Accountingisation and the narrative (re)turn of business model information in corporate reporting

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Abstract

Purpose – The debate about whether corporate reports should focus on numbers or narrative is long-standing. The recent push for business model information to be included in corporate reports has revitalised the debate. Many scholars suggest this constitutes a move towards narrative-based reporting. This study aims to investigate the debate and draws a comparison with the juxtaposition of the narrative and rational paradigms. This study also investigates how accountingisation influences the way business model information is presented in corporate reports.

Design/methodology/approach – This study analyses data from the financial and non-financial reports from 86 globally listed companies. This study first uses content analysis to code the data. This study then uses a partial least squares-structural equation model to test how accountingisation influences how firms report their business model information.

Findings – This study finds that accountingisation and a rational paradigm shape how companies present information about their business model in their financial and non-financial reports. This suggests that the dominance of quantitative measures in accounting affects even the presentation of narrative-based information. Despite the much-touted shift towards qualitative reporting, this study argues that companies find it difficult to cast off the yoke of a traditional numbers-based mindset.

Research limitations/implications – This paper contributes to the debate on numbers- versus narrative-based corporate reporting and the workings of narrative and rational paradigms. In it, this study lays out theoretical and empirical findings of accountingisation. This study also makes a case for freeing corporate reports from the shackles of an accountingisation mindset.

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Originality/value – This study provides new insights into how companies report information about their business models and the influence of narrative and rational paradigms on financial and non-financial reporting.

Keywords Accountingisation, Narrative, Business model, Corporate reports, Non-financial reporting, Rational paradigm

Paper type Research paper

1. Introduction

Academics have often criticised traditional financial reporting for its reliance on metrics that are not particularly suited to representing the value of intangible resources (Beattie and Smith, 2013). Traditional financial reports quantify a firm's performance in terms of financial metrics (reporting numbers) (Strampelli, 2018). Over time, scholars have promoted several non-financial reporting frameworks and initiatives, arguing that reports can be improved by narrative-based reporting (Beattie, 2014; Beattie and Smith, 2013). However, despite the recent expansion of non-financial reporting (Stolowy and Paugam, 2018), the numbers versus narrative debate remain alive and kicking (Dumay and Rooney, 2016; Martin-Sardesai *et al.*, 2020b).

The debate is shaped by a new focus on business models (BM) in accounting. A BM is "a communication device that can improve a company's disclosure, offering insight into the logic that underlies the value-creation process" (Bini *et al.*, 2019, p. 11). This concept has revitalised the long-standing debate on accounting for intangible assets and intellectual capital by bolstering the case for using more informative business reporting (Abhayawansa and Guthrie, 2016; Beattie and Smith, 2013). However, the BM focus has not settled the question of whether business reporting should prioritise narrative or quantitative measures (Beattie and Smith, 2013; Roslender and Fincham, 2004).

This numbers versus narratives debate can be compared to the controversy surrounding narrative and rational paradigms. According to Fisher (1984, p. 2), a paradigm is:

> [. . .] a representation designed to formalise the structure of a component experience and to direct understanding and inquiry into the nature and functions of that experience – in this instance, the experience of human communication

The narrative paradigm assumes that all forms of human communication are stories – that is, "interpretations of aspects of the world occurring in time and shaped by history, culture and character" Fisher (1989, p. 57) and that people are storytellers with a narrative capacity (Fisher, 1985; Weick and Browning, 1986). Therefore, because stories can make the intangible aspects of corporate value creation visible (Holland, 2004), narratives are a more feasible way to convey value creation than numbers (Mouritsen *et al.*, 2001).

Meanwhile, the rational paradigm uses rules of logic to collect, analyse and measure information (Baum, 1996). It uses a hierarchical system within which experts can debate points while non-experts are relegated to the spectator stand (Weick and Browning, 1986). The rational paradigm concentrates the power to disclose and understand information on corporations and managers, which obstructs the development of two-way communication – or what Dillard and Vinnari (2019) call "dialogical accountability" in contrast to "monological accountability". While many believe that BM information can improve business reporting by helping to explain a firm's value creation, what constitutes good business reporting depends on one's attitude towards the paradigm underlying the reporting approach, as this influences the user's understanding.

Power and Laughlin (1992) coined the expression "accountingisation" to express the phenomenon of reframing organisational self-understanding in accounting terms, thus subverting existing value systems. Similarly, Jones and Dugdale (2001, p. 38) use the term "accounting regime", meaning "a distinctive body of knowledge providing discursive representations and vocabularies that inform and are informed by, actors" perceptions of the world. We contend that accountingisation or an "accounting regime" approach expresses the rational paradigm.

In this study, we examine how accountingisation influences BM information in corporate reporting. Our analysis reveals the narrative and rational paradigms at work in different corporate reporting practices. Accounting, as a language, is an essential framework that actors draw upon to interpret economic events (Englund *et al.*, 2011). Further, it is a language that inherently implies quantifying objectives (Robson, 1992) and an integral part of reporting practice. According to Järvinen *et al.* (2020), quantification implies "fake precisionism" and "limits the discussion to themes and questions preferred by company management". As a result, BM information in corporate reports can fall into an accountingisation trap, whereby numbers are privileged over narrative (Dumay and Roslender, 2013). We are interested in testing whether this consistently happens and, if so, what the implications of a focus on numbers might be.

The research design uses a two-step content analysis methodology that combines text analysis with a partial least squares-structural equation model (PLS-SEM). PLS-SEM is a standard multivariate analysis method for analysing complex models given either a priori knowledge or based on a theory (Ringle *et al.*, 2012; Sánchez, 2013). It is well-suited to smaller sample sizes. The corpus for the text analysis comprised the financial and non-financial reports of 86 leading global companies. The hypotheses tested posit that different paradigms explain how BM information is presented in financial and non-financial reports. These are developed in Section 2.3.

This study contributes to the debate about improving traditional corporate reporting by digging into the numbers versus narratives question. Dumay and Rooney (2016, p. 227) conclude that "balancing the use of numbers or narrative is a matter of choice based on the type of knowledge to be transferred, the actor's epistemological viewpoint or the directions of a more powerful actor". Although report preparers use different paradigms as they produce financial and non-financial reports, we demonstrate that they are inclined to quantify BM information.

