Innovation in public service media

A multiple-case study analysis of innovation projects at the NPO and BBC

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ABSTRACT

Structural changes brought about by liberalisation policies ended public service broadcasters (PSB) monopolies. Consequently, the context in which European PSB operate is considerably different than when they were first introduced. They now face increased competition, while government funding is being threatened, spaces for democratic involvement are decreasing, and audiences increasingly expect on-demand and participatory media. PSB's legitimisation now has to be based on its role in society and its added value concerning the public service mandate. Scholars have recognised the importance of innovation in advancing the current media landscape and especially in maintaining the relevance of PSB. Drawing upon these premises, this research investigates what innovation activities PSB undertake and how these contribute to their societal objectives. The NPO and BBC have been selected as case studies to answer the research question: What strategies do PSB have in place to face today's innovation challenges? To answer this question, this study analysed 100 innovation projects published by NPO and BBC. The analysis is based on data immersion and coding in order to develop a framework to assess innovation within PSB by bringing innovation and societal impact together, which can inform innovation strategy for PSB in the future. Drawing upon literature on innovation management, media innovation and public value, this research argues that currently widely adopted frameworks are not able to fully capture innovation strategies at PSB. The newly developed framework goes beyond existing frameworks and includes objectives such as audience interaction, the reaching of new audiences, empowering audiences, improving production through the use of artificial intelligence and machine learning, stimulating innovation, as well as sustainability. The main findings show that incremental innovation within production and distribution prevail and that traditional public values such as universality of availability are still leading in PSB's innovation strategies.

KEYWORDS: *innovation, innovation strategy, media innovation, public service broadcasting, public service objectives*

Preface and acknowledgements

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List of abbreviations

BBC   British Broadcasting Corporation

LBIOI Literature-based innovation output indicator

NL   The Netherlands

NPO   Nederlandse Publieke Omroep [Dutch Public Broadcaster]

PSB   Public service broadcasters

PSM   Public service media

R&D   Research & development

UK   United Kingdom

1. Introduction: the complex conditions of public service broadcasting

1.1 The changing public service broadcasting landscape

While public service broadcasters (PSB) used to be the most-watched channels on television, liberalisation policies ended PSB monopolies and the introduction of significant competition commercialised the landscape (Cunningham, 2015). This evolution has been brought about through several developments. Ellis (2002) describes three phases of television in the case of the United Kingdom (UK): scarcity, availability and plenty. The era of scarcity meant there were only few channels available on television. In this era, PSB were introduced, described as a period of standardised mass communication. The availability phase is characterised by a multiplication of channels, while the era of plenty established the spread of cable and satellite systems in the market and the increasing expansion of channels and broadcasters due to emerging digital technologies. Other scholars define roughly similar phases as those presented by Ellis (2002). Johnson (2012) speaks of broadcast, cable/satellite and digital eras, while Lotz (2014) describes the network era shifting into the multichannel transition, followed by the post-network era. In the current digital era, broadcasters are faced with increasing competition from other channels and ways of distribution.

Additionally, the introduction of the Internet created a globalised, fragmented media landscape in which broadcasters fight for audiences' attention. Since recently, computer-related media use has increased, while television viewing has decreased, particularly among young people. Increasingly, audiences require on-demand and participatory media (Głowacki & Jackson, 2013). This means that PSB are expected to move from the traditional supply-oriented transmission model to a demand-oriented model of providing service and content (Bardoel & Lowe, 2007). Hence, reaching audiences has become more difficult and requires targeting individual citizens. This is partly due to the individualisation of society, characterised by decreasing collective participation and diminishing interest in established institutions (Bardoel & d'Haenens, 2008a).

The conditions in which PSB operate have altered significantly, but a clear legitimisation of PSB is crucial to justify their role in serving democracy, supplying information and making quality programmes (Meijer, 2005). Consequently, while PSB used to be justified on a technical basis because of a lack of frequencies, now PSB's legitimisation has to be based on its role in society and its added value (Bardoel & d'Haenens, 2008a).

1.1.1 Maintaining public service values

PSB are thus faced with considerable challenges, while trying to retain their role as an alternative to commercial broadcasters (Enli, 2008). PSB's distinctive role requires them to provide broad audiences with universal and comprehensive service, reflecting cultural

diversity, while remaining independent from both the government and the market (Bardoel & d'Haenens, 2008a). However, network-era media markets advance an indistinct boundary between fostering public value and obtaining private assets (Ibrus et al., 2019). While variations of governance between countries exist – this includes for example the British model, which relies on self-regulation and internal control compared to the Dutch model having strict regulation of programme output by an external supervisor – recent regulatory changes on national and EU level undeniably endorse a market-oriented strategy (Bardoel & d'Haenens, 2008a).

Recently, one way for PSB to reach a broader audience was to move services to new media platforms, as these offer interactivity and the ability to target audiences more accurately. As explained earlier, this is necessary because audience fragments are now increasingly present online rather than through television viewing. National and EU policies permit PSB to move to new platforms, as long as the new service fits with the public service objectives and does not skew competition (Bardoel & d'Haenens, 2008a). This makes PSB's move to digital services difficult, as they are not able to simply transfer them to digital platforms, but have to justify the service as distinctly separate and complimentary to commercial activities (Grummell, 2009).

Some scholars are critical of the existence of PSB or at least in its current form (Congdon, 2004; Hoynes, 2003), opposing the facilitation of unfair market competition compared to commercial broadcasters. Simultaneously, some argue that traditional public values are losing their force and that the public interest is being reformulated to incorporate consumerist and economic values (Van Cuilenburg & McQuail, 2003). Despite criticism, however, PSB around the world also continue to attract considerable levels of public trust (Debrett, 2009) and many European PSB still occupy the highest market position in their country (Meijer, 2005). Throughout Europe, PSB are thus building new relationships with the society they function in and are instructed to serve, while retaining their connection with government, the media market as a whole, and civil society at large (Bardoel & d'Haenens, 2008a). The public service objectives are being reformulated as a strategic concern in legacy PSB, due to the importance of heritage values in the legitimisation of PSB (Lowe & Maijanen, 2019).

1.1.2   *Innovation as a possible solution*

Many organisations adopt innovation in order to respond to increasing industry competition and to attempt to improve organisational performance (Damanpour et al., 2009). Similarly, PSB have turned to innovation as a way to tackle the above-mentioned challenges. Innovation can take place at several levels, for instance at product, process, organisation or market level and it implies undertaking new activities and breaking with

routines (Puijk, 2015). Because of the many changes in PSB's provision, new structures, skills, or technology are required (Brown & Osborne, 2012).

Additionally, changing policy discussions in Europe surrounding the 'creative industries' have affected PSB activities. PSB are presumed to counteract market failures, but also to have a positive cascading effect on the economy, society and culture. This means PSB are now presumed to be propellors and innovators in the domain of convergent media and online distribution (Ibrus et al., 2019) and are generally seen as a development centre for talent and innovation (Bardoel & d'Haenens, 2008a). In fact, historically, PSB were seen as drivers of innovation, until criticism from private companies, de-regulation, and budget cuts in the 1980s reduced support for PSB as a leader of innovation in the industry (Donders et al., 2012).

Moreover, in sectors like public service media (PSM) that are of both economic and public nature, innovation can also bring benefits to society that exceed efficiency savings or individual user benefits. In theory, private companies will only invest in innovation when their costs are lower than the commercial benefits obtained. It could thus be argued that PSB innovation is necessary for societal benefits. As PSB are obliged to meet public service objectives, they will focus innovation on the realisation of societal benefits, more so than private companies (Donders et al., 2012). However, the transfer of approaches from innovation theory to media is not straightforward. Thus, this research set out to apply innovation and public value literature in order to assess how PSB are innovating in order to fulfil their public service objectives and survive in an increasingly competitive environment.

1.2 Uncovering innovation strategies within PSB

Considering the challenges faced by PSB and the fact that media organisations increasingly employ innovation to combat contemporary challenges (Küng, 2013), the following research question has been designed: *What strategies do PSB have in place to face today's innovation challenges?* In order to answer this question, several sub-questions are tackled in this study: *What type of innovation projects do PSB undertake? How do these innovation projects contribute to their societal role as PSB? How do these innovation projects contribute to combatting contemporary challenges?* This research analyses innovation projects from two PSB: Nederlandse Publieke Omroep (NPO) operating in the Netherlands and British Broadcasting Corporation (BBC) operating mainly in the UK. These cases were selected to represent PSB because of their distinct characteristics. Both are PSB with considerable viewing and support, albeit in a small and larger market. Additionally, the two PSB have different financing models and resources, but have a considerable amount of innovation projects underway and have different reputations concerning innovation. This selection allows the comparison of innovation projects and enables viable assumptions for the larger PSB context in Europe.

This research draws on the above-mentioned questions and sets out to build a new framework to assess innovation within PSB by bringing innovation literature and societal impact together. Through quantitative and qualitative analysis of multiple innovation projects, the study of a number of instrumental case studies can develop a better understanding of innovation within PSB, how they relate to public value objectives and to theorise about a broader context.

1.3 Scientific relevance

Academically, this research can add insight into how we conceptualise and study innovation in PSB by providing a framework to study PSB's innovation strategies. This research fills a gap in innovation literature, considering that much of it has focussed on commercial manufacturing or product-oriented firms, rather than public service organisations or those in the creative industries (Evans, 2018). Innovation theory emphasised the role of large firms in stimulating innovation, as they have the means to invest in R&D (Schumpeter, 1934). Insights into PSB's innovation strategies thus also give insights into broader understanding of innovation, because large companies have considerable impact. Through the analysis of the selected cases, the findings add to research on PSB operating in larger and smaller markets.

Dogruel (2014) argues that an integrative framework combining theoretical and empirical approaches from economic and social innovation theory as well as media-specific frameworks are required. Considering that the characteristics of media innovations are seldom the focus of research, analysing them is crucial to develop a framework to study media innovations. Additionally, a common framework is crucial for academic research because theoretical improvement might suffer from the distinct terminologies of innovation management, thus limiting the expansion of knowledge (Adams et al., 2006). Uncovering what type of innovation projects media organisations like PSB undertake can help us understand why PSB choose to invest in certain projects, answering a call for analysis of data that demonstrate rationales for implementing innovation within PSB (Evans, 2018). This study thus adds to the knowledge about PSB's response to contemporary challenges through innovation.

Additionally, assessing how innovation projects contribute to PSB's societal role furthers understanding about how rather abstract public service goals are to be realised or measured (Hargreaves Heap, 2005; Harrison & Wessels, 2005; Moe, 2010). Within public service management, there has been a call for research with the intention to develop and evaluate new approaches, examine required conditions for implementation and develop empirical guidelines for practice to measure public value (Guthrie et al., 2014). Harrison and Wessels (2005) also called for a new framework which would allow the identification of reconfiguring forms of media, representing both traditional and new media, in order for

existing PSB objectives to be redefined. In short, this research will contribute to the academic discussions on how PSB are dealing with disruption and innovation to build tomorrow's public service media (PSM).

1.4 Societal relevance

Answering the earlier-mentioned research questions can help PSB practitioners to adapt innovation strategies that work to combat the challenges created by the changing media environment, considering many are struggling to update their strategies and reinvent their organisations for the digital age (Głowacki, 2020). Additionally, it will provide practitioners with a framework to measure the contribution of their innovation activities to their public service objectives. This is imperative, considering the increased pressure on PSB to justify their activities (Bardoel & d'Haenens, 2008a). With the aim of legitimising PSB's funding, Donders and Pauwels (2008) acknowledges the need for involved stakeholders to define the public service remit in the digital age, in order to effectively differentiate commercial from public service.

Uncovering PSB's innovation strategies facilitates the creation of a common framework for assessing innovation. This is necessary because the intricate processes of measuring an organisation's innovation capabilities need to be uncovered in order to effectively manage them (Adams et al., 2006). Considering that both the conceptualisation and application of innovation have an impact on the competitiveness of media organisations and sector development, the study of how and to what extent current innovation exhibits itself in the media is relevant (García-Avilés et al., 2018). Additionally, analysing two distinct PSB can result in the uncovering of best practices for PSB in creating their innovation strategy. While the nature of PSB presents a different dynamic from that of commercial media, some of the challenges they are facing are similar and thus findings could also be useful for commercial broadcaster practitioners (Donders, 2019).

1.5 Chapter overview

This thesis is divided into the following chapter structure. Firstly, an extensive review of theory is presented to outline the theoretical framework that guided the analysis of data and the interpretation of results. The framing of the research is discussed and the concepts of innovation management and public value are defined. Secondly, a detailed description of the method used is presented, outlining the multiple-case study design, and describing the data and method of data analysis. Thirdly, the results and developed framework are presented and discussed in view of the theory and findings. Lastly, the conclusion presents a critical reflection, grounding the results within academic debates of innovation within PSB, presenting its implications and suggesting future research.

2. Theoretical framework: innovation typologies and public service objectives

The aim of this chapter is to firstly present previous literature on the central concepts that have guided this research; media innovation, innovation management, public value and public service objectives. Reviewing these topics frames the research and develops the context of innovation and public service value in which this research took place. Additionally, this review of theory is presented to outline the theoretical analytical framework that guided the analysis of data and the interpretation of results.

2.1 Innovation

2.1.1 Defining (media) innovation

The term innovation is notoriously ambiguous and lacks a clear definition. Adams et al. (2006) adopt the UK Department of Trade and Industry's definition of the term as "the successful exploitation of new ideas" (p. 22). Storsul and Krumsvik (2013) state that innovation is the application of existing knowledge in new contexts in order to introduce new possibilities. However, Law (2016) adds to this definition that the changing of an organisation or its processes can be a valuable form of innovation. Often in defining innovation, the distinction is made between innovating and inventing, as innovation highlights the putting into practice of a new idea. For example, Hashimzade et al.'s (2017) define innovation as "the economic application of a new idea. Product innovation involves a new or modified product; process innovation involves a new or modified way of making a product" (p. 85). In this definition, innovation types are addressed, a common way in literature to understand and study innovation.

Considering the challenges faced by media institutions, innovation has increasingly become crucial for the continuation of this industry and media organisations increasingly value innovation (Küng, 2013). However, innovation within the media industry is distinct, as it concerns the understanding and explaining of contemporary developments in the media landscape within the framework of innovation and innovation theory (Storsul & Krumsvik, 2013). Additionally, it is distinct from the definitions given above because of the characteristics of the media landscape. To illustrate, the constant necessity for newness in the media industry is a main characteristic of media innovation, often resulting in new products. However, not all new media products can be considered an innovation, but only those that distinguish themselves in design, purpose or way of use. Furthermore, the high-risk nature of media products and processes makes the media industry at times seem less innovative and increases the significance of reproductions and cross-media strategies (Dogruel, 2014). Importantly, media innovations are not just media technology innovations, as changes in media practices both reflect and advance societal changes as well. Even if the influence of technology must not be neglected or taken for granted, all media is innately

social, and with further innovation in current media practices, the social aspect of media should not be disregarded (Bruns, 2014).

Previous research on the characteristics of media innovations found that they are distinguishable from other types of innovations by a multitude of dimensions. For example, Dogruel (2014) claims that media innovation comprises not merely new media content or technology products, but includes organisational developments, new services, and new thinking patterns of media business and organisations. Because of the interplay between intangible (creative), technological and organisational features of innovation, innovations cannot be limited to just product, process or organisational innovation, as is often done within economics research, because overlap between these occur. This overlap of media innovations as both process and product innovations means they promote economic and social change processes and can thus be characterised as economic and social innovations. Furthermore, media innovations often pursue a new media's design, purpose and ways of use first, before considering economic exploitation, highlighting this intersection between economic and social innovation (Dogruel, 2014).

To accommodate media innovation's distinctiveness, this study adopts García-Avilés et al.'s (2018) definition of media innovation as "the capacity to react to changes in products, processes and services through the use of creative skills that allow a problem or need to be identified, and to solve it through a solution that results in the introduction of something new that adds value to customers and to the media organizations" (p. 27).

As mentioned earlier, innovation is most commonly associated with processes, products, procedures or outcomes (Walker et al., 2002). These innovation processes need to be effectively managed. Adams et al. (2006) propose that competitive advantage is strongly dependent on an organisation's management of the innovation process. As mentioned in the introduction, they argue that a common framework for assessing innovation is necessary in order to efficiently manage the processes involved. Their review of innovation management literature suggests that an organisational measurement framework for innovation can help managers track and assess their innovation processes, uncover limitations and find solutions. However, they also found that innovation measurement does not take place regularly and where it does, it tends to focus on output measures.

Thus, to understand innovation, it is important to analyse strategies, as strategies are used to manage the innovation process. Additionally, the management of innovation within media management and economics has been identified as a critical area of research in the field (Dogruel, 2014).

2.1.2   PSB as frontrunners of innovation or slow to adapt?

Some insightful research on innovation within PSB has already been conducted. Reviewing these can set the context in which the present study takes place. Firstly, case studies have been employed in earlier research on innovation within PSB, however, many studies are limited to one case (Born, 2003; Ibrus et al., 2019; Puijk, 2015; Vanhaeght, 2019; Wilson et al., 2010) or only several cases (Cunningham, 2015; Enli, 2008; Van den Bulck & Moe, 2012). Often, the study of innovation within PSB primarily focuses on innovation related to production and distribution of content (Donders, 2019; Ibrus et al., 2019; Puijk, 2015), reaching audiences (Debrett, 2015; Enli, 2008; Lowe & Maijanen, 2019) or technological innovations (Fernández-Quijada et al., 2015). While these studies prove that PSB conduct innovation in several areas, it might neglect or marginalise the distinctive PSB context.

Earlier research has suggested that PSB could become coordinators for all of the media systems conceptualised as 'innovation systems'. In the introduction, the idea of PSB being driving forces of innovation was already mentioned, stemming from changes in policy discussions surrounding the 'creative industries'. The standard objective for PSB to counteract market failures is now expanded to counteracting what is known as "innovation system coordination failure" (Ibrus et al., 2019, p. 370). This stems from the idea of national innovation systems, defined by Freeman (1995) and Lundvall (1992) as related organisations of knowledge production and value creation that, when well-coordinated, facilitate the development and distribution of new technologies. National innovation systems should then contribute to economic growth (Ibrus et al., 2019). Additional studies have argued for the central role of PSM within a networked media system, proving that PSB are implementing partnerships and collaborations to enhance the media industry as a whole (Wauters & Raats, 2018).

However, several studies have contradicted the above claims, instead arguing that young media businesses are key drivers of innovation for the industry (Compaine & Hoag, 2012; Mehdi Sharifi et al., 2019). Dogruel (2015) also acknowledges that most media innovation research considers only the part young media organisations play as driving forces of innovation. In addition, previous research has concluded several barriers for PSB in conducting innovation. Głowacki (2020) found that path-dependencies and past legacy hold back development within PSB. The influence of path-dependency has been acknowledged in earlier innovation research by Paul David (1985) and Brian Arthur (1994), stating that decisions are limited by choices made in the past, even if the circumstances are now different. Innovations thus depend on the path of its development. This might explain why certain legacy media are seemingly slow to adopt innovative practices (García-Avilés et al., 2018). Especially concerning data-driven technologies, such as artificial intelligence and virtual reality, PSB seem to be lacking in activity (Głowacki, 2020). On top of that, PSB

need to approach users themselves for innovations, because facilitators between them and smaller, more agile organisations are often not present. This complicates the theory of efficient media markets, which states that large organisations with plenty of resources should make use of small organisations, which have an advantage in innovating, while facilitators bring these two together (Mehdi Sharifi et al., 2019). Additionally, previous research concluded that accountability of innovation is difficult because practices are often informal and the primary role of techno-enthusiasts and bureaucratic challenges make open innovation difficult to achieve within PSB (Fernández-Quijada et al., 2015).

