A study of innovation in the making CARMACAL and the Dutch outbound travel industry

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Introduction

How to reduce carbon emissions and contribute to climate change mitigation? For years the carbon-intensive travel industry has been struggling with this question. Research has addressed the relation between climate change and tourism (e.g., Gössling et al 2015; Becken, 2013; Gössling, 2010; Gössling et al 2010; Bows et al, 2009). Their work produced models and measurement methods, and recommended mitigation policies and actions (Scott, 2011; Dwyer et al, 2010; Gössling et al 2010; McKercher, 2010). Major industry players have since adopted carbon reduction measures in their CSR policies (Thomas Cook group, 2015; TUI Group, 2015). However, the bulk of the travel industry consists of SMEs that typically have limited resources available for CSR. CARMACAL may offer a solution for the sector at large. CARMACAL is a user-friendly application that enables tour operators to accurately measure the complete carbon footprint of their tour packages and integrate carbon management in their business (CSTT, 2016a). The industry acknowledged its relevance: in April 2016 CARMACAL won the WTTC Tourism for Tomorrow Innovation Award.

Yet, CARMACAL is just an element in a complex process of innovation in the making. Indeed, at its very core CARMACAL is a piece of technology, the outcome of a network stitched together by the people and organizations enrolled in the project that developed it. CARMACAL is their collective invention; a hybrid collection of human and non-human elements, a network of people and things. It is the product of researchers and software engineers that connected databases, obtained licenses, invented algorithms, and developed interfaces, and –while this work was in full progress- enrolled a wide range of people and organizations in this collective endeavour. The result? When users enter numbers, select options and click *ok*, CARMACAL will produce figures, percentages and graphs. But what is the value of this invention, apart from a sense of pride evoked by great achievement? Only when the inventors succeed in enrolling customers, suppliers, staff, and investors in their network to collectively translate these readings into actions, value is mobilized. Only then, their invention becomes innovation.

This innovation process resembles "a fate played out in accordance with a mysterious script", held together by a collection of confusing and diverse decisions made by a considerable number of different and at times conflicting actors that are unable to assess the value of their decisions at the moment they make them (Akrich et al, 2002a, p. 188). Hence innovation is the *result* of this chaotic ordering process: an *outcome* that appears in front of its observers as black boxes: elements taken for granted as an integrated part of daily reality. Therefore, to understand this process of innovation in the making, observers should analyse innovation in its environment (ibid), and examine how relational practices of actors are ordered into relatively stabilized networks (Jóhannesson et al, 2012).

Several scholars in tourism and management research have called for empirical studies at micro level that show how innovation works (Wirtz et al, 2015; Mustak, 2014; Camisón and Momfort mir, 2012; Hjalager, 2010). Some argued such work should clarify the role of CSR in innovation (Kudlak and Low, 2015; Glavas and Aguinis, 2012). We addressed this research gap and analysed innovation in the making, using a study of CARMACAL. We looked how –through a process of linking people, organizations, ideas, technologies, data, and resources over time- CARMACAL was constructed. Also we examined how this process has (not) affected the ways in which participating tour operators mobilize value.

Literature review

Any innovation process is a quest to mobilize new sources of value. Innovation entails "the art of interesting an increased number of allies who will make *you* stronger and stronger" (Akrich et al (2002a, p. 205, italics added). Early literature indeed portrayed innovation as a human affair: the actions of the risk-taking figure of the entrepreneur on his quest for novelty were considered the prime source of value. Once pioneering becomes established practice, this innovator is removed through a process of creative destruction (Schumpeter, 1942; 1934). Management literature has expanded ever since and replaced him with the notion of the firm. Amit and Zott (2001) reviewed several theoretical domains of the management literature and portrayed the firm as the omnipresent mobilizer of value. Transaction cost economics sees value as the result of the firm's efficient transactions. Porter's value chain framework locates it in the firm's value chains and claims value is mobilized through its strategic policies. The resource-based view holds that value resides in the firm's resources, while the dynamic capabilities approach puts it in the firm's internal processes and suggests value is mobilized when linked to opportunities. Yet, none of these domains questions the notion of the firm itself: it has become a black box par excellence. Rather than self-evident *beings* equipped with the power to mobilize value independent from others, Ren et al (2012) argue entities like firms are *performed.* We follow Paget et al (2010) and view the firm as a construct, the outcome of a constant ordering process performed in a network of managers, staff, customers, suppliers, competitors, shareholders, technologies, and capital. It is held together by transaction mechanisms, contracts, and collections of at times conflicting ideas, and collectively

assembles, distributes, and trades products and services. It activates value when it includes tangible user benefits and stabilizes over time.