Our findings reveal both the reporting approaches and the organisations' changes resulting from non-financial reporting practices. We find that, despite pressure from scholars and practitioners, the corporate practice has not ultimately shifted towards narrative-based reporting. Accountingisation has deep roots in most organisations, influencing actors who quantitatively describe reality (Martin-Sardesai *et al.*, 2020a). As a result, we contend that accountingisation prevents non-financial reporting from developing narratives aimed at a broader category of stakeholders.

Our paper begins by setting out the context of this study, followed by hypothesis development (Section 2). Next, we describe our research methods (Section 3). Our results follow in Section 4. Section 5 concludes our paper by discussing the results and their theoretical and practical implications.

2. Literature, theory and hypothesis development

2.1 Business model information in corporate reporting

BMs became popular in the mid-1990s on the cusp of the digital era as a way to explain how organisations create, deliver and capture value (Osterwalder and Pigneur, 2010). Despite

initial scepticism, BMs gradually entered both the corporate reporting lexicon Page (2014) and the research agendas of scholars. Many studies to date have revealed close ties between corporate reporting, communication practices and transparency. Together, these form a blueprint for how companies do business (Nielsen, 2005). However, because corporate reporting exists to explain how businesses create value, scholars have argued that corporate reporting needs to revolve around a firm's BM (Michalak *et al.*, 2017).

The assumed importance of BMs has led several corporate reporting bodies to promote initiatives and frameworks that guide how information on a firm's BM should be reported (European Parliament, 2014; Financial Reporting Council, 2010; IIRC-International Integrated Reporting Council, 2013). For example, the IIRC's <IR> framework positions BMs at the centre of the six capitals (i.e. financial, manufactured, intellectual, human, social and relationship and natural capital). These represent stocks of value that underlie the value creation process of firms by highlighting the connections between financial and non-financial elements (IIRC-International Integrated Reporting Council, 2013; Simnett and Huggins, 2015; Tweedie *et al.*, 2018). Reporting on their BM allows companies to share information about their future non-financial value drivers and plans – in contrast to backwards-looking traditional financial reports. Because including information about a firm's BM is a relatively new development in corporate reporting, we expect the content, shape and structure of corporate reports to change as time passes (Michalak *et al.*, 2017).

The growing interest in BMs has revived the long-standing numbers-narratives reporting debate in accounting research (Roslender and Nielsen, 2017). The term 'narrative' – which Mouritsen *et al.* (2002) define as a story of how things work, what a firm's identity is and what the reasons for its activities are – first appears in (Adelberg, 1979, p. 186). Adelberg argues that accountants should include business narratives in financial reports to communicate the "economic and social information about the events and conditions that have affected, are currently affecting, and will affect the business entity in the immediate future. Afterwards, scholars have also argued that including business narratives in reports would radically improve corporate reporting quality (Beattie *et al.*, 2004). Narrative reporting represents a way to tackle the limits of number reporting as another and more comprehensive way to share information about how a firm creates value.

Despite these arguments favouring narrative reporting, it has not caught on and reporting quantitative information has remained the norm in accounting practice (Carnegie and West, 2005). However, scholars have continued to insist that stakeholders require a range of information about companies – information that may go beyond financial valuation, even though it has financial implications (Hopper, 2019). For example, financial reports that only contain quantitative information cannot answer questions about a company's response to environmental issues. Some scholars have touted BM information as a golden ticket in addressing this gap based on the idea that reporting on a company's BM complements quantitative reporting (Beattie, 2014). Further, reporting on a company's BM seems like a move towards a more integrated, narrative-based reporting practice (Beattie and Smith, 2013). Yet, as reporting BM information has increased, it has fast become an integral part of accounting and reporting practice that typically involves quantifying objectives (Power and Brennan, 2021; Unerman *et al.*, 2018). In this study, we are interested in testing whether accountingisation influences the BM information included in financial and non-financial reporting.

2.2 Accountingisation and the rational and narrative paradigms in corporate reporting practices

As we argued earlier, the numbers versus narratives debate in corporate reporting demonstrates the differences between a rational and a narrative paradigm. The rational paradigm, which derives from Aristotle's work on logic, posits that members of society act rationally and objectively to collect and analyse information without relying on their values, interests or emotions (Baum, 1996; Fisher, 1984). Firms clarify "what is to be regarded as right and important, and who has the right to hold others (financially) accountable for their actions" (Englund *et al.*, 2011, p. 500), thus appearing rational to their stakeholders. Additionally, as Power *et al.* (2003) assert, accounting information in corporate reports helps "rationalise and justify decisions *ex post*". Therefore, the rational paradigm, which organises information through defined methods and rules, dominates accounting practice.

Organisations strive to make "the intangible tangible" through accountingisation (Dumay, 2009). As a result, they are locked into the accounting domain and privilege the measuring approach. As Chaminade and Roberts (2003) explain, they follow the mantra of "what gets measured gets managed", assuming that measuring itself is a way to ensure follow-through. Organisations consider quantified information more accurate and comparable across organisations than qualitative information (Järvinen *et al.*, 2020). Further, they regard that monetary information is higher quality than qualitative information (Wiseman, 1982). As such, accountingisation imbues organisations with quantitative measures and financial imperatives (Martin-Sardesai *et al.*, 2020a).

The rational paradigm helped accountingisation become a key component of new public management and the healthcare system (Kurunmaki *et al.*, 2003; Lapsley, 2007). That said, we observe the phenomenon in several fields. Power and Laughlin (1996, p. 447) outline that accountingisation "colonises areas of social life by creating newly internalised facts and vocabularies that potentially undermine actors' capability to question its self-evident mission". Thus, accounting "may curb our field of vision by redescribing reality into terms of calculable economic reason" (Holmgren Caicedo *et al.*, 2019, p. 374), limiting our assessments. In recent decades, accounting values, practices and procedures pierced deep into the core of organisations, controlling their constituent parts (Kurunmaki *et al.*, 2003; Martin-Sardesai *et al.*, 2020a).

Financial statements represent the pinnacle of accountingisation as they provide the dominant "rational" or "numbers-based" representation of an organisation while excluding other possibilities (Power *et al.*, 2003). Critics claim financial accounting does not merely represent and communicate reality but creates a distorted portrait of it by capturing only a limited picture of multi-dimensional organisations (Hines, 1988; Morgan, 1988). Accounting is interpretative and accountants "construct meaning and engage in all kinds of symbolically significant activities" (Morgan, 1988, p. 479). Thus, "accounting threatens to delinguistify the public realm and to absorb and transform public discourse in its own image", affecting the interaction between information and users' understanding (Power *et al.*, 2003, p. 147). Even more importantly, the accounting process operates within the rational paradigm, which uses a hierarchical system "in which some are qualified to judge and others to follow" (Weick and Browning, 1986, p. 249). Therefore, only accounting experts can debate, interpret and assess and non-experts are considered spectators.

