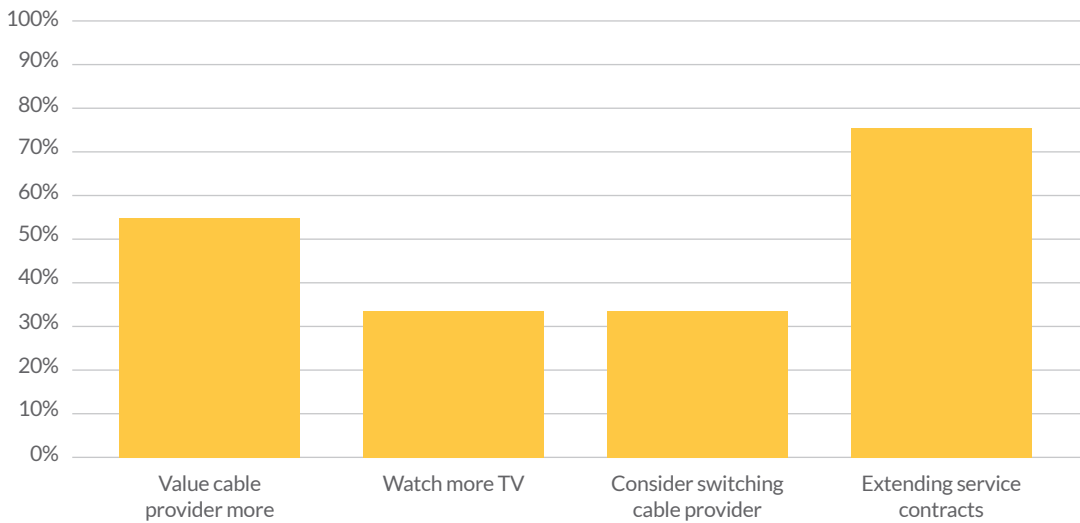
A Note on Personalization: Personalization allows individualized (device- or user-level) results to be presented based on users' preferences learned from their viewing behaviors. Since personalization is demonstrable only to a limited degree in settings such as focus groups and results can be unreliable as a result, the topic of personalization was not explored as part of the functionality and usability experience that can benefit users. However, from participants' comments about the limitations of current search functionality, it is evident that users require this and are aware of its absence.

Such an incremental system overcomes the keyword entry limitations that deterred many participants from using search regularly. Particularly when using a T9 remote, the TiVo system predictively sorts through results using relevance and keyword intersection. For example, "Hanks" + "volleyball" would yield the unique title "Castaway." For a large majority of the participants (88 percent), such keyword search was perceived to be the desired, intuitive and efficient way to search for content.

Eighty-eight percent of focus group participants surveyed also thought the advanced keyword search was easy to use and 75 percent believed it was simpler than current discovery methods they used, including EPG browsing and channel-hopping.

The research showed current perceptions of pay-TV search functionality are poor; one-third of participants would consider switching cable operators to get advanced keyword search. More than half of participants felt such keyword search would have a positive impact on their viewing experiences and relationships with pay-TV providers, whether implemented on a remote control interface, a connected device remote control or a second-screen application. Three out of four participants said they were willing to extend their service contracts if advanced keyword search was offered. One-third of participants also felt this improved search and discovery would lead them to watch more television programming. All of these factors have a direct bearing on a pay-TV operator's revenue and ARPU.

