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The provision on Web accessibility and VOD access services for people with disabilities: A case study of South Korea

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The provision on Web accessibility and VOD access services for people with disabilities : A case study of South Korea

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Abstract

As more people around the world are watching video contents through online, the subject of web accessibility and VOD accessibility is currently being debated at the worldwide policy level. Currently, most linear television content providers are required to provide a certain proportion of their content accessible through a subtitle, audio description, or signing services. However, in Korea, there is no policy or regulation for accessible broadcasted VOD contents. Therefore, this paper conducted an in-depth interview with media professionals, policy advisors, community media foundation's viewers support department, video content service providers, and accessibility advocates to discover current issues of a provision on VOD accessibility for the people with disability and find out impediment factors that cause delays in providing accessible services under fast-changing ICT environment. Referencing the case of existing legislation of U.S., U.K and W3C recommendations, this paper suggests what to do in future access service provision.

Keywords

Disability, Web Accessibility, VOD accessibility, Accessible service, Policy, ICT

1. Introduction

"Accessibility" has been referred to one of eight principles of the UN Convention on the Rights of Persons with Disabilities (Protect Human Rights, 2014). The purpose of accessibility is to provide equal access for people with disabilities and as a result of longer life expectancies, accessibility now covers a wide spectrum of needs, thus benefiting everyone in different situations to different degrees. And many solutions developed for increasing accessibility, such as subtitle service, for example, benefit general public users with situational limitations. The worldwide population of people with disabilities will continue to increase in number (Albrecht, Fitzpatrick, & Scrimshaw, 2003; Metts, 2000), and the numbers will only grow as the populations of the world ages (Hill, 2013). Before long, the elderly will comprise the largest population segment in the world (Paciello, 2000).

Making services more accessible will normally mean providing programmes with subtitle, audio-description or signing. Therefore, “access services” refer to such techniques. Linear television content providers are already required to make a certain proportion of their content accessible by providing a subtitle, audio description, and signing. However, VOD content is not as accessible as broadcast television contents and there are no policy or legislation on VOD services. The nature of video on demand (VOD), streamed online, is no longer restricted by space and time. Audiences are able to modify access and can use multiple devices. The U.S. is the only country which has dealt with this issue via legislation with the *21st Century Communications and Video Accessibility Act 2010.* Since then providing subtitle on broadcasted television contents and distributed through the internet became compulsory(K. Ellis, Kent, Locke, & Clocherty, 2017). Developments in Information Communications Technologies (ICT) make affordable access to act fully in social participation. However, many people with disabilities do not have equal access to new media and many technologies that are developed do not allow for equal access. Law and policy have made significant progress in some nations, yet, the field of academic and industry research around equitable accessibility of VOD services for people with disability is surprisingly omitted.

Therefore, this paper investigates the impediment factors in providing accessible services under fast-changing ICT environment. And try to uncover what to do to overcome the current problem on future access service provision. In finding answers to these questions, this paper will first, provide a historical overview of the accessibility service for the people with disability, including the development, background, and state of the current accessibility service industry. In Sections 3, the theoretical framework and 4, a case study of U.S and U.K will be presented. Section 5, data collection and methodology of this study will be given. And Section 6 will show the results of the in-

depth interviews with the experts. In Section 7, briefly summarized results of this study will be explained along with the implications of the findings. And lastly, suggestions for future research and the limitations of this study will be discussed.

2. Overview of Accessibility

2.1. Development of the Web Accessibility

World Wide Web is based on an egalitarian principle as a global information space. According to Tim Berners-Lee, the Web must allow equal access to those in different economic and political situations; those who have physical or cognitive disabilities (Berners & Fischetti, 2001). Yet, equal access to the Web has remained elusive as barriers like geography, political situation, language, cost exists. As technology advances, more people use Web and a wide range of devices (Henry et al., 2014) to access information. While Internet has been described as "liberation technologies" (Norman, 1992), which supposedly provide people with disabilities access to social, political, and cultural realms that had historically been excluded, these technologies have also produced disability by creating barriers to use (Henry et al., 2014). In order to use websites and services, people with disabilities rely on assistive technologies such as screen readers which transform text into audio. However, this alteration relies upon Web pages being coded in such a way that technologies can parse and transform the code (Ellcessor, 2012). This kind of code is described as "accessible," and best practices for accessible development are laid out in a variety of Web accessibility policies. The Web Accessibility Initiative (WAI) of the Worldwide Web Consortium (W3C) released the Web Content Accessibility Guidelines (WCAG) 1.0 in 1999 and WCAG 2.0 in 2008 were released, establishing voluntary guidelines for creating websites that would be accessible for users with disabilities. WAI work involves developing specific guidelines for accessibility of websites, web applications, browsers, authoring tools. Recently, equal access for people with disabilities are becoming more understood and explored in areas like 'Web4All (W4A) 2014' research conference (http://www.w4a.info/2014). And World Wide Web Consortium (W3C) strives to integrate accessibility throughout the development of web specifications and provides a forum to increase collaboration among web accessibility and related areas (https://www.w3.org). The fundamental design of the Web has the potential to work for all people, whatever their hardware, software, language, culture, location, or physical or mental ability (Henry et al., 2014). Therefore, for people

with disabilities, accessible technology is essential to provide equal access to information and interaction.