Accounting is the language of business (Davidson *et al.*, 1974), but it is not the "native language" of non-experts. Corporate reports are for "the whole audience who might read it" Crowther (2012, p. 123) – meaning those who are financially literate, especially in financial reporting. Financial literacy is "the ability to read and understand fundamental financial statements, including a company's balance sheet, income statement and cash flow statement

as determined by the board of directors in the exercise of its business judgement" (Kouaib *et al.*, 2018, p. 610). Therefore, accounting has implications for power and knowledge. It creates a distinction between "those who have the information, and who hold others accountable on the basis of it, and those who understand accounting language and those who do not" (Conrad, 2005, p. 6). The rational paradigm underlying accounting practices thus helps to concentrate power in organisations, limiting who has and can disclose information.

Since the late 1970s, a "narrative turn" has crept into the human sciences, proposed as a way to combat the limits of quantitative methods, to more accurately capture the complexity of human experience (Paschen and Ison, 2014) and to produce information that even the financially illiterate can understand. Narratives are not a simple description. Rather, they explain events and activities that have occurred or will occur in the future (Pentland, 1999; Wolfe and Shepherd, 2015). As such, "narrative presents something close to the identity of the firm and therefore presents some kind of raison d'⊠tre of its activities" (Mouritsen *et al.*, 2002, p. 14). Hence, it is a rich source of insights into firms. It can explain their actions, their environmental contexts and convey meaning to the reader (Pentland, 1999; Wolfe and Shepherd, 2015).

As an alternative to the rational paradigm, Fisher (1984, p. 2) proposed the narrative paradigm, "a dialectical synthesis of two traditional strands in the history of rhetoric: the argumentative, persuasive theme and the literary, aesthetic theme". It counters the rational paradigm, which uses a direct, metric-centric approach and numerical reasoning to support arguments (Lim and Puspita, 2020). Thus, the narrative paradigm involves stories not calculations and narratives not numbers.

The narrative paradigm democratises power and knowledge as it assumes that all people have a narrative capacity, that experts are storytellers, and non-experts are active participants, not just mere spectators (Weick and Browning, 1986). According to Roberts (2004, p. 131), the narrative paradigm is "less elitist than the rational world paradigm". The capability to create and follow stories – "narrative intelligence" – is considered a primary human intelligence by narrative paradigm scholars (Randall, 1999, p. 13). Everyone has a fundamental narrative intelligence, and unlike in the rational paradigm, people can become "not just literate, but literate literarily" (Bogdan, 1990). Furthermore, people can evaluate how reliable stories are by assessing both narrative probability and fidelity. Narrative probability refers to the coherence, consistency and noncontradiction of the story, perhaps compared to previous stories. Narrative fidelity refers to the degree to which the story "accords with the logic of good reasons" (Fisher, 1985, p. 349). As everyone can judge narrative fidelity and probability, everyone can assess whether a story is reliable (Fisher, 1984), determining for themselves what to believe. Unlike numbers, narratives may turn non-experts into active participants. For these reasons, the narrative paradigm is, supposedly, a better way to represent reality.

A "narrative turn" also exists in accounting and corporate reporting (Beattie, 2014). The narrative nature of non-financial reports represents a step away from a purely rational paradigm. However, the literature calls for further improving the quality of corporate reporting by focusing on the "stor [ies]" of organisations (Beattie and Smith, 2013, p. 246). Narratives explain future possibilities and explore how businesses might succeed going forward (Dumay, 2008). They help a wide variety of people – including investors and financially illiterate stakeholders – gain an overall picture of a firm's performance and make judgements on their prospects. We argue that, by describing a company's BM, by showing the connections between its components and explaining the meaning of its measures, narratives provide meaningful explanations of how an organisation creates value.

2.3 Hypothesis development

This study unpacks the paradigms behind BM information in corporate financial and non-financial reports. We analyse how companies communicate their BM information in their corporate reports.

A financial report mainly presents a company's numbers – the counts and amounts of its key financial indicators. It is the principal kind of data managers use to demonstrate the value of a business (Roslender and Fincham, 2004). Financial reporting "should provide information to help present and potential investors and creditors and other users in assessing the amounts, timing and uncertainty of prospective cash flows" (Kothari, 2001, p. 120). Non-financial reporting, meanwhile, presents other non-financial information about a company to "help stakeholders better understand a company's overall performance, business strategy and growth perspective" (Perrini, 2006, p. 74). In this study, we consider non-financial reporting to include a wide range of voluntary and mandatory reports produced in addition to annual financial reports – such as sustainability reports, corporate social responsibility reports, social reports and integrated reports (Stolowy and Paugam, 2018).

Financial and non-financial reports have different aims, audiences and rules. Financial reports express the rational paradigm, providing numbers-based information to financially literate users. In particular, they contain information that helps shareholders assess prospective dividends and proceeds (FASB, 1978). Their content is derived from established quantitative methods and rules, and the information is written in accounting language. Non-financial reports supplement and complement financial reports (Merkl-Davies and Brennan, 2017). They express the narrative paradigm by including information that is difficult to quantify for a broader audience (Beattie and Smith, 2013).

These two types of corporate reports mutually interact (Einhorn, 2005), with the content of financial reports often influencing that of non-financial reports (Bagnoli and Watts, 2007). Bagnoli and Watts (2007) find that good news in a financial report is not usually discussed at length in the counterpart non-financial report; bad news, however, will be. Others, such as Stolowy and Paugam (2018), argue that the two reports contain very different material. However, despite their connections, they are fundamentally informed by different paradigms. We expect to see some differences in the BM information included in each type of report. Therefore, the first hypothesis to be tested is:

H1. Due to the different paradigms informing financial and non-financial reporting, firms will present different types of BM information in the two types of report.