Figure 2: Perceptions and attitudes toward keyword search



User Attitudes Toward Voice-Based Search

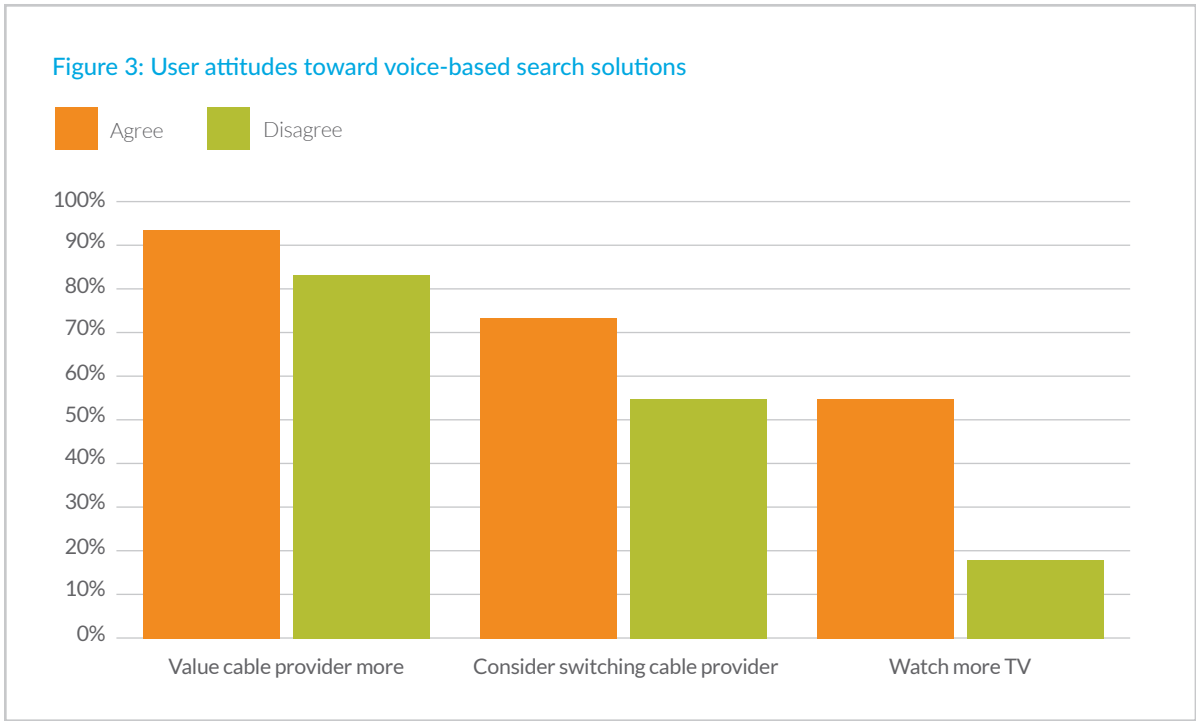
The smartphone has been instrumental in making voice user interfaces (VUI) mainstream, and has generated interest in using the technology on other devices, including the TV. Pay-TV providers must not fall behind as large consumer electronics (CE) manufacturers embrace and enhance this technology, making it commercially available on televisions.

Voice search interface capabilities differ greatly. While some are command-based and therefore prescriptive in nature, newer systems being developed such as TiVo's conversational interfaces are more diverse, allowing consumers to use natural language and carry out compound searching (searching within a previous subset of results), enabling iterative refinement of search results in line with human thought processes.

This study tested user attitudes toward both command-based and conversational search interfaces. Initial reactions to both simple voice command and conversational interface systems were strongly positive, and users felt these would significantly improve the way they search for TV content. Overall, 60 percent of the online survey participants supported this finding. While voice commands were found to be useful, the conversational interface moved television usability to a realm of natural interface the participants almost unanimously felt would transform the way they experienced television.

Voice interfaces received highly favorable reviews from participants across the board. However, there were a few key areas where the differences between simple voice command interfaces and conversational interfaces were more pronounced. Among these, the number of participants who would watch more television using conversational interfaces was 37 percent higher than the number who would do so with simple voice command options.

More than 70 percent of participants stated they would consider switching their pay-TV provider to gain access to conversational interface technology – 17 percent more than those who would consider switching for a voice command solution. The ease and speed with which they could find content was cited as the key facilitator in increased viewing times, but the “fun” element was also deemed to add to the overall TV experience and promote viewing. More than 80 percent using conversational interfaces would place a greater value on their relationships with cable providers – 10 percent higher than with voice commands alone.