Business models delineate how business creates, distributes and captures value from technological innovation (Teece, 2010), and thus resemble a map of the network's architecture. The concept has been well reviewed in management literature (Wirtz et al, 2016; Zott et al, 2011; Shafer et al, 2005). Da Silva and Trkman (2014) argued business models explain how innovation projects that deal with technology foreign to prevailing industry logic would benefit the firm. Those benefits may include sustained value (Achtenhagen et al, 2013), increase of profit and growth (Chesbrough, 2010), monetization of novel technology (Wirtz et al, 2010), and new ways to deliver products and value to customers (Markides, 2006). Baden-Fuller and Haefliger (2013) argue that a business model is a *model:* a node in the network that represents a copy of things (a miniature of reality) and things to be copied (an illustration of the ideal case). It resembles Van der Duim's (2007) network calculus; ""a more or less explicit framework of interconnected concepts with which to read the relevant empirical reality and translate it into new actions "(p. 970). A key ordering process of innovation is therefore the enrolment of new technology in this framework.

CSR links new beneficiaries to business. These actors may be human, non-human, or hybrids (i.e. communities, governments, charities, the environment). Value is mobilized once these beneficiaries have stabilized their network, and benefits are performed. CSR has become an integrated part of management literature. Various handbooks and edited volumes discussed the concept; see for instance Tolhurst and Pohl (2012); Henningfeld et al (2012); Ihlen et al (2011); Blowfield and Murray (2008), and Crane et al (2008). CSR should be viewed in the context of evolving political discourses about the role of business in society. During Cold War years, Western Governments advanced business as the proponent of free market capitalism in attempts to counter Soviet Communism (Spector, 2008). Questioning the nature of corporate practices served no political purpose; first and foremost, business was meant to be business; Friedman's (1970) free agent that *focused* value mobilization exclusively on maximizing shareholder profit. Academic debates on CSR were predominantly US centered, and revolved around definitional issues and ideas about ethical leadership of the corporation (for a review see Carroll, 1999). While neoliberalism eroded state power after the Cold War, the CSR construct got increasingly entangled with sustainable development discourse (see Carroll, 2008; 1999). Business now had to serve voluntary philanthropy as side dish. This implied *balancing* its value mobilization process; business was to pursue growth while voluntary addressing its impacts on society to avoid state intervention (Coles et al, 2013). Porter and Kramer (2006) considered this balancing act counterproductive, as it disconnected strategy from social responsibility. Nevertheless, CSR research revolved around stakeholder management along dimensions that correspond with the triple bottom line of sustainable development (Aguinis and Glavas, 2012; Carroll, 2008; Dahlsrud, 2006). Also it extensively explored whether this balancing act had a business case (Carrol and Shabana, 2010). Since the 2008 financial crisis global business has witnessed little organic growth. While facing increased

stakeholder pressure to address social and environmental challenges states alone cannot solve, the question whether business is capable of creating genuine impact remains unanswered (Kudlak and Law, 2015). To achieve this, business needs to *transform* its value mobilization process, and become an agent of change that creates *shared* or s*ustainable* value: social and environmental benefits that result in increased shareholder value (Mirvis et al 2016; Porter and Kramer 2011; Hart and Millstein, 2003). Yet, the question remains how such innovation is realized.

Within these parameters this paper addresses two knowledge gaps. First, several scholars have called for empirical studies at micro level that show how innovation works. Such work should look at the development of relationships and trust in service innovation networks (Mustak, 2014), the role of CSR in stimulating innovations and addressing the environmental crisis (Kudlak and Low, 2015), underlying mechanisms of CSR at the micro level (Glavas and Aguinis, 2012), and the relationships that constitute business models (Wirtz et al, 2015; Baden-Fuller and Morgan, 2010). In tourism research Hlajager (2010) called for research to look into innovation processes of tourism enterprises, and Camisón and Momfort mir (2012) suggested more empirical work on innovation and technology diffusion in tourism. Akrich et al (2002a) argued such case studies should avoid the trap of retrospective explanation. Observers should avoid "edifying stories which retrospectively invoke the absence of demand, technical difficulties or inhibitory costs." Such stories may be true, but this truth is controversial as it is "blindly created by the story" (p. 190). *Understanding* innovation therefore requires observers to challenge these "discourses of accusation" (Akrich et al, 2002a; 2002b, p.224), and reconstruct the perspectives, actions, arguments, and decisions of those involved in the process as innovation unfolds, *in the context of the moment.* Second, Tourism research has studied innovation (e.g., Hjalager, 2015; Brooker and Joppe, 2014; Rodríguez et al, 2014; Camisón and Momfort mir, 2012; Paget et al, 2010; Hjalager, 2010), and looked at CSR (e.g., Font et al, 2016; Wells et al, 2016; 2015; Lee et al, 2013; Sandve and Øgaard, 2013; Font et al, 2012; and Schwartz et al, 2008). However, the bulk of this work has treated these concepts separately: little tourism research has explored interrelations between both concepts. This work answers their calls by addressing aforementioned knowledge gaps and providing a predominantly qualitative case study of a CSR-driven innovation process in which technology diffusion takes centre stage.