In South Korea, Korean Web content Accessibility Guideline 2.1 was released in 2015. This standard was developed with reference to the "Web Content Accessibility Guidelines 2.0" developed by the W3C for the purpose of ensuring that persons with disabilities access to the Web site. It was developed in consideration of the 12 conditions of the W3C Web Content Accessibility Guidelines 2.0, 2008. The criteria also include touchscreen-based devices to ensure accessibility of the mobile web. However, Web accessibility has countless variables, including policies, varied implementation by a host of Web developers and users, the capacities of assistive technologies, and the expertise and motivations of users with disabilities (Ellcessor, 2012). Therefore, this Guideline cannot force players of the access service industry.

2.2. Development of the VOD services for people with disabilities

Video on demand (VOD) is an interactive TV technology that allows subscribers to view programme in real time or download programs and are available to a variety of users across a range of devices. The concept of VOD has evolved with new media technologies. VOD was first commented on in an article published in March 1971 in the 'Iowa City Press Citizen' which described the practice of watching television programmes on videocassette. From DVDs, pirated videos on the Internet, and to catch-up television streamed online shows commodified technological shift of VOD services. There are two types of VOD services; free services and subscription-based services. Free services rely on advertising for revenue and subscription-based services get paid a fee to gain access to large collections of content (Ellis et al., 2017). Technology and delivery model of VOD contents services markets have rapidly changed. And the emergence of these subscription-based VOD services has caused a major shift in the way television contents are consumed.

In South Korea, major Over-The-Top (OTT) platforms that service VOD contents are Pooq, the N-screen service of terrestrial TV programs, and Tving by CJ HelloVision. Also, in January 2016, the leading global OTT provider Netflix from the U.S. launched a stand-alone business in Korea (Kim, Kim, Hwang, Kim, & Kim, 2017). Despite fast-growing VOD services market, there is no consensus on standards for people with disabilities as they are delivered by a highly fragmented range of suppliers. Because there are no policy or regulation, accessible VOD service is not offered much. Only Educational Broadcasting System (EBS) offers a significant amount of accessible catch-up or VOD services through their own website because most of the contents are made for the

education. Korea Broadcasting System (KBS) which is the main public broadcasting company is barely offering accessible catch-up or VOD services. The rest of the broadcasting companies or VOD platforms do not offer accessible services for their contents. This is due to the complex copyright problems which need to be considered first before offering the contents accessible to the people with disabilities.

2.3. Past research on Accessibility

The core of disability study is the internet, digital media, media and cultural studies, and the complexity of the relationship between technologies, and representations (Ellcessor, 2012). Since the *Americans with Disabilities Act* (ADA) in 1991, researchers started to pay attention to how disability researchers need to alter to develop pragmatic policy recommendations (Watson, 1993). In the 1970s, the U.S, the community of people interested in and affected by disability was transformed by the disability rights movement and demanded equal access to all aspects of American society as civil rights. Since then, many people wrote about disability policies. Media experts debate the images and attitude towards the people with disabilities (Covey, 1998; Cumberbatch, 1992; Nelson, 1994; Wolfson & Norden, 2000; Yuker, 1988), historians wrote about the important people with disabilities, constant critiques of various policies from the perspective of consumers with disabilities (Bickenbach, 1993; Borsay, 1986; Drimmer, 1992; Oliver, 1996; Oliver & Barnes, 1998; Pothier & Devlin, 2006; Weber, 1998), and few economical perspectives (Bound & Burkhauser, 1999).