Similar to the advanced keyword search, preference for conversational-based search was found to be rooted in its ability to follow users’ train of thought as new results are presented, mirroring their behavior when discussing and searching for TV shows and movies with other people and when searching the internet on personal devices. Most viewed the ability to carry out searching at this level through the TV as opposed to a personal device as a process simplification. Even those who did not actively use personal devices at present to search for content felt it was something they would use on a regular basis to enhance their overall TV experience.

Additionally, participants felt conversational-based search offered the ability to search as a group rather than individually. Alignment of conversational search with current human interactions around the TV meant that participants could see themselves using it with their partners, families and friends, making the process of searching for content more social, interactive and fun, as well as faster and more efficient.

SUMMARY AND CONCLUSIONS

While the industry has focused on providing users with improved forms of recommendations over the past few years, our research found search optimization is a much higher priority. This is primarily because most viewers stated that they know “pretty much” what they want to watch, and that having an easy and efficient way to search would be the most effective way for them to find that content. A subsequent online survey of 915 participants from across the U.S. confirmed this finding as well, with survey respondents preferring search over recommendations by a significant margin (77 percent versus 5 percent).

Viewers’ inability to find the content they are searching for is causing lost revenues for digital pay-TV operators as viewers switch off the television when they can’t find what they are looking for. According to the broader online survey conducted by TiVo, more than 85 percent of pay-TV subscribers have turned off the TV without finding something to watch. Almost 50 percent of viewers frequently turn off the TV without finding anything to watch.

Improving placement and access to search mechanisms within the TV interface would enhance use of these systems through greater exposure, but this is not enough. The functionality within these systems must also be improved to allow users to search in the way they want – using advanced keyword search and predictive features, T9 with predictive search feature and voice along with conversational search capabilities. Moreover, the manner in which search results are determined and organized needs to match viewing behaviors, which have some unique requirements for television and video.

The prescribed nature of many current search systems is not sufficient for users to navigate the vast repositories of content now available. Pay-TV operators therefore need to ask the following questions if they are to successfully meet the needs of their customers:

- Does the search facility offer users the ability to search in a naturalistic way (e.g., keywords)?
- Is it easy to find and use by the entire user base (not just early adopters)?
- Does it render accurate results that will help build users' trust?
- Does it offer a predictive element that allows mistakes to be rectified quickly?
- Are the results personalized for accuracy and removal of annoyance factors, such as previously viewed programs?
- Does the level of functionality make the system truly useful to viewers?

Both keyword and voice search have demonstrated ability to simplify and accelerate the searching process. The most preferred solution was the conversational interface, which over 70 percent of participants stated they would consider switching pay-TV providers to access. Just over half the participants also stated this solution would entice them to watch more TV, as it would be much easier to find suitable content.

By meeting their customers' search needs, pay-TV operators would also gain the ability to increase yields through subscribers extending contracts or switching to operators offering these features. They would also gain ROI through increased viewing times as the length of time searching for content would decrease and advertising impressions would increase as a result of the increased viewing time. Enabling users to easily find what they want to watch will result in greater content consumption, driving higher advertising inventory and, potentially, paid transactional on-demand viewing. An augmented ability to find suitable content would also reduce the number of instances when the TV is switched off due to an inability to find suitable content to watch, again increasing viewership.

ABOUT TIVO

TiVo is leading the way in the discovery and personalization of digital entertainment. We help power top brands around the world with market-leading guides, metadata, recommendations, audience analytics and advanced advertising solutions. With products deployed through an innovative cloud-based platform, TiVo is enabling customers worldwide to increase their reach, drive consumer satisfaction and create a better entertainment experience.

TiVo's pioneering technologies bridge the semantic gap in usability for connected devices and applications based on our proprietary knowledge graph semantic database. Powered by our knowledge graph engine, TiVo's conversation services are used by Tier 1 service providers in North America and major smartphone manufacturers globally for intelligent search, personalization and recommendations solutions.

ABOUT THIS RESEARCH

Three independent focus groups were conducted with a total of 24 participants. Focus group findings were further examined through 1:1 interviews with some participants and a follow-up online survey with all participants. Separately, a 915-person online survey was conducted to further confirm certain findings across a larger population. Reference to this broader research is annotated in the paper; more complete results are being published as a separate report.



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