Our second hypothesis goes further. In line with the narrative paradigm, non-financial reports should use narrative language that everyone can understand. However, firms are sometimes reluctant to communicate the intangible aspects of their value creation (Holland, 2004). Additionally, as BMs become an integral part of accounting and reporting practice, they may become accountingised (Dumay and Roslender, 2013), influenced by the existing, numbers-based values of the accounting field. Therefore, we contend that the BM information included in financial and non-financial reports relies primarily on numbers, even though non-financial reports supposedly reflect a narrative paradigm. Hence, our second hypothesis is:

H2. Accountingisation influences how BM information is reported in both financial and non-financial reports.

3. Research method

We used a two-step content analysis method to test our hypotheses, first analysing the text of financial and non-financial reports, then applying a PLS-SEM to the resulting data set. PLS-SEM is a statistical data model that helps estimate and test relationships between different variables (Lee *et al.*, 2011; Sánchez, 2013). In our study, using a PLS-SEM allowed us to test whether there were significant differences in the BM information between the financial and non-financial corporate reports in our sample. Ultimately, the PLS-SEM helped us to estimate the influence of accountingisation on BM information reporting.

3.1 Sample and data collection

Our sample was selected from a list of the top 25% publicly listed companies by market capitalisation in the 2016 OSIRIS database (9,680 firms). Because these companies have global visibility, we anticipated their reports would feature more BM information, and they more likely adopt non-financial reports. Using the Neyman optimal allocation formula to get the optimal sample size, we selected 96 firms spread across a range of industrial sectors and geographic areas as a starting sample. We excluded ten firms from this initial sample because they did not have both financial and non-financial reports, leaving 86 firms in the final sample (Table 1). Of these, five enterprises produced integrated reports, four provided environmental, social and corporate governance (ESG) information in their reports, and one published an ESG report.

We manually collected corporate reports from 2016 from the companies' websites and, with the aid of NVivo software, coded the contents into categories for analysis (Krippendorff, 2013). First, we analysed the reports from 2016 because it was two years after the release of the initial version of the IIRC's <IR> framework that included the reporting of BM information. Second, it is the year before the European Union Directive 95/2014 for non-financial reporting came into effect that requires large European companies to disclose BM information. In so doing, we avoid the potential bias caused by the mandatory effects of the European Union regulation and increase the chance to gather the effects from the voluntary adoption of the IIRC's <IR> framework. The coding process involved transcribing, recording, categorising and interpreting statements for analysis (Krippendorff, 2013). Although many studies only examine selected sections of the corporate reports (Beattie *et al.*, 2004), we coded the full content of all 172 corporate reports following

Table 1. Sample composition

	Geographic area						
Industrial sector	Africa	Asia	Central and South America	Europe	North America	Oceania	Total
Industrial	1	9	1	6	5	1	23
Consumer discretionary	0	8	1	4	6	0	19
Information technology	0	4	0	3	3	0	10
Financials	0	1	1	2	3	0	7
Materials	0	3	0	2	2	0	7
Consumer staples	1	2	0	2	1	0	6
Health care	0	2	0	1	2	0	5
Energy	0	1	0	1	1	0	3
Real estates	0	1	0	1	1	0	3
Utilities	0	1	0	1	1	0	3
TOT	*2*	*32*	*3*	*23*	*25*	*1*	*86*

Beattie *et al.* (2004). They recommend that researchers begin by analysing the topics and then the attributes of each item of information.

The coding scheme was based on a merger between two popular BM frameworks – the CANVAS business model framework Osterwalder and Pigneur (2010) and the V4 business model dimensions framework (Al-Debei and Avison, 2010). Although CANVAS has become something of a de-facto standard for conceptualising BMs (Joyce and Paquin, 2016), its nine building blocks translates into too many variables to feasibly model with PLS-SEM. With only four elements, the V4 framework has fewer dimensions than CANVAS business model framework. However, its elements are derived from the information systems literature. Therefore, it can be sector-specific to analyse a broader set of industries. Thereby, we merged the nine dimensions of CANVAS into the four dimensions of V4 to create a non-sector-specific coding scheme. The specific mappings between the two frameworks are listed in Table 2.

Topic is the linear combination of the four dimensions of V4. To complete our coding scheme, two additional attributes could also be identified for each item of information – these being the financial information presented about an organisation's BM expressed in monetary terms, such as assets or revenue, i.e. *Monet,* and that of a quantitative nature, such as carbon emission levels or counts towards performance indicators, i.e. *Quant*.

Therefore, our final scheme comprised three latent variables – *Topic*, *Monet* and *Quant* – each broken down into four manifest variables, being the four dimensions of the merged framework: *value architecture* (*va*), *value finance (vf)*, *value network (vn)* and *value proposition* (*vp*). Latent variables (LVs) represent constructs that cannot be measured directly. They are indirectly measured by manifest variables (Sánchez, 2013). Manifest variables (MVs) s are blocks of attributes, that are observed-measured and contain information of latent variables (Sánchez, 2013). Thus, any given sentence could be coded to up to 12 different categories; albeit, most sentences only applied to 1 or 2. In the coding process, the coding categories were not considered mutually exclusive. A detailed description of each of the variables is given in Table 3.

Note that we took the sentence as our unit of analysis as they "are far more reliable than any other unit of analysis" Milne and Adler (1999, p. 243) and are recommended when performing manual coding (Beattie *et al.*, 2004) [1].

We performed pilot coding using ten sets of reports and then measured the agreement between the two coders. We shared our results with all the co-authors of this paper to identify areas of coding disagreement and revised our coding rules to ensure both consistency and internal validity going forward (Beattie *et al.*, 2004). One author coded the remaining 162 reports and discussed the results with all the authors. Finally, we considered the quantity of information coded to each dimension and attribute as the frequency variable needed to perform the PLS-SEM analysis (Appendix).

