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Author/s:

Meese, J;Wilken, R;Nansen, B;Arnold, M

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Entering the Graveyard Shift: Disassembling the Australian TiVo

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**James Meese¹, Rowan Wilken¹, Bjorn Nansen²,
and Michael Arnold²**

Abstract

This article analyzes the operation and subsequent failure of TiVo in Australia. Drawing on actor-network theory, we unpack the TiVo assemblage throughout our paper, and look at the various human, technical, and institutional interventions that constituted it and constrained its possible futures. This analysis will be conducted by tracing how TiVo attempted to establish itself as a viable social and technical assemblage and assessing its influence on “new locales of regulation, new practices, new ethical stances, and new institutions.” Our approach offers an inclusive analytical lens by considering how a collection of actors—large and small, human and nonhuman—were actively involved in assembling and disassembling the network required by TiVo for an ongoing presence in Australia. It also contributes to a growing body of work that outlines the usefulness of ANT to media studies scholarship.

Keywords

television, TiVo, digital video recorder, actor-network theory, postbroadcast, assemblage.

Introduction

The Australian arm of TiVo appears to be in terminal decline. Despite an aggressive introduction in mid-2008 by TiVo Inc. and its local business partner Seven Media Group (Neiger 2008; TiVoHD 2008), TiVo Inc. are currently battling rumors that they are shutting down the Australian arm of the company. A journalist inquiring into TiVo’s status in Australia discovered that “units are no longer being sold online via

¹Swinburne University, Melbourne, Victoria, Australia

²University of Melbourne, Victoria, Australia

Corresponding Author:

James Meese, Swinburne Institute of Social Research, Swinburne University, 399 Burwood Rd. Hawthorn, Victoria 3122, Australia.

Email: jmeese@swin.edu.au

TiVo's website or listed on either of their retailer websites, Harvey Norman or Joyce Mayne" (Cartwright 2012). TiVo Australia's social media accounts have not been updated for some time, and cold calls to local retail outlets confirm that many stores aren't expecting to receive any new stock from the company (Cartwright 2012; Kidman 2013). In a matter of years TiVo has almost vanished from Australian shores as a corporate and cultural presence, and journalists are suggesting that the technology itself is falling into obsolescence (Turner 2012). TiVo's failed antipodean excursion, standing in stark contrast to the technology's enthusiastic adoption in the United States, underlines the specificities of new media cultures and offers a valuable vantage point to assess the processes through which particular technologies become either stabilized or as in the case of the Australian TiVo, superseded.

This article uses concepts drawn from actor-network theory (hereafter ANT) (Callon 1986a, 1986b; Latour 1999, 2005; Law 1992), and their use in the study of markets and media (see Callon 1998; Callon, Millo, and Muniesa 2007; Couldry 2001, 2008; Goggin 2009; Teurlings 2013) to explore why TiVo failed to establish itself as a viable technology in Australia. Rather than accepting TiVo as a "single and coherent object" (Law 1992: 384) we unpack the TiVo assemblage throughout our paper, and look at the various human, technical, and institutional interventions that constituted it and constrained its possible futures. This analysis will be conducted by tracing how TiVo attempted to establish itself as a viable social and technical assemblage and assessing its influence on "new locales of regulation, new practices, new ethical stances, and new institutions" (Goggin 2009: 163). Using ANT to disassemble the TiVo allows us to understand why it failed to establish broader social acceptance around its sociotechnical affordances in Australia and reveals the contingency of new media cultures and the level of social construction present in the take up of new technologies.

We have previously written about the arrival and reception of the TiVo in Australia (Wilken et al. 2011), taking a cultural economy approach to examine issues of ownership, representation, and consumption. This research considered the TiVo's introduction in terms of licensing and functionality issues, in terms of marketing and media discussion, and in terms of the ways users first engaged with the device. In this paper, we shift our attention from the emergence and reception of TiVo, to consider its stabilization and subsequent unraveling. This alternative analysis of TiVo is predicated on ANT, which offers a more inclusive analytical lens by shifting from questions of culture, representation, and economics to consider a broader collection of actors—large and small, human and nonhuman—actively involved in assembling and disassembling the network required by TiVo for an ongoing presence in Australia. Our approach also contributes to a growing body of work that examines the usefulness of ANT to media studies (Couldry 2001, 2008; Goggin 2009; Muecke 2009; Teurlings 2013). The following section will outline how ANT operates as a theoretical framework and the benefits that ANT can bring to the study of media.