Methods

Little empirical research at micro level analysed how innovation works. Also limited tourism research examined the interrelations between CSR and innovation. Therefore this study aims to analyse how innovation works by providing an empirical account of an ongoing CSR-driven innovation process. In the specific setting of the Dutch outbound travel industry we illustrate how CARMACAL was constructed and its implications for the value mobilization process of tour operators. The study draws from qualitative data collected in two thesis research projects (table 1). In total 21 semi-structured interviews with CARMACAL project partners were

conducted (table 2). All interviews have been transcribed verbatim and analysed using open and themed coding (table 3). This study had two limitations. As it involved an analysis of innovation in progress, the subject matter was highly dynamic at the time of the interviews. Second, interviews have been transcribed in Dutch. Quotes from the data have been translated in English. Possibly this affected the connotation of the message.

Table 1. Thesis research projects

Thesis	Topic
Blom, J. (2016). *Eco-efficiency in tour operating. An analysis of the application of the eco-efficiency ratio on selected trips and its implications for decision-making.* Unpublished bachelor's thesis. NHTV Breda University of Applied Sciences & Wageningen University. Breda and Wageningen, The Netherlands.	Eco-efficiency, carbon management, tour operators, CSR.
Vermeer, J. (2016). *From Invention to innovation? A case study of CARMACAL*. Unpublished bachelor's thesis. NHTV University of Applied Sciences, Breda, The Netherlands.	Innovation, carbon management, tour operators, CSR.

Table 2. Respondents

Respondent	Position	Organization	Date interview	Duration interview
R1	Director	Tour operator (SME)	02-03-2016	53 min.
R2	Director	Tour operator (SME)	09-03-2016	32 min.
R3	Sustainable tourism coordinator	Tour operator	10-03-2016	17 min.
R4	Travel expert	Tour operator (SME)	15-03-2016	22 min.
R5	Director	Tour operator (SME)	17-03-2016	N/A
R6	Manager marketing & sales	Tour operator (SME)	16-03-2016	30 min.
R7	Sustainability coordinator	Tour operator (SME)	21-03-2016	N/A
R8	Product manager	Tour operator (SME)	22-03-2016	31 min
R9	Manager tour operating	Tour operator (SME)	23-03-2016	N/A
R10	Director		14-03-2016	26 min
R11	Sustainable tourism coordinator	Tour operator	30-04-2016	41 min
R12	Junior Carbon Advisor	Consultancy agency	25-03-2016	35 min

R13	Manager	Certification program	01-04-2016	N/A
R14	Researcher	Research and knowledge institute	24-02-2016	39 min
R15	Researcher	Research and knowledge institute	25-02-2016	30 min
R16	Manager	Industry association	18-03-2016	53 min
R17	Product manager	Tour operator	09-05-2016	29 min
R18	Sustainable tourism coordinator	Tour operator	10-05-2016	19 min
R19	Product manager	Tour operator	13-05-2016	22 min
R20	Product manager	Tour operator	13-05-2016	31 min
R21	Product manager	Tour operator	24-05-2016	28 min

Table 3   Themes & codes

No	Theme	Description
1	**The construction of CARMACAL**	Drivers
		Perspective of creators
		Current actions and strategies
		Cost/benefit perspectives
		Technical improvements
		Perceived conditions for future success (excl. label)
2	**The social-technological struggle**	Compatibility with tour operating practices
		Hold strategies and externalization
3	**The absence of the customer**	Perspectives on customers
		Perspectives on social responsibilities
		Concern effects of label on business
		Strategic purposes

Context

The carbon footprint of Dutch holidaymakers is considerable. With 17.9 million holidays in 2014, The Netherlands represents a major international leisure travel market. 11 million

holidays involved plane travel (including 2.5 million long haul return flights). 7.1 million trips concerned package holidays (NBTC, 2014). For decades the approximately 3400 tour operators and travel agents that constitute the Dutch outbound travel industry have supplied this market (Reiswerk, 2016). They have built their market positions by reselling travel services in exchange for a fee through de facto information monopolies. At present this business model is under pressure. Recent ICT developments increased market transparency, empowered consumers, and facilitated new entrants with web-based business models. The Dutch Association of Travel Agents and Tour Operators (ANVR) represents approximately 180 tour operators and travel agents in the Netherlands (CSTT, 2016b). It commissioned a range of studies that analysed the innovation challenges of the industry (ANVR and Capgemini, 2015; Beulink et al 2012; Nijboer and Goedegebure, 2012;). All studies emphasized the importance of sustainability, and the ANVR has claimed sustainability supports innovation (Reiswerk, 2015). Yet, integration tendencies in the international travel industry seem to confine rather than encourage such innovations (Hjalager, 2010). Although front running tour operators and the ANVR have been actively engaged in CSR for some time (van de Mosselaer et al, 2012), this involvement resulted in limited business innovation. CARMACAL may bridge this gap.