This review of previous research on innovation within PSB shows varying ideas on PSB innovation and the management thereof. Further understanding of innovation management is needed in order to develop a new framework for assessing the value of innovation projects that can help management make the right decisions in pursuing projects and help respond to path dependencies.

2.1.3   (Media) innovation types

Walker et al. (2002) argues that in order to measure and understand innovation it needs to be categorised. Creating typologies of innovation is one of the most common ways in literature to understand and study innovation and innovation strategies, as it helps to delineate differences between innovation types and innovation processes. Menor et al. (2002) state that even if there is agreement between academics that different types of innovation exist, there is no consensus on what these types are. Nonetheless, many researchers have put forth innovation types and frameworks to assess them.

Classic research by Schumpeter (1934) identified five types of innovation: introduction of a new product or service, introduction of a new production process, opening up of a new market, securing of a new source of raw materials or other inputs, and the creation and application of a new organisational structure in an industrial sector. As one of the earliest typologies of innovation, Schumpeter's (1934) research has been expanded on by many other researchers (Avlonitis et al., 2001; Menor et al., 2002; Oke, 2007; Partanen et al., 2014).

Additional models to characterise innovation types include those by Osborne (1998) who classified innovation as being discontinuous (innovation) or continuous (organisational development), leading to four types of innovation. Firstly, innovation can be "total innovation", which is characterised by being discontinuous, indicating that it is new to the organisation and is serving a new user group. Secondly, "expansionary innovation" includes innovations that offer an existing service to a new user group. Thirdly, "evolutionary innovation" are innovations that provide a new service to an existing user group of an organisation. Finally, "developmental or incremental innovation" includes innovations that

are based on adapting or modifying an existing service to an existing user group of an organisation.

Walker et al. (2002) used a traditionally private sector approach to measuring innovation and applied it to public sector in order to uncover the extent of innovation in public service organisations. Coombs et al.'s (1996) literature-based innovation output indicator (LBIOI) is used to measure innovation activity within a national economy. It is generated by sampling sections of technical and trade publications that announce new products and typifying these. When this is conducted over an extended period of time, the data can be used to monitor published innovations over time in order to explore adoption and diffusion rates (Coombs et al., 1996). The types of innovations identified by Coombs et al. (1996) can be distinguished by characteristics: new, novel, improved, accessory, differentiation, and/or process. The differentiation between "new" and "novel" innovation is determined by its function. A changed product that serves a new function is "new", while "novel" products perform the same function as before, with new technology. Walker et al.'s (2002) application of LBIOIs to the public sector found that it needed the addition of Osborne's (1998) typology to account for personal and human services innovations, as Coombs et al.'s (1996) method was better suited for product-based innovations. However, the technique was found to be useful to capture valid and reliable data about the nature and extent of innovation in the public service sector (Walker et al., 2002).

Francis and Bessant (2005) identified the four P's of innovation: product, process, position, and paradigmatic innovation. "Product innovation" refers to changes in the product or service offered while "process innovation" refers to changes in the way in which the product or service is created and delivered. "Position innovation" relates to how products or services are positioned or framed within a certain context, while "paradigmatic innovation" relates to changes in an organisation's mindset, values, and business models. Their model suggests placing innovations conducted within an organisation on a diamond-shaped framework, with each corner representing one of the four P's. This helps organisations concentrate their efforts, manage interdependencies and expand options. Placing the innovations on the diagram is a means for management to think systematically about utilising the innovation capabilities of the organisation (Francis & Bessant, 2005).

Keeley et al.'s (2013) "Ten Types of Innovation", developed within Deloitte branch Doblin, claims that all innovations are some combination of ten types organised within three categories: configuration, offering, and experience. Configuration, comprising of profit model, network, structure, and process innovation, focuses on the inner workings of the organisation. Offering, comprised of product performance and product system innovation, is focussed on the product or service. Lastly, experience, comprising of service, channel, brand, and customer engagement innovation, focusses on the customer-facing elements of an organisation. Keeley et al.'s (2013) framework has been used in earlier research

(Corrales-Estrada, 2019). Typically used as a tool to diagnose and improve innovation, they suggest adding up types for increased performance. While most organisations add up two types per innovation, the most innovative organisations include at least twice as many (Keeley et al., 2013). Damanpour et al. (2009) researched the combinative effect on performance of undertaking different types of innovation within public service organisations. Changing the focus every year to a particular type of innovation was concluded to be damaging, while deviation from the industry standard in adopting innovation types could be advantageous to organisational performance.

Moving on to typologies to categorise media-specific innovations, Storsul and Krumsvik (2013) suggest looking at those through two dimensions: the type of innovation and the degree of novelty. According to them, media innovation types encapsulate Francis and Bessant's (2005) earlier explained product, process, position and paradigmatic innovation. However, Storsul and Krumsvik (2013) suggest adding "social innovation" to this framework to incorporate and describe media innovations. Social innovation refers to innovations that meet social demands and enhance individual's lives. Secondly, the degree of novelty reaches further than simply a new media product, as it requires some additional effect, economically or socially, in order to be labelled an innovation. To define the degree of novelty, the Schumpeterian tradition of "radical" versus "incremental" innovation is adopted. Incremental innovations refer to gradual progressions where one innovation extends another, while radical innovations have an extensive impact that may alter the economy (Storsul & Krumsvik, 2013). Similarly, Christensen (1997) distinguishes between "sustaining" and "disruptive" innovations, with disruptive innovations being a particular kind of radical innovation. Within the media industry, the majority of innovations were found to be incremental or sustaining. However, examples of radical innovations are present such as the internet, music streaming, social media platforms and on-demand services (Storsul & Krumsvik, 2013).

Previous research by Evans (2018) concluded that public media organisations make sense of innovation by relying on process-oriented rather than product-oriented frameworks. Additionally, literature on process innovation can allow us to understand what drives innovation (Evans, 2018). Schumpeter's (1934) definition of process innovation emphasises new methods and practices, of which key dimensions for public service organisations include internal drivers and sources. Internal drivers pertain knowledge or resources within an organisation, while sources are the inspiration for ideas. Inspiration can stem from internal factors, such as knowledge and ideation, or external factors, such as the adoption or imitation of outside ideas (Evans, 2018).

Additional research by García-Avilés et al. (2018) concluded a media innovation index. Their method provides a series of indicators that allow the degree of innovation of media initiatives to be measured and evaluated by identifying what type of innovation is

taking place and assigning value to them. They firstly establish whether the innovation uses in-house technology, outsourced technology or whether it is non-technological. Additionally, they determine whether the degree of innovation is incremental or radical, following Schumpeter's dichotomy. Then, the area of innovation is assessed, such as product or service, production and distribution process, company organisation or marketing. By assigning points to each innovation initiative, they created an index of innovation projects conducted within the Spanish media sector. Results indicated that while more technological than non-technological innovations were recorded, most innovations used outsourced technology. Additionally, incremental innovations prevail, while most initiatives were conducted in the area of product or service, production or distribution and marketing, while less so within company organisation. While most frameworks reviewed were created to evaluate innovation from many different sectors, García-Avilés et al.'s (2018) framework was specifically created for and applied within the media sector.

2.1.4 Review of innovation typology frameworks

Definitions of (media) innovation and innovation typologies have been critically discussed and can be used as a guideline to construct a theoretical framework for assessing what type of innovation projects PSB conduct. Table 1 gives an overview of the previously reviewed literature on innovation.

Table 1 Literature study on innovation types

Literature / approach	Focus in research	Identified types of innovation
Schumpeter (1934)	Five types of innovation	1. Introduction of a new product or service 2. Introduction of a new production process 3. Opening up of a new market 4. Securing of a new source of raw materials or other inputs 5. Creation and application of a new organisational structure in an industrial sector
Schumpeter (1934)	Degree of novelty of innovation	1. Incremental innovation 2. Radical innovation
Coombs et al.'s (1996)	Literature-based innovation output indicator (LBIOI) identifying types and origins of innovation	1. New 2. Novel 3. Improved 4. Accessory

		5. Differentiation
		6. Process
Osborne (1998)	Four types of innovation, classified as discontinuous (innovation) or continuous (organisational development)	1. Total innovation
		2. Expansionary innovation
		3. Evolutionary innovation
		4. Developmental or incremental innovation
Francis and Bessant (2005); Storsul and Krumsvik (2013)	The four P's of innovation, Storsul and Krumsvik (2005) add social innovation to better conceptualise media innovation	1. Product
		2. Process
		3. Position
		4. Paradigmatic innovation
		5. Social innovation
Keeley et al.'s (2013)	Ten Types of Innovation, pertaining three overarching areas: configuration, offering and experience	1. Profit model
		2. Network
		3. Structure
		4. Process
		5. Product performance
		6. Product system
		7. Service
		8. Channel
		9. Brand
		10. Customer engagement
García-Avilés et al. (2018)	Media innovation index	1. Product or service
		2. Production and distribution process
		3. Company organisation
		4. Marketing

2.2 Public value

2.2.1 Defining public value

The concept making the organisations under study distinct from others, is their mandate to serve the public interest or to provide public value. A classic definition of public value is the value that an organisation contributes to society. The term was originally devised by Mark Moore (1995) who understood it as the public equivalent of private organisations' stakeholder value. Placing this in the PSB context, Harrison and Woods (2001) introduce the term "public good" when defining PSB as "non-individual goods or benefits, which are for the benefit of, and enjoyed by, the community" (p. 477). However, Alford and O'Flynn (2009) argue that public value entails a wider range of concepts than

public goods, namely because it encapsulated outcomes rather than output and it has meaning to people. This study takes on Crosby et al.'s (2017) definition of public value: "that which is valued by the public or is good for the public (including the public sphere) 'as assessed against various public value criteria'" (p. 658). Public value criteria translated to PSB are also called public service objectives. Public service objectives show a high level of complexity, as there are several approaches from different countries and policies enforcing them.

Within the field of public sector management, Moore (1995) developed the corresponding framework for public value management, suggesting that the strategy of a public sector organisation must meet three broad tests: it must be legitimate and politically sustainable; it must be practically and administratively feasible; and it must create something of value or constitute public value. The idea of the framework is that management must attempt to optimise alignment among these three components. However, this framework has been critiqued on several levels. Some question whether it measures what public service managers do or what they should be doing, noting that "the criteria for evaluating aspirations differ from those that seek to assess evidence" (Rhodes & Wanna, 2007, p. 408). However, Alford and O'Flynn's (2009) review of critiques and developments surrounding Moore's (1995) framework concludes that both supporters and critics have extended the framework's ideas, sometimes misconstruing them. They also state that predictions about whether public value will demonstrate lasting value in the public and management domain are not possible.

2.2.2 Public value tests and objectives, crucial or in need of reinvention?

Moving away from the definition of public value, there is no denying that an explicit legitimisation of PSB's role in society is necessary, because of the challenges mentioned in the introduction. Despite differences in countries, there are still widespread indications that basic functions should be provided by PSB, such as affordable, universally available and reliable information, education and culture, and programmes serving minority interests. It is believed that these cannot and will not be adequately supplied by commercial broadcasters (Bardoel & d'Haenens, 2008a). However, how the rather abstract public service goals are to be realised or measured is often unclear (Hargreaves Heap, 2005; Harrison & Wessels, 2005; Moe, 2010). One of the ways in which public value is currently measured within PSB is through so-called 'public value tests'. These are tests implemented to approve proposals of new public services, often seen as the results of competition policy led by the European Union (EU) (Moe, 2010).

Earlier research within the UK, Germany and Norway looking into these public value tests found that the agents involved, the actions and the scope are different across cases. All tests assess the relevance in terms of compliance with the public service mandate,

market impact and cost/value of new services, but there are slight differences, such as the UK and Norwegian tests only applying to new services, but the German test applying to all existing services (Moe, 2010). There is also conflicting research on whether the current public value tests inhibit innovation (Cunningham, 2015), or whether innovation already contributes to societal goals such as diversity (Debrett, 2015; McElroy & Noonan, 2018). For example, scholars have acknowledged that using the current public value tests means that any intention by PSB to move into new media services needs to be justified based on forecasts instead of actual results, hindering innovation instead of stimulating it (Cunningham, 2015; Ibrus et al., 2019). According to Lowe and Maijanen (2019) the public service values make the delivery of relevant, modern, and individualised services in a highly competitive market difficult, even though scholars have acknowledged the increasing importance of the audience as engagers with public service media and encourage PSB to recognise and accommodate their audiences' needs (Głowacki & Jackson, 2013). Additionally, some scholars argue that governments have been holding back the modernisation of PSB through very detailed objectives and public value tests, as well as accountability mechanisms (Lowe & Bardoel, 2007). Cunningham (2015) thus suggests a more agile, facilitative responsibility for PSB in conducting experimental R&D for the system.

Despite criticism, the public service values remain foundational to the legitimacy of PSB (Lowe & Maijanen, 2019). In addition, political support still exists for the idea of PSB both at the EU level and in many member countries (Harrison & Wessels, 2005). For example, the Council of Europe has endorsed the public service mandate in the information society, claiming that it is even more relevant in the information society and that PSB should use new interactive technologies, be present on appropriate platforms, and be able to provide individualised, interactive and on-demand services (Jakubowicz, 2007). Previous research also supported the importance of PSB within the information society, as many scholars recognise a lack of access to technologies, lack of skills and capacities, the knowledge gap and the dominance of elites in online conversations (Harrison & Wessels, 2005). Additionally, previous research argues that traditional public service values are claimed successfully in a reconfigured and reinterpreted sense of service (Harrison & Wessels, 2005)

In contrast, Born (2003) found that PSB executives predict that the PSB values will decline in importance and that commercialism and public service innovation will become synonymous. Additionally, some scholars believe that the combination of neoliberal performativity and commercialised actions with traditional PSB values is troublesome, as the ambiguity surrounding PSB values leaves them difficult to measure (Grummell, 2009). Yet, PSB are asked to measure PSB objectives to justify their activities. This has generally resulted in increased pressure on PSB practices, causing changes in production, such as

the employment of convenient recording and editing technologies and increased multiskilling of staff (Grummell, 2009). PSB executives' continuing commitment to traditional PSB objectives also pose complications in fulfilling PSB objectives today, as the heritage broadcasting logic is competing for dominance with the logic of digital media. Their struggle includes maintaining PSB legitimacy, while pursuing activities for renewed significance in a new media landscape (Lowe & Maijanen, 2019). Additionally, earlier research into PSB 2.0, defined as a set of new policies concerning online media inspired by the PSB objectives, suggests that the objectives are in conflict with leading liberal market ideas that see liberalisation and deregulation as the logical outcomes of new technological advancement (Brevini, 2013).

This section has demonstrated that there are varying views on the public service objectives, their usefulness, and how they ought to be managed. Regardless, at present, the PSB objectives are still a crucial part of the PSB context.

2.2.3   Public service objectives

The management of public value involves taking into account the full range of public value criteria (Crosby et al., 2017). In order to understand how public value is managed within the PSB context it is thus useful to discuss the public value criteria set out for PSB, often called PSB objectives in practice and literature.

There is no universal definition of PSB's societal objectives. However, several scholars have put forward goals such as citizenship, universality, quality, informing the public, supporting national culture, being non-commercial and cultivating democracy (Born & Prosser, 2001; Harrison & Wessels, 2005; Lowe & Maijanen, 2019; Meijer, 2005). Earlier research discusses the so-called Reithian principles, as established by the first Director-General of the BBC John Reith. These were values for PSB to inform, educate and entertain (Harcup, 2014). The Broadcasting Research Unit more formally defined eight principles of British broadcasting, namely "universality of availability", "universality of appeal", "provisions for minorities", "service to the public sphere", "educational programming", "distance from all vested interests", "structure that encourages competition for good programming, not competition for numbers", and "broadcasting rules that liberate rather than restrict the program maker" (Broadcasting Research Unit, 1986). This purpose would, in different forms, be adopted by many other broadcasting institutions outside the UK.

A previous review by Donders and Van den Bulck (2016) established a set of goals based on previous literature, several PSB's mission statements, and objectives identified by the European Broadcasting Union (EBU, 2013), namely universality, quality and distinctiveness, creativity and innovation, identity construction and diversity, and accountability.

The Council of Europe (2007) has defined PSB objectives as, among other things:

- Providing a reference point for all members of the public;
- Fostering social cohesion and integration of all individuals, groups and communities;
- Providing impartial and independent information and comment, and innovatory and varied content which complies with high ethical and quality standards;
- Fostering pluralistic public discussion and promoting broader democratic participation of individuals;
- Contributing actively to audio-visual creation and production and greater appreciation and dissemination of the diversity of national and European cultural heritage.

Additionally, new duties are suggested by UNESCO regarding globalisation, migration and the growing multicultural character of many societies, urging PSB to promote intercultural and inter-religious dialogue and understanding amongst groups (Jakubowicz, 2007). Research within the Catalan PSB context found that inter-religious dialogue was minimally present and often from a Euro-Catholic perspective (Huertas Bailén, 2020).

Previous research has argued the importance of education as a PSB objective, claiming that it has been consistently neglected in practice. Rather, the educational objective is now a changing and flexible one ranging from formal education to educative and edinfotainment formats, although it is argued that the latter is increasingly employed because of financial, institutional and popularity concerns (Grummell, 2009). Education was already part of the Reithian values and the objective has been mentioned by many as a traditional PSB objective (Bardoel & d'Haenens, 2008a; Harcup, 2014; Lowe & Maijanen, 2019). However, as developments showed a broader ideological change of positioning PSB within an economic frame, PSB started to incorporate education into general programming instead of targeting specific educational groups. As PSB increasingly adopted reforms, its scheduling, marketing and advertising also changed. Educational programming was placed in off-peak times, positioned as minority interest, resulting in lower audience ratings and decreasing its potential advertising revenue. Because of this, the more popular "edinfotainment" took hold, combining education with entertainment and information tactics from conventional broadcasting (Grummell, 2009).

Overall, scholars clearly acknowledge that PSB content should be distinctive from commercial broadcasters' content (Bardoel et al., 2005). This 'distinctiveness' is often brought up in discussions on policy and legitimacy of PSB. However, distinctiveness is very difficult to measure and is considered an ambition rather than a measurable criteria for PSB by some scholars. Still, distinctiveness is often linked to the public service objectives such as "high quality, trusted news, or bringing the nation together" (Hendrickx et al., 2019, p. 286).

Looking specifically at the cases selected for this study, the NPO's public purpose is to provide programmes suitable for all groups within Dutch society. Its objectives are officially formulated in the Media Act (Mediawet), stating that a programme has public value when it is varied (offering information, culture and/or education), of high quality, and suitable for all groups in society (Rijksoverheid, 2016). NPO sets their innovation goals by closely connecting them to public service objectives in their 'Innovation Horizon' for the upcoming two to three years. Firstly, everyone should be seen and heard by effectively reaching target groups and matching content to these target groups. Secondly, fragmentation should be counteracted by creating collective experiences, using recommendation systems for defragmentation, and utilising participatory media. Thirdly, trust should be built by increasing credibility of the broadcaster, facilitating media literacy, and shortening the distance between creators and audiences. Lastly, their public purpose should be highlighted by making the PSB impact tangible, and utilising immersive media (NPO, 2020).