V4 business model dimensions	CANVAS model
Value proposition	Value proposition
Value architecture	Customer segment Key activities Key resources
Value network	Key partners Channels Customer relationship
Value finance	Cost structure Revenue streams

Table 2.
V^4 business model dimensions linked to components of CANVAS model

Table 3.
Description of variables

Variable	Abbrev	Description	Example phrase from a sentence
Topic	*Topic*	Information about the organisation's . . .	
value architecture	*va*	. . . resources/activities	"We use a highly automated, continuous flow approach where different pieces of equipment are joined directly or by conveyor to create an in-line assembly process"
value finance	*vf*	. . . cost/revenue	"This increase in industrial segment revenues was partially offset by lower revenues at Oil and Gas and Transportation"
value network	*vn*	. . . partners/channels	"We operate multiple distribution center platforms tailored to meet the needs of our stores and customers, based on the types of products, local geography and transportation and delivery requirements"
value proposition	*vp*	. . . product/service and customers	"In skin and personal care, we offer a wide variety of products, ranging from deodorants to personal cleansing to skincare"
Monetary	*Monet*	Information expressed in **monetary** terms about the organisation's . . .	
value architecture	*m_va*	. . . resources/activities	"In particular, capital expenditure in 2016 primarily concerned generation plants (€355m)"
value finance	*m_vf*	. . . cost/revenue	"The cost of materials including purchased services rose by only €3.1m from €69.3m to €72.4m"
value network	*m_vn*	. . . partners/channels	"This US$35m fund will focus on "catalyzing" a startup ecosystem that can leverage or enrich SAP data sets, platform technologies, or business workflows"
value proposition	*m_vp*	. . . product/service and customers	"Infectious disease products sales were $3.2bn, a decline of 12.3% from 2015"
Quantity	*Quant*	Information expressed in **quantitative** terms about the organisation's . . .	
value architecture	*q_va*	. . . resources/activities	"We also took significant steps aimed at further improving the effectiveness and efficiency of our research and development activities, which harness the talent of 23 000 scientists, physicians and business professionals"
value finance	*q_vf*	. . . cost/revenue	"In 2016, revenue increased by 0.6%"
value network	*q_vn*	. . . partners/channels	"In the zone Africa and the Middle East, the retail network has made of approximately 5,000 service-stations in 2016, spread across more than 40 countries"
value proposition	*q_vp*	. . . product/service and customers	"By the end of 2016, nearly 1.8 million lamps had been sold, improving the day-to-day lives of nearly 9.5 million people"

3.2 Partial least squares-structural equation model

Wold's (1974, 1982) PLS-SEM approach has become a foundational multivariate analysis method in several disciplines, including accounting (Hair *et al.*, 2012; Lee *et al.*, 2011). The PLS-SEM approach follows the spirit of a dimension reduction technique, providing a practical summary of how a set of predictors systematically explains a set of dependent variables (Sánchez, 2013, p. 34). It has several advantages – among them the ability to handle small sample sizes and the flexibility to deal with a wide range of data analysis tasks, including studies of structural systems (Sánchez, 2013). The model does not depend on a priori assumptions of a particular scale or a normal data distribution (Latan and Ramli, 2014). It can also be used to generate hypotheses from qualitative methods or to test hypotheses using quantitative research (Hair *et al.*, 2017).

The model does depend on some pre-established relationships among LVs. LVs can be measured through formative or reflective methods depending on the cause-effect relationships between the relevant LVs and MVs. Formative correlations are those where a linear combination of MVs determine the LVs (Lee *et al.*, 2011). Reflective correlations are the reverse, where MVs reflect the variation in the LVs (Lee *et al.*, 2011). To establish these a priori relationships, researchers either draw from previous knowledge of the phenomenon or program the relationships according to the hypothesis they want to test. A PLS-SEM also helps to explore possible relationships that are not based on theoretical or causal justifications (Hair *et al.*, 2017).

The three LVs of our model are topicality (*Topic*), monetisation (*Monet*) and quantification (*Quant*) are the three characteristics of BM information we seek to examine. From the literature, the four value variables combine linearly to confirm "topicality". Topicality is an attribute that scholars have seen as a basic condition to assess the relevance of documents (Xu and Chen, 2006). Topical relevance is "a determination of the intellectual content of a document, usually in terms of some subject classification" (Froehlich, 1994, p. 125), specifically, topicality means "how well the topic of the information retrieved matches the topic of the request" (Harter, 1992, p. 602). In our research, *Topic* indicates the dimensions of BM a sentence refers to and reflects the narrative concept Holland (2004) regardless of the information attributes. *Monet* and *Quant* represent the impact of accountingisation (Martin-Sardesai *et al.*, 2020a). Unlike *Topic*, the four value dimensions of these variables are designed so as to test our hypotheses.

We used the PLS-SEM in the *R*-statistical software package "PLSPM". To build the model, we established two sub-models – an outer model and an inner model. We used the outer model to investigate the relationship between each LV and its MVs, ultimately adopting a reflective measurement approach to test our first hypothesis.

Outer model tests "the relationships between each LV and its block of attributes" Sánchez (2013, p. 23) and tries to obtain the best estimates for the LVs based on their attributes (MVs) in terms of loadings and communality. We explore loadings and communality in detail in our results section. If different attributes (MVs) explain the differences in the content and attributes of BM information between the two types of reports, the hypothesis is supported. In our case, this means that financial and non-financial reports do provide different information to meet the needs of different audiences.

Inner models test the relationships between LVs (Sánchez, 2013), which we used to test our second hypothesis (Figure 1). Following the direction of the arrows, *Quant* explains any variance in *Monet* because any monetary measure must be quantified first, while *Quant* and *Monet* (both representing the accountingisation of BM information) interact and shape *Topic*. Through the inner model, we tested whether these relationships are positive and statistically significant. Thus, if the impact of *Quant* and *Monet* on *Topic* is significant for

both financial and non-financial reports, then our second hypothesis is supported. Such a result would indicate that BM information is accountingised even though different paradigms inform the two types of reports.

4. Results

4.1 The types of business model information in financial and non-financial reporting (hypothesis 1)

To test *H1*, we applied the outer model to our sample financial and non-financial reports and compared the results. First, we checked whether the blocks of attributes were unidimensional. Checking this ensures that if a construct (LV) changes, then the associated indicators will also change in the same direction. We evaluated unidimensionality by calculating Dillon-Goldstein's rho, the first eigenvalue and the second eigenvalue in the correlation matrix of attributes. A Dillon-Goldstein's rho value higher than 0.7 signals unidimensionality; the first eigenvalue should be greater than 1, and the second eigenvalue should be less than 1 (Sánchez, 2013). According to Chin (1998), Dillon-Goldstein's rho takes into account the extent to which the LV explains its block of indicators (MVs). Within a PLS-SEM, it is considered a better indicator than Cronbach's alpha. The unidimensionality scores of three blocks of attributes ensure that the MVs reflect the associated LV.