Actor-Network Theory and Media Studies

The broad theoretical framework of ANT developed through the work of Bruno Latour (1999, 2005), Michel Callon (1986a, 1986b, 1998) and John Law (1992), establishes

a radical symmetry in its treatment of actors of all kinds, refusing any agentic hierarchy between the human and nonhuman. ANT also avoids dualist conceptions of society and nature or subject and object and instead welcomes hybridity. It repositions such dichotomies as heterogeneous assemblages—"society-nature" or "subject-object"—in which humans and nonhumans are inextricably mixed together (Nimmo 2011). Rather than focusing on institutional history and questions of control and ownership, as is the case with political economy, ANT attends to the politics of everyday life, a politics that is constituted by humans and a range of other nonhumans, all of whom express agency. Thus, when thinking of the wider media environment, ANT might look at how a *range* of actors—fiber, screens, people, laws, factories, regulations, money, scripts, policy documents, and musical products—are assembled to constitute an actor network.

There are at least two essential points of difference between this analysis, and an analysis founded in, say, a cultural studies or political economy approach. The first is that ANT avoids a human-centric perspective in which all chains of agency begin and end with human action and reaction. In ANT, nonhumans also act in the world, and their actions need to be attended to. The second is that ANT proposes a "flat" ontology in which all networks of actors, no matter how small or vast, are neither transcendent nor subject to reductionism. In this ontology TiVo is not reducible to its disk-drive, user-interface, electronic program guide, and so on, nor is it subjugated as a by-product of market forces, government regulation, or a changing mediascape. TiVo, disk-drives, user-interfaces, electronic program guides, market forces, government regulations, a changing mediascape, and many others are all actors on the same ontological plane. They jostle with one another to negotiate relationships and settle into stable networks. As explained by Latour (1999: 19), these negations constantly circulate, and there are no privileged and subordinate levels of analysis: "The social is a certain type of circulation that can travel endlessly without ever encountering either the micro-level or the macro-level." Furthermore, ANT also understands all actor-networks as contingent. This is an important methodological realization, one that can more fully account for the dynamic nature of contemporary media environments and why particular actors succeed or fail. Actors are constantly in a process of making themselves indispensable to others through a variety of strategies (see Callon 1986a, 1986b). This process stabilizes the identities of each actor, cuts them off from alternative realizations of their identity, and "transforms weak, provisional, and generally defined identities into durable and seemingly irreversible ties" (Shiga 2007: 41). By noting this procedural aspect of "assembling," ANT highlights the compromises made by each actor in the name of an assemblage, the work that needs to be done to maintain the integrity of the network and extend its life in time and space, and the process through which weak connections can become reified. Such a theoretical approach allows us to acknowledge the messy and contingent relations that exist between the technical and the social, and productively accounts for the presence and deployment of power in a nonhierarchical setting.

ANT has started to be deployed in media studies, with a number of scholars noting its potential usefulness to the field (Couldry 2004; Goggin 2009; Muecke 2009; Teurlings 2013). Signaling his interest in the material-semiotic assemblages that

constitute actor networks, Gerard Goggin (2009: 153) argues that ANT's focus on assemblages "brings into relief something quite distinctive about media cultures":

[The framework] radically questions the constitution, production and reproduction of the social, how assembling culture occurs and what its significance is. To take a Latourian perspective is to radically question the givenness of its structures. (Goggin 2009: 153)

This framework evokes a very different sense of media from established political or cultural economic approaches (Goggin 2009: 153). The intensification of contemporary media leads to media "claiming a wide range of areas and investments" (Goggin 2009: 153). However, they are doing so in ways that traditional political and cultural economies find difficult to adequately comprehend and this process of intensification—of media that operate across or beyond "given" institutional or structural systems—is something that needs to be traced and accounted for (Goggin 2009: 153).