The BBC still states the earlier-mentioned Reithian principles as their societal goals: to inform, educate and entertain (BBC, 2020). The broadcaster has a public value test that assesses new services. Whether a service has to go through the test depends on its impact, novelty, duration and financial consequences. The test is twofold: a public value assessment and a market impact assessment. The former is important in this context, as it assesses the new service based on four key drivers of public value: reach, quality, impact, and cost or value for money (Moe, 2010).

2.2.4 Review of public value frameworks

An extensive list of public value objectives have been identified and can be used to build a theoretical framework for evaluating whether innovation projects that PSB conduct contribute to their unique societal mandate. Table 2 gives an overview of the previously reviewed literature on public service objectives.

Table 2 Literature study public service objectives

Literature / approach	Focus in research	Identified public service objectives
Broadcasting Research Unit (1986)	Formally defined eight principles of British broadcasting	- Universality of availability - Universality of appeal - Provisions for minorities - Service to the public sphere - Educational programming - Distance from all vested interests

		- Structure that encourages competition for good programming, not competition for numbers
		- Broadcasting rules that liberate rather than restrict the program maker
Moore (1995)	Public management	- Legitimate and politically sustainable
		- Operationally and administratively feasible
		- Must create something of value or constitute public value
		- Maximise alignment between these three elements
Born and Prosser (2001)	Survey of numerous PSB studies, revealing core values embodied within PSB	- Citizenship
		- Universality
		- Quality
Harrison and Wessels (2005)	Traditional public service values	- Universal access
		- Provision of free-to-air services
		- Plurality of content and suppliers
Meijer (2005)	Three objectives	- Make quality programmes
		- Supply good information
		- Involve people in democratic culture
UNESCO; Jakubowicz (2007)	UNESCO-suggested tasks regarding globalisation, migration and increasingly multicultural nature of societies	- Promote intercultural and inter-religious dialogue and understanding amongst groups
Donders and Van den Bulck (2016); European Broadcasting Union (2013)	Set of goals, based on previous literature, several PSB's mission statements, and objectives identified by the European Broadcasting Union	- Universality
		- Quality and distinctiveness
		- Creativity and innovation
		- Identity construction and diversity
		- Accountability
Lowe and Maijanen (2019)	Set of core values adopted in Northern Europe based on Reithian values	- Informing and educating the public
		- Cultivating democracy
		- Supporting domestic culture
		- Guaranteeing universal service

		- Being non-commercial and non-governmental entities
Lowe and Maijanen (2019)	Set of values in traditional terms as concluded through interviews with PSB management	- To develop and defend democracy - To provide independent, impartial and trustworthy information - To provide relevant content for all - To ensure that high journalistic standards are maintained - To serve as a domestic cultural institution - To maintain and develop national identity
Council of Europe (2007), adapted from Jakubowicz (2007)		- A reference point for all members of the public - A factor for social cohesion and integration of all individuals, groups and communities - A source of impartial and independent information and comment, and of innovatory and varied content which complies with high ethical and quality standards - A forum for pluralistic public discussion and a means of promoting broader democratic participation of individuals - An active contributor to audio-visual creation and production and greater appreciation and dissemination of the diversity of national and European cultural heritage

2.3 Towards a (new) integrated framework

Previous research on innovation and public service objectives within PSB shows many distinctions. Even if the theory differs significantly, they share some common ground. Most definitions of innovation and frameworks incorporate types of innovation, while public value definitions highlight the universality, accessibility, and quality of information. The range of different concepts and interpretations of innovation and public value highlights the need for a framework to evaluate innovation within PSB and its contribution to public service objectives. The reviewed frameworks on innovation types and public service objectives will form the foundation for analysis, as it can help uncover what innovation types and public service objectives are being addressed.

3. Method: multiple-case study analysis

3.1 Multiple-case study approach

This research aims to uncover what strategies PSB have in place to face today's innovation challenges by analysing innovation projects conducted by PSB. To answer the research question: *What strategies do PSB have in place to face today's innovation challenges?* and sub-questions: *What type of innovation projects do PSB undertake? How do these innovation projects contribute to their societal role as PSB? How do these innovation projects contribute to combatting contemporary challenges?,* this research employed a deductive and inductive, multiple-case study approach to generate new theory (Edmondson & Mcmanus, 2007). A number of instrumental case studies have been selected to develop a greater understanding of innovation within PSB, how these activities relate to public service objectives and to theorise about a broader context (Mills et al., 2010b).

Case study research is defined as research that "investigates a contemporary phenomenon in-depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (Yin, 2014, p. 97). Innovation within the PSB context is indeed influenced by complex factors such as rapidly changing audience needs, the obligation to continuously legitimise activities, and the tension between economic objectives and the public service mandate.

Additionally, case study research is a frequently used method for innovation research within PSB (Born, 2003; Cunningham, 2015; Enli, 2008; Ibrus et al., 2019; Puijk, 2015; Van den Bulck & Moe, 2012; Vanhaeght, 2019; Wilson et al., 2010). However, as mentioned earlier, many studies employ one or only several cases. This research thus employs a comparison of a set of cases to draw conclusions about the type of innovation taking place and their contribution to PSB objectives. Drawing on data from multiple cases allows the researcher to engage in comparative analysis and thus develop more transferable theoretical insights than would be possible from a single case (Eisenhardt & Graebner, 2007). Additionally, these multiple cases are more powerful than a single-case design because it offers the opportunity for more extensive descriptions and explanations of the phenomenon (Yin, 2014). This thesis argues that the study of the similarities and differences across cases strengthens theory and transferability (Mills et al., 2010b).

3.2 Why NPO and BBC?

For this study, the NPO and BBC have been selected as the organisations under study to enhance validity and transferability. Selecting two organisations allowed the researcher to gather the kind of rich, longitudinal data typically used in studies analysing one or two organisations (Cunningham, 2015; McElroy & Noonan, 2018; Rindova & Kotha, 2001) while also allowing for the comparison of insights across the organisations using a

multi-case logic (Eisenhardt & Graebner, 2007). PSB in many countries, including the UK, are market leaders and still play a prominent role in broadcast provision both at European and national levels (Enli, 2008). In contrast, the Dutch PSB operates in a fairly small media market (Donders, 2019). Analysing the innovation projects of these two PSB expanded the findings to both smaller and larger PSB. Additionally, public spending per capita differs significantly for these two PSB, with the Netherlands spending 34 EUR and the UK spending 73 EUR per capita in 2011. The Netherlands thus spent below the average of 60.3 EUR per capita and the UK above (Cunningham, 2015). On top of that, The BBC is considered to take a leading role in the development of digital era strategies for PSB and has been acknowledged as an important initiator for technological innovation (Donders, 2019; Enli, 2008; Głowacki, 2020; Schlesinger, 2010). The NPO also adopts an active strategy in the digital domain, but focusses on technology-driven experiments (Bardoel & d'Haenens, 2008b). Overall, these two organisations were selected to balance the need for comparability with the need to maximise chances for discovering variation (Strauss & Corbin, 1997).

3.3 Data description and sample

    The collected data consisted of 100 innovation projects and their descriptions, generally ranging between 300-700 words. These descriptions were obtained through desk research, as they were available on appropriate sections of the broadcasters' websites. The units of analysis thus consisted of textual descriptions of these innovation projects. In order to obtain the descriptions, the web scraping tool Web Scraper was used to automatically extract the relevant information from the websites. This tool enabled the researcher to set up a mechanism that searched for the individual project descriptions within the website, scraped and extracted the text, which could then be exported to an Excel file. In this file, the original project URL, title, timeframe (where applicable) and text were displayed. This allowed the data to be organised and stored in a structured way, facilitating the analysis. Both selected PSB have webpages as part of their larger corporate website that state the innovation or R&D projects that they are currently conducting or have completed.

    The NPO webpage (https://innovatie.npo.nl/projecten) is part of the larger innovation website of the NPO. The purpose of the page is described as displaying all innovation projects, serving as a display of the activities that the NPO conducts in terms of innovation. The webpage states that each project within the NPO innovation department is required to be innovative in at least one of the following areas: target group, interactivity, technology, content form, process and distribution. The projects were categorised by the following six themes: artificial intelligence, immersion, interactive video, mobile journalism, new platforms and voice. Additionally, every project referred to the broadcaster or channel that is undertaking the project. The descriptions are mostly short, between 150 – 350 words, with

some outliers of around 500 words. The descriptions did not state the timeframe in which the project took place. At the time of writing, there are five pages displaying 12 projects, totalling 60 projects. Figure 1 shows an overview of the NPO innovation projects webpage.
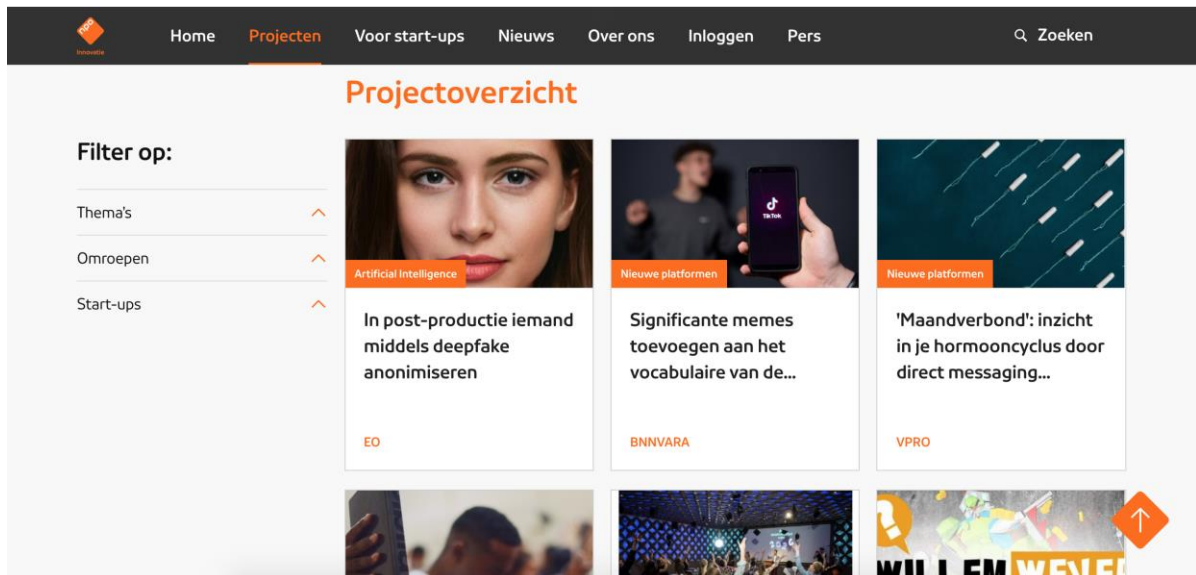
Figure 1 NPO innovation projects webpage (NPO, n.d.)

The BBC webpage (https://www.bbc.co.uk/rd/projects) is part of the larger R&D section of the BBC corporate website. The 'Projects' section of the R&D website showed the latest seven projects published, indicating that the projects appear to be ordered based on timeframe. The projects were grouped by topic, working similarly to tags, such as: sustainability, children, IP production & broadcast, artificial intelligence & machine learning, data, and many others, totalling 41 topics. Figure 2 gives an overview of the R&D projects webpage. When clicking on 'View all projects', 141 projects were displayed over 10 pages at the time of writing. The viewer then had the ability to filter by decade, starting in 1990, in which two projects were conducted. The project description are between 600 – 800 words, with some outliers of around 1500 words. Each contains a timeframe in which the projects were undertaken, for example 'Project from 2012 – present' and a section titled 'What we're doing' and 'Why it matters'. Additionally, the individual project descriptions display the section and work stream it belongs to, as well as the topics it has been assigned, the project team and their functions and project partners such as universities or unions.
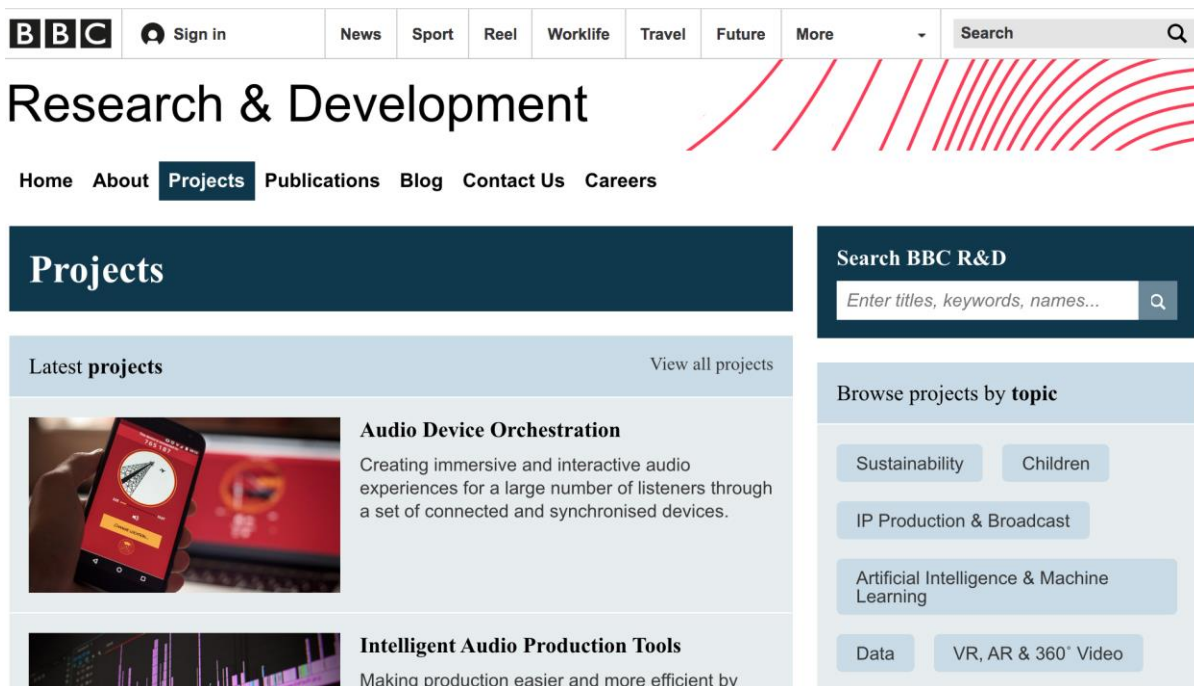
Figure 2 BBC Research & Development projects webpage (BBC, n.d.)

In terms of sample, this research analysed 100 project descriptions. This allowed for similar and dissimilar innovation activities to occur, meaning those that fit into previous frameworks well or do not fit previous frameworks accurately. The stronger the dissimilarities, the more descriptions are necessary to strengthen the newly developed framework (Yin, 2014). The exact time period in which the innovation project took or is taking place is not available for the NPO projects, but we might assume that the newest projects are at the top of the page. Therefore, the sample was obtained by selecting the most recent projects from both the websites, starting from the top of the webpage. Overall, a balanced sample was considered, ensuring that equal amounts of project descriptions from the BBC and from the NPO were analysed and current information was obtained where possible. Additionally, projects were analysed until a point of saturation was met, where no new theoretical contributions were found by analysing more projects.

3.4 Data analysis and operationalisation

Ultimately, this research aimed to develop its own framework inspired by previous innovation typology frameworks, while incorporating public value objectives through a partly inductive and deductive process of coding. Data analysis was grounded in a combination of quantitative and qualitative data analysis of multiple case studies. Previous research stated that studies into media innovation require a multidisciplinary approach that combines quantitative and qualitative methods (García-Avilés et al., 2018). This allowed the researcher to reduce and reconstruct the data, while organising and interpreting it in a continuous, ongoing process. Additionally, when there is a large amount of data to be analysed, this method can uncover reoccurring ideas or patterns (Mills et al., 2010c). Lastly,

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document analysis has been previously employed within PSB research, usually in combination with other methods (Fernández-Quijada et al., 2015; Khajeheian & Tadayoni, 2016; Zaragoza-Fuster & García-Avilés, 2020).

The process for analysing data largely followed the phases set up by Braun and Clarke (2006): data immersion, generating initial codes, merging similar codes into larger categories and revising and improving themes. While data immersion is the first step in the phases set up by Braun and Clarke (2006), this study firstly reviewed previous research and employed these insights on innovation and PSB objectives as a basis for coding, combining an inductive and deductive process to develop a framework. Thus, the second step in the analysis encapsulated reading the many descriptions of the innovation projects in order to list key ideas and themes. Then, the data was reduced to manageable fragments and assigned codes, either deductive or inductive. To illustrate, in order to answer the sub question: *What type of innovation projects do PSB undertake?* this study utilised the frameworks discussed in chapter two as a deductive foundation. These provided a series of indicators for the types of innovation that might show up in the data. The units of analysis were coded based on the frameworks and formed the base for the initial codebook identifying what type of innovation is undertaken. In order to measure how the innovation projects contribute or relate to PSB objectives, a similar process was conducted. A project was labelled as relating to or contributing to a certain PSB objective when it explicitly or implicitly stated to do so.

After coding, text fragments with identical codes were compared for similarities and differences. Subsequently, codes were reduced into larger categories or revised into themes. By looking at similarities and differences, and the theory-related material, themes were uncovered within the data. This combination of deductive and inductive coding is common within qualitative analysis of case studies, combining theoretical notions and frameworks, while also exploring emerging findings from within the data. This combination facilitated the organisation of data in a systematic way (Mills et al., 2010c). The Miles and Huberman (1994) tradition within qualitative analysis of case studies entails the use of matrixes or charts to represent the data. This method was employed to create an overview of the extensive amount of innovation projects and find relations between specific innovation types and public service objectives, based on previous research and frameworks for these two central concepts. This allowed for the reduction of data into visual representations (Mills et al., 2010c), facilitating the understanding of connections between codes.

Thus, the analysis of the texts comprised three phases overall: immersion in the data, coding deductively and inductively following Braun and Clarke's (2006) stages, and visualising the data as suggested by Miles and Huberman (1994). To facilitate this type of analysis, the software ATLAS.ti was employed, a data storage, organisation, management

and qualitative analysis tool. This software is often employed within case study research, as it enables the researcher to link codes and themes, enhancing the analysis and construction of theory (Mills et al., 2010a).

3.5 Limitations and ethics

It is important to mention that the current study is affected by limitations. One such limitation is the selected type of analysis and its tendency to overlook key pieces of data outside the expected categories. The researcher was thus careful not to disregard emergent conclusions based solely on the data. Memos and notes were made logging steps in the analysis process and emerging ideas, which helped the researcher to be reflexive. Importantly, reflecting on initial codes that were generated and gaining a sense of continuities and linkages between them uncovered themes that helped answer the research question (Bryman, 2016).Additionally, case study research is especially prone to substantiating a preconceived notion surrounding certain phenomena, as the researcher needs to understand the issues beforehand and this understanding might produce a bias towards supportive evidence and away from contradictory evidence (Yin, 2014). The researcher thus remained open to contrary evidence to those found in previous literature and considered these findings carefully.