The social and economic impact of the Internet and Information Technology (IT) have made significant growth. Along with U.S. government agencies (the National Institute on Disability, Rehabilitation Research, and the National Science Foundation) joined with leading IT companies and the European Commission to fund the important initiative of web accessibility, making the Web accessible for everyone became critical. Among web accessibility research, one third of them are about accessible design and evaluation of created web sites (Baguma & Lubega, 2008; Friedman & Bryen, 2007; Kuzma, 2010; Kuzma et al., 2009; Lazar et al., 2004; Nielsen, 1999), and the rest of them are about web accessibility guidelines (Abascal, Arrue, Fajardo, Garay, & Tomás, 2004; Chisholm & Jacobs, 2001; Harper & Chen, 2012; Sloan et al., 2006), school and education (Comeaux & Schmetzke, 2007; Fulton, 2011; Hackett & Parmanto, 2005; Schmetzke, 2001; Schmetzke & Comeaux, 2009; Seale, 2006), and a recommendation and implication of the law (Yu, 2002).

However, very few papers are available for VOD accessibility issues since it is an early stage. Nevertheless, many of them discuss importance on the provision of VOD contents policy because VOD services are traversing terrestrial borders and available platforms and devices are diverse (K. Ellis et al., 2017; García-Crespo, López-Cuadrado, & González-Carrasco, 2015). Few explored the fundamental passage of the policy and its political implications.

3. Theoretical framework and Research question

Under ICT environment, accessibility has gradually become visible and legible (Annable, Goggin, & Stienstra, 2007) and enlarged to encompass its global dimensions, and placed government and disability advocacy organizations as an important actor within the frame (Stienstra, Watzke, & Birch, 2007). Therefore, this study adopted the actor network theory and the technological systems framework to investigate impediment factors of web and VOD access services and suggest solutions on future access service provision.

3.1. Actor network theory(ANT)

The founder of actor network theory (ANT) is Latour (1993), Callon (1999) and originally emerged out of the sociology of scientific knowledge. It focuses on the complex, multi-directional interrelationships of components in a system and this involved tracing how particular actors went about building a network by using various materials, both human and nonhuman. In ANT, a network where elements of any kind may be included: humans, technological artifacts, organizations, institutions, etc (Aanestad, Hanseth, & Berg, 2004). The theory emphasis on the' powers of association' and focus on its effect (Clegg & Haugaard, 2009). The power of association is an ability to set aside any analysis that grounds itself in notions like consciousness, intentions, motives and focus instead on changes to the action. Therefore, ANT challenges on not just the facts but on the explanation of what and how the action occurred. It is focusing on the relationality of components that holds things in their place and considers human and objects alike (Clegg & Haugaard, 2009). Therefore, allowing us to see how associations take place within institutions.

3.2. Technological systems theory

According to Carlsson and Stankiewicz (1991), a technological system is a network of agents interacting in a specific industrial area under a particular institutional infrastructure (Carlsson & Stankiewicz, 1991). In technological system theory, the components are physical artifacts, organizations, and legislative artifacts because they are socially constructed and adopted in order to function in the system (Bijker, Hughes, & Pinch, 1989). Physical or non-physical artifacts functioning as a component of a system and interacts with each other. Therefore, the characteristic of the components derives from the technological system. Over time, technological systems manage to incorporate the environment into the system to eliminate the source of uncertainty (Bijker et al., 1989). The key success factor for a system to grow is the balanced co-evolution of all the components of the system (Hughes, 1987).

ANT does not offer any detailed guidelines on how to analyze descriptions of actor networks (Latour, 1993). However, accordance with the explanatory concept of the Technological systems theory, this paper will adopt a more specific framework to analyze the current access service infrastructures and associated actor networks. The conceptualized actors and artifacts are in three separate domains and defined specific types of passage points through which the actor network must pass during the access service process. The three domains are: (1) government policy and regulation, (2) technology, and (3) industry. The proposed research questions are listed below.

Research question 1: What are the impediment factors in providing accessible services under fast-changing ICT environment?

Research question 2: Among three factors (Policy & Regulation, Technology, Industry), which factor would be the most important for the provision of VOD accessibility?

Research question 3: What can we do to overcome the current problem on future access service provision?

4. Data Collection and Methodology

This study will take a case study and in-depth interview to examine the access service industry in South Korea. Both methods are a useful qualitative data collection technique that can be used for a variety of purposes. A case study aims to explore and advancing understanding a present circumstance (Cousin, 2005; Demarrais & Lapan, 2003) and an in-depth interview can serve as

explanatory factors (Boyce & Neale, 2006; Guion, Diehl & McDonald, 2001). Accessible archival materials like white papers from government publications, industry reports, academic papers, news articles, and materials related to accessibility issues were also collected to compile information and reliable statistical figures relevant to the accessibility industry.

Through a case study of U.K and U.S as a leading country in providing accessibility and related policy, comparative analysis approach will be taken by presenting the result of the in-depth interview. An in-depth interview is most appropriate for situations in which you want to ask open-ended questions that elicit depth of information which allows the interviewer to deeply explore the respondent's perspectives on a subject (Mccormack, 2004). This paper adopted an in-depth interview to explore current issues on a provision on VOD accessibility for the people with disability and discover the problems that cause delays in providing accessible services under fast-changing ICT environment.