Using this method reveals the variables contributing to most effectively explaining the single construct are different in the two types of reporting practices (Table 4). Regarding the outer model estimation results for testing *H1*, the outer loadings measure the relationship between the single construct and its variables. An MV with a low loading implies that it has little shared variance with the LV (Lee *et al.*, 2011). The cut-off for the outer loading is $\geq$0.7 (Latan and Ramli, 2014). The loadings that exceed this level are shaded. Communality represents the amount of variability explained by an LV (in percentage terms), calculated as the squared correlations of the LV to its indicators. A communality value of greater than 0.49 is considered significant (Sánchez, 2013).

Our results show that only *value finance* (vf) has a significant and positive direct effect on *Topic* in financial reports. Meanwhile, *value architecture* (va), *value finance* (vf) and *value proposition* (vp) all have a positive and statistically significant connection with *Topic* and explain its variance in non-financial reports. For example, financial reports typically highlight the revenues generated by core products and services, as this extract from our data shows:

> Cloud and software revenue climbed to €18,424 million in 2016, an increase of 7%. Cloud and software revenue represented 84% of total revenue in 2016 (2015: 83%). Service revenue increased 2% from €3,579 million in 2015 to €3,638 million, which was 16% of total revenue, in 2016.

(SAP, Financial Report)

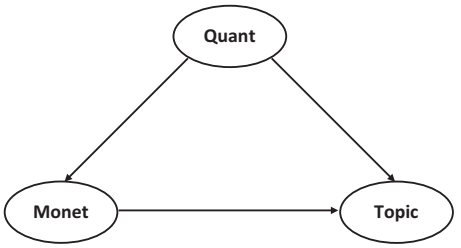

Figure 1.
Structural model of the relationships between latent variables

LVs	DG. rho		Unidimensionality		eig. 2nd		MVs	Loading		Communality	
	Financial reports	Non-financial reports	Financial reports	Non-financial reports	Financial reports	Non-financial reports		Financial reports	Non-financial reports	Financial reports	Non-financial reports
Topic	0.7870680	0.8484421	1.976959	2.353180	0.9142472	0.8491158	Va	0.56993229	0.8757969	0.324822811	0.7670202
							Vf	0.82912278	0.8151406	0.687444577	0.6644541
							Vn	0.52581498	0.5196449	0.276481393	0.2700309
							Vp	0.64800077	0.7853927	0.419905001	0.6168416
Monet	0.6346392	0.7872921	1.256198	1.951725	0.9871748	10.444.079	m_va	0.18676016	0.7193817	0.034879357	0.5175100
							m_vf	0.96124577	0.8874066	0.923993427	0.7874904
							m_vn	0.37474414	0.4314303	0.140433167	0.1861321
							m_vp	0.05723762	0.6489597	0.002276145	0.4211487
Quant	0.7260240	0.8042640	1.662067	2.060425	0.9997980	0.9070725	q_va	0.59511955	0.8471721	0.354167275	0.7177006
							q_vf	0.85404210	0.8442313	0.729387901	0.7127264
							q_vn	0.36928673	0.4505947	0.136372687	0.2030356
							q_vp	0.54487762	0.6372677	0.296891622	0.4061101

Table 4.
Unidimensionality and *H1* estimations

In non-financial reports, firms highlight the details of their products and services, their technological architectures, their organisational infrastructures and their operational configurations – for example, as this extract from our data shows:

> In 2016, we will increase our sales of smartphones as we adequately respond to changes in the market environment through reinforced products and continuous streamlining of our lineup. Additionally, we will lead all market growth through cutting-edge innovation as we increase supply and continuously strengthen profitability based on a lineup that focuses on competitive product models not just in high-end markets, but also in low- and mid-priced markets.

(Samsung, Non-financial report)

Therefore, while financial reporting focuses on a firm's financial performance, non-financial reporting provides a broader picture of performance and the BM beyond financial metrics. Our results for *Monet* and *Quant* were similar: m_vf and q_vf had the greatest hand in shaping these aspects of the financial reports. However, while we expected this result in the financial reports, we were also surprised by the significant impact these variables had on the non-financial reports. We contend this is due to the monetisation and quantification of value architecture (m_va; q_va) in the non-financial reports, alongside information provided in those reports on costs and revenues. To conclude, our results confirm *H1*: firms do indeed vary the BM information they present in financial and non-financial reports according to the characteristics and aims of the two forms of reports because of their different audiences.

4.2 Accountingisation's influence in financial and non-financial reporting (hypothesis 2)

To test our second hypothesis – whether accountingisation influences how BM information is reported – we used our inner model, which measures the relationships between LVs (*Quant*, *Monet* and *Topic*). We conducted two separate tests for financial and non-financial reports (Figure 2).

Our analysis shows that, in both financial and non-financial reports, the LV *Quant* has a significant impact on *Topic* and *Monet* and *Monet* does not explain the variance of *Topic*. This means that quantitative information has a significant impact on *Topic*, but monetary information has not. The small impact of *Monet* is likely explained by the nature of BM information, which is usually about elements that may be monetised difficultly. This is the rationale we could not limit the concept of accountingisation to the monetary commiseration only because we analysed corporate factors and performance (especially in non-financial reports) that can be arduously expressed through monetary information. Thus, accountigisation manifests more prominently in the quantification instead of monetisation, so confirming that accountingisation may refer to the broad approach of using quantitative measures, which are not limited to financial measures and monetary values (Dumay, 2009; Järvinen *et al.*, 2020; Jones and Dugdale, 2001; Martin-Sardesai *et al.*, 2020a, 2020b).

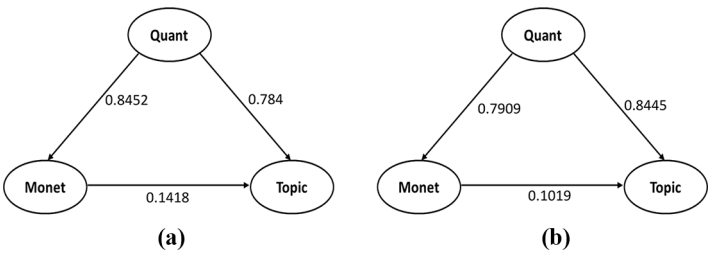

Figure 2.
Inner models

Notes: (a) Financial reports; (b) Non-financial reports

We expected *Quant* to have a significant impact on *Monet* as monetary information is also clearly quantitative. However, these results go further, showing the influence of numbers over non-financial information. Therefore, our second hypothesis is confirmed. Altogether, our models demonstrate that firms report on their BM information in both financial and non-financial reports with an accounting mindset, although these two types of reports are informed by different paradigms.