CARMACAL is the outcome of the CARMATOP project, funded under the RAAK-SME program by the Dutch Ministry of Education, Culture, and Science. The RAAK-SME program (Regional Attention for Knowledge Circulation) subsidizes two-year innovation projects in which Dutch Universities of Applied Sciences create new knowledge through research in collaboration with a SME consortium in a specific sector. This research should be demand driven, i.e. based on concrete needs of participating SMEs. NHTV's Centre for Sustainable Tourism and Transport Studies led this project, in collaboration with HZ University, and expert partners ANVR, ECEAT and Climate Neutral Group. 16 tour operators participated in the project: most of them are considered CSR frontrunners in the Dutch travel industry (ANVR, 2016; CSTT, 2016b; 2016c). CARMATOP contained three work packages: research into carbon calculators and consumer research into carbon footprint communication on tour packages (I), development and testing of the ICT tool (II), and research into carbon management, develop and test carbon management strategies, and preliminary research into a possible carbon label for tour packages (III) (CSTT, 2016b). CARMATOP ran from 2013 to 2015. At present, tour operators and other interested organizations can purchase annual user licenses from the recently established Carbon Management Travel and Tourism foundation (CSTT, 2016a).

Results

The following sections present the results of the interviews and correspond with the themes presented in table 3.

1. The construction of CARMACAL

CARMACAL resembles a network that got constructed through the coincidental blending of two different ideas about emission reductions: carbon management and carbon labeling. The first idea started in 2010 when a tour operator approached CSTT with this question; *"to decide whether it makes sense for us to start compensating our tours in the future, I need to know the carbon footprint of our tours. Can you map this for us*?"(R2). The following two years CSTT did two projects with this company. In the first project researchers invented a formula that enabled basic calculation of the carbon footprint of the company's long haul group tours. In the second they assessed how the company could reduce its carbon footprint without affecting the customers' holiday experience; *"this was easy; offer customers direct flights whenever possible" (*R2)*. Both projects concerned carbon *management*: a B2B activity that aids business to reduce emissions through informed adjustments of its operations. During the Dutch Holiday Exhibition in January 2012, the tour operator shared her experience in a meeting with other tour operators. It picked up collective interest. Some present in the meeting were excited about a presentation by professor Stefan Gössling they had attended just before. Gössling had talked positively about carbon labeling; "*his story about labeling was really inspiring, how important labeling is to get the sustainability movement going"* (R1). Gössling's suggestion may have been prophetic, for the promise of labeling mobilized industry collaboration; *if everybody starts his own label, we risk ending up with 36 different labels. Why don't we make it an industry-wide initiative? We started a project group and involved others. NHTV joined, as well as GreenSeat. And this is how CARMACAL started"* (R1). This is how carbon management got entangled with carbon labeling: a B2C activity that aids business to achieve emission reductions by enticing customers to alter their purchase behavior. While both concepts share emission reduction, each entails fundamentally different ideas about who should take responsibility and change behavior: business or customers? However, both require accurate measurement of emissions. The project group needed a single application to consistently measure the carbon footprint of tour packages, and turned to the RAAK-SME program for funding support, which resulted in the CARMATOP project.

To secure funding, a project proposal had to be constructed that demonstrated the project included new knowledge development (carbon measurement techniques), application (carbon management by means of an ICT tool), and relevance for industry and higher education (a consortium of universities, tour operators and branch organizations). Informed by the RAAK-SME funding requirements, CARMATOP became the ordering process that linked carbon management and carbon labelling. CARMATOP afforded influence to the experts of CSTT, who had to create the calculator; *"we had particular ideas regarding research, which we could implement in CARMATOP, while also addressing their questions regarding the label. So it was a combination of both. But I do think it was our initiative. More so since sitting down, thinking, and writing the RAAK proposal required an enormous amount of time and you cannot ask tour operators to lead that process"* (R15). Their rationale for CARMATOP was carbon management; "*our intention with this project was that tour operators would start working*

with it internally, the name is not without reason carbon management" (R15). But it was the idea of the carbon label that enrolled tour operators in the network and established the consortium; *"without the label tour operators cannot come up with a reason to work with CARMACAL"* (R1). The creators put it into CARMATOP, but ordered as separate work package. Unlike the tool, the label was not something that had to be built, only researched. While it was not their initial intention, the creators had enrolled the carbon label in the network and made it part of CARMACAL's purpose. After completion of CARMATOP not the project but the tool itself had to hold the network together. Over a period of a year only 8 licenses had been sold (R14). *"As it is now it will not have a future"* (R2). While those involved enrolled in CARMACAL for different reasons (table 4), all agreed that expansion of the tool's user base was essential. *"To keep this system going, we need more participants"* (R14). They proposed a variety of strategies (table 5) that illustrate how the existence of the device as well as the uncertainty of its future triggered networks configurations. These will determine whether the network will hold, or fall apart.