Between April and May of 2018, supported by the National Research Foundation (NRF) of South Korea, an in-depth interview was conducted with media professionals, policy advisors, community media foundation's viewers support department, video content service providers, and accessibility advocates. Of the 13 interviewees who completed the interview, 2 were media professionals, 2 were policy advisors, 3 were community media foundation viewer's support department, 2 were video contents providers and 4 were accessibility advocates (see Table2). Each interview lasted between 60 and 120 minutes. These interviews consisted of open-ended interviews designed to elicit context and alternative perspectives on the web accessibility and VOD services for people with disabilities and occasionally, informative questions were included, in an effort to confirm research findings or enhancement of interpretations. The content of In-depth interview questions, focusing on the interviewee's knowledge and information about VOD and Web accessibility related issues, were constructed in the context of ICT. Interviews were audiotaped, documented to probe for deeper meaning and understanding, and analyzed based on three elements; policy and regulation, Technology, industry players.

<Table 2> List of participants of an in-depth interview

Classification	Total participants	Institution
Media Professionals	2	SeongKongHoe University Hanyang University

Policy Advisors	2	The Korea Communications Commission (KCC)
Community Media Foundation	3	Viewer's Support Department for people with disabilities
Service Providers	2	KBS, CJ
Accessibility Advocates	4	Korea Blind Union Kore Association of the Deaf

5. Result

It is important to understand how accessibility is conceptualized and enacted at the levels of policy, practices, and representations. Therefore, this paper present a case study of an access service provision within the U.K and the U.S., as their standards often exert influence on other national, industrial and international standards. Such legislation has played an important role in highlighting accessibility issues in ICT environment.

5.1 U.K

The regulatory system of the broadcasted VOD service in the UK was established and enforced since 19th of December, 2009. Based on 'The Audiovisual Media Services Directive' from EU, UK added *The Audiovisual Media Services Regulations 2009* into *Communications Act 2003*. *The Audiovisual Media Services Regulations 2009* regulates the definition of VOD service similar to TV, the role of the regulatory body, the duty of the service provider, harmful contents, advertisement, sponsorship, indirect advertisement restriction and execution, penalty, suspension of the face, and etc. According to this regulation, on-demand service should meet the following requirements of first, the primary purpose should be to produce programs that are similar to the format and content of television program service. Second, approach to the service must be on-demand. Third, have to have someone with the editorial rights. Fourth. the object is a public service. And lastly, the one who holds the editorial rights must be under the jurisdiction of the United Kingdom. The object of this regulation will apply not only in Television programmes but also online movie service and platforms that provide VOD service regardless of TV, mobile applications, set-top boxes, and more. The regulations on the contents of VOD service are handled by Ofcom, the UK Communications

Commission. The regulations for VOD advertisements are operated separately by the Advertising Standards Authority (ASA).

Ofcom has a duty under 'section 368C of the Act' to encourage providers of On-demand programme services (ODPS) to ensure that their services are progressively made more accessible to people with disabilities. ODPS providers can achieve this through subtitling, audio-description, and signing known as 'access services'. ODPS regulated by Ofcom include a wide range of services, such as public service broadcasters' catch-up services, film services, and local TV archives. Authority for Television On Demand (ATVOD), an organization created by Ofcom in 2010 to 2015, conducted researches for Ofcom to provide a new model of guideline for more accessible ODPS. According to the report form ATVOD in 2015, on-demand programme markets are very complex in structure and many of the business operators are from abroad. For example, ITV and Channel4 are content providers, Sky and Virgin are platform operator, Samsung and Apple are device provider, and Netflix and Amazon are VOD services providers. Ofcom's collection of data through ATVOD on the accessibility of ODPS were reported from all providers of ODPS, on an annual basis on their provision of access services and published this data annually. ATVOD's chosen ODPS providers are Amazon Instant Video, Blinkbox, Channel 4, Channel 5, Comedy Central, Discovery, Disney, FilmFlex, Fox, ITV, MTV, Nickelodeon, Picturebox, Sainsbury's Entertainment, Sky, UKTV and Universal, as well as the platforms Sky, Virgin and YouView as of July, 2017 and listed service providers are required to provide 50% of the subtitling service (ATVOD, 2015).