Table 5 shows the reliability and validity results of the inner model estimations. The primary measure of reliability is the coefficient of determination (R^2), which assesses prediction accuracy (Hair *et al.*, 2012; Nitzl, 2016). Specifically, R^2 indicates the amount of variance in the endogenous latent variables, which is explained by its independent latent variables. Values greater than 0.6 represent good explanatory power (Hair *et al.*, 2014). As our results show, *Quant* explains most of the variance in *Monet* and *Topic*, and the overall prediction accuracy of the inner model is good.

Redundancy indicates the model's validity (Hair *et al.*, 2014). As explained by Sánchez (2013, p. 69), redundancy "reflects the ability of a set of independent latent variables [to] predict values of the indicators' endogenous construct". Values higher than 0.375 denote a large model, while the values of 0.125 and 0.25 denote fit and moderate models, respectively (Latan and Ramli, 2014). The redundancy scores for *Topic* in both models are very high, which indicates that *Quant* largely predicts its value. *Monet* has mid-range scores of 0.19 (financial/non-financial) and 0.29 (financial/non-financial), suggesting that *Quant* only partially predicts its values.

Goodness of fit (GoF) measures the overall performance of both the inner and outer models. According to Latan and Ramli (2014), the value of 0.52 for the financial reports indicates that the model is fit moderate, while the score of 0.62 for the non-financial reports denotes a large model.

Finally, we performed a bootstrap *t*-test to compare and test the differences between the two groups. The bootstrap *t*-test is a resampling method that involves "separating the data into groups and then running bootstrap samples with a replacement for each group" (Sánchez, 2013, p. 120). Our results appear in Table 5. Columns 2 to 4 show the path coefficients; "diff.abs" is the absolute difference between the path coefficients for the financial and non-financial reports. The next three columns report the *t*-test statistics, the degrees of freedom and the associated *p*-value. The last column shows the significance of the difference between the path coefficients at the 5% level.

As Table 6 shows, the impact of *Quant* and *Monet* on *Topic* is not significantly different between the financial and non-financial reports. This fact further confirms our second hypothesis, suggesting that accountingisation influences the kind of BM information included in both financial and non-financial reports. In turn, our findings show that introducing BMs as a core feature of corporate reporting has not changed the form and

		R^2		Mean redundancy	
Variables	Type	Financial reports	Non-financial reports	Financial reports	Non-financial reports
Quant	Exogenous	0.0000000	0.0000000	0.0000000	0.0000000
Monet	Endogenous	0.7143504	0.6255279	0.1969075	0.2990463
Topic	Endogenous	0.8227146	0.8596577	0.3514336	0.4982462
	GoF	0.5264861	0.6229102		

Table 5. Results of inner models

paradigm through which organisations produce those reports: numbers still trump narratives.

Although our model follows a more predictive than explanatory approach, we also tested the endogeneity in our inner model using the Gaussian Copula approach (Hair *et al.*, 2019). We found an endogeneity issue with the LV *Quant* when considering the whole sample (172 reports) regardless of the type of reports in the test. However, this endogeneity disappears when we distinguished between financial and non-financial reports, which means that the type of report is a variable explaining both quantification and topicality. This evidence supports our findings of the difference between financial and non-financial reports and demonstrates the need to treat financial and non-financial reports in separate inner models. However, it brings us to the same conclusion about the influence of accountingisation in corporate reporting.

5. Conclusion

Our study is motivated by the ongoing tug-of-war between narrative and rational paradigms and the related debate on privileging numbers or narrative in corporate reporting (Dumay and Rooney, 2016; Martin-Sardesai *et al.*, 2020b). We investigated the content and attributes of the BM information presented in corporate reports, assuming that the rational and the narrative paradigms each inform a type of report (financial or non-financial). We find that companies report on their BMs in different ways according to the report type and its associated audience. However, accountingisation heavily influences BM information in both types of reports. In other words, companies are prone to quantifying information about their BMs. This reliance on quantification reinforces Chaminade and Roberts' (2003) argument that accounting holds to a "what gets measured gets managed" rationale. By our results, firms are clearly anchored to established reporting practices grounded in the rational paradigm. Accordingly, BM information inadvertently falls into the accountingisation trap and reports continue to privilege numbers over narratives. We do not see the long-desired narrative turn in accounting or corporate reporting despite great efforts by many to induce it.

5.1 Theoretical contribution to the debate between numbers and narrative

This study extends both our empirical knowledge and our theories on the numbers-v-narratives debate, linking it to the debate between the rational versus narrative paradigm that underpins corporate BM reporting. Prior studies have explored some of these same themes, but none have been able to support their contentions with quantitative evidence. For example, Dumay and Rooney (2016) argue that using numbers or narrative is an actor's choice based on their epistemological viewpoint. Our study takes a step forward by demonstrating that it is the rational paradigm that informs corporate reporting. This paradigm leads firms to choose numbers over narrative in corporate reports. Relying on the previous theoretical contributions (Baum, 1996; Fisher, 1984; Power *et al.*, 2003), this paradigm is used by companies to rationalise decisions and provide a semblance of reliable and objective information. That quantitative information dominates corporate reporting is

Table 6. Group comparison

$test	Financial reports	Non-financial reports	diff. abs	*t*-stat	deg.fr	*p*-value	sign.05
Quant–>Monet	0.8684	0.8237	0.0448	0.4133	170	0.3400	no
Quant–>Topic	0.7903	0.8462	0.0559	0.4894	170	0.3126	no
Monet–>Topic	0.1394	0.0992	0.0402	0.0280	170	0.4888	no

not only the result of a single actor's choices; but it is also a shared intentional approach to rationalise information in the users' eyes.

This rational approach is rooted in the shared values in the organisations' culture. Accountingisation is influenced by the logic to collect, analyse and measure information and by the social and organisational practices to transform information into comparable numbers. This attitude guides and inspires preparers in both financial and non-financial reporting as accountingisation infiltrates companies at every level (Martin-Sardesai *et al.*, 2020a). Our results show that an accounting mindset influences corporate reports and even non-financial information is quantified and reported in numbers. Thus, even though the two reports have different purposes, different content and a different audience, both remain anchored to the rational paradigm.