Nick Couldry (2008: 2) also emphasizes the value that ANT brings to media studies, noting that ANT could help scholars avoid "the implicit functionalism in much media theory." Echoing the concerns of Goggin, he points to ANT as a useful theoretical tool that allows us to shed light on the various human and nonhuman elements that make up "the social." Rather than assuming that media *is* the social, Couldry calls for scholars to challenge the "mystifying effacement of the vast linkages of networks that make up the media process" (2008: 4), which has typified so much work in media studies. For Couldry, the benefit of ANT is that it allows a materialist approach toward the social embedding of technology to emerge.

In the context of the analysis of TiVo that follows, ANT is useful as it allows for an account of media that moves beyond traditional structural approaches to media that fail to account for the "intensification" of media and an increasingly convergent media environment that operates through and across these traditional structures. In short, it allows us to study both the granular interrelations between small-scale actor networks such as an electronic program guide, and large-scale actor networks such as an international treaty, providing a means of following their interrelations to account for the highly dynamic nature of media systems (see Goggin 2009).

ANT also emphasizes the generative and transformative potential of the connections between human and nonhuman actors—media cultures are not just there; they are constructed and they *do* things. As Joshua Braun (2013) notes,

... studies oriented around traditional industries tend to omit the contributions of players coming from unexpected quarters.

Considered within such a theoretical framework, TiVo can only emerge as a viable product through complex and shifting arrangements that are influenced by the interconnected performative assertions of hardware and software, specific local regulatory contexts, local, national and international legal maneuvers, changing viewing cultures and technological environments, and industry upheavals. Rather than presenting a meta-narrative of disruption and obsolescence, ANT allows for a fine-grained account of how technological innovations integrate themselves into the world.

Establishing an Actor Network around TiVo

We now turn to the story of TiVo in Australia and our analysis proceeds in two stages. In the first stage, using ANT we detail the prehistory of TiVo and its subsequent emergence, and outline how TiVo was able to enroll a collection of actors and their networks—consumers, law, television, broadcast networks, hard drives, the Internet, politicians, the Freeview symbol, VCRs, and PVRs—and establish a space from which the TiVo could operate in Australia. In so doing we “disassemble” TiVo, and reveal the various actors that were enrolled and networks that were disrupted to create a viable actor network around TiVo, and to support TiVo’s attempt to configure the technology as a natural part of the social. Following this analysis, we then explore how ANT can productively account for the creation as well as the failure of these networks, and assess the longer-term lack of success of TiVo in Australia through this theoretical framework. We begin this account by examining the broad socio-technical network of relations that constituted the arrival of TiVo in Australia.

To facilitate the successful introduction of a new technology into a world saturated with existing actor networks, a significant amount of repositioning, and reassembling must occur. What was strange and innovative must become natural and necessary as the new and the old jostle for allies, coherence, and durability and take new shapes. As Michel Callon (1986a: 21) notes, this demands a particular generative capacity from advocates of new technology:

[T]echnologists may be sometimes endowed with the capacity to construct a world, their world, to define its constituent elements, and to provide for it a time, a space, a history.

As part of this process they must enroll various actors, negotiate their roles, bind them together coherently and thus delimit a vision of the actor’s particular place in the actor network and their actor-network’s particular place in the entire collective that is often (mis)named “the social.” Establishing these complicated arrangements and developing a viable narrative of coherence became the first task of TiVo Inc. as they looked to introduce TiVo to Australia.