According to a statement called 'Accessibility of on-demand programme services' in April 2017 reports on Ofcom's decisions and plans on how to encourage providers of ODPS. Ofcom showed their plans to continue to work with consumer groups to identify what matters most to consumers in this area and with industry to identify obstacles. If the service provider meets the requirements of Ofcom, 100 % subtitle service is recommended for the on-demand program broadcast on its own brand website. Ofcom recommends on-demand content distributed through a platform operated by a third party to provide 70 % subtitle service based on the platform that most users watch on the content. And this should be based on each broadcaster's own information about where most of their VOD content is being viewed (Ofcom, 2017).

5.2 U.S.

Since *Telecommunications for the Disabled Act of 1982*, U.S. has taken new steps to ensure that IT is accessible to people with disabilities (see Table 1). This Act includes making the federal

government a model user of accessible technology, providing low-interest loans to people with disabilities who might not otherwise be able to afford accessible technology, and investing in research and development to improve accessible technology such as speech and gesture recognition, text-to-speech, and automatic subtitling.

In 2009, a study conducted by the FCC revealed that people with disabilities are less likely to use Internet-based communications technologies: 65 percent of Americans have broadband at home, but only 42 percent of Americans with disabilities have these services.

< Table 1 > Disability Related Laws Implemented by the FCC

Telecommunications for the Disabled Act of 1982
Hearing Aid Compatibility Act of 1988
Americans with Disabilities Act of 1990 (Title IV – Telecommunications Relay Services)
Television Decoder Circuitry Act of 1990
Telecommunications Act of 1996
Twenty-First Century Communications & Video Accessibility Act of 2010

(source: https://www.fcc.gov/general/disability-rights-office)

This gap is due in part to physical barriers that people with disabilities confront in using the Internet. It is for this reason that the National Broadband Plan, adopted by the Commission in March 2010, recommended that Congress and the FCC should modernize accessibility laws to keep pace with broadband technologies. On October 8, 2010, President Obama signed the *Twenty-First Century Communications and Video Accessibility Act* (CVAA) into law to keep up with the fast-paced technological changes. The CVAA updates federal communications law to increase the access of people with disabilities to modern communications. The CVAA makes sure that accessibility laws enacted in the 1980s and 1990s are brought up to date with 21st-century technologies, including new digital, broadband, and mobile innovations. The CVAA is divided into two broad titles or sections. Title I. addresses communications access to make products and services using Broadband fully accessible to people with disabilities. For example, smartphones will be required to be usable by blind and visually impaired people as well as people with hearing aids. Title II. of the accessibility act breaks new ground to make it easier for people with disabilities to view video programming on television and the Internet. For example, programs shown on television with captioning will be

required to include the captioning when they are re-shown on the Internet. Both titles include provisions to ensure that people with disabilities have access to emergency information (21st Century Communications and Video Accessibility Act, 2011). The CVAA expands the requirement for video contents equipment, equipment that shows TV programs, to be capable of displaying subtitle, to devices with screens smaller than 13 inches (e.g., portable TVs, laptops, smartphones), and requires these devices to be able to pass through video descriptions and emergency information that is accessible to people who are blind or visually impaired, if technically feasible and achievable.

Not only by the law the U.S is making an effort to increase accessible services of video contents services, but also they operate the 'Disability Rights Office (DRO)' addresses disability-related matters including access to telecommunications services and equipment. Access to televised emergency information, subtitling on television and television programs on the Internet, video description, and accessible user interfaces, text menus, and program guides. The DRO reviews relevant agenda items and other documents and coordinates with Bureaus and Offices to develop recommendations and propose policies to ensure that communications are accessible to persons with disabilities, in conformance with existing disability laws and policies, and to ensure that they support the Commission's goal of increasing accessibility.

Under the National Deaf-Blind Equipment Distribution Program (NDBEDP), also called "iCanConnect," the Federal Communications Commission (FCC) may provide up to $10 million annually from the Interstate Telecommunications Relay Service Fund (TRS Fund) to support local programs that distribute equipment to eligible low-income individuals who are deaf-blind, so that these individuals can access telecommunications service, Internet access service, and advanced communications services (Allocations for the national deaf-blind equipment distribution program, 2018).

5.3 South Korea: In-depth Interview

In case of Korea, television contents access services for people with disability is influenced by legislation from abroad and consistent requirements from the domestic accessibility advocates. Unlike broadcast television, currently, there is no government or corporate policy for accessible VOD services because VOD service is terrestrial, traversing national boundaries and thus, challenging legislative boundaries (Ellis, Kent & Locke, 2016).