These findings unveil a conflicting force between the purpose of reporting and how reports are prepared. Although non-financial reporting is theoretically an expression of the narrative paradigm and targeted to a broad set of users, it too is touched by accountingisation. This tacit conflict extends over the main actors involved – the stakeholders and preparers – and their power (Conrad, 2005; Weick and Browning, 1986). The individual actor, who is responsible for collecting non-financial information that is narrative in nature, elaborates it by reducing it into quantitative information. As a result, preparers tend to exclude non-expert stakeholders allowing only (accounting) experts to debate, interpret and assess information.

The main emphasis in a narrative is the connection among fragmented pieces of information in a story (Holland, 2004). Narratives can help link the different components of a company's BM while numbers can give objective credibility to those descriptions and reduce ambiguity (Chaminade and Roberts, 2003; Holland, 2004; Järvinen *et al.*, 2020; Robson, 1992). As Dumay and Rooney (2016) point out, neither numbers nor narratives (nor their combination) can adequately meet the needs of all an organisation's stakeholders. Yet, as narrative can enact a more inclusive reporting, we need to find a trade-off between the rational and the narrative paradigms. However, it is unlikely that inclusive reporting that incorporates narrative will become widespread without modifying current corporate reporting practices.

Beattie *et al.* (2004) claim that we need more non-financial information about businesses while Beattie and Smith (2013) argue that BMs represent an attractive source of non-financial information. However, contrary to what several scholars predict (Michalak *et al.*, 2017), reporting on a firm's BMs has not radically reshaped corporate reporting practices. Current non-financial reports contain BM information but are still produced with an old-fashioned accounting mindset. As our study demonstrates, by using an accountingisation vocabulary, report preparers follow a rational schema. Thus, the accounting mindset, which tends to infuse a narrative with numbers, remains the dominant epistemological view.

Companies have not overcome the limits of traditional reporting models. If firms cannot move from numbers to a narrative – or at least move freely between them – they will not escape the trap of accountingisation (Dumay and Roslender, 2013). They thus cannot provide a full context for understanding corporate information (Michalak *et al.*, 2017). We need to recognise accountingisation at work in reporting on BMs and free report writers – and companies – from the accounting mindset.

5.2 Practical implications

We began this article by mentioning "a push" to include business model information in corporate reports. One such gambit is the European Directive 95/2014 on non-financial reporting (European Parliament, 2014). However, the corresponding member state

regulations have not harmonised narrative reporting practice (Strampelli, 2018). As a result, several scholars have strongly advocated for reforms to this and other similar initiatives (Abhayawansa and Guthrie, 2016). Reporting regulations, such as the European Directive 95/2014 (European Parliament, 2014), may drive firms to change their reporting practices substantively, as might other frameworks and guidelines, such as the IIRC's <IR> framework (IIRC-International Integrated Reporting Council, 2013), in their call for more significant disclosures of BM and other non-financial information (Tweedie *et al.*, 2018). The concept of integrated thinking behind the <IR> framework may also encourage companies to understand how interdependent the financial and non-financial aspects of their business strategy are (Simnett and Huggins, 2015). But at present, reports include "what the organisation wants to disclose, rather than what is prescribed by a particular framework" (Dumay and Rooney, 2016, p. 229), suggesting it will take more to change the norm.

A change of focus within corporate reporting, from numbers to narrative, can democratise corporate reports and transform non-experts into active participants. Our findings can help researchers and policymakers unlock BMs from the accountingised corporate reporting status quo. Instead of simply introducing new reporting guidelines, we advocate the need to change the mindset behind the production of corporate reports into one that values both numbers and narratives. We know this will not happen overnight. However, unless the growing pressure from investors and financially illiterate stakeholders to make companies more accountable, responsible and transparent lifts, every company eventually will have to change its mindset.

This study has some limitations. First, we analysed a sample of corporate reports published in 2016 because we expected to find early evidence of organisations reporting BM information. Future research could compare our results with the analysis of more recent reports to determine whether much has changed over time. As the attitude of report writers to accountingisation depends on their epistemological viewpoint and social identity (Dumay and Rooney, 2016), future scholars in this field could also fruitfully explore how national, organisational and accounting cultures affect the narrative and rational paradigms. Future research can examine accountingisation in corporate reporting to explore other rationales underpinning its use, such as concealing sensitive information (Dumay *et al.*, 2018), the institutionalisation of reporting practices (de Villiers and Alexander, 2014) and the use of calculations to support arguments (Westerdahl, 2020).

Note

1. Compared to words, coding sentences allowed us to consider the context in which the idea was expressed. We acknowledge that there is some debate over using sentences versus paragraphs as a coding unit (Dumay and Cai, 2014). However, sentences are more suitable for our purposes because paragraphs can be long, they tend not to follow precise linguistic rules, and it can be arduously difficult to distinguish one paragraph from the next in a badly-formatted PDF. According to Hackston and Milne (1996, p. 86), sentences have the advantage of being 'natural units of written English which clearly exist between two punctuation marks', thus providing a more reliable measure than paragraphs. As such, using sentences for both coding and measurement provided 'complete, reliable and meaningful data for further analysis' (Milne and Adler, 1999, p. 243).

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Appendix

Table A1. Descriptive statistics from the coding

Reports	Mean	Max value	Min. Value	Total count of text units
Financial reports				
Topic				
VA	5.88372093	26	0	506
VF	18.4651163	77	0	1588
VN	4.27906977	28	0	368
VP	13.5116279	64	0	1162
Quant				
Q_VA	3.1627907	20	0	272
Q_VF	18.127907	76	0	1559
Q_VN	1.61627907	25	0	139
Q_VP	1.56976744	21	0	135
Monet				
M_VA	0.06976744	1	0	6
M_VF	17.1860465	77	0	1478
M_VN	0.04651163	1	0	4
M_VP	0.10465116	2	0	9
Non-financial reports				
Topic				
VA	4.70930233	25	0	405
VF	3.48837209	73	0	300
VN	2.63953488	29	0	227
VP	6.59302326	51	0	567
Quant				
Q_VA	2.88372093	16	0	248
Q_VF	3.45348837	72	0	297
Q_VN	0.79069767	10	0	68
Q_VP	0.6744186	7	0	58
Monet				
M_VA	0.08139535	2	0	7
M_VF	3.20930233	66	0	276
M_VN	0.03488372	1	0	3
M_VP	0.03488372	1	0	3

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