Further limitations stem from the restrictions that were set by the analysis. The main restriction in this sense derives from the conscious decision of focussing on project descriptions of NPO and BBC, rather than focussing on other PSB which arguably could shed light on innovation activities and their contributions to public service objectives within certain contexts. However, the two selected cases have been argued above and can highlight a smaller and larger market context. Using documents or texts not created for research purposes means the research is unobtrusive and a reactive effect can be largely dismissed as a limitation (Bryman, 2016). Regarding ethics, the use of secondary data decreases the likelihood of harming individuals, communities and environments. Secondary data was made publicly available by the organisations under study and obtaining it did not involve individuals (Isreal & Hay, 2006). Considering the scope of this study and the ethical considerations mentioned above, the researcher is confident that this study gives new insights by building on reliable data.

4. Results: blending traditional and contemporary activities

In order to present the results of the analysis in an insightful manner and respond to the research question, this section firstly presents general findings based on the two cases and their innovation projects. Secondly, attention is given to the new integrative framework to assess innovation activities within PSB, developed by adjusting previous frameworks and adding new parameters observed within the data.

As mentioned in the previous chapter, NPO projects are assigned a theme on their innovation website. 52% of NPO projects were categorised as concerning 'new platforms', often related to their activities within channel innovation. Secondly, 12% of NPO projects were concerned with 'artificial intelligence'. Both of these themes will be elaborated on in a later section. Additionally, there were an equal amount of projects themed immersion, 'mobile journalism' and 'voice' (10%). Lastly, the sample included projects themed 'interactive video' (6%). Most BBC projects commenced in 2019 (10%), 2018 (18%) or 2017 (20%) and are still being conducted at the moment. The oldest project within the dataset was started in 2006, while the newest was undertaken in the year 2020.

4.1 Integrative framework

To arrive at the new framework, codes constructed based on the literature were devised into categories through a process of comparing projects that were assigned similar codes. Similar or related categories were then developed into parameters for the framework. This was done for both innovation types and PSB objectives.

Firstly, some quantitative measures indicate what types of innovation projects both NPO and BBC undertake. Table 3 shows codes related to innovation types (based on table 1) that were employed most to least often to code fragments within NPO and BBC innovation projects. Codes attached to less than 10 fragments of data were omitted.

Table 3 Fragments coded with innovation types

	BBC projects	NPO projects	Totals
Production and distribution process	59	17	76
Customer engagement	32	33	65
Network innovation	53	9	62
Channel innovation	10	44	54
Product performance	22	13	35
Product or service	17	15	32
Developmental or incremental innovation	18	9	27
Process	18	4	22
Evolutionary innovation	8	11	19

Considering the prevalence of certain codes, such as 'production and distribution process', 'customer engagement' and others, further analysis was conducted by comparing the text fragments that they were applied to and determining whether overlap with other codes was evident. Based on the analysis, innovation types could firstly be divided into 'evolutionary' or 'incremental' innovation. Both codes appear considerably often in the dataset and showed overlap with 'product performance' or 'product or service' as these indicated the modification of products or services for an existing user group. Hence, the decision was made to revise 'evolutionary' and 'incremental' innovation into two categories forming the first level of the framework. In-depth exploration of the code 'network innovation' indicated a division between projects pertaining external collaboration and internal harnessing of capabilities, thus 'collaborative' and 'internal' form the second level of the framework. Lastly, in terms of innovation types, three areas of the value chain were prevalent in the projects: production, distribution and customer engagement. The decision to separate the code 'production and distribution process' was made after comparing text fragments to those coded with 'channel innovation', which uncovered a similarity with distribution process innovation. This choice is further justified in a later section. Throughout this process, codes that occurred frequently were used as a guide to undertake further analysis of text fragments in order to obtain and revise categories. Additionally, to help reduce the data and find connections, visual representations in the form of networks were constructed. Figure 3 shows such a network representing innovation types.

Figure 3 Types of innovation within PSB projects

The above-mentioned process was similarly conducted for PSB objectives. A significant number of projects mentioned a connection to PSB objectives (coded based on table 2). Table 4 shows the codes related to public service objectives that were utilised most to least often to code fragments within NPO and BBC innovation projects. Codes that were found less than 10 times within projects were omitted.

Table 4 Fragments coded with public service objectives

	BBC projects	NPO projects	Totals
Audience interaction	26	39	65
Universality of availability	39	17	56
Reaching (new) target group	12	35	47
Universality of appeal	15	22	37
User data	29	6	35
PSB as stimulator innovation	32	0	32
Broadcasting rules that liberate rather than restrict the program maker	25	3	28
Educational programming	4	21	25
Creative industries	22	1	23
Service to public sphere	6	14	20
Provisions for minorities	4	14	18
Provision of information	7	10	17
Empowerment	14	2	16
Privacy	14	2	16
Public versus commercial	11	3	14
Creating conversation about difficult topics	1	10	11

Based on the analysis, some PSB objectives suggested a clear connection to certain innovation types. For example, traditional PSB objective 'broadcasting rules that liberate rather than restrict the program maker' – reformulated to 'liberating the programme maker' to accommodate broader meanings – was prevalent within the data and could be connected to production. Another traditional PSB objective 'universality of availability' could be connected to distribution innovation. Additionally, this objective was grouped with 'provisions for minorities', considering that the latter contributes to the former objective. However, other objectives were frequently addressed within innovation projects, but required different wording to encapsulate the multitude of ways they related to innovation

activities. 'Reaching (new) target audiences' and 'universality of appeal' were grouped, as the projects relating to these had the objective of reaching the audience by making products or services appealing. 'Educational programming' and 'provision of information' were revised into a category to represent projects that aimed to educate audiences, but also indicated a connection to educating audiences about their personal data.

Additionally, underlying values were discovered that indicated a connection to the value chain, but more accurately represented economic and socio-cultural values that many PSB innovation activities addressed. For example, the prevalent code 'user data', when compared with projects coded 'empowerment', illustrated that PSB are enabling users to control their personal data. The code 'public versus commercial' also indicated a relation to 'user data', which is further explained in a later section. Additionally, 'PSB as stimulator of innovation' was grouped with 'creative industries' to illustrate activities in which PSB are seemingly leading the industry in fostering innovation. Further analysis into the codes 'service to the public sphere' and 'creating conversations about difficult topics' revealed projects pertaining the fostering of connectedness among society. They were thus revised into another category and subsequent parameter of the framework labelled 'social cohesion'. A visualisation of the process of grouping codes connected to public service objectives can be found in figure 4.
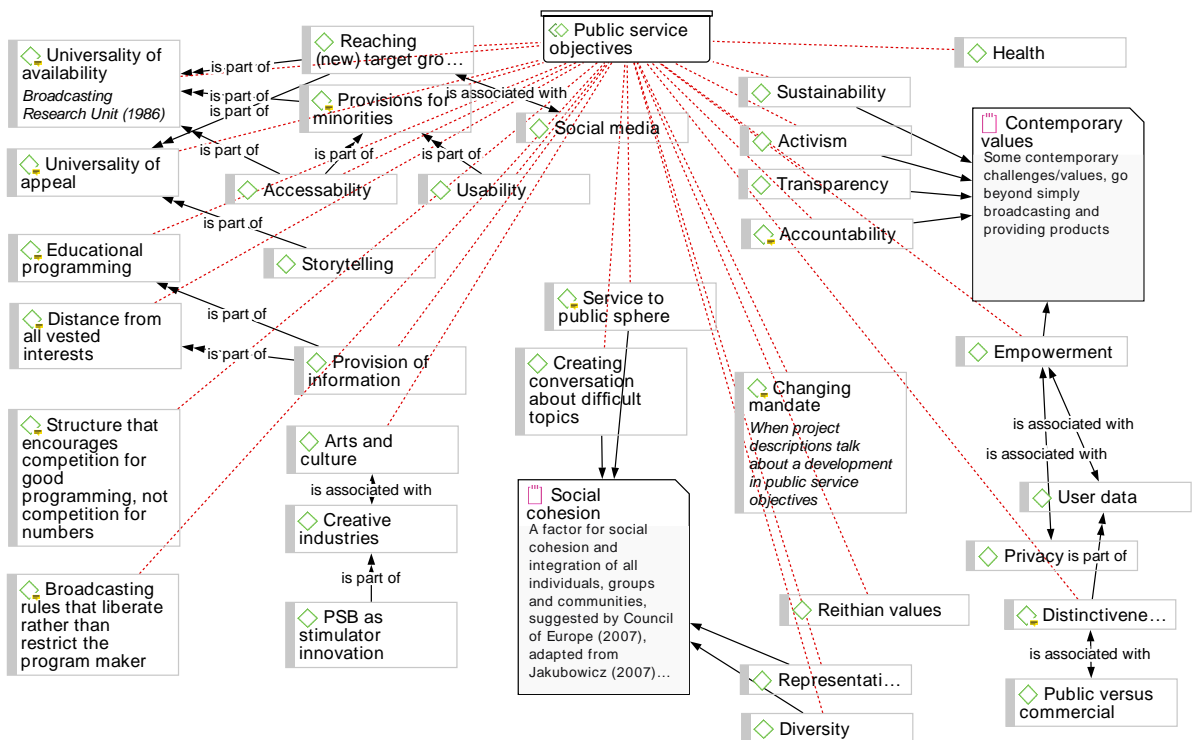

Figure 4 Public service objectives within PSB projects

Ultimately, this process resulted in a multi-level typology of innovation types and PSB objectives addressed via PSB innovation. Below the integrative framework is presented, illustrating the categories resulting from in-depth analysis and indicating their relation to each other. The parameters for each innovation type and public service objective will be discussed in-depth below, arguing their place within the framework, explaining how they were present within the data and their relation to previous frameworks and research. A detailed representation of the coding and analysis process that resulted in themes and parameters, including definitions of the codes, can be found in appendix B.
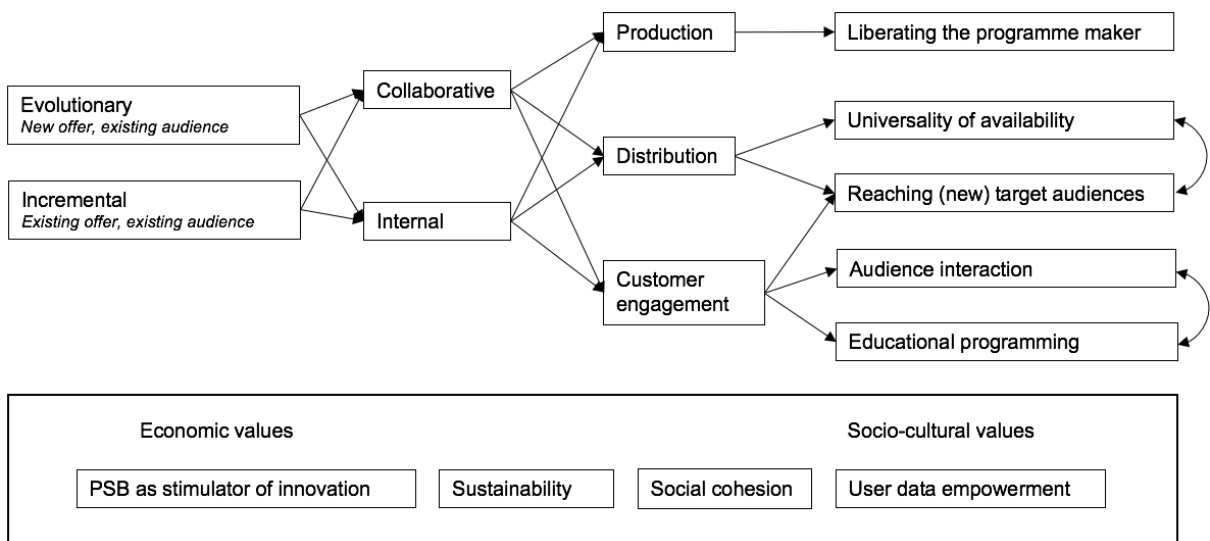
Figure 5 Framework to assess innovation types and public service objectives

4.2 Innovation types parameters

4.2.1 Evolutionary or incremental innovation

Firstly, 'developmental or incremental innovations', as typified by Osborne (1998), is defined as the modification of an existing service to an existing user group of the organisation. This type of innovation was notably present, connected to 26% of all projects. Additionally, 'developmental or incremental innovation' was used to code 27 fragments of data.

> For example, NPO addresses developmental or incremental innovation in its project 'A renewed dynamic app for Zapp?', in which they take an existing product, the Zapp app, and adapt or modify it for the existing user group. They state: "To increase the relevance of the Zapp app, the idea of a dynamic app was born. In the new environment Zapp content is offered in a dynamic way. For this new interface we mainly looked at apps like Instagram and TikTok" (NPO, project 22, para. 1).

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However, 'evolutionary innovation' projects are also undertaken as PSB try to reach existing target audiences with a new service. 18% of projects are coded as 'evolutionary innovation'.

> To illustrate, BBC conducts an evolutionary innovation in their project 'New Audience Experiences for Mobile Devices', stating: "In this project we are investigating whether 5G technology can enable such visually-rich experiences, and what users think about them" (BBC, project 12, para. 1). Here the focus is on new experiences, enabled by new technology, but for an existing user of BBC services.

Combined, evolutionary and incremental innovation make up almost half of the projects analysed (44%), and thus are added as the first level of the framework to determine whether the project is modified or completely new and whether it addresses existing target groups. This finding is in accordance with García-Avilés et al.'s (2018) finding that incremental innovations prevail within media innovation. Important to note here is that the public nature of the data might withhold PSB from revealing innovations that are not yet established within the market.

4.2.2 *Collaborative or internal innovation*

'Network innovation' is defined as the harnessing of capabilities and assets of others. It is present within 74% of BBC projects, either to describe innovation within a specific department of the organisation or with a different organisation such as a university. Often, a 'collaboration' is mentioned in conjunction with 'network innovation', co-occurring within 58% of all projects. BBC especially emphasises how it collaborates with industry partners or universities on certain activities, as evident from the codes 'collaboration' and 'network innovation' co-occurring within 74% of BBC projects. Hence, a clear distinction within network innovation between collaborative and internal innovation is made within the framework.

> An example of collaborative network innovation is the BBC project 'Personal Data Stewardship', in which they describe: "BBC R&D is already working in partnership with leading UK universities to explore the potential of a different approach to the collection, processing and use of personal data. Databox is an EPSRC partnership between Imperial College, University of Cambridge and University of Nottingham with industry partners the BBC, BT, Microsoft Research, and Telefonica (BBC, project 11, para. 7)."

This finding supports Wauters and Raats' (2018) argument for the central role of PSM within a networked media system, providing evidence that PSB are implementing partnerships and collaborations to enhance the media industry as a whole. Notably, some BBC projects offer data sets to be readily downloaded from their innovation website. This infers open innovation, which Dogruel (2014) put forward as an eligible framework to capture interactions between media organisations and other professional and individual actors which often constitute media innovation. This latter finding is also in accordance with Mehdi Sharifi et al.'s (2019) claim that PSB often need to approach users themselves for innovations, because facilitators between them and smaller, more agile organisations are often not present. They claim that this complicates the theory of efficient media markets, stating that large organisations with considerable resources should make use of small organisations, which have an advantage in innovating, while facilitators bring these two together (Mehdi Sharifi et al., 2019). However, in this case the facilitators seem to have been omitted purposefully to allow for the direct approach of users, enabling open innovation. This finding then disputes earlier results concluding that procedural problems make open innovation difficult to achieve within PSB (Fernández-Quijada et al., 2015).

4.2.3 Production process

The examined data shows the word 'production' 205 times, alluding to the most frequently employed code, namely 'production and distribution process', used to code 76 fragments within the data. A large number of BBC's projects (56%) and a significant amount of NPO's projects (26%) relate to the production or distribution of content. This confirms previous research by Evans (2018) claiming that public media organisations make sense of innovation by relying on process-oriented rather than product-oriented frameworks. Additionally, this finding agrees with Dogruel's (2015) conclusion that media innovation is mostly process innovation. Moreover, it explains why many studies on PSB innovation primarily focus on the role of innovation in relation to the production and distribution of content (Donders, 2019; Ibrus et al., 2019; Puijk, 2015).

> BBC's project 'Intelligent Audio Production Tools' addresses production innovation by unlocking "new creative possibilities in audio production through the application of audio analysis and machine learning … This can make production easier and more efficient by helping to organise, navigate, and enhance sound" (BBC, project 2, para. 1). Additionally, NPO's project 'Anonymising someone using deep fake in post-production' addresses production innovation through deep fake technology: "Whereas deep fake was previously only possible in controlled conditions (fixed shots, good lighting, frontal shots, neutral background), the technique now

seems to have been developed to such an extent that good results can also be achieved in less controlled situations, making it widely applicable for all kinds of productions" (NPO, project 10, para. 4).

However, it should be mentioned that the category of 'production and distribution process' as presented in the framework by García-Avilés et al. (2018) appears to be too broad, as it covers both production and the separate activity of distribution innovation. Dogruel (2014) already acknowledged that the definite distinguishing between product, process and organisational innovation within economic research does not always apply to media innovation. A further distinguishing of production and distribution within the adjusted framework can specify which innovation pertains to production and which one pertains to distribution. Furthermore, investigating the code 'channel innovation' is likely to reveal more about innovation within distribution, which will be expanded upon in a subsequent section.

While there is evidence that production process innovation is an important part of the innovation strategy of PSB, the findings also reveal what kind of technological innovations are applied in production innovation. Consequently, it is important to acknowledge the role of 'artificial intelligence' in production innovation. 'Artificial intelligence' and 'machine learning' occasionally occur with 'automation' coded to the same fragment (3 and 4 times respectively), inferring that those technologies are repeatedly applied to facilitate production. Automating tasks such as tagging content within archives can help reduce workload for production teams, something that both NPO and BBC projects provide evidence of.

> To illustrate, NPO's 'Robot editor +Eddie' uses machine learning, artificial intelligence and smart algorithms to search the archive of Brandpunt on the theme of poverty (NPO, project 12). Similarly, BBC uses artificial intelligence and machine learning in their project 'KiWi' to investigated the possibility of automatically assigning topics to large programme archives (BBC, project 46).

This closely relates to Storsul and Krumsvik's (2013) definition of media innovation, namely applying existing knowledge in new contexts. Both NPO and BBC have valuable archives, and use innovation to optimise these existing resources in new ways. Although some of the projects are non-technological, most of them do incorporate technologies. This confirms García-Avilés et al.'s (2018) earlier finding that more technological than non-technological projects are evident within media innovation. In contrast to earlier research claiming that PSB are not experimenting with data-driven technologies (Głowacki, 2020), projects connected to artificial intelligence, machine learning and other data-driven technologies are reasonably frequent within the data, as seen in table 5.

Table 5 Fragments coded with emerging technologies

	BBC projects	NPO projects	Totals
Artificial intelligence	8	9	17
Machine learning	13	3	16
Augmented reality	3	3	6
Smart home	5	1	6
Cloud	5	0	5
Virtual reality	4	1	5
Chatbots	0	3	3
Mixed reality	1	1	2

4.2.4   Distribution process

This study argues that any framework assessing PSB innovation activities should distinguish between production and distribution innovation, as distribution pertains the reaching of audiences via a new channel or platform and is equally significant as production is for PSB. Evidence for this is found within the data, with 'channel innovation' being used to code 54 fragments across all projects. Especially NPO innovation activities indicated a focus on new platforms or 'channel innovation'. More than half of their projects (52%) pertained to new platforms, demonstrating that NPO innovation projects aim to reach existing and new audiences in novel ways. Additionally, it explains why many studies on PSB innovation commonly focus on innovation's role in reaching audiences (Debrett, 2015; Enli, 2008; Lowe & Maijanen, 2019). This finding also appears to reaffirm the high significance of imitations and cross-media strategies within media innovation because of the costly risk the undertaking requires (Dogruel, 2014). Using content that NPO knows works on TV and adapting it for another channel provides considerable certainty of success, which is often necessary within media innovation. This distinguishes NPO's activity from that of the BBC, where 'channel innovation' is used to code 18% of projects.