Through the in-depth interview, interestingly, most of the respondents questioned back if accessible VOD services of all contents for people with disabilities are necessary. According to the

interviewees, unlike television contents, VOD services are based upon a consumerism. VOD services are delivered through multiple-system operators such as cable or satellite TV and there are too many platform and device providers, network operators, VOD platforms and content providers, and TV operators that service catch-up with TV content. Therefore, it is extremely uneasy to be able to define who is responsible for accessible services and which depth we should consider. Also, due to the commercial broadcasting system that has pursued profit, conceiving of television access in terms of availability, especially in Korea, has stimulated a consumerist value in the understanding of media rather than an understanding based upon public values, the universality of broadcasting or equality of human rights. Therefore, whether to watch a VOD content is the choice of consumer and accessibility issues related to VOD contents are relatively difficult.

However, in case of broadcast television contents that are re-offered through the internet such as catch-up or VOD can be understood based upon a notion of public value or universality of broadcasting. Many of the respondents believed that consumers with hearing or visual impairments should have access to television contents whether broadcast or on-demand since it can be vital to participation and inclusion in social and cultural life. Therefore, this research focuses only on broadcasted VOD contents.

From the research, this article first tried to find impediment factors of the future access service provision and many of the interviewees pointed at governance. Interviewee C, media professionals highlighted the way to approach towards the concept of accessibility to explain the importance of governance.

"Look at the history of mass media and telecommunications, research on the digital divide, and the history of media accessibility for people with disabilities. Accessibility is too often figured as a single state, an end-goal to be achieved. Rather than moving toward a unitary kind of access for all. Legal protections from discriminatory practice are probably indispensable, but such guarantees cannot be the only strategy toward ending the discrimination and social exclusion faced by people with disabilities. Policy and regulations only push the service provider by giving them an obligation and penalty. Thus, imbalance could occur. Access service for the people with disabilities in television contents has been pushed by the advocates and government because countries like U.S and U.K were providing it. Without learning to understand the reason why the services providers need to offer the same opportunity of their contents accessible, everybody unwillingly followed the policy of the government. There are no proper communication opportunity or regular meeting among the industry players. Many complain and different opinions from each player exist. However, no way to solve the disagreement. To prevent this kind of side effects of the law, we need to fall back on the

concepts of ‘public service’ and ‘universal service’ and learn to understand the philosophical construct of the access service”

Universal service applied in telecommunications is grounded in economic judgments and can be measured. Public services applied in broadcasting is not measurable as it has a more political-cultural dimension (Bugelman, 2000). The application or implementation of these two concepts tend to differ amongst nations and most of the research used a market way of regulation or a non-market one. Also, interviewee A, a policy advisor indicated that how the structure of providing access service is important in governance.

“Co-evolution and symbiotic co-operation from each player who is involved in access service industry are very important. Therefore, for the adoption of specific accessibility guidelines and standards for different players in access service industry, governance plays an important role to create more reliable accessibility environment.”

Therefore, it is time to reconsider what kind of regulatory framework will we need to facilitate balance in social, political and cultural objectives.

Another interviewee L, a service provider, pointed at the technical issues in converting subtitles for multiple platforms, and the associated costs as an impediment factor.

“There are a variety of features currently available that can support the playback of videos accessible such as subtitling and audio description as well as lip-reading avatars, signing avatars, spoken subtitles and etc. However, it will cost too much. Some machines may need an upgrade and some may need to be replaced with a new one. Also, current technical set up may not be compatible with other platforms. It will cost a lot to have the compatible technology and the extra cost will lead the problem back to the question of whose responsibility it is to make content accessible.”

The delivery of access services to consumers involves collaboration between numerous different players. There is continued debate over technical issues associated with delivering access services to multiple platforms, and the relative responsibilities of content providers and platform operators in overcoming these issues. Technical problems require money and associated problems need time to overcome.

For the second research question, choosing the most important factor for the provision of VOD accessibility among three (Policy & Regulation, Technology, Industry), every respondent pointed out the industry players as first, policy and regulation, and lastly technology. Technology is the least important factor is because of the complexity of website design or limited navigation services are making contents inaccessible. Currently, each service providers have different settings because the existing guideline is unenforceable. Assistive software and specific hardware are essential to

facilitate access to the Internet for people with disabilities. Therefore, accessibility policies should be put in place ahead to provide standards. Hence, policy and regulation have been pointed out as the second most important element. Emerging Internet-based VOD contents consumption requires new legislation to require a minimum level of accessibility. Following this, the accessibility requirements applied to broadcast television also needs to be applied to broadcasted VOD contents. Therefore, according to interviewee D, a media professional, the need of realizing the necessity of mutual cooperation from the industry player is the most essential.