TiVo took almost a decade to reach Australian shores after it launched in the United States. This significant delay meant that Australian consumers were already aware of TiVo as a brand; however this did not mean that the introduction of the technology would be a simple matter. In a 2005 deal, Australian Pay TV provider Foxtel put together a network around a digital video recorder called iQ (Foxtel iQ PVR launches with OpenTV software 2005), which allowed subscribers to record and replay cable television. The exclusivity of this deal meant that unlike its U.S. counterpart, the Australian TiVo would not be able to compete in this market. TiVo Inc. also found that it was introducing TiVo into an already crowded commercial environment in which the software and hardware it had assembled did not in themselves offer a compelling inducement to consumers, or in early ANT idiom, an “obligatory passage point.” There were already plenty of sociotechnologies available to that enabled television to be recorded and replayed. In these circumstances TiVo needed to turn from its failure

to connect to cable or connect in a unique way to free-to-air and instead establish a new narrative.

The attempt to establish this positioning narrative becomes apparent when looking at the launch of TiVo in mid-2008. TiVo was framed as a revolutionary new technology that would respond to the needs and wants of Australian consumers, as well as freeing them from the strictures of free-to-air broadcast programming schedules. It also suggested a linking bridge between the old free-to-air broadcast media and the possibilities of cable broadband, with the introduction of TiVo representing the future of television, and a technology that “lies at the intersection between broadcast and broadband” (TiVo HD 2008). TiVo was also presented as a populist device in an attempt to distinguish itself from Foxtel iQ. Unlike the United States or the United Kingdom, Australia has seen a relatively slow take up of subscription cable television with only around 30 percent of the population subscribing to pay television (Groves 2013; McDuling 2012). Therefore TiVo was able to develop a viable narrative that positioned itself as a technology providing viewing “freedom” to the bulk of the nation’s television viewers.

This discourse was continued in early advertisements that introduced the technology to the Australian public. The most instructive ad sees an everyday man pause his television program—newly equipped with TiVo—before turning to the camera and informing the audience that his life has changed. He walks out his front door to join an advancing army of everyday consumers, brandishing remotes, and continues talking to the camera:

This is a revolution, no more being told what to watch, when to watch it. This is TV your way, in your time . . . no-one’s going to tell us what to do, when to do it, because we’re Australian . . . and we’re taking control . . . join the revolution . . . TiVo, TV your way. (TiVo Australia TV Ad 3 2008)

Throughout this process TiVo Inc.’s narrative is one that emphasizes its trusted brand name, but more importantly outlines the process through which TiVo would alter and influence the “social.” Unlike the Foxtel iQ, a marker of status, TiVo positions itself as a technology “for all Australians.” Through interceding in the relationship between viewers and broadcasters, TiVo hoped to destabilize a long established and extensive actor network, and to position itself as a passage-point between the extant world of broadcast media and the new world of digital media. In this new world, TiVo would mediate relations between viewers and broadcasters, and in so doing, enhance the agency of viewers.

By studying this narrative, we also begin to see who TiVo Inc. enlists as actors in its actor-world order to realize its vision, and sustain TiVo’s position in Australia’s wider media culture. Most importantly, TiVo established a corporate partnership with one of Australia’s largest media players, the Seven Media Group, enlisting them as an actor in their actor-world, one who would happily espouse TiVo’s narrative of “revolution” (see Bodey 2007). Strategically important due to the membership of broadcast television network Channel Seven in the Seven Media Group, this partnership allowed

TiVo to present itself as a friend to traditional media. In doing so TiVo avoided conflict with broadcast organizations that had previously raised legal concerns about the disruptive aspects of DVR recording and instead was able to position itself as a welcome addition to the existing media environment (see Fitzgerald and Atkinson 2008).

As part of its enrollment into TiVo's actor world, Channel Seven would publicize the new technology and use its local celebrities and its knowledge of the Australian market to push sales (see TiVo Australia TV Ad 3 2008). Harvey Norman, a national retailer with more than 190 stores in Australia, was enrolled as a launch partner and stood as a mediator that would quickly introduce TiVo as a purchasing option in the retail stores across Australia (Dahdah 2008). Consumers were to be enlisted through the "enhanced agency" narrative deployed at the launch and through the following months were expected to be willing participants in a televisual "revolution." The television set itself stood as a necessary actor in the entire process. It was enrolled and reshaped semiotically in its relation to the viewer through TiVo's aforementioned "enhanced agency" narrative. This implied a concomitant reduction in the television's agency, and the television was linked materially through the aforementioned hardware and software.