Table 4. Personal drivers & rationales

Drivers	Quotes
Take responsibility for one's impacts	*"You may say, why are you making all these efforts, yes well, I think it is a sort of basic responsibility. That is my feeling about it"* (R1) *"We know it is a polluting industry… "it is very important that this development will come, as we have to reduce our footprints, therefore something needs to change"* (R2)
Do their part to contribute to sustainability	*"Leave the world behind in good condition"* (R1) *"I want to make the world a bit better"* (R2) *"To help the world, let's say for a better planet"* (R6) *"The preservation of the planet as a whole…And we are not the only ones, who can go and save the planet, but if everybody contributes their part, we will come a long way".* (R11)
Secure the future of the business and the industry	*"We find nature in a tour package very important and we want to conserve this"* (R4) *"If a Dutch tourist, making a long distance journey to discover new things, will act irresponsibly in all those beautiful places, these places will disappear in five years and we won't have any places to visit anymore. We would kill our own business"* (R9) *"Our idea behind it is that when you neglect your destination, or the planet, than you will not have business anymore. You will not be able to offer the holidays that you for instance offered 50 years ago"* (R11)
Acknowledge consumers are getting aware of climate change	*"People are getting more aware of the fact that something needs to happen, and of climate change"* (R10) *"There is more attention for climate change, and people start noticing it is important, it only still needs to be transformed in customer behavior"* (R12)

Increase credibility and transparency towards customers	*"Now it is just done, all those discussions on different companies to compensate with, different amounts customers have to pay, well this is the start that at least everybody uses the same calculator"* (R1) *"We want to be very transparent on this, that people can see how it actually works"* (R2) *"It is unjustifiable to cooperate with the CARMATOP project and say at one point that you will keep working with your own five regions system, because that was exactly the thing we were struggling with, if all the different CO2 compensation programs keep doing their own thing, using their own methods, the compensation of emissions will not gain credibility towards the customers"* (R16)
Stay ahead of government regulations	*"The government will start setting targets, there are already agreements to reduce the CO2 emissions as a country, and companies will play a significant role in this"* (R2). *"It is unavoidable"* (R8; R10)
Increase employee loyalty	*"With some companies, who really go green, I think you can create a sort of loyalty among employees by implementing sustainable practices such as CARMACAL. These companies already have employees who find it important of course"* (R14).

Table 5. Strategies

Strategy	Quotes
Attract larger funds to continue it as a project	*To keep CARMACAL running we need a party that will finance the project"* (R16).
Attract international attention to obtain larger funds	*"CARMACAL needs to try and obtain larger funds, and so international attention would be beneficial"* (R1)
Scale up by selling more licenses to tour operators	*"A sales department for CARMACAL, who inform other tour operators on the current situation and who really try to sell it"* (R5).
Develop and launch the label to attract more tour operators	*"As soon as the label is ready, tour operators will start using CARMACAL. Because as soon as companies like SNP or TUI put the label on their website, others will start using it as well...* *The label will help tour operators differentiate their business from the competition"* (R12).
Integrate CARMACAL in Travelife	*"One of the criteria of becoming Travelife certified should be that you have a carbon management policy that consists of the carbon calculator and a presentation of this carbon footprint on the website"* (R1)

2. The social-technological struggle

Tour operators *operate tours* for profit. The product manager is the key operator and takes centre stage. The job is supply rather than market driven; "*90% of the time it is a continuation of the previous year. We are not going to start all over every year and invent the wheel again,*

we have an existing product supply and we're building upon that in the years thereafter" (R17). Products cannot just be dropped: this depends on price and contract conditions (R17). Also there is business; *"You're in a commercial company, profit always comes first"* (R19). Portfolio decisions are mainly based on sales and profit of the previous year (R17, R19, R20, R21). Carbon emissions are only discussed when asked. Such factors are included as criteria in certifications, but have never been a decisive factor regarding the portfolio (R5, R9, R17, R19, R20, R21). While there is intention to make CARMACAL happen, *"that it will be normal to work with and people should stop seeing it at as a sort of side dish, it should start belonging to the business"* (R3, R4), there is little action. Some deploy hold strategies and first want to learn from the experiences of early-adopters, others struggle with implementation (R9) or made it the business of interns; *"look interns, you just cannot expect them to know a lot about tour packages, so you have to check it afterwards. But okay, for the basics it is fine, yes"* (R8). This makes it complicated to get staff involved in carbon management; *"it should become part of the process, that a product manager has to work with it, because that person needs to start thinking, oh, okay, I will make a new tour, let me see how this looks in relation to carbon management"* (R2). The slow pace of adoption frustrates the creators of the tool; *"it is just too bad, as this project was meant to improve the offer of tour operators… Why would they not seriously set targets for themselves? Like: yes I will try to improve it with 3 % each year per tour or in total, regardless how they want to do it. Because for that you can use the tool perfectly of course, as it will show you which tours have high amounts of carbon emissions. And then you can communicate to the customers"* (R14). This illustrates what happens when a new piece of technology reaches the work floor. Not the thing but its novelty will challenge the dominant practices and procedures established over time. And naturally, this raises both support and resistance of those performing them. It is exactly these clashes that embody innovation in the making. Through these processes of ordering the link between carbon management and tour operating practice is negotiated and strategies are constructed. As such, CARMACAL illustrates the reworking of social-technological relations that constitute the practice of tour operating.