"Service providers must understand the philosophical base of the accessibility services that has been widely accepted by countries from abroad and recognize the needs of accessible service for people with disabilities. Understanding what it means to have a disability and what constitutes a disability should be the root of the provision of accessible service. For example, the terminology of 'disability', espoused by the U.S. with Disabilities Act (ADA) is broad, unlike Korea. In the U.S., disability is defined as "with respect to an individual, (A) a physical or mental impairment that substantially limits one or more major life activities of such individual; (B) a record of such an impairment; or (C) being regarded as having such an impairment."

The term 'disability' implies a lack of ability, a deficiency, or inferiority. In U.S. and U.K, 'people with disabilities' is the preferred terminology, as it weighs more of the people rather than defining them by their ability status (Ellcessor, 2012). Useable accessibility services of VOD will only evolve and improve the understanding of disabilities from the industry players as well as the audiences and willingness of spontaneous participation to provide equal access services for all. If all the players understand the disability and recognize the needs of accessible service along with the well-prepared policy, technological issues can be solved with less problem.

Answers to the research question 3, Interviewee B, a policy advisor indicated that to overcome the current problem on future access service provision is clarifying the definition of current VOD.

"Currently, there is no clear definition of VOD service in *the Broadcasting Service Act* in Korea. We can only infer from the article 9 of *the Broadcasting Act* 2; Registration requirements for projects using broadcasting channels, 2 of Article 13; The Enforcement Decree of the Broadcasting Service Act, based on paragraph 2; Criteria for applying capital requirement to the radio channel user's business registration, the concept of VOD is that the viewer chooses a certain time and a particular broadcast program to watch. From the current law of Korea, it is difficult to regulate accessible service of broadcasted VOD content because VOD service carries characteristics of broadcasting service and telecommunication service at the same, and the applied law could be different depending on the service provider."

Therefore, policy advisors and service providers strongly recommended having a separate regulatory system for service providers, users, and the real-time broadcasts as VOD utilization increases. To avoid an equity issue of regulation among different platform providing VOD service, clarify the legal concept definition of the VOD service is urgent. Specifies the obligations of providers of VOD services, and specify the periodical survey on the VOD service industry are necessary. In addition, we need to consider the provisions of such regulatory mechanisms, advertising, sponsorship, content review and marginalized protection for the minority users. Since the regulation on VOD service calls for the transition from the conventional two-way vertical regulation to the regulatory system suitable for the convergence environment of broadcasting and telecommunication, ultimately, as many of the interviewees suggested it is also necessary to review the legal system based on the convergence of broadcasting and telecommunication. Many of the interviewees agreed to benchmark the case of U.K. "In case of Korea, benchmarking of U.K would be suitable. By forming a separate institution to collect a data from the existing industry and discuss with all the players associated with to plan a future access service provision is what we need. On-demand services are based on emerging and fast-changing technologies with proprietary technologies and they are delivered by a highly fragmented range of suppliers. Researched and proven data must be the fundamental base of the future provision of access services."

Furthermore, as most of the respondents highlighted, we need to study and understand why VOD is different from broadcast television and poses new challenges for accessibility. We need to look at what has changed with the advancement in technology, who is now providing accessible service, and on what platform. Because we can't have an accessible Web or VOD service unless everyone who is building it understands the importance of making it accessible. And through a separate institution that represents access provision, policy makers, service providers, advocates should regularly discuss issues in accessibility service.

6. Conclusion

This research attempted to fill in gaps in media, disability, and accessibility studies by bringing them together in the study of broadcasted VOD accessibility. Access by people with disabilities has been largely omitted in media studies while changes in technology and advancements. As more people around the world are watching video contents online, the subject of web accessibility and VOD accessibility is currently being debated at the worldwide policy level. Currently, most linear

television content providers are required to provide a certain proportion of their content accessible through a subtitle, audio description, or signing services. However, in Korea, there is no policy or regulation for accessible broadcasted VOD contents. Related policies should reflect the diversity of the society (Burgelman, 2000) and should examine the approaches taken in the leading countries like U.K, and the U.S. to provide legal provisions and regulations. Therefore, this paper conducted an in-depth interview with media professionals, policy advisors, community media foundation's viewers support department, video content service providers, and accessibility advocates to diagnose the current Korean market and identify what to prepare for the future accessible services provision.