Social media is also a significant part of this innovation type, and thus 'channel innovation' as described by Keeley et al. (2013) is frequently undertaken by NPO to reach audiences where they are known to be present. 28% of NPO projects directly relate to reaching or engaging with audiences via TikTok, Pinterest, Instagram or other social media platforms.

> To illustrate, NPO's project 'Is Pinterest an attractive tool to reach
> women?' addresses distribution or channel innovation through
> considering Pinterest as a distribution channel for their existing content on
> women in the resistance movement during the Second World War:
> "Online, we want to highlight three female resistance heroes in a way that

the story sticks and the Netherlands gets to know these women better. We see this as an opportunity to experiment with Pinterest as a platform to tell the story" (NPO, project 2, para. 1).

4.2.5   Customer engagement

'Customer engagement' is the second-most occurring type of innovation within the data, used to code 44% of projects. Coded within 54% of NPO and 36% of BBC projects, this finding indicates a similarity in innovation activity within PSB. Customer engagement is defined by Keeley et al. (2013) as using customer insights to develop meaningful connections between the customer and the organisation. It is seemingly a response to previous research urging PSB to "understand audiences and their needs and to accommodate them as participants in the media enterprise in a fast-changing information society" (Głowacki & Jackson, 2013, p. 272). This type of innovation is thus closely connected to improving an existing product or reaching audiences. Consequently, this code is often paired with 'product performance' (co-occurring 7 times) or 'channel innovation' (co-occurring 10 times). Further analysis of these co-occurrences demonstrate how PSB use customer insights in their innovation. In this case, either to reach audiences via a new channel or improve product performance by engaging audiences. In addition, NPO's innovation activities focus on what Keeley et al. (2013) describe as the customer-facing elements of an organisation or the experience, with 'customer engagement' and 'channel innovation' co-occurring within 18% of their projects. In contrast, BBC's activities focus more on the inner workings of the organisation or configuration, with 'network innovation' and 'process innovation' being more prominently used to code activities.

> For instance, the project 'That you can participate is normal now, isn't it?' asks the question "How can we engage viewers more with our video content through valuable/activist in-player interaction?" and speaks of the customer insights that NPO will obtain: "That is why BNNVARA will research/do: merge prototypes/research results/learnings into 1 flow in which you are asked about the reliability of what you see + outcome + social; select target group/subject/themes; conduct user interview/data/test" (NPO, project 28, para. 3). Additionally, BBC also mentions customer engagement in their project 'Digital Wellbeing': "We have researched core human values by conducting user studies, empirical research, and cross-referencing this with psychological theory and evidence" (BBC, project 6, para. 13).

4.3 Public service parameters

4.3.1 Liberating the programme maker

'Broadcasting rules that liberate rather than restrict the programme maker' are also demonstrated in PSB innovation projects, especially within BBC projects. This PSB objective, as presented by the Broadcasting Research Unit in 1986, is one of the few presented in the review of literature that is focused on production capabilities of the organisation, rather than the audience. Considering that this objective was presented in a framework defining eight principles of British broadcasting, this finding appears to be specific to the British context and thus explains why it is found within 34% of BBC projects. Additionally, this objective also closely aligns to 'production and distribution process' innovation, which is found frequently in BBC projects as well. However, this objective is found within 6% of NPO projects and therefore does show a reasonable interest of PSB to improve the process of production for programme makers. Earlier explanation of the application of artificial intelligence already showed that this type of activity is employed to improve and facilitate production. Additionally, 'automation' is also framed as saving the producer time in a pressurised work environment.

> To illustrate, NPO's project 'How to obtain better metadata?' mentions that the applied technique "can also be applied to optimise the work of (online) research editors working for EenVandaag" (NPO, project 18, para. 3). Similarly, BBC's 'AI in Media Production' project mentions how "there are many production tasks that are repetitive, or even formulaic. These tasks could instead be performed by machines, freeing up creative people to spend more of their time being creative" (BBC, project 18, para. 7).

Earlier research within the Irish PSB context claims that reforms caused changes in production practices, highlighting the need to relieve programme makers from manual work (Grummell, 2009). This finding provides evidence that the streamlining of work found in earlier research is now done through the application of new technologies, but that the same principle remains.

4.3.2 Universality of availability

'Universality of availability' is the second-most frequently used code to indicate a fragment of the data connected to PSB objectives. This code was used on 56 fragments of the data and observed within 42% of all projects. More specifically, it was found in 34% of NPO projects and 50% of BBC projects. In the examined projects, 'universality of availability' is thus still seen as an important PSB objective, supported by how often it is found in previous literature (Born & Prosser, 2001; Broadcasting Research Unit, 1986;

Donders & Van den Bulck, 2016; Harrison & Wessels, 2005; Lowe & Maijanen, 2019). Within table 2, versions of universality of availability such as 'universality', 'universal access', 'guaranteeing universal service' are all mentioned as a PSB objective. Apart from this objective showing up in the reaching of audiences, it also relates to the accessibility of content for minorities, formulated as 'provisions for minorities'. These two codes co-occur among 5% of all projects.

> BBC addresses this objective in their project 'Next Generation Audio' mentioning how the innovation would make "TV more accessible for those with a hearing impairment or those viewing in noisy locations, such as on public transport" (BBC, project 8, para. 3). Similarly, NPO mentions how enabling voice within their game app linked to the TV programme 'De Slimste Mens' "would also make the game available to people with visual impairments" (NPO, project 20, para. 6).

Considering that this objective is a traditional one, this finding supports earlier research claiming that the public service values remain foundational to PSB legitimacy (Lowe & Maijanen, 2019). Although earlier research claimed that this makes the provision of contemporary, individualised services in a competitive market difficult, the delivery of individualised services is most definitely part of both NPO's and BBC's innovation activities as revealed by the frequency of 'audience interaction' and 'personalisation' within the data, which will be elaborated on in a subsequent section.

4.3.3 Reaching (new) audiences

Closely related to the traditional public value of universality of availability, 'reaching (new) target audience' is coded 47 times within the data. Seemingly, NPO puts slightly more activity into this objective, as it is coded significantly more often in NPO projects (56%) compared to BBC projects (20%). However, it appears logical that NPO would invest more in this specific public value as one of their innovation goals is to ensure everyone is seen and heard by effectively reaching target audiences and matching content to these groups (NPO, 2020). Enli's (2008) research already acknowledged the challenge PSB specifically face in attracting large audiences and representing an alternative to commercial channels. Additionally, in a fragmented media landscape it is becoming increasingly difficult for PSB to reach and engage audiences, with young audiences being especially hard to reach. The notion that the reaching of (new) audiences is crucial for PSB is partly supported by the attention it has received in previous research (Debrett, 2015; Enli, 2008; Lowe & Maijanen, 2019). As mentioned earlier, NPO adopts channel innovations to reach this new audience, with 28% of projects directly mentioning a social media platform to enter into.

> To illustrate, the project 'Spuiten en Slikken', TikTok for educational
> content?' mentions how TikTok has many young users in the Netherlands
> and investigates whether the programme 'Spuiten en Slikken' can use
> short, interactive (vertical) videos to educate young people about sex
> (NPO, project 3).

As previous research concluded, PSB are grappling with a heritage that remains crucial for PSB legitimacy, while attempting to develop concepts and practices that are important for maintaining their significance in a fragmented media landscape (Lowe & Maijanen, 2019). This code is then associated with the traditional value of 'universality of appeal', co-occurring among 12% of projects, because striving to be universally appealing helps contribute to the reaching of audiences. Initiatives like the one mentioned above indicate that PSB are investing in initiatives for changes in distribution in order to remain relevant and reach new audiences.

4.3.4 Audience interaction

'Audience interaction' is coded most frequently in the sample to indicate a fragment of data connected to public service objectives, closely related to the innovation type of 'customer engagement' as proposed by Keeley et al.'s (2013) framework. This finding supports earlier acknowledgement of the increasing importance of the audience as engagers with public service media (Głowacki & Jackson, 2013). Moreover, it supports earlier findings of audience participation being an important strategy for media companies under scrutiny and that participation should be an essential part of the PSB values (Enli, 2008). Considering that this code occurred within 54% of NPO projects, we can infer that 'audience interaction' is of high priority for the NPO specifically. This is confirmed by their Innovation Horizon plan, which states that fragmentation should be counteracted by utilising participatory media, among other things (NPO, 2020). However, BBC also addresses this theme within their projects, with the code attached to 28% of their projects.

> NPO addresses audience interaction in the context of fostering
> democratic participation by harnessing mobile journalism in their project
> 'Can MoJo turn a passive viewer into an active viewer?': "Can we make
> our community more active through "Live" functionalities on Instagram
> and Facebook? Can we let our audience participate more in the social
> debate? … We will stream live on Facebook and YouTube using a
> smartphone. Here, Noureddine will talk to an expert or experience expert
> about a topic related to the broadcast. Viewers can also ask their own
> questions via the chat function." (NPO, project 27, para. 3).

4.3.5 Educational programming

'Educational programming' is utilised to code 36% of NPO projects and only 8% of BBC projects. This confirms earlier studies suggesting it as a traditional PSB objective (Bardoel & d'Haenens, 2008a; Grummell, 2009; Lowe & Maijanen, 2019). However, findings from NPO projects seem to support the notion of PSB's crucial role as an educator, while BBC's lower number of educational projects supports the notion that this role has been consistently neglected (Grummell, 2009). Closely related to the traditional value of 'provision of information', used to code 15% of all projects, educational programming suggests an extension of this traditional value, while it is also being redefined. To illustrate, within 12% of NPO projects, 'educational programming' co-occurs with 'audience interaction'. This supports earlier findings that the traditional PSB value of educating citizens is in a process of renewal, where one-to-many communication shifts into a two-way interaction with the audience (Enli, 2008).

Additionally, earlier research explained that educational programming was positioned as a minority interest and thus placed in off-peak times, resulting in lower viewer ratings, hence decreasing its potential advertising revenue and changing the way educational content was presented on PSB (Grummell, 2009). This might explain NPO's aim to bring educational programming to audiences via new channels or add elements to make educational content more entertaining.

> For example, in their project 'Spuiten en Slikken', TikTok for educational content?' social media is used to educate teenagers about sex (NPO, project 3), while an attempt to make education more entertaining is made in their project 'Experiment WebAR online series', in which they explain that "we see webAR as an opportunity to strengthen our online informative/educational stories through the deployment/addition of webAR" (NPO, project 7, para. 2).

This finding thus supports the earlier claim that, increasingly, edinfotainment is employed, mixing education with entertainment and information strategies from conventional broadcasting (Grummell, 2009).

4.4 Underlying economic and socio-cultural values

4.4.1 PSB as stimulator of innovation

A new category that emerged from the data is 'PSB as stimulator of innovation'. The results show that PSB acknowledge this lead role and enforce it through their innovation activities. Especially BBC seemingly puts emphasis on this, as revealed by the amount of

BBC's innovation projects (50%) connected to the topic. As already established in earlier research by Ibrus et al. (2019), PSB's objective to counteract market failures is now extended to also counteract innovation system coordination failure. Additionally, Schumpeter (1934) emphasised the role of large firms in stimulating innovation, as they have the means to invest in R&D. This finding thus contradicts more recent claims that young media businesses are stimulators of innovation rather than legacy companies (Compaine & Hoag, 2012). Within this theme, BBC either presents itself as a frontrunner on a particular issue or mentions the greater implications of the project for the creative industries. The code 'creative industries' co-occurs with 'PSB as stimulator of innovation' in 28% of BBC projects.

> This is exemplified in the following description in BBC's project 'Responsible machine learning': "This work programme aims to deepen our knowledge of the key challenges facing the media industry, with a specific focus on public service broadcasting to help keep the BBC at the forefront of debates, developments and best practice" (BBC, project 17, para. 5).

Frequently, 'collaboration' is an important aspect within this theme (co-occurring in 24% of BBC projects), closely related to 'network innovation', either within the BBC organisation or with external organisations in the creative industries.

> For example, BBC's project 'Sustainable engineering' mentions: "For sustainability, collaboration is absolutely crucial. It requires systemic change, and by working with others in the media industry, we can achieve far more than we can alone. Fortunately, collaboration is built into our culture in BBC R&D. We share knowledge and join forces with others such as the Digital Production Partnership (DPP), the Digital Television Group and the European Broadcasting Union (EBU) to help bring about a more sustainable broadcasting industry" (BBC, project 14, para. 6).

4.4.2 Sustainability

Interestingly, 'sustainability' was found within both BBC and NPO projects, while not mentioned as a public service objective in previous research. It was coded 5 times within the entirety of the data, within 4% BBC projects and 6% of NPO projects. It was thus found more or less equally within both organisations, suggesting reasonable importance of the topic within the industry. Although sustainability is spoken about in some literature in relation to the longevity of innovation and public value strategy and its influence on PSB's survival (Lowe & Maijanen, 2019; Moore, 1995), the ways in which it was observed in this

study are distinct. Within BBC projects, it concerns environmental sustainability in terms of production. Previous research acknowledges the relatively burden that media put on the environment and employ ecomedia or environmental media studies to investigate this topic further (Cubitt, 2014; Starosielski & Walker, 2016).

> Consequently, BBC speaks of their new object-based media needing to be "climate-friendly" in their project 'Delivering Object-Based Media at Scale with Render Engine Broadcasting' (BBC, project 13, para. 17). Additionally, BBC aims to "'ensure that environmental sustainability is embedded in our decision making through how we design, develop and deploy new technology" (BBC, project 14, para. 1).

Furthermore, earlier research has focussed on the way media communicate about ecological sustainability (Bonfadelli, 2010). This relates more closely to NPO activities concerning sustainability, as these projects try to support the audience in being more sustainable, through the promotion of train travel or sustainable consumer products.

> To illustrate, NPO's project 'I see what you do not see' aims to promote train travel over travel by car, by making train travel an improved experience for frequent travellers on specific routes: "We want to enrich their usual journey with a sustainable perspective and mobilise them to share this experience" (NPO, project 21, para. 2).

Overall, this objective was found scarcely within the data but due to its stand-out nature from other objectives, it appears to be a new prevalent topic within PSB innovation and thus should not be dismissed as part of future research into PSB objectives.

4.4.3   Social cohesion

A code that was found reasonably often within NPO projects is 'creating conversations around difficult topics', used to code 14% of NPO projects. Additionally, the code 'service to public sphere', indicating whenever a project cultivates democratic participation, promotes social cohesion, intercultural understanding and supports national or EU culture, was employed to code 28% of NPO projects and 6% of BBC projects. These codes are closely related to a concept found within several frameworks labelled 'social cohesion'. For example, fostering social cohesion was proposed by the Council of Europe as a PSB objective. More specifically, Jakubowicz (2007) mentions the UNESCO mandate for PSB to promote intercultural and inter-religious dialogue. Although there was no strong evidence that this specific objective is equally prominent among both broadcasters, NPO has a significant amount of projects connected to the theme.

For example, the project 'Smart speak helps with good conversation' mentions connecting people through a conversation starter via smart speaker (NPO, project 1). Additionally, NPO's project 'EO in Amsterdam Zuidoost' acknowledges how "many Dutch young adults of colour from multicultural church communities are not familiar with NPO" (NPO, project 4, para. 1) and aims to change this through user innovation.

The latter project specifically aims at inter-religious dialogue, but this was the only project within the dataset that was found to do so, supporting earlier research concluding that inter-religious dialogue is present within PSB content, but only rarely so (Huertas Bailén, 2020). Although this parameter is quite broad, it groups and indicates several traditional values of PSB that are still used to justify innovation activities today, such as cultivating democracy, promoting dialogue between different social groups and supporting national culture.

4.4.4   User data empowerment

Küng (2013) already concluded that innovation has increasingly become crucial for the continuation of the media industry and that media organisations increasingly value innovation to combat contemporary challenges. Data analysis has revealed several innovation activities at both the BBC and NPO that relate to these contemporary challenges. More specifically, disruptive changes in the industry are employed to justify certain innovation activities. In the example below, a contemporary development is addressed and used to justify why the BBC has decided to partake in this project.

BBC's 'Databox' project mentions: "Personal data is broadly seen and treated as the 'new currency' or 'oil' that fuels the digital economy and an increasing array of 'personalised' services, but it is not a currency or commodity that individuals can easily control at the current moment in time. HDI seeks to address this situation, and the widespread 'crisis of trust' that accompanies it, by putting the individual at the centre of personal data processing and providing mechanisms that help people understand and control the flow of their personal data" (BBC, project 23, para. 3).

Furthermore, the word 'data' occurs 258 times within the total sample, more than any other word, excluding non-content words such as conjunctions and prepositions. Additionally, the code 'user data' occurs among 24% of BBC projects and among 10% of NPO projects. The findings surrounding user data are twofold. They either help reach an audience and make content appealing through 'recommendation systems', with the code 'user data' and 'recommendation systems' co-occurring among 12% of all projects.

Alternatively, they help educate and empower audiences to become aware of how their data is used and allow them to alter to what extent their data is utilised. While not co-occurring among NPO projects, the codes 'user data' and 'empowerment' co-occur across 12% of BBC projects, indicating BBC's objective to empower audience members to take control of their personal data.

> For example, BBC's project 'Building a public service internet' mentions how they will "treat data as a public good: put data back in the hands of people, enhance privacy, and give the public autonomy and control over the data they create" (BBC, project 24, para. 10).

The framework on public service objectives could not account for this finding, but does suggest that public service objectives and values are reinterpreted in a new media environment including new audience behaviours, as claimed in earlier research by Harrison and Wessels (2005). Regarding recommendation systems, this finding indicates that PSB are finding new ways to reach audiences, as the Council of Europe has endorsed the public service mission in the information society, claiming that PSB should be able to provide individualised, interactive and on-demand services (Lowe & Bardoel, 2007). However, the finding on user data empowerment indicates an entirely new PSB objective. While user data was previously difficult to obtain, PSB now see themselves as partly responsible for educating audiences about the use of their data and empowering them to control what is used and what is not. Some scholars have acknowledged the lack of skills and the dominance of elites in online discussions, justifying the role of PSB in educating and empowering users (Harrison & Wessels, 2005).

Concerning this, there is sometimes a narrative created of PSB as juxta posing commercial entities. The code 'public versus commercial' indicates this opposition, coded within 8% projects. In these projects, PSB seemingly supports the audience and the ethical use of their data, whereas commercial entities are seen as harming the audience by using their data in an unethical way.

> For example, BBC's 'Personal Data Stewardship' project mentions: "The problem to date, at least in part, has been that organisations including private companies and governments have built systems to harvest, process, aggregate and re-use personal data in ways that undermine individual consent, privacy and personal agency" (BBC, project 11, para. 7).