At its core tour operating is about the passion to turn beautiful places one knows well into memorable experiences for others. And product managers resemble the human directories that make this possible: some know their product well, better than CARMACAL; *"when you have a beautiful hike from A to B to C to D in Mallorca and you find a hotel at exactly 18 kilometers in a fantastic village, you will take that one, whether it is sustainable or not. You can't say let's walk another 35 kilometers, because the next hotel has a Green Key certificate, that is not how it works"* (R1). These human directories accumulate knowledge through consultation with local agents in destinations, hotel visits and private holidays (R17). Their knowledge is often tacit and not easily translated into a machine. CARMACAL confront product managers with their own decisions regarding tour packages. It points out trade-offs between passion and environment, established through negotiations with the machine. These involve dilemmas of all kinds; *"I think it is very complicated, at this moment, because you will get that*

challenge, for instance the most successful hotel and then CARMACAL will show this hotel is very negative with high CO2 emissions, yes that becomes a challenge, I find that very complicated" (R6). The human directories may sense competition from the machine when the practices and knowledge they embody are no longer self-explanatory.

They will construct their arguments to defend their positions. *"We will not use CARMACAL to change our tour packages, we already have a certain vision on how our tour packages should look and what they should include"* (R9). We found many arguments like this one (table 6), but as observers we are not in a position to question their validity. This is the task of the innovators, those participating in the process. A daring task, for it takes courage to burn what one used to worship (Akrich et al, 2002b). We must however challenge *what they represent*, because these arguments lay out priorities, and the act of prioritizing always suggests an ordering process of some kind. The point is it is so human to grant top priority to what one has experienced before: the action that renders the biggest award or avoids a certain penalty; *"new tour packages are made, which has priority to make those right, adjustment in older packages needs to happen first, guidelines, contracts, that always has priority one. After that comes sustainability and information related to that"* (R5). The frustration expressed by the tool's creators holds the fear of failure. Some hope for state intervention to speed up things; *"this will be necessary to create a mind shift among tour operators"* (R15). If the tool ends up at the bottom of a product manager's to-do list, it will become unimportant. Once prone to arguments that serve to give it little priority, it will be difficult to veer back up. A self-defeating prophecy, struggling to earn back the relevance it lost for its users, stuck in a business occupied with the issues of the day.

Table 6. Arguments to defend current practices

Arguments	Quotes
Further technological improvements are required	*"It should become more user-friendly, much more atomized, and a link should be created between our tour package offers and the tour packages that are in the calculator"* (R11).
Using the tool is labor-intensive and therefore too expensive.	*"The fact that it is so extremely labor-intensive per tour makes us think two or three times, whether this is actually feasible for us"* (R9). *"We have around 135 tour packages, imagine what it will cost us to enter it all"* (R9).
Too busy with other tasks	*"We have really been busy with all kinds of other things, and you really have to sit down and focus to do it well.. We should really plan it well, divide the work and do it during the quiet summer period"* (R7).
Do not see the benefit of entering the entire portfolio.	*"So when you have entered ten tours and you notice that there is maybe a difference of 1 percent per destination package, yeah, then it is kind of nonsense to enter all tours in CARMACAL"* (R2).
No staff available.	*"We did not start yet... it just has to do with man and woman power"* (R5).

Not all product elements are available in the tool.	*"There are many standard options in the tool, and that is exactly what we try to do as little as possible, offering standard tour packages. Airlines is relatively clear, but local transport, homestays, small-scale accommodation…so we still have to do extra research and guesswork"* (R9).
It weakens the product at the risk of losing business.	*"We could offer transport by land, but if all the tour operators offer a flight, and we will be the only ones offering transport by land, that does not make sense, because they will book with another tour operator anyway then"* (R2). *"It is just kind of nonsense to put red stamps all over your own company"* (R9).
The suppliers are not interested, and we have too little influence to convince them to get certified.	*"They cannot financially make ends meet let alone that they worry about other things"* (R17) Four more tour operators are willing to take the accommodation as it is (R20).
Broader sustainability focus is preferred.	A label for CO_2 emissions only misses out on the people side of sustainability (R16).