From the in-depth interview, this paper discovered that governance and cooperation based on mutual understanding must be the ground of access service industry. All players within the industry of access service play an important role in the provision of broadcasted VOD accessibility and thus, it requires symbiotic relationship. Therefore, among three elements; policy and regulation, Technology, industry, cooperation within the industry based on the mutual understanding on accessibility services is considered as the most important. Working together with consumer groups, access service providers and other stakeholders to encourage service providers are essential to increase accessibility. Currently, Ofcom from the U.K is supporting the 'Television on Demand Industry Forum' because ofcome believe that this group can provide an effective means for content providers and platform operators to share experience and technical know-how with a view to increasing accessibility. Traditionally telecommunications regulation operators are subject to license obligations including the responsibility to provide non-discriminatory access. The content carried by telecommunications networks has been considered a private matter and has been unregulated. Telecommunications regulators have also traditionally controlled market entry, service pricing, and technical regulations to ensure interoperability of equipment. In contrast, in the audio-visual sector, the emphasis has been on the regulation of content. In the film industry control has been exercised through a system of classification and censorship. In the broadcasting industry, licensing has provided the basis for regulation on political and cultural criteria. Therefore, it is necessary to have an organization composed with experts in the related field and conduct a survey on how many people with disabilities need accessible broadcasted VOD services, what are the existing barriers, to what extent should the government consider VOD service accessible, and how to achieve this goal with less trouble. Many of the respondents strongly recommended that policymakers need to use supportive research, like U.K, to establish their own position, presenting and argue with the opponents. And regular meeting among policy advisor, service provider, and advocates who represent the people with disabilities through the organization must be scheduled. Much of the

opinions by advocates on disability policy tends to argue that the current system is inadequate and that additional or different services are needed. However, opinions of advocates would hardly get to the Korea Communication Commission (KCC) and service providers because the people who is in charge frequently changes, there are no regular meetings where all the industry player share their opinions, and that only makes all the parties only understand their point-of-view of 'disability' and 'access services'. From a regular meeting, everyone needs to consider how decisions should be made on specific levels of services or propose safeguards to ensure that services are used wisely.

Through the organization, imbalance could be prevented. The regular meeting will prevent the side effects of the law that only force industry player without mutual understanding each other. Fall back on the concepts of 'public service' and 'universal service' of the access service, finding out what kind of regulatory framework will we need to facilitate balance in social, political and cultural objectives would be the first step. Study the existing market and analyze them with logical data to achieve this goal must be conducted as a firm ground of future access service policy. Useable accessibility services of VOD will only evolve and improve with a comprehensive accessibility policy, service providers, and advocacy.

Accessibility will play a crucial role in near future as devices are becoming pervasive, smarter and more connected. Everything from our smartwatches, to our cars and in-home assistance, will have an Internet connection within the next few years. The Internet of Things (IoT) presents both promise and peril for accessibility. As with any new technology, the potential peril is that the IoT devices or the cloud infrastructure used to access them may not be built to be accessible, which may prevent some people from leveraging their advantages. With little attention paid to how someone who cannot speak or who cannot hear would use them. Advanced technology can be used to provide an accessible user experience for all.

However, this paper is not without limit. When the in-depth interview is conducted, generalizations about the results are usually not able to be made because small samples are chosen and random sampling methods are not used. Nevertheless, this paper provided valuable information with same stories, themes, issues, and topics emerged from the interviewees. Further research on the consumer side of accessibility will elaborate to existing research. From the literature review, this study discovered that the bulk of literature pays little attention to questions of users' access to technology, equity, motivations, or ecosystem of the industry and governance. For example, how many people with disabilities are consuming VOD services, which devices are they use for VOD services, what it means to have equal accessible services to them and how will this access service influence them will be necessary.

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Appendix 1. In-depth interview guide

Type of Question	Interview Question
Main (Open) Question	MQ1: Due to the changes of watching television contents, from linear television into non-linear services like VOD, accessibility issues related to VOD services became important around the world. Why do you think that VOD accessibility is limited and what would be impediment factors? MQ2: Among three factors(Policy & Regulation, Technology, Industry), which factor would be the most important for the provision of VOD accessibility? ➢ Policy & Regulation: VOD accessibility and web accessibility related policy and regulation, the degree of the government support, improvement of the current policy related to accessibility issues ➢ Technology: developing a technical standard for Web accessibility, device compatibility in converting to multiple platforms ➢ Industry: media ecosystem, the price of the contents of the subtitle, audio description or sign language, governance among players
Sub Question 1. Policy & Regulation	SQ1: What kind of policy and regulation do you think is needed for the provision of broadcasted VOD accessibility issues? SQ2: Among the two nations(U.S. and U.K), which nation would you consider as a leading country in providing good accessibility in broadcasted VOD, which nation do you think is well prepared in terms of promising broadcasted VOD accessibility and which nation do you think that we need to benchmark and why?
Sub Question 2. Technology	SQ: Do you think that there are any technical issues that are delaying broadcasted VOD accessibility?
Sub Question 3. Industry	SQ: How would you evaluate the players of accessibility industry's performance? What do you think is the current problems and what could

	be done to improve or overcome the barriers?