The VCR and other "televisual extensions" to the traditional television (Thomas 2008: 93), were connected to the material-semiotics of TiVo in two ways. On the one hand they were made materially redundant by TiVo's superior hardware and software, but on the other hand, they were important semiotically as well-understood exemplars of a technology type that TiVo could position itself within and ultimately transform. TiVo Inc. also enlisted the Internet as a material-semiotic network, with the company encouraging consumers to engage with online televisual consumption solely through TiVo, redirecting consumers away from the myriad of consumption options online to a usage of broadband that was constituted largely through the TiVo device. For its part, the Seven Group benefited from the alliance with TiVo through giving the group access to TiVo's associations with "the future of television."

Along with the Seven Group, the Freeview network was the most important ally recruited to TiVo's actor world, and the link to Freeview further cemented TiVo's stability and growing power in Australia. Freeview, a network constructed and maintained by the vast majority of Australia's free to air digital networks, had made numerous attempts to resist the introduction of PVRs, but in 2007 decided to "make their program listing information available to manufacturers of set top boxes, [PVRs] and other service providers" as long as manufacturers complied with a range of "requirements designed to protect copyright, protect the integrity of the program information and facilitate collection of ratings information" (Free TV Australia 2007). Compliant manufacturers would be formally endorsed by Freeview in the form of a "Freeview" logo on their device. Thanks to the articulation of the Seven Media Group and the TiVo, it is unsurprising that TiVo was considered an exemplary PVR, earning its Freeview endorsement soon after launch (Broughall 2009).

Considering all of TiVo's efforts to reshape its actor-world, it is important to re-emphasize the agency of nonhuman actors and their significance at every scale of analysis. As Callon (1986a: 23) explains, one can identify the significance of an actor

and their agency by considering whether the network under examination would break down and fall apart if that actor were to be removed from the actor world. Turning to the TiVo then, we consider the small-scale nonhuman actors such as disk drives, remote controls, and EPGs, and judge that TiVo would fall apart without their cooperative agency. At a larger scale, heterogeneous actor networks such as the Seven Group and Harvey Norman are also vital, and TiVo would again cease to exist without their cooperation.

Translation: Sustaining and Extending TiVo Inc.'s Actor Network

Given that all actor networks are unstable and require active maintenance, how does the Australian TiVo protect its linkages, build new ones, and avoid the possibility of its own demise? According to actor-network theory, TiVo can only survive through a process of circulating translations, a “contingent, local and variable” process that “generates ordering effects such as devices, agents, institutions, or organizations” (Law 1992: 386). By 2008 TiVo Inc. has established an actor world that is heterogeneous, robustly linked, and relatively stable. It is now part of a broader narrative of social and technological change that supports TiVo’s disruptive influence and provides it with legitimacy. However, there are many other actors outside the network who have contrary goals, who resist TiVo’s narrative and the position the TiVo network imposes on them, and seek to at least reshape and at most disassemble the TiVo network. Within TiVo, too, actors are restless, and we see “a heterogeneous set of bits and pieces each with its own inclinations” (Law 1992: 386), and each ready in principle to mutiny.

At this point in our story TiVo had established a relatively stable and extensive network of associations whereby it was able to speak on behalf of others. Callon (1986a: 24) deploys a useful term—*Translator-Spokesman*—to explain how this process of translation operates. He notes that each actor is assigned “an identity, interests, a role to play, a course of action to follow and projects to carry out.” The translator speaks on behalf of each actor and reconfigures their aims with the goal of establishing coherence between the actors, collectively linked to the preferred vision of the actor world. Part of this process of translation is simplification. Actors—who are always complex and retain their own intricacies and lives—will be “black-boxed,” with the process of translation ignoring these complexities, as each actor is slowly reduced to be a serviceable part of a particular actor world, providing each actor with context, significance, and limitations (Callon 1986a: 30).