3. The absence of the customer

In our data the customer is an abstraction. He is presented as an *idea* constructed through arguments, and not as a *body*, for he has not yet enrolled in CARMACAL. Numerous actors assembled him over and over again (Akrich et al, 2002a). The customer appeared in the ordering process that constructs his role and responsibility in reducing the carbon footprint of tour packages (table 7). Sometimes he is framed as the ego-consumer that should not be bothered; *"Most people do not care at all, they are not interested in the environmental impact of their tour packages at all. Those people planned to go on a holiday, and they will do so, no matter what"* (R14). Occasionally he functions as the mirror that projects the tour operator's own preferences and ideas; "*to what extent should you burden people that go on a holiday? I always find it aggravating when other people try to point out such things to me*" (R10). Others hold him responsible: he has been put on trial for not behaving green enough (R1) or because of possession of holiday needs; *"the customer wants to go on holiday, and I understand that, but then they also have to take responsibility for it"* (R4). And there are those who defend him and claim he cannot be held responsible for a crime he did not commit (R15). *"Customers "should be left out of the picture. After all, what can they do to change it, stay at home?"* (R14). This shows how each time a different version emerged, always speaking its own truth.

Table 7. Distribution of responsibility (business – customer)

Position	Quotes

The customer is responsible.	*'Eventually it is all about changing the behavior of the customer"* (R1). *"It is up to the customers what to do with the information, but eventually the result could be that people will travel more sustainably"* (R3). *"The customer wants to go on holiday, and I understand that, but then they also have to take responsibility for it"* (R4) *"We will create awareness about the effect travelers have on the world, and what the customer decide to do with this is up to them, whether they take it for granted or act upon it"* (R6).
Both the business and the customer are responsible.	*"If you have to pay more for it, it should come from the customer as well, as they will have to pay for it, though if the prices stay the same and packages become CO2 neutral, then the customer does not have to do anything, also not taking responsibility"* (R4).
The business is responsible, but responsibility may gradually shift to the customer.	*"Initially the companies should start working with CARMACAL as the customer is not yet paying attention to it"* (R16). *"The industry has more knowledge about the impacts than the average customer…These organizations need to take the first steps to raise awareness among customers"* (R11).
The business is responsible, no matter what.	*"Customers trust us and believe that when something should be done, it will be done by the company, so by us"* (R3).

The customer also emerged in CARMACAL's quest for value; a process of ordering that seeks to delineate his benefits. Some prefer him voiceless. They framed him as the one who has to pay the bill in the end. Their relationship seems purely transactional; *"If you have to pay more for it, it should come from the customer as well, as they will have to pay for it* (R4). Once reduced to his wallet, he got linked to all sorts of economic obstacles. He appears when mocked for spending too little; an argument meant to maintain the industry's price-based propositions that seem written in stone; *"in the end Dutch people are very conscious about their budget and careful with spending money, so they are not willing to pay more for a sustainable tour package"* (R8). Also when carbon management happens in the back office, his voice is not required; *"our customers book with us, because they assume it will all be taken care of by us, these customers do not go to our website and search for a holiday with a first criterion that it should be sustainable"* (R1). When carbon management is applied with an eco-efficiency strategy in mind, the customer is steered to the most sustainable package that earns the company the best profit. Informing him about this trick requires the company to publish confidential information, and whether he benefits remains questionable. Others seek to reach out to him; *you can wait for the customers to ask for it, but that is not how it works"* (R1). They have pushed the quest for value beyond their spreadsheets, and presently seek to experiment with various ways to include him in CARMACAL. Most hope to find value in the carbon label, which may increase his awareness; *"you offer information a customer is not asking for, so you are one step ahead of the customer and if you then explain it to them, it will be adding value"* (R3). They hope this will result in demand *"I think that when customers see a label, green you*

are doing well, red you are not doing well, large groups of people will be sensitive for this and will adjust their tour package" (R5). Some seek value in carbon offsetting based on CARMACAL; *"the label may offer added value when you can do something with it and when it is credible. When you can possibly do something with compensating."* (R10). Finally, some see offsetting as means to build a relation with customers by offering them a customized offsetting offer (R1). The point is that nobody knows, because without physical presence in CARMACAL customers remain silent.

Conclusion and discussion

Scholars in various fields called for more empirical research at micro level that analyses how innovation works (e.g., Kudlak and Low, 2015; Wirtz et al, 2015; Mustak, 2014; Glavas and Aguinis, 2012; Camisón and Momfort mir, 2012; Baden-Fuller and Morgan, 2010; Hjalager, 2010; Akrich et al, 2002a; 2002b). Also limited tourism research examined the interrelations between innovation and CSR. Most work treated these concepts separately (e.g., Font et al, 2016; Wells et al, 2016; 2015, Hjalager, 2015; Brooker and Joppe, 2014; Rodríguez et al, 2014; Lee et al, 2013; Sandve and Øgaard, 2013; Camisón and Momfort mir, 2012; Font et al, 2012; Paget et al, 2010; Hjalager, 2010, Schwartz et al, 2012). The aim of this study was therefore to analyse how innovation works by providing an empirical account of an ongoing CSR-driven innovation process. We examined CARMACAL in the specific setting of the Dutch outbound travel industry. We illustrated how CARMACAL was constructed and its implication for the value mobilization process of tour operators.