This highlighting of PSB's 'distinctiveness' is often used to influence policy and prove PSB legitimacy, although earlier research mostly focussed on the distinctiveness of PSB content rather than innovation activities. Nonetheless, distinctiveness is often linked to

public service objectives such as high quality, trusted news, or bringing the nation together (Hendrickx et al., 2019).

4.5 Gaps in innovation in PSM

Although this study has thus far outlined innovation activities within PSB, the findings can also highlight currently overlooked themes within PSB innovation. Although these themes were found within previous frameworks, they were not evident in the data of the present study.

Firstly, 'paradigmatic innovation', defined as changes in an organisation's mindset, values and business models, closely related to 'profit model' innovation, was infrequently found within NPO and BBC projects. This finding confirms earlier acknowledgement by Dogruel (2014) that media innovations often focus on developing the new media's purpose, design and contexts of use, before economic exploitation or a way to make profit is pursued. Including currently overlooked innovation types like business model innovation can help distinguish PSB from industry standards surrounding innovation, which could be advantageous to organisational performance (Damanpour et al., 2009).

Although evidence of internal network innovation was found, suggesting that the harnessing of current departments is present within PSB innovation, research revealed that 'company organisation' or 'structure' innovation were rarely found within the data. This mirrors previous research indicating that this area of innovation is scarcely addressed compared to other areas such as production or distribution (García-Avilés et al., 2018). While 'company organisation' is defined as activity pertaining to the nature of the organisation or the team of the PSB and can be related to internal network innovation, this code was not found in relation to rearranging the organisational structure or company assets. This demonstrates that innovation activities do not pertain structural changes within the organisation.

Thirdly, PSB values that were scarcely addressed in the PSB innovation activities are 'diversity' and 'representation', even though some previous frameworks did mention it as a PSB objective. For example, Donders and Van den Bulck (2016) assign 'identity construction and diversity' as a PSB objective. This findings suggests a gap between PSB objectives found in earlier research and PSB mission statements and the activities currently undertaken by NPO and BBC.

5. Conclusion: innovation strategies within public service media

The current research has investigated what innovation strategies PSB have in place to face today's challenges by analysing NPO and BBC innovation projects. In this final chapter, an answer to the research questions is formulated in light of the developed framework and the academic debate surrounding innovation research. Additionally, theoretical and practical implications of the findings are discussed. Lastly, suggestions for future research on the intersection between innovation and PSB objectives are presented.

5.1 Innovation in public service media

Overall, to answer the research question: *What strategies do PSB have in place to face today's innovation challenges?* findings demonstrated that PSB innovation activities are twofold. Firstly, they focus innovation around their main activities as broadcasters, namely production, distribution and customer engagement, while addressing several traditional public service values, such as universality of availability, educational programming and social cohesion. Overall, the findings indicate that innovation strategies within PSB include mostly evolutionary or incremental innovation and network innovation, further divided into either collaborative or internal innovation.

Secondly, they undertake innovation projects in more uncharted territory, such as artificial intelligence and machine learning, to facilitate production and liberate the programme maker. They are in the process of reformulating public service values by reaching new target audiences through channel innovation, engaging audiences through audience interaction and adapting educational programming by adding elements of edinfotainment. Additional public service values are introduced, such as being a stimulator of innovation within the industry, sustainability, and empowering audiences to learn about their user data and control their privacy. These latter three, along with social cohesion, also represent underlying economic and socio-cultural values for PSB, indicating foundational objectives connected to their innovation activities. Importantly, not all activities mentioned in previous frameworks are undertaken by NPO and BBC and the use of the framework uncovered deviations from previous research.

In conclusion, this study indicates that contemporary challenges are all addressed in PSB innovation strategies and rely on traditional innovation and public service value frameworks as well as more contemporary issues of importance not previously addressed in research. These key findings informed the newly developed framework that facilitates the assessment of innovation activities within PSB and their contribution to societal objectives.

5.2 Theoretical implications

The findings of this study offer some theoretical implications and contributions to the field of innovation and PSB research. In this section, the existing theory and frameworks are

re-evaluated in light of the new framework and findings in order to validate, challenge, nuance, or extend it.

Earlier the product-focussed outlook of many innovation frameworks was already addressed, along with the inability of this focus to accurately apply to media innovations. Overall, the frameworks developed by previous scholars on innovation types were all useful for coding, but often overlap occurred. Some were better suited for product innovation, such as those presented by Coombs et al. (1996) and Schumpeter (1934), while some are better suited to describe service or media innovations, such as those by Osborne (1998), Keeley et al. (2013) and García-Avilés (2018). Considering that frameworks including process innovation were more useful proves that researchers should continue to look at media innovations differently, focussing on process innovation rather than product innovation. The findings extend the phenomenon that media innovations are a distinct type of innovation from those solely focussed on economic activity (Dogruel, 2014).

Next, there is an implication to be found in the findings related to PSB objectives. Many of the current frameworks presenting PSB objectives do not cover the width of public service values that innovation activities of PSB highlight. Although existing frameworks on PSB objectives cover the traditional values that PSB adhere to, such as those set out by the Broadcasting Research Unit (1986), new standout objectives reflect changes within society, such as the increasing fragmentation of audiences in part due to social media, increased personalisation because of artificial intelligence and machine learning, increased automation within production and the heightened awareness of individuals concerned about personal data or sustainability. This firstly implies that traditional PSB objectives are claimed, but in a reconfigured and reinterpreted sense of service (Harrison & Wessels, 2005) Secondly, it implies a reinvention of PSB objectives, as argued by Lowe and Maijanen (2019). The implication this holds for academics is an encouragement to consider non-traditional viewpoints in further studies uncovering PSB objectives by looking outside of conventional conceptions of the values.

Additionally, a noteworthy finding in this study are the underlying values that innovation activities in PSM address. Considering that not all PSB objectives could be directly related to PSB production, distribution or customer engagement, the findings of this study offer a contribution to a new way of thinking about PSB objectives in the form of potential innovation activities directly related to underlying economic or socio-cultural values of PSB. This finding drives implications for scholars to expand PSB objectives to include those that, despite seemingly unrelated to the value chain, are ultimately supportive of the PSB remit within the media industry and society. This would encourage a conceptualisation of PSB objectives as being both related to their economic productivity and societal role.

Ultimately, the outcome of this research furthers current innovation studies and how innovation is conceptualised and assessed within PSB, filling a gap within innovation

literature, which has often neglected service organisations (Evans, 2018). Forms of innovation that contribute to public service objectives are found to be exhibited by PSB, organisations that were seemingly less innovative or more restricted in their activity (Dogruel, 2014; Głowacki, 2020). This challenges and ads nuance to these concepts and bears an implication for scholars to further explore innovation, public service objectives and their interaction. Additionally, it provides a flexible framework for future scholars to use when conducting research on innovation types and public value within PSB. Crucially, this framework has been developed with a focus on the media industry, and thus can be applied to study PSB or other media organisations. By incorporating the distinctive public service objectives of PSB and connecting them to innovation activity, conclusions can be made about why PSB decide to undertake certain innovation projects.

5.3 Practical implications

Besides theoretical implications, this study and its findings bear implications for PSB and the media industry. Uncovering how innovation is used to combat contemporary challenges and meet PSB objectives demonstrates the power innovation strategies hold. While this study did not specifically look at outcomes of innovation initiatives, the role of innovation strategies in advancing the media industry has been shown to be theoretically supported. Additionally, providing a framework for the assessment of innovation projects and their contribution to PSB objectives demonstrates that innovation activities can contribute to public value goals, in contrast to previous claims that public service innovation can only correspond with commercialism (Born, 2003).

Practically, this research has developed a multi-level typology framework to assess innovation activities within PSB and the contribution of these activities to their public service objectives, enabling managers to monitor and assess their innovation processes, uncover limitations and find solutions. By identifying what innovation types are present within PSB, it becomes apparent where investments or adjustments can be made to more thoroughly meet innovation or public service objectives that PSB want to pursue. Considering that PSB have to increasingly legitimise their presence (Bardoel & d'Haenens, 2008a), the newly developed framework could significantly help PSB find meaningful relations between innovation and public service in their innovation strategies.

Should PSB managers want to utilise the framework, it is important to keep in mind that particular findings bear certain implications. Firstly, the limited activity surrounding business model innovation urges managers to consider the importance of this activity within their organisation. Considering the rapid changes within the media landscape and the decline of television viewing, PSB could consider how their current business model can be adapted to ensure their continued reach and relevance. Additionally, innovation in organisational structure was also scarcely found, even though organisational change has

been previously identified as a worthwhile form of innovation (Law, 2016). Moreover, diversity and representation were objectives found to be scarcely addressed in innovation strategies. Hence, including these currently overlooked areas of activity can help PSB cover more ground in innovation and ensure that as many PSB objectives as possible are met.

Additionally, while PSB innovation activities were uncovered from two PSB with similar objectives, their innovation activities differed on some levels. Their distinct environments, such as BBC operating in a larger market and NPO operating in a smaller market, makes their innovation capabilities and needs differ slightly. Despite this, the framework is flexible and can be transferred to other PSB contexts. Thus, on the one hand, the framework guides the user to be aware of important aspects of innovation and PSB objectives while also inviting critical considerations and modifications. The framework is a tool that can be modified to fit the needs of the manager and the nature of the PSB, as each PSB might have different resources or objectives.

Although there is debate about whether the PSB objectives are hindering innovation (Cunningham, 2015; Ibrus et al., 2019) or whether they are being reimagined (Harrison & Wessels, 2005), currently, PSB operate with a distinct remit. Hence, any discussion of the ways in which PSM should adapt innovation practices is complicated by this remit, as compared with the commercial nature of much of its environment. It is not the case, this study has argued, that PSB can simply adopt previous innovation frameworks because these were not made for PSB in the first place. Overall, the new flexible framework can help PSB justify their current and future innovation activities. It is a tool for those in charge of PSB innovation strategies to assess their current activities and make adjustments where needed. By using this framework, they can more accurately depict the added value that their innovation activities bring to society. Moving away from a traditional view of innovation focused on economic output, we can start to consider the underlying and connected socio-cultural values that PSB innovation contribute to. Taking this different perspective can help PSB to foster innovation by relieving them of traditionally set boundaries that do not or limitedly consider their distinctive mission. The aim with this newly developed framework is to demonstrate this distinctiveness and the way innovation can fit within and support this remit.

5.4 Recommendations for future research

In conclusion, the current study has uncovered results that future research could rely upon to expand both innovation studies of PSB and studies of PSB objectives. Firstly, research could explain some of the gaps found within the analysis. For example, evaluating why business model innovation is less prevalent in PSB or why PSB are addressing diversity and representation limitedly. Further research could prove whether this holds true or whether these findings are affected by certain conditions.

Additionally, the selected sample of innovation projects analysed could be expanded. Although project descriptions as obtained from the innovation or R&D webpages have proven to be insightful for the study of innovation activities and public service objectives within PSB, other secondary data might prove useful such as strategy documents or other parts of PSB's websites. For example, NPO has a website dedicated to their societal contribution (https://maatschappelijkewaarde.npo.nl/). This website contains a webpage presenting innovation projects specifically related to public service objectives. This webpage and additional strategy documents of both BBC and NPO might provide additional insights into how innovation activity of PSB contribute to their public service objectives.

Moreover, further research could consider other types of data to strengthen the claims made and obtain new findings regarding innovation activities within PSB. For example, while this study exclusively contained innovation projects made public on the respective webpages of BBC and NPO, there might be a great deal of descriptions or data on unpublished projects, either because they did not provide the intended result or would reveal trade secrets. However, this data could offer a comprehensive view of innovation activities within the NPO and BBC. Future research could analyse this data or, alternatively, secondary data not stemming from the organisations themselves, such as news articles or trade journals, similarly to Coombs et al.'s (1996) literature-based innovation output indicator (LBIOI). Furthermore, the analysis can be enhanced with the addition of interviews with those responsible for the innovation activity within the organisations under study, in order to collect information about aspects that are more complicated to obtain through textual descriptions on the organisations' websites (García-Avilés et al., 2018). Future research should also test the framework on other PSB, which could shed light on innovation activities and their contributions to public service objectives within other contexts. For example, analysing activities of two PSB that are complementary in terms of market size or historical context would uncover whether findings hold true in these circumstances.

Furthermore, while stressing the importance of policy measures and path-dependencies of innovation within the PSB context and despite the fact that focus has been given to activities that PSB are able to conduct, this study has inevitably overlooked the influences that affect what innovation activities PSB are unable to undertake. Thus, considering the different regulatory structures surrounding the NPO and BBC and analysing how these affect innovation activities and public service objectives could provide insightful results, especially considering that previous research has claimed these aspects to be influential to PSB innovation activity (Głowacki, 2020; Lowe & Bardoel, 2007).

Moreover, considering that this research has focussed exclusively on the analysis of project descriptions and taken an organisational perspective, future research could expand the findings by focussing on audience perceptions of the innovativeness of both BBC and

NPO through focus groups or interviews with avid watchers or target groups that are harder to reach for PSB to obtain further insights on the effect of innovation activities and their contribution to public service objectives independent of the organisations own involvement. Overall, further research into innovation within the PSB context is recommended to test the developed framework and findings of this research.

      To conclude this thesis, it can be stated that a contribution to the literature regarding innovation research has been made and a further understanding of contemporary developments within PSM innovation has been facilitated, while also providing avenues for further research.

References

Adams, R., Bessant, J., & Phelps, R. (2006). Innovation management measurement: A review. *International Journal of Management Reviews*, *8*(1), 21–47. https://doi.org/10.1111/j.1468-2370.2006.00119.x

Alford, J., & O'Flynn, J. (2009). Making sense of public value: Concepts, critiques and emergent meanings. *International Journal of Public Administration*, *32*(3–4), 171–191. https://doi.org/10.1080/01900690902732731

Arthur, B. (1994). *Increasing returns and path dependence in the economy*. Michigan, US: University of Michigan Press.

Avlonitis, G., Papastathopoulou, P., & Gounaris, S. (2001). An empirically based typology of product innovativeness for new financial services: Success and failure scenarios. *Journal of Product Innovation Management*, *18*(5), 324–341. https://doi.org/10.1111/1540-5885.1850324

Bardoel, J., & d'Haenens, L. (2008a). Reinventing public service broadcasting in Europe: Prospects, promises and problems. *Media, Culture & Society*, *30*(3), 337–355. https://doi.org/10.1177/0163443708088791

Bardoel, J., & d'Haenens, L. (2008b). Public service broadcasting in converging media modalities: Practices and reflections from the Netherlands. *Convergence*, *14*(3), 351–360. https://doi.org/10.1177/1354856508091086

Bardoel, J., d'Haenens, L., & Peeters, A. (2005). Defining distinctiveness in search of public broadcasting performance and quality criteria. In G. F. Lowe & P. Jauert (Eds.), *Cultural dilemmas in public service broadcasting*. Göteborg: Nordicom.

Bardoel, J., & Lowe, G. F. (Eds.). (2007). From public service broadcasting to public service media: The core challenge. In *From public service broadcasting to public service media RIPE@2007* (pp. 9–26). Göteborg: Nordicom.

BBC. (n.d.). *Projects*. BBC Research & Development. Retrieved 5 February 2021, from https://www.bbc.co.uk/rd/projects

BBC. (2020). *Bringing us closer: BBC annual plan 2020/2021* [Annual report]. BBC. https://www.bbc.com/aboutthebbc/reports/annualplan

Bonfadelli, H. (2010). Environmental sustainability as challenge for media and journalism. In M. Gross & H. Heinrichs (Eds.), *Environmental sociology: European perspectives and interdisciplinary challenges* (pp. 257–278). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-90-481-8730-0_15

Born, G. (2003). Strategy, positioning and projection in digital television: Channel Four and the commercialization of public service broadcasting in the UK. *Media, Culture & Society*, *25*(6), 774–799. https://doi.org/10.1177/0163443703256004

Born, G., & Prosser, T. (2001). Culture and consumerism: Citizenship, public service broadcasting and the BBC's fair trading obligations. *The Modern Law Review*, *64*(5), 657–687. https://doi.org/10.1111/1468-2230.00345

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brevini, B. (2013). A normative framework for PSB online: The idea of PSB 2.0. In B. Brevini, *Public service broadcasting online: A comparative European policy study of PSB 2.0* (pp. 30–53). London: Palgrave Macmillan UK. https://doi.org/10.1057/9781137295101_4

Broadcasting Research Unit. (1986). *The public service idea in British broadcasting: Main principles*. London, UK: British Film Institute Publications.

Brown, K., & Osborne, S. P. (2012). *Managing change and innovation in public service organizations*. London, UK: Routledge.

Bruns, A. (2014). Media innovations, user innovations, societal innovations. *The Journal of Media Innovations*, *1*(1), 13–27. https://doi.org/10.5617/jmi.v1i1.827

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford, UK: Oxford University Press.

Christensen, C. (1997). *The innovator's dilemma: When new technologies cause great firms to fail*. Boston, MA: Harvard Business Review Press.

Compaine, B., & Hoag, A. (2012). Factors supporting and hindering new entry in media markets: A study of media entrepreneurs. *International Journal on Media Management*, *14*(1), 27–49. https://doi.org/10.1080/14241277.2011.627520

Congdon, T. (2004). Bye-bye BBC? *Economic Affairs*, *24*(2), 70–70.

https://doi.org/10.1111/j.1468-0270.2004.00479.x

Coombs, R., Narandren, P., & Richards, A. (1996). A literature-based innovation output

indicator. *Research Policy*, *25*(3), 403–413. https://doi.org/10.1016/0048-

7333(95)00842-X

Corrales-Estrada, M. (2019). Types of innovation. In M. Corrales-Estrada (Ed.), *Innovation*

and entrepreneurship: A new mindset for emerging markets (pp. 113–139). Bingley,

UK: Emerald Publishing Limited. https://doi.org/10.1108/978-1-78973-701-

120191009

Crosby, B. C., 't Hart, P., & Torfing, J. (2017). Public value creation through collaborative

innovation. *Public Management Review*, *19*(5), 655–669.

https://doi.org/10.1080/14719037.2016.1192165

Cubitt, S. (2014). Ecomedia futures. *International Journal of Media & Cultural Politics*, *10*(2),

163–170. https://doi.org/10.1386/macp.10.2.163_1

Cunningham, S. (2015). Repositioning the innovation rationale for public service media.

International Journal of Digital Television, *6*(2), 203–220.

https://doi.org/10.1386/jdtv.6.2.203_1

Damanpour, F., Walker, R. M., & Avellaneda, C. N. (2009). Combinative effects of

innovation types and organizational performance: A longitudinal study of service

organizations. *Journal of Management Studies*, *46*(4), 650–675.

https://doi.org/10.1111/j.1467-6486.2008.00814.x

David, P. (1985). Clio and the economics of QWERTY. *American Economic Review*, *75*(2),

332–337.

Debrett, M. (2009). Riding the wave: Public service television in the multi-platform era.