In the case of TiVo, we see a series of translations occur in an attempt to stabilize itself in Australia. It “translates” Channel Seven—one of the three large FTA networks in Australia—repositioning it as an advocate of TiVo, with its identity and indeed its televisual future, no longer linked to its long history of broadcasting, but rather read through the possibilities and freedom inherent in the TiVo. This translation is even supported by Channel Seven CEO David Leckie at the launch, where he claimed that “TiVo [would] play a key role in the future of free-to-air television in Australia” (TiVo

HD 2008). A range of large-scale heterogeneous actor networks, including Channel Seven, their employees, the Seven Media Group as a whole, and indeed—according to Leckie—the entire functional infrastructure of FTA television, is simplified and redirected, positioned inexorably in TiVo’s actor world, and is given a new identity as a media resource and a new dependency on the success (or failure) of TiVo.

Further translations would follow. TiVo Inc. spoke on behalf of a range of actors, reshaping their identity, their position in the world of the social, and oriented them around the TiVo. Harvey Norman’s “retail distribution and logistics” (Dahdah 2008) were deployed as infrastructural support for the TiVo to access all of Australia’s hardware consumers. Viewers, televisions, VCRs, hard drives, the Internet, and the Freeview consortium were also translated through TiVo’s own narrative of the social and technical, and TiVo’s attempt at translation was to this point successful. It sold five to six times the volume of any other PVR in the first 5 months following its launch—14,000 units all up—and found itself with AUD\$9.8 million in revenue to be shared between stakeholders. Emboldened by its success, TiVo Inc. sought to enroll more actors to its expanding actor network, sensing that this would further entrench the TiVo in the Australian media ecology (Avenell 2013).

A range of new retailers were allowed to sell the TiVo from late-2008 onward, with JB Hi-Fi, Clive Anthony’s, David Jones and The Good Guys officially added to the list of distributors alongside Harvey Norman. JB Hi-Fi CEO Richard Uechtritz spoke confidently of TiVo’s durability, claiming that TiVo would “stay relevant over time” (Avenell 2013; TiVo retail expansion 2008). Consumers were also able to purchase TiVo’s directly from the TiVo website, making the hardware increasingly accessible. New software was also deployed when TiVo released a subscription service—CASPA On-Demand—allowing downloadable content to be delivered directly to users of a TiVo device. Internet service providers Internode, Primus, and iiNet were added to the actor network, with TiVo Inc. engaging in a series of corporate partnerships that allowed ISP subscribers to perform unmetered downloads on CASPA (Avenell 2013).¹ Throughout this time of expansion and consolidation, TiVo Inc. continued their narrative of significant social and technological change, with the TiVo positioned at the heart of a new media environment.

By 2009, TiVo made another dramatic move forward through successfully associating itself with the biggest game in town—the National Broadband Network (NBN). The NBN is the largest infrastructure project in Australia’s history, providing fiber to the premises of 93 percent of Australian homes, and a minimum 100 Mb/s download performance. The NBN was clearly an actor network that would change the entire media-scape and alter the foundations on which all media actor networks stood. In this context, TiVo and the NBN were directly linked through a strategic project in an early rollout area in Tasmania. Robbee Minicola, CEO of TiVo in Australia, translated the NBN, repositioning this infrastructure as just another actor vital to the success of TiVo in Australia:

Many people do not understand what the NBN is—let alone the impact it will have in our own home . . . Our aim is to demystify what the NBN means, remove technological jargon

from the equation and enable Australians to understand how a product such as a TiVo can be turbo-charged by an Internet speed up to 200 times faster than the average Internet connection. (Lui 2009)

TiVo Inc. engaged in the range of additional activities across 2008–2010 that spoke to its transformative potential, signing content distribution agreements with leading studios, broadcasting 3D TV directly into homes ahead of its rivals, and starting trials on the new 4G spectrum (Avenell 2013).