Carbon management and carbon labelling each imply different notions about the distribution of responsibility for emission reduction between customers and business. Their coincidental entanglement resulted in CARMACAL. Initially, a funding search to develop a carbon measurement tool constructed this network, which led to the CARMATOP project. CARMATOP constitutes an ordering process that linked carbon management to carbon labelling through the funding requirements of the RAAK SME program. It produced the tool. Upon completion, not CARMATOP and its project funding but sales of the tool itself has to hold the network together. This requires expansion of its user base. At present both the existence of the device as well as its uncertain future triggers network configurations that will determine whether the network will hold or fall apart. Tour operating is a business activity driven by product stock rather than markets. At its core is the product manager, a human directory whose knowledge is often tacit and not easily translated into a machine. In this territory the tool encounters applause and hesitation, because it creates situations in which everyday routines are no longer self-evident. The tool continuously meets various counter-arguments that lay out priorities. When enrolled in this ordering process of prioritization, it risks becoming unimportant. Once stuck at the bottom of to-do lists in a business occupied with the issues of the day, it will be difficult to earn back lost relevance for its users. In CARMACAL the customer resembles an idea constructed through arguments. He features in the process of ordering that delineates his role and responsibility in reducing the carbon footprint of tour packages. Also he emerged

in CARMACAL's quest for value, an ordering process that seeks to identify his benefits. However as body he is absent as CARMACAL struggles to give him a role.

This paper makes three contributions to the literature. First, we show how CSR has triggered innovation. Our findings explain the enrolment of CARMACAL: how coincidence and the entanglement of two ideas constructed this network, and how a project and a piece of technology held it together. We found a CSR premise in all the different rationales, ideas, and strategies of those enrolled, which shows how CSR provided CARMACAL with a calculus (Van der Duim, 2007). And we identified CARMATOP as the ordering process that linked carbon management and carbon labelling and produced the tool. This study offers empirical evidence of underlying CSR mechanisms at the micro level (Glavas and Aguinis, 2012), and the role of CSR in stimulating innovations and addressing the environmental crisis (Kudlak and Low, 2015). All tour operators participate voluntarily and display a 'right thing to do" attitude, rather than business motivations. As a result this study did not find empirical evidence of a CSR business case (which supports the claim of Mirvis et al (2016). The struggle of CARMACAL to enrol in the mainstream operations of tour operators –illustrated by the negotiations of trade-offs between product managers and the machine- encapsulates an attempt to move CSR beyond voluntary balancing acts (Coles et al, 2013).

Second, we demonstrate how dominant operational practices restrict innovation. Our findings show how social-technological confrontation enrols the tool in an ordering process that judges its relevance while innovation is in the making. The study provides an empirical account of challenges related to this technological diffusion and innovation in tourism enterprises (Camisón and Momfort mir, 2012; Hjalager, 2010). It also suggests that as long as current dominant operating practices prevail, the tool will not be able to reach a position where it can mobilize value and demonstrate its benefits to business (Da Silva and Trkman, 2014). However, its ability to measure the carbon footprint of tour packages puts a normative claim on its users. It invites tour operators to engage with broader problem framings and analytical perspectives (Smith et al, 2010). This may create a new ordering process that takes CARMACAL beyond the business-sustainability dichotomy of the classic CSR business case, transforms present business models, and produces shared or sustainable value (Mirvis et al 2016; Porter and Kramer 2011; Hart and Millstein, 2003). This requires space for the innovators to experiment with the tool in business settings, as well as strategic leverage to navigate the many "discourses of accusation"(Akrich et al, 2002b, p.224) encountered in the process.

Third, we show how the supply driven logic of the travel industry shapes an innovation environment that externalizes the customer from the innovation process and compromises innovation. Our findings illustrate CARMACAL is only performed when tour operators participate. To meet their requirements, it had to translate into their practices (Van der Duim, 2007) and adopt industry logic. Our findings illustrate how CARMACAL -with its technical and business-to-business orientation- has always considered the planet and its climate or the tour

operators and their tour packages as its main beneficiaries, and never actively involved customers. The ordering processes that delineate their benefits and actions related to carbon footprint reduction of tour packages never gave them a voice. This makes the distribution of responsibility a matter of ownership. The customer made the footmark while on holiday, but who owns his footprint? It can be argued that as long as customers are not given the choice to purchase greener packages, the legal entity that packaged and resold them their holidays has to accept full responsibility for the carbon footprint of its products. As long as customers are not brought into a position to evaluate the product offer and express their preferences, they have no influence in the network. Enrolling customers in the network –no matter how- is therefore a fundamental prerequisite in the value mobilization process. This study illustrates the importance of knowledge about the role of customers in innovation processes of tour operators. With the dominant position of tour operators in directing tourism flows acknowledged (e.g., Adriana, 2009; Sigala, 2008; Schwartz et al, 2008;), and interest in the co-creation of value and services picking up (O'Cass and Sok, 2015; Sørensen and Jensen, 2015; Cabiddu et al, 2013), there is need for further research in this field.

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