Media, Culture & Society, *31*(5), 807–827.

https://doi.org/10.1177/0163443709339466

Debrett, M. (2015). "Tools for citizenship?" public service media as a site for civic

engagement: An Australian case study. *Television & New Media*, *16*(6), 557–575.

https://doi.org/10.1177/1527476414557951

Dogruel, L. (2014). What is so special about media innovations? A characterization of the

field. *The Journal of Media Innovations*, *1*(1), 52–69.

https://doi.org/10.5617/jmi.v1i1.665

Dogruel, L. (2015). Innovation research in media management and economics: An

integrative framework. *Journal of Media Business Studies*, *12*(3), 153–167.

https://doi.org/10.1080/16522354.2015.1069478

Donders, K. (2019). Public service media beyond the digital hype: Distribution strategies in

a platform era. *Media, Culture & Society*, *41*(7), 1011–1028.

https://doi.org/10.1177/0163443719857616

Donders, K., & Pauwels, C. (2008). Does EU policy challenge the digital future of public

service broadcasting?: An analysis of the commission's state aid approach to

digitization and the public service remit of public broadcasting organizations.

Convergence, *14*(3), 295–311. https://doi.org/10.1177/1354856508091082

Donders, K., Ranaivoson, H., Lindmark, S., & Ballon, P. (2012). Public broadcasters and

innovation: A contested combination in Flanders. *Innovation: Management, Policy &*
Practice, *14*(2), 276–288. https://doi.org/10.5172/impp.2012.14.2.276

Donders, K., & Van den Bulck, H. (2016). Decline and fall of public service media values in

the international content acquisition market: An analysis of small public broadcasters

acquiring BBC Worldwide content. *European Journal of Communication*, *31*(3), 299–

316. https://doi.org/10.1177/0267323116635833

EBU. (2013). *Empowering society: A declaration on the core values of public service media*.

EBU.

Edmondson, A. C., & Mcmanus, S. E. (2007). Methodological fit in management field

research. *Academy of Management Review*, *32*(4), 1155–1179.

https://doi.org/10.5465/amr.2007.26586086

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and

challenges. *The Academy of Management Journal*, *50*(1), 25–32.

https://doi.org/10.2307/20159839

Ellis, J. (2002). *Seeing things: Television in the age of uncertainty*. London: Tauris.

Enli, G. S. (2008). Redefining public service broadcasting: Multi-platform participation.

Convergence, 14(1), 105–120. https://doi.org/10.1177/1354856507084422

Evans, S. K. (2018). Making sense of innovation: Process, product, and storytelling

innovation in public service broadcasting organizations. *Journalism Studies, 19*(1),

4–24. https://doi.org/10.1080/1461670X.2016.1154446

Fernández-Quijada, D., Bonet, M., Candel, R. S., & Arboledas, L. (2015). From rhetorics to

practice: Implementation of technological innovation within Spanish public service

media. *The Journal of Media Innovations, 2*(2), 23–39.

https://doi.org/10.5617/jmi.v2i2.845

Francis, D., & Bessant, J. (2005). Targeting innovation and implications for capability

development. *Technovation, 25*(3), 171–183.

https://doi.org/10.1016/j.technovation.2004.03.004

Freeman, C. (1995). The 'national system of innovation' in historical perspective.

Cambridge Journal of Economics, 19(1), 5–24.

García-Avilés, J. A., Carvajal-Prieto, M., De Lara-González, A., & Arias-Robles, F. (2018).

Developing an index of media innovation in a national market: The case of Spain.

Journalism Studies, 19(1), 25–42. https://doi.org/10.1080/1461670X.2016.1161496

Głowacki, M. (2020). Pasts, presents and futures of public service media: The challenges of

adaptation and change in the age of data. *Communication Today, 11*(2), 105–117.

Głowacki, M., & Jackson, L. (Eds.). (2013). *Public media management for the twenty-first*

century: Creativity, innovation, and interaction. New York, NY: Routledge.

Grummell, B. (2009). The educational character of public service broadcasting: From

cultural enrichment to knowledge society. *European Journal of Communication,*

24(3), 267–285. https://doi.org/10.1177/0267323109336756

Guthrie, J., Marcon, G., Russo, S., & Farneti, F. (2014). *Public value management,*

measurement and reporting. Bingley, UK: Emerald Group Publishing.

Harcup, T. (2014). Reithian principles. In *A Dictionary of Journalism.* Oxford, UK: Oxford

University Press.

Hargreaves Heap, S. P. (2005). Television in a digital age: What role for public service

broadcasting? *Economic Policy, 20*(41), 112–157. https://doi.org/10.1111/j.1468-

0327.2005.00134.x

Harrison, J., & Wessels, B. (2005). A new public service communication environment?
Public service broadcasting values in the reconfiguring media. *New Media &
Society*, *7*(6), 834–853. https://doi.org/10.1177/1461444805058172

Harrison, J., & Woods, L. M. (2001). Defining European public service broadcasting.
European Journal of Communication, *16*(4), 477–504.
https://doi.org/10.1177/0267323101016004003

Hashimzade, N., Myles, G., & Black, J. (2017). Innovation. In *A Dictionary of Economics.*
Oxford, UK: Oxford University Press.

Hendrickx, J., Raats, T., Ranaivoson, H., & Opgenhaffen, M. (2019). 'Distinctiveness' and
programme diversity in public broadcasting revisited: A seven-country comparison.
International Journal of Media & Cultural Politics, *15*(3), 283–302.
https://doi.org/10.1386/macp_00002_1

Hoynes, W. (2003). Branding public service: The 'new PBS' and the privatization of public
television. *Television & New Media*, *4*(2), 117–130.
https://doi.org/10.1177/1527476402250672

Huertas Bailén, A. (2020). Interreligious dialogue in public service broadcasting. A case
study in Catalonia (Spain). *Religions*, *11*(9), 441.
https://doi.org/10.3390/rel11090441

Ibrus, I., Rohn, U., & Nanì, A. (2019). Searching for public value in innovation coordination:
How the Eurovision Song Contest was used to innovate the public service media
model in Estonia. *International Journal of Cultural Studies*, *22*(3), 367–382.
https://doi.org/10.1177/1367877918757513

Isreal, M., & Hay, I. (2006). *Research ethics for social scientists*. SAGE Publications, Inc.

Jakubowicz, K. (2007). Public service broadcasting in the 21st century: What chance for a
new beginning? In G. F. Lowe & J. Bardoel (Eds.), *From public service broadcasting
to public service media*. Göteborg: Nordicom.

Johnson, C. (2012). *Branding television* (1st edition). New York, NY: Routledge.

Keeley, L., Walters, H., Pikkel, R., & Quinn, B. (2013). *Ten Types of Innovation: The*

discipline of building breakthroughs. Hoboken, NJ: John Wiley & Sons.

Khajeheian, D., & Tadayoni, R. (2016). User innovation in public service broadcasts: Creating public value by media entrepreneurship. *International Journal of Technology Transfer and Commercialisation*, *14*(2), 117. https://doi.org/10.1504/IJTTC.2016.081635

Küng, L. (2013). Innovation, technology and organisational change. Legacy media's big challenges. An introduction. In T. Storsul & A. H. Krumsvik (Eds.), *Media innovation. A multidisciplinary study of change* (pp. 9–12). Göteborg: Nordicom.

Law, J. (2016). Innovation. In J. Law (Ed.), *A Dictionary of Business and Management*. Oxford, UK: Oxford University Press.

Lotz, A. (2014). *The television will be revolutionized* (2nd edition). New York, NY: NYU Press.

Lowe, G. F., & Bardoel, J. (Eds.). (2007). *From public service broadcasting to public service media RIPE@2007*. Göteborg: Nordicom.

Lowe, G. F., & Maijanen, P. (2019). Making sense of the public service mission in media: Youth audiences, competition, and strategic management. *Journal of Media Business Studies*, *16*(1), 1–18. https://doi.org/10.1080/16522354.2018.1553279

Lundvall, B.-Å. (1992). *National systems of innovation: Towards a theory of innovation and interactive learning*. London: Pinter.

McElroy, R., & Noonan, C. (2018). Public service media and digital innovation: The small nation experience. In G. Ferrell Lowe, H. Van den Bulck, & K. Donders (Eds.), *Public service media in the networked society* (pp. 159–174). Göteborg: Nordicom.

Mehdi Sharifi, S., Khajeheian, D., & Samadi Mashhadi, K. (2019). Corporate media entrepreneurship in public service broadcasts: An exploratory study of IRIB use of external innovations. *AD-Minister*, *34*, 101–118. https://doi.org/10.17230/ad-minister.34.

Meijer, I. C. (2005). Impact or content?: Ratings vs quality in public broadcasting. *European Journal of Communication*, *20*(1), 27–53. https://doi.org/10.1177/0267323105049632

Menor, L. J., Tatikonda, M. V., & Sampson, S. E. (2002). New service development: Areas for exploitation and exploration. *Journal of Operations Management*, *20*(2), 135–157. https://doi.org/10.1016/S0272-6963(01)00091-2

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded source book* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Mills, A., Durepos, G., & Wiebe, E. (2010a). Computer-based analysis of qualitative data: ATLAS.ti. In *Encyclopedia of case study research* (pp. 183–184). Thousand Oaks, CA: SAGE Publications, Inc. https://doi.org/10.4135/9781412957397

Mills, A., Durepos, G., & Wiebe, E. (2010b). Multiple-case designs. In *Encyclopedia of case study research* (pp. 583–584). Thousand Oaks, CA: SAGE Publications, Inc. https://doi.org/10.4135/9781412957397

Mills, A., Durepos, G., & Wiebe, E. (2010c). Qualitative analysis in case study. In *Encyclopedia of case study research* (pp. 749–757). Thousand Oaks, CA: SAGE Publications, Inc. https://doi.org/10.4135/9781412957397

Moe, H. (2010). Governing public service broadcasting: "Public value tests" in different national contexts. *Communication, Culture & Critique*, *3*(2), 207–223. https://doi.org/10.1111/j.1753-9137.2010.01067.x

Moore, M. H. (1995). *Creating public value: Strategic management in government* (1st ed.). Cambridge, MA: Harvard University Press.

NPO. (n.d.). *Projecten*. NPO Innovatie. Retrieved 5 February 2021, from https://innovatie.npo.nl/projecten

NPO. (2020). *INNOVATIEAGENDA HORIZON 2 (2-3 JAAR VOORUIT)*. NPO.

Oke, A. (2007). Innovation types and innovation management practices in service companies. *International Journal of Operations & Production Management*, *27*(6), 564–587. https://doi.org/10.1108/01443570710750268

Osborne, S. P. (1998). *Voluntary organizations and innovation in public services*. London, UK: Routledge.

Partanen, J., Chetty, S. K., & Rajala, A. (2014). Innovation types and network relationships. *Entrepreneurship Theory and Practice*, *38*(5), 1027–1055.

https://doi.org/10.1111/j.1540-6520.2011.00474.x

Puijk, R. (2015). Slow television: A successful innovation in public service broadcasting. *Nordicom Review*, *36*(1), 95–108. https://doi.org/10.1515/nor-2015-0008

Rhodes, R. a. W., & Wanna, J. (2007). The limits to public value, or rescuing responsible government from the platonic guardians. *Australian Journal of Public Administration*, *66*(4), 406–421. https://doi.org/10.1111/j.1467-8500.2007.00553.x

Rijksoverheid. (2016, December 22). *Wat doet de Nederlandse Publieke Omroep (NPO)? - Rijksoverheid.nl* [Onderwerp]. Rijksoverheid; Ministerie van Algemene Zaken. onderwerpen/media-en-publieke-omroep/vraag-en-antwoord/nederlandse-publieke-omroep

Rindova, V., & Kotha, S. (2001). Continuous 'morphing': Competing through dynamic capabilities, form, and function. *The Academy of Management Journal*, *44*(6), 1263–1280. https://doi.org/10.2307/3069400

Schlesinger, P. (2010). 'The most creative organization in the world'? The BBC, 'creativity' and managerial style. *International Journal of Cultural Policy*, *16*(3), 271–285. https://doi.org/10.1080/10286630903302766

Schumpeter, J. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.

Starosielski, N., & Walker, J. (2016). *Sustainable media: Critical approaches to media and environment*. New York, NY: Routledge.

Storsul, T., & Krumsvik, A. H. (2013). What is media innovation? In T. Storsul & A. H. Krumsvik (Eds.), *Media innovations: A multidisciplinary study of change* (pp. 13–26). Göteborg: Nordicom.

Strauss, A., & Corbin, J. M. (1997). *Grounded theory in practice*. Thousand Oaks, CA: SAGE Publications, Inc.

Van Cuilenburg, J., & McQuail, D. (2003). Media policy paradigm shifts: Towards a new communications policy paradigm. *European Journal of Communication*, *18*(2), 181–207. https://doi.org/10.1177/0267323103018002002

Van den Bulck, H., & Moe, H. (2012). To test or not to test: Comparing the development of

ex ante public service media assessments in Flanders and Norway. *International Journal of Media & Cultural Politics*, *8*(1), 31–49. https://doi.org/10.1386/macp.8.1.31_1

Vanhaeght, A.-S. (2019). Audience participation in public service media: From a media-centric to a society-centric approach. The Monitor: A best practice of the Dutch public service broadcaster NPO. *VIEW Journal of European Television History and Culture*, *8*(16), 45–58. https://doi.org/10.18146/2213-0969.2019.jethc174

Walker, R. M., Jeanes, E., & Rowlands, R. (2002). Measuring innovation – applying the literature-based innovation output indicator to public services. *Public Administration*, *80*(1), 201–214. https://doi.org/10.1111/1467-9299.00300

Wauters, D., & Raats, T. (2018). Public service media and ecosystem sustainability. In G. Ferrell Lowe, H. Van den Bulck, & K. Donders (Eds.), *Public service media in the networked society* (p. 17). Göteborg: Nordicom.

Wilson, C. K., Hutchinson, J., & Shea, P. (2010). Public service broadcasting, creative industries and innovation infrastructure: The case of ABC's Pool. *Australian Journal of Communication*, *37*(3), 15–32.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Zaragoza-Fuster, M.-T., & García-Avilés, J.-A. (2020). The role of innovation labs in advancing the relevance of public service media: The cases of BBC News Labs and RTVE Lab. *Communication & Society*, *33*(1), 45–61. https://doi.org/10.15581/003.33.1.45-61

Appendix A Units of analysis

Project	Project title	Project link
NPO Project 1	Smart speaker helpt bij goed gesprek EO	https://innovatie.npo.nl/projecten/smart-speaker-helpt-bij-goed-gesprek
NPO Project 2	Is Pinterest een aantrekkelijk middel om vrouwen te bereiken? NOS	https://innovatie.npo.nl/projecten/is-pinterest-een-aantrekkelijk-middel-om-vrouwen-te-bereiken
NPO Project 3	'Spuiten en Slikken', TikTok plek voor voorlichting? BNNVARA	https://innovatie.npo.nl/projecten/spuiten-en-slikken-tiktok-plek-voor-voorlichting
NPO Project 4	EO in Amsterdam Zuidoost EO	https://innovatie.npo.nl/projecten/eo-in-amsterdam-zuidoost-1
NPO Project 5	GIRL POWER? BETER GEEF JE ONS GELD POWER! BNNVARA	https://innovatie.npo.nl/projecten/girl-power-beter-geef-je-ons-geld-power
NPO Project 6	'AI Songfestival', is de nieuwe Duncan Laurence een robot? VPRO	https://innovatie.npo.nl/projecten/ai-songfestival-is-de-nieuwe-duncan-laurence-een-robot
NPO Project 7	Experiment WebAr online series NTR	https://innovatie.npo.nl/projecten/experiment-webar-online-series
NPO Project 8	'Maandverbond': inzicht in je hormooncyclus door direct messaging platforms VPRO	https://innovatie.npo.nl/projecten/maandverbond-inzicht-in-je-hormooncyclus-door-direct-messaging-platforms-2
NPO Project 9	Hoe beleef je je examenjaar zonder écht examen? NOS	https://innovatie.npo.nl/projecten/hoe-beleef-je-je-examenjaar-zonder-echt-examen
NPO Project 10	In post-productie iemand middels deepfake anonimiseren EO	https://innovatie.npo.nl/projecten/in-post-productie-iemand-middels-deepfake-anonimiseren-1
NPO Project 11	'Kinderen voor Kinderen Park', dansles via de smartspeaker BNNVARA	https://innovatie.npo.nl/projecten/kinderen-voor-kinderen-park-dansles-via-de-smartspeaker
NPO Project 12	'+Eddie', kunstmatig intelligente editor KRO-NCRV	https://innovatie.npo.nl/projecten/eddie-kunstmatig-intelligente-editor
NPO Project 13	Significante memes toevoegen aan het vocabulaire van de doelgroep BNNVARA	https://innovatie.npo.nl/projecten/significante-memes-toevoegen-aan-het-vocabulaire-van-de-doelgroep-kan-dat-1
NPO Project 14	Wie weet waar Willem Wever Woont? In de cloud! KRO-NCRV	https://innovatie.npo.nl/projecten/wie-weet-waar-willem-wever-woont-in-de-cloud
NPO Project 15	Chatbots: in conversatie naar relevante content EO	https://innovatie.npo.nl/projecten/chatbots-in-conversatie-naar-relevante-content
NPO Project 16	Live ervaringen delen met 'Wat Je Niet Leert' op Twitch NTR	https://innovatie.npo.nl/projecten/live-ervaringen-delen-met-wat-je-niet-leert-op-twitch
NPO Project 17	Top 2000 online quiz samen beleven NTR	https://innovatie.npo.nl/projecten/top-2000-online-quiz-samen-beleven-1

NPO Project 18	Hoe verkrijg je betere metadata? AVROTROS	https://innovatie.npo.nl/projecten/hoe-verkrijg-je-betere-metadata-1
NPO Project 19	'Willem Wever Challenge', antwoorden via conversational interface KRO-NCRV	https://innovatie.npo.nl/projecten/willem-wever-challenge-antwoorden-via-conversational-interface
NPO Project 20	'Ben jij de slimste?', multiplayer voice quiz via de smartspeaker KRO-NCRV	https://innovatie.npo.nl/projecten/ben-jij-de-slimste-multiplayer-voice-quiz-via-de-smartspeaker
NPO Project 21	Ik zie wat jij niet ziet EO	https://innovatie.npo.nl/projecten/ik-zie-wat-jij-niet-ziet
NPO Project 22	Een vernieuwde dynamische app voor Zapp? NPO Zapp	https://innovatie.npo.nl/projecten/een-vernieuwde-dynamische-app-voor-zapp
NPO Project 23	Slaat Visual Novel ook aan bij Nederlandse jongeren? EO	https://innovatie.npo.nl/projecten/slaat-visual-novel-ook-aan-bij-nederlandse-jongeren-1
NPO Project 24	'Horrorstories', Instagram een platform voor fictie? VPRO	https://innovatie.npo.nl/projecten/horrorstories-instagram-een-platform-voor-fictie
NPO Project 25	Persoonlijke geschiedenisverhalen op basis van je locatie NTR	https://innovatie.npo.nl/projecten/persoonlijke-geschiedenisverhalen-op-basis-van-je-locatie-1
NPO Project 26	Levensechte insecten in je eigen slaapkamer KRO-NCRV	https://innovatie.npo.nl/projecten/levensechte-insecten-in-je-eigen-slaapkamer-1
NPO Project 27	Kan MoJo een passieve kijker veranderen in een actieve kijker? NTR	https://innovatie.npo.nl/projecten/kan-mojo-een-passieve-kijker-veranderen-in-een-actieve-kijker-1
NPO Project 28	Dat je kan meedoen, is nu toch gewoon normaal? BNNVARA	https://innovatie.npo.nl/projecten/dat-je-kan-meedoen-is-nu-toch-gewoon-normaal
NPO Project 29	'Dustin', chatgesprekken met slimme apparaten VPRO	https://innovatie.npo.nl/projecten/denkende-dingen-chatgesprekken-met-slimme-apparaten
NPO Project 30	Maakt MoJo politiek Den Haag dichterbij? NOS/NTR	https://innovatie.npo.nl/projecten/maakt-mojo-politiek-den-haag-dichterbij-2
NPO Project 31	Wereldse denkers reageren op filosofische stellingen HUMAN	https://innovatie.npo.nl/projecten/wereldse-denkers-1
NPO Project 32	Huiselijk geweld tot leven brengen met augmented reality EO	https://innovatie.npo.nl/projecten/huiselijk-geweld-tot-leven-brengen-met-augmented-reality
NPO Project 33	'VPRO aan het typen...', WhatsApp als storytelling platform VPRO	https://innovatie.npo.nl/projecten/vpro-aan-het-typen-whatsapp-als-storytelling-platform
NPO Project 34	Onderzoek Wearables BNNVARA	https://innovatie.npo.nl/projecten/onderzoek-wearables
NPO Project 35	Waarom is er eigenlijk niet een soort eco-bellingcat? BNNVARA	https://innovatie.npo.nl/projecten/waarom-is-er-eigenlijk-niet-een-soort-eco-bellingcat-1