At this stage in the development of TiVo, we see the signs of a successful translation; the point at which an “actor-world renders itself indispensable,” when the actors that form a part of such a world have “no future” outside of the world (Callon 1986a: 26). Sales were intimidatingly strong, a range of corporate and government interests had centered around the technology, the television itself was reconfigured around the notion of the PVR, and their social and technical narrative was not only being sustained it was also enrolling new interests as time went on. Over a long period of time, successful translation has a significant impact. It makes people forget the history of objects. It leads to the emergence of durable organization and institutional forms; establishing a new “natural order” (Callon 1986b: 28) of televisual consumption with TiVo at its heart.

The Failure of TiVo

Despite the above, TiVo is now struggling in Australia and it is equally possible to understand its demise through the same process of translation. Translation is a difficult process, never fully completed or entirely stable, and is always under threat from actors attempting to create their own actor-worlds (see Callon 1986a, 1986b; Law 1992). This process of creation is therefore always relational, with actors engaging with a push and pull of narratives and organization as they attempt to inscribe their vision on to an actor world. The fact that these processes are contingent does not mean that we cannot ascertain clear evidence of enrollment. The statement of Channel Seven CEO David Leckie, who links the future of FTA directly to TiVo, is evidence of clear and strong enrollment between Channel Seven and the social and technical narrative of TiVo (TiVo HD 2008). But resistance does occur from less invested actors, which ultimately can lead to the breakdown of an actor world.

The first signs of resistance in TiVo’s actor world came from consumers, who had initially been enthusiastic about their recruitment. Sales dropped in early 2011, with somewhere between 70,000 and 100,000 rumored to be sold from its launch in 2008 to February 2011, suggesting a dramatic drop off in consumer engagement, with the targets well below the internal goals the company set for itself. The failure of the TiVo-Channel Seven consortium to reach their mid-2011 target of 500,000 units led to redundancies, leaving only five or six staff to manage the entire country and the downgrading of customer support to email-only (see Cartwright 2011; Showbridge 2011). Resistance to the actor-world of TiVo was also eventually seen through previously enrolled actors, from an array of nonhuman actors including televisions, the Internet,

the NBN, and hard disks to ISPs and eventually retail stores. A series of industry developments meant that, by the 2010s, streaming video was increasingly becoming an attainable reality for Australian consumers, shifting their television consumption from the couch to practically anywhere.

A range of comprehensive IPTV services were launched by a number of Internet service providers severing the link TiVo Inc. attempted to consolidate between the TiVo device and the Internet since its launch. iiNet broke from its previous relationship with TiVo by launching iiNetTV, selling a PVR device and content access through its own ISP; Telstra's BigPond released an on-demand service available on their proprietary T-Box device or through select Internet-enabled TV manufacturers; on-demand content was provided by traditional cable provider Foxtel on the Xbox 360 console; over-the-top (OTT) services such as Quickflix, expanded its mail delivery DVD rental service to include online streaming for Internet-connected devices; and finally so-called "super aggregators" such as Apple TV and Google TV, continued to offer content using OTT services such as iTunes and proprietary set-top boxes (The Australian Communications and Media Authority [ACMA] 2012). While many of these new Internet TV services incorporated set-top boxes or PVRs similar to TiVo, importantly much of this new content was to be routed directly to Internet-enabled devices, including TV screens.

Hard disks continued to become cheaper and larger (see Walter 2005) meaning that TiVo Inc. needed to add storage capacity to maintain relevance, considering the first TiVo only carried 160 gb of data. TiVo Inc. allowed consumers to add on external hard drive to increase capacity, and also released a 1TB version of the TiVo in 2011. Despite the increased capacity, the new TiVo failed to engage with recent innovations in the PVR market leading influential technology reviewer Adam Turner to declare TiVo "the dinosaur of the Australian market." Instead of offering smartphone apps with remote scheduling, extra online content, extra tuners or content streaming, all TiVo could offer was "a bigger hard drive and a hefty price tag" (Turner 2011). The total breakdown of the actor world was seen when it was revealed that the original exclusive retailer Harvey Norman had stopped stocking TiVo at the end of 2012 ultimately spelling the demise of the Australian TiVo (Cartwright 2012).