NPO Project 36	TikTok de plek voor een sterke 3FM community? NPO	https://innovatie.npo.nl/projecten/tiktok-de-plek-voor-een-sterke-3fm-community-1
NPO Project 37	'De muziekverkenner': Object Based Audio NTR	https://innovatie.npo.nl/projecten/de-muziekverkenner-object-based-audio-1
NPO Project 38	'Hey Jelle!', experimentele dialogen via de smartspeaker NTR	https://innovatie.npo.nl/projecten/hey-jelle-experimentele-dialogen-via-de-smartspeaker
NPO Project 39	TikTok geschikt kanaal om nieuws bij jonge doelgroep te krijgen NOS	https://innovatie.npo.nl/projecten/tiktok-geschikt-kanaal-op-nieuws-bij-jonge-doelgroep-te-krijgen-1
NPO Project 40	Interactieve video maakt het volgen van een bakrecept makkelijker MAX	https://innovatie.npo.nl/projecten/interactieve-video-maakt-het-volgen-van-een-bakrecept-makkelijker-1
NPO Project 41	Met AI Formule 1 audiofragmenten abstraheren zonder redactionele inzet NOS	https://innovatie.npo.nl/projecten/met-ai-formule-1-audiofragmenten-abstraheren-zonder-redactionele-inzet-1
NPO Project 42	Instant gratification zorgt voor directe betrokkenheid bij Zapp live KRO-NCRV	https://innovatie.npo.nl/projecten/instant-gratification-zorgt-voor-directe-betrokkenheid-bij-zapp-live-1
NPO Project 43	Levert een interactieve video meer educatieve waarde voor SchoolTV NTR	https://innovatie.npo.nl/projecten/levert-een-interactieve-video-meer-educatieve-waarde-voor-schooltv-1
NPO Project 44	Met welke vertelvormen kan FunX de doelgroep op TikTok bereiken NPO	https://innovatie.npo.nl/projecten/met-welke-vertelvormen-kan-funx-de-doelgroep-op-tiktok-bereiken-1
NPO Project 45	Biedt de Looking Glass mogelijkheden voor de toekomst van TV NPO	https://innovatie.npo.nl/projecten/biedt-de-looking-glass-mogelijkheden-voor-de-toekomst-van-tv-1
NPO Project 46	Welke technieken en werkprocessen komen er kijken bij live interactie? KRO-NCRV	https://innovatie.npo.nl/projecten/lijdt-een-web-app-tot-meer-betrokkenheid-bij-zapp-live-1
NPO Project 47	Verhoogt een mobile journalism toolbox de kwaliteit van UGC? KRO-NCRV	https://innovatie.npo.nl/projecten/verhoogt-een-mobile-journalism-toolbox-de-kwaliteit-van-usg-1
NPO Project 48	Kan MoJo de doelgroep meer betrekken bij onderzoeksjournalistiek? VPRO	https://innovatie.npo.nl/projecten/kan-mojo-de-doelgroep-meer-betrekken-bij-onderzoeksjournalistiek-2
NPO Project 49	Werkt Klokhuis content op TikTok? NTR	https://innovatie.npo.nl/projecten/werkt-klokhuis-content-op-tiktok
NPO Project 50	'Geschiedeniscanon', les van Willem van Oranje NTR	https://innovatie.npo.nl/projecten/geschiedeniscanon-les-van-willem-van-oranje
BBC Project 1	New Forms of Value	https://www.bbc.co.uk/rd/projects/new-forms-value-bbc-data-economy
BBC Project 2	Intelligent Audio Production Tools	https://www.bbc.co.uk/rd/projects/intelligent-audio-production-tools
BBC Project 3	StoryKit: An Object-Based Media Toolkit	https://www.bbc.co.uk/rd/projects/object-based-media-toolkit
BBC Project 4	Intelligent Video Production Tools	https://www.bbc.co.uk/rd/projects/intelligent-video-production-tools

BBC Project 5	Visual Data Analytics	https://www.bbc.co.uk/rd/projects/visual-data-analytics
BBC Project 6	Digital Wellbeing	https://www.bbc.co.uk/rd/projects/digital-wellbeing
BBC Project 7	IP Production Facilities	https://www.bbc.co.uk/rd/projects/ip-production-facilities
BBC Project 8	Next Generation Audio	https://www.bbc.co.uk/rd/projects/next-generation-audio
BBC Project 9	Computing and Networks at Scale	https://www.bbc.co.uk/rd/projects/computing-and-networks-at-scale
BBC Project 10	Audio Device Orchestration	https://www.bbc.co.uk/rd/projects/audio-device-orchestration
BBC Project 11	Personal Data Stewardship	https://www.bbc.co.uk/rd/projects/bbc-box-personal-data-management-privacy
BBC Project 12	New Audience Experiences for Mobile Devices	https://www.bbc.co.uk/rd/projects/5g-mobile-virtual-augmented-reality
BBC Project 13	Delivering Object-Based Media at Scale with Render Engine Broadcasting	https://www.bbc.co.uk/rd/projects/render-engine-broadcasting
BBC Project 14	Sustainable Engineering	https://www.bbc.co.uk/rd/projects/sustainable-engineering
BBC Project 15	XR Audio Tools	https://www.bbc.co.uk/rd/projects/xr-audio-tools
BBC Project 16	Perceptive Radio	https://www.bbc.co.uk/rd/projects/perceptive-radio
BBC Project 17	Responsible Machine Learning in the Public Interest	https://www.bbc.co.uk/rd/projects/responsible-machine-learning
BBC Project 18	AI in Media Production	https://www.bbc.co.uk/rd/projects/ai-production
BBC Project 19	Low Latency Live Streaming with MPEG DASH	https://www.bbc.co.uk/rd/projects/low-latency-live-streaming-mpeg-dash
BBC Project 20	Human Data Interaction	https://www.bbc.co.uk/rd/projects/human-data-interaction
BBC Project 21	Culture UK	https://www.bbc.co.uk/rd/projects/culture-uk
BBC Project 22	Reinventing the News Article	https://www.bbc.co.uk/rd/projects/reinventing-news-article
BBC Project 23	Databox	https://www.bbc.co.uk/rd/projects/databox
BBC Project 24	Building A Public Service Internet	https://www.bbc.co.uk/rd/projects/public-service-internet
BBC Project 25	Dynamic Adaptive Streaming over IP Multicast	https://www.bbc.co.uk/rd/projects/dynamic-adaptive-streaming-ip-multicast-dasm
BBC Project 26	4G and 5G Broadcast	https://www.bbc.co.uk/rd/projects/4g-5g-mobile-broadcast
BBC Project 27	Data Science Research Partnership	https://www.bbc.co.uk/rd/projects/data-science-research-partnership
BBC Project 28	Living Room of the Future	https://www.bbc.co.uk/rd/projects/living-room-of-the-future
BBC Project 29	5G-Xcast	https://www.bbc.co.uk/rd/projects/5g-xcast
BBC Project 30	Cloud-Fit Production Architecture	https://www.bbc.co.uk/rd/projects/cloud-fit-production
BBC Project 31	Speech-to-Text	https://www.bbc.co.uk/rd/projects/speech-to-text
BBC Project 32	BBC Trecvid EastEnders Academic Challenge Dataset	https://www.bbc.co.uk/rd/projects/bbc-trecvid-eastenders-academic-challenge-dataset

BBC Project 33	Narrative Structures for Responsive Media	https://www.bbc.co.uk/rd/projects/narrative-structures
BBC Project 34	Mythology Engine Exploring	https://www.bbc.co.uk/rd/projects/mythology_engine
BBC Project 35	Switch Control	https://www.bbc.co.uk/rd/projects/switch-control
BBC Project 36	Portable Production Tool	https://www.bbc.co.uk/rd/projects/portable-production-tool
BBC Project 37	Lip Reading in the Wild and Lip Reading Sentences in the Wild Datasets	https://www.bbc.co.uk/rd/projects/lip-reading-datasets
BBC Project 38	IP Studio	https://www.bbc.co.uk/rd/projects/ip-studio
BBC Project 39	Broadcast Wi-Fi	https://www.bbc.co.uk/rd/projects/broadcast-wifi
BBC Project 40	Storycrate	https://www.bbc.co.uk/rd/projects/storycrate
BBC Project 41	IP Studio: Lightweight Live	https://www.bbc.co.uk/rd/projects/ip-studio-lightweight-live
BBC Project 42	Ingex	https://www.bbc.co.uk/rd/projects/ingex
BBC Project 43	DVB-T2	https://www.bbc.co.uk/rd/projects/dvb-t2
BBC Project 44	The World Service Radio Archive	https://www.bbc.co.uk/rd/projects/worldservice-archive-proto
BBC Project 45	MyMedia	https://www.bbc.co.uk/rd/projects/mymedia
BBC Project 46	KiWi	https://www.bbc.co.uk/rd/projects/kiwi
BBC Project 47	The Programme List	https://www.bbc.co.uk/rd/projects/the_programme_list
BBC Project 48	Web Audio	https://www.bbc.co.uk/rd/projects/w3c-audio-working-group
BBC Project 49	Multimedia Classification	https://www.bbc.co.uk/rd/projects/multimedia-classification
BBC Project 50	Companion Screens	https://www.bbc.co.uk/rd/projects/companion-screens

Appendix B Coding scheme

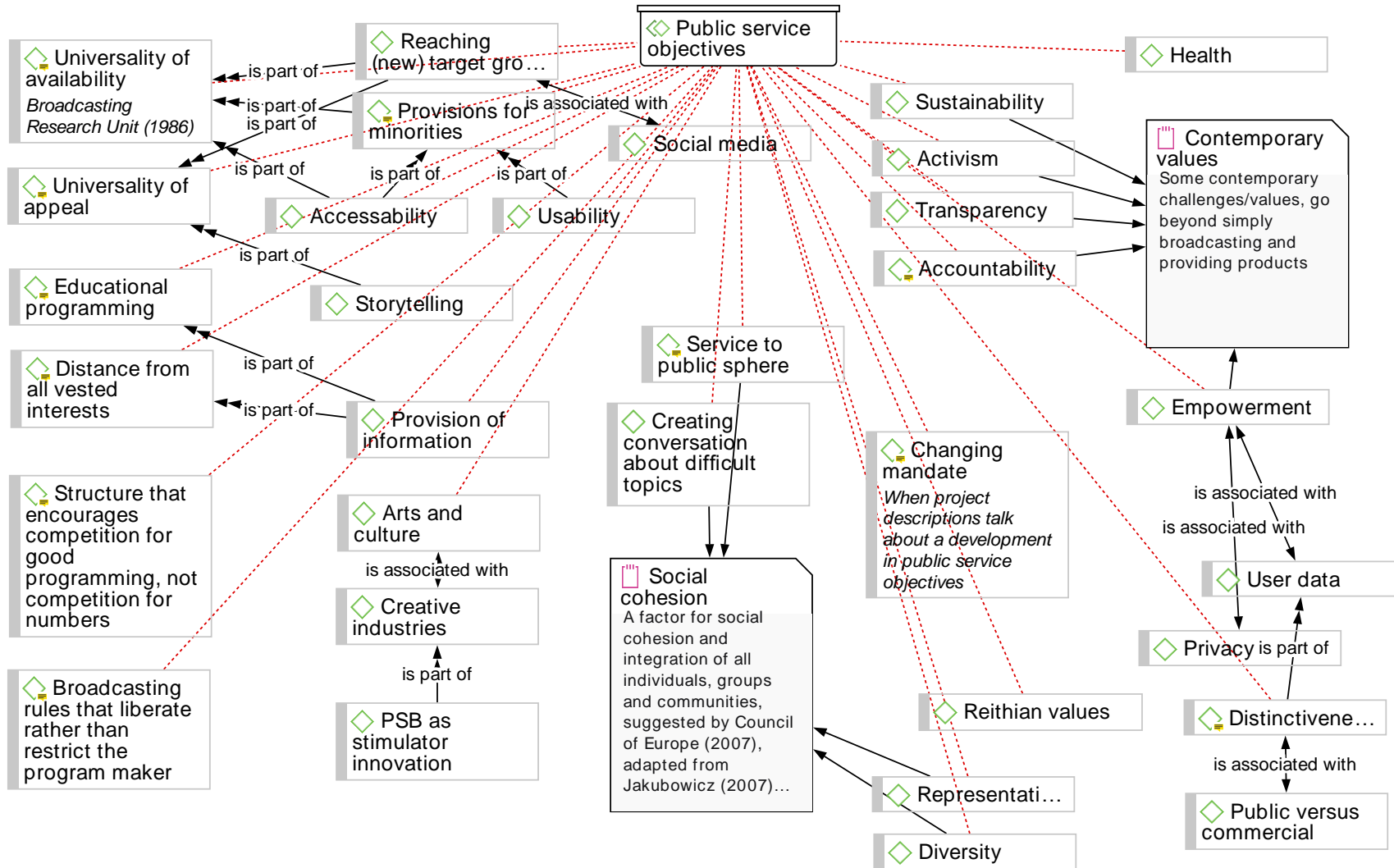| Theme	Groupings	Initial code	Definition
Innovation type	Incremental	Developmental or incremental innovation	Adapting or modifying an existing service to an existing user group of organisation
		Improved	Innovation pertaining to improving an existing product, service or process
		Product performance	Improving an organisation's existing product
		Adaption of an existing product	Adapting an existing offering or service
PSB		Product or service	Activity pertaining to the product or service of the PSB
	Evolutionary	Evolutionary innovation	Providing a new service to an existing user group of an organisation
		Novel	New or definitively changed product, with a different technology, but with the product performing the same function as before
	Collaborative	Network innovation	Harnessing the capabilities and assets of other organisations
		Collaboration	Activity mentions a collaboration between departments within the organisation or other organisations
	Internal	Network innovation	Harnessing the capabilities and assets of internal departments
		Company organisation	Activity pertaining to the nature of the organisation or the team of the PSB
	Production process	Production and distribution process	Activity pertaining to the production or distribution

			process of the PSB
		Introduction of a new production process	Introducing a new production practice
		Artificial intelligence	Project using artificial intelligence; the simulation of human intelligence in machines
		Machine learning	Project using machine learning; the simulation of human learning or accumulation of knowledge in machines
		Process	Refers to changes in the way in which the product or service is created
		Automation	Innovation addresses the automation of manual production tasks
	Distribution process	Production and distribution process	Activity pertaining to the production or distribution process of the PSB
		Channel innovation	Innovation in the way through which the product or service is offered
		Social media	Innovation activity mentions social media as a new distribution method
		Process	Refers to changes in the way in which the product or service is delivered
	Customer engagement	Customer engagement	Using customer insights to develop meaningful connections between the customer and the organisation
		Brand	Renewing the way an organisation represents its offering
		Marketing	Innovation activity pertaining to the commercial action or strategy of the PSB, especially concerning audience engagement

		Personalisation	Using customer insights to enable the customisation of an individual user's content
Public service objectives: traditional	Liberating the programme maker	Broadcasting rules that liberate rather than restrict the program maker	Activity tries to overcome or solve restrictions that producers face
		Automation	Innovation addresses the automation of manual production tasks in the context of relieving staff of work
	Universality of availability	Universality of availability	Activity aims for audiences to be able to access, listen to or view the product
		Provisions for minorities	Activity improves the accessibility or appeal of products or services for minorities
		Usability	Innovation project addresses the ease of use of a service or product
		Reaching (new) target group	Activity's objective is to reach an existing or new target group
		Accessibility	Activity addresses the accessibility of products or services for audiences
	Social cohesion	Creating conversation about difficult topics	Project encourages dialogue between audiences about a taboo or difficult to address topic
		Service to the public sphere	Project cultivates democratic participation, promotes social cohesion and intercultural understanding and supports national or EU culture
Public service objectives: new	Reaching (new) target audiences	Reaching (new) target group	Activity's objective is to reach of an existing or new target group
		Social media	Innovation project addresses social media as new

			channel
		Universality of appeal	Activity aims to improve attractiveness of product
	Audience interaction	Audience interaction	Addresses audience participation, e.g. two-way dialogue
		Social media	Innovation activity mentions social media as a way for audiences to participate
Underlying economic values	PSB as stimulator innovation	PSB as stimulator of innovation	Project mentions role of PSB in stimulating innovation
		Collaboration	Activity mentions a collaboration between departments within the organisation or other organisations
		Open source	Project makes data or software available for downloading
		User innovation	Innovation conducted by the user or audience
		Creative industries	Project mentions the broader media or creative industry
Underlying socio-cultural values	Sustainability	Sustainability	Innovation projects addresses sustainability
		Activism	Activity tries to bring about political or social change
	Educational programming	Educational programming	Project contributes to bringing educational content to audiences or users
		Provision of information	Provides objective information to audiences
		Reithian values	Activity mentions the Reithian values; to inform, educate and entertain
	User data empowerment	User data	Project pertains the audience's personal data

		Empowerment	Activity gives power or control to the user
		Privacy	Project addresses audience members' privacy as an objective or concern
		Distinctiveness	Activity distinguishes the PSB as different from something else, e.g. commercial enterprises
		Threats of digitalisation	Project mentions increasing digitalisation as a threat to the audience or the PSB
		Distance from all vested interests	Project mentions the objectiveness of the PSB
		Educational programming	Project contributes to bringing educational content about personal data and privacy to audiences or users
		Public versus commercial	Project suggests PSB are distinctive from commercial broadcasters when it comes to handling user data

Appendix C Networks ATLAS.ti

Types of innovation network

Public service objectives network

Integrated framework

Network innovation

Broadcasting rules that liberate rather than restrict the program maker

Developmental or incremental innovation

Network innovation
Collaborative: collaboration with external partner is mentioned
Internal: innovation project benefits multiple teams inside the organisation

Production and distribution process

is part of

is part of

is associated with

Evolutionary innovation

is part of

is part of

Universality of availability

is part of

is part of

Customer engagement

is part of

Reaching (new) target gro…

is part of

Audience interaction

PSB as stimulator innovation

Sustainability

is part of

Educational programming

Social cohesion

User data

is associated with

is part of

Empowerment