Returning to the concept of translation and actor-network theory we can explore the process and ramifications of this decline. At the end of his landmark study of the scallops and fishermen in St Brieuc Bay, Callon (1986b) notes dryly that "from translation to treason there is only a short step." This process is essentially what we saw during the rapid decline of TiVo in Australia. TiVo had an initial burst of popularity in mid to late-2008, which saw TiVo Inc. able to speak on behalf of a range of representatives and stand as a legitimate spokesperson, not just of their own product, but of a particular vision of society and indeed of the near future. For a brief moment in time TiVo's future as a sociotechnical device in Australia seemed assured and it was understood as a natural part of the media environment. However, a sudden drop in sales saw their vision of the social challenged and important actors rebelled, separating themselves from TiVo's actor network, redefining their identities, enrolling in new projects, and ultimately damning the Australian TiVo to obsolescence.

Conclusion: The Value of Actor-Network Theory

This article has explored the broad socio-technical network of relations affecting the arrival and ultimate fate of TiVo in Australia through the framework of ANT. We have detailed how such a framework operates and then turned to the case of TiVo, explaining how TiVo Inc. enrolled various actors in their actor network and engaged in a process of translation to sustain and maintain such a network. We have also outlined how the ultimate failure of this network eventually led to TiVo's demise in Australia. Throughout this process we have treated actors of different kinds in a symmetrical fashion, attended to the negotiations and compromises made to add to an assemblage and maintain its membership, and have detailed the dynamics of performance within and between assemblages. The significant complexity of these processes involved in TiVo's rise and fall underline the benefit that ANT can bring to analyses of media objects.

What ANT does so usefully is unpack these complexities, which are often hidden in "simplistic notions of causality and impact narratives" that are often deployed to explain technological change (Shiga 2007: 53). John Shiga explains that ANT and the theory of translation:

[P]roblematizes dominant themes in studies of new technologies and artifacts such as the notion of instantaneous information transfer, direct political/economic influences as the prime mover of technological change, and nonhuman agency as the imitation of human action. (Shiga 2007: 53)

This approach, which we have deployed throughout this article, suggests that concepts like "impact" and "revolution" obscure a much more finely grained process that explains how new technologies integrate themselves into the social. It also privileges the role of human actors when—as seen through the example of the TiVo, which was so reliant on technical objects such as hard drives and VCRs—nonhuman actors had a vital role to play in its success and failure.

In concluding our analysis of TiVo, we suggest that ANT has much to bring to the discipline of media studies. As well as providing a valuable tool through which to tell the story of TiVo's dramatic rise and fall, ANT allowed us to attend to the variety of alliances that make up the contemporary media environment and account for the contingency of such alliances. It also highlights links between a range of actors, which allowed us to account for a number of influential actors regardless of their apparent "size." ANT reveals the constructed nature of the social and the constant possibility of failure in these alliances. It makes the natural fact of technology and media strange again and suggests more productive and detailed forms of analysis and understanding.

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Note

1. The licensee of TiVo in Australia, Hybrid Television Services, owned by Seven Media Group, has announced that the Caspa On-Demand service will soon be available on other Internet-enabled devices. This has yet to be realized or made available (see Hybrid Television Services 2010). Furthermore, unlike many other countries, Australian ISPs often have a monthly download limit on many of their plans. Once consumers exceed this limit their Internet speeds are “shaped” and run significantly slower. Therefore, “unmetered” downloads would be of great interest to many households who consume significant amounts of data.

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Author Biographies

James Meese is a doctoral candidate at the Institute for Social Research, Swinburne University of Technology, Melbourne, Australia.

Rowan Wilken holds a Discovery Early Career Researcher Award in the Swinburne Institute for Social Research, Swinburne University of Technology, Melbourne, Australia.

Bjorn Nansen holds a Discovery Early Career Researcher Award in the Department of Computing and Information Systems at the University of Melbourne.

Michael Arnold is a senior lecturer in the School of Historical and Philosophical Studies, at the University of Melbourne.