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Abstract

The broad usage of social media tools holds challenges and opportunities. Success in social media behaves similar as friendships, it has to be earned and developed. Hence, organizations need to plan ahead social media presence for effective management. Therefore, the main purpose of this thesis is to analyze a model based management approach for social media strategies, based on three research questions. What are existing modeling approaches for social media strategies? How can modeling methods support social media strategies? How can modeling methods be implemented and evaluated? At this moment no domain specific modeling approach was identified. Instead, two existing approaches for social media strategies - the honeycomb framework and the social strategy cone - along with the modeling method ADOScore are discussed as related work in this thesis. To support social media strategies with a modeling method seven key elements of the social strategy cone and the vision and strategy model type of ADOScore are considered as business requirements. For the technical realization of the modeling method approach ADOxx was used as modeling platform. Twitter was selected exemplary as social

Abstract

media channel to be able to validate the modeling method approach. For communicating with Twitters API the Java library Twitter4J was implemented. The modeling method consists out of four model types, which are Vision and Strategy, Policy, Resource, and Strategy Plan. To evaluate the modeling method two fictitious use cases were introduced, realized and evaluated in the thesis.

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1. Introduction

1.1. Motivation

According to Facebook's newsroom there are an average of 1.28 billion daily active users in March 2017 (Facebook, 2017). In 2016 statista.com (Statista, 2016) noted a world population of 7.4 billion people, that means a seventh of the world population is daily online on social networks. Based on the ubiquity of social networks and their wide reach independent of time zones and borders one post forwarded to friends with a simple mouse click may reach thousands of people. This could have a huge impact on a company's reputation and could be used either to harm or support a company (A. M. Kaplan and Haenlein, 2010).

Gossieaux and Moran (2010) emphasized the term Human 1.0, which covers the process of humans to become the only hyper-social species that supports others without being related. Behaviors have been hardwired into humans based on thousands of years of evolution and have been

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proven to be as successful as humans have been so far. For instance the need to help and be helped is caused by the reflex reciprocity, mirror neurons are responsible for mimic others, subconsciously humans want to look self-confident to find a better mate and people buy things repeatedly, even if not fully satisfied, because they are used to herd. For the sake of fairness, a person is willing to pay a personal price. In comparison to the human evolution business organizations are quite young and Web 2.0 took merely a decade to develop ((Gossieaux and Moran, 2010)).

Smith (2007) asked people in his "ultimate bargaining game" to play a game to test fairness. One person out of two receives a sum of money. His or her task is to divide the money and to offer it to the other person who is allowed to accept or refuse the offer. If the offer is refused, no one gets money. The researcher's result shows that the second person tends to refuse an offer if it is too low and is willing to pay a personal price to harm the other person for being unfair. Transferring this situation to an interaction between an organization and customer and the customer feels treated unfair he or she would bad-mouth the company, product or service. Considering today's possibilities, it is not only possible to talk back to a company but also to reach out to thousands of people and bad-mouth a company to an unpredictable extent (Smith, 2007; Gossieaux and Moran, 2010).

For modern business organizations, the increasing set of new technologies and communication possibilities within social media leads to a new way of interaction with customers, partners and employees (Magee, 2010).

1.1. Motivation

Social business enables an employee to be seen as someone with an innate infrastructure not only related to their work but also to their “personal lives, friends, coworkers, social applications, and other businesses” (Magee, 2010).

If business organizations are able to establish a successful community they could gather great profit, as for example Cisco did in 2008 with the I-Prize (Gossieaux and Moran, 2010). Cisco searched for the next billion-dollar product line and invited people and teams to share their ideas and business plans online. The whole community was able to vote and comment the submitted content, but the final call was reserved for the review board of Cisco. With this basic approach Cisco received over 1000 new business ideas from participants of over 104 countries and formed a highly active community (Gossieaux and Moran, 2010).

A survey by Harvard Business Review Analytic Services showed that approximately two-thirds of the 2100 conducted companies are either currently using social media or planning social media appearances (Gillan, 2010). For many surveyed, social media’s influence is unknown as they have to find out how to use the different channels best, estimate the effectiveness, and build up a strategy that includes social media (Gillan, 2010).

Social media causes a shift from traditional transactional relationships (e.g., Enterprise Resource Planning (ERP), Customer Relationship Management (CRM)) to real-time process-driven relationships with customers,

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prospects and suppliers (Magee, 2010). Based on the large scale of social networks, automated techniques are necessary to promote their potentials regarding functionality and performance. Such automated techniques are still far from real-world practice and effective tools are valuable to study, experiment and validate innovative techniques (Gossieaux and Moran, 2010).

Through social media it seems that corporate communication has been democratized (Kietzmann et al., 2011). Individuals and communities are able to share information about brands without permission by creating, sharing, and consuming "blogs, tweets, Facebook entries, movies, pictures, and so forth" (Kietzmann et al., 2011, p. 242). A good example is the "United Breaks Guitars" video published on YouTube by Dave Carroll. Baggage handlers had broken his guitar after a United Airlines flight. Carroll tried to get his claim honored for a year without success when he decided to record a music video about his experience. He advertised the fact on Twitter and uploaded it on YouTube. The video has been viewed over 15.7 million times by now ([sonsofmaxwell], 2009). Time.com cited United Breaks Guitars as one of YouTube's best videos and it was even discussed on Cable News Network (CNN) and other television channels. The negative publicity caused a brand and public relations crisis for United Airlines, since many passengers felt familiar with airline service failures. The story went international and United Airline's market capitalization lost about 20 percent on the day it was published in The Times of London (Kietzmann et al., 2011; Berthon et al., 2012).

1.2. Problem Statement

Previous studies focused on the outcome or possibilities of social media and have shown the importance of social media channels regarding a company's reputation, but also as a channel to retrieve valuable feedback from customers. However, company's struggle with the effective usage of social media channels, which shows that no structured approach towards an effective social media management is available. In this context, fairness is an important aspect when it comes to customer treatment as negative feedback of customers can reach many people across the globe. This shows that policies regarding communication with fair treatment of customers is key for social media management.

1.2. Problem Statement

McKinsey&Company (2015) conducted the survey "Transforming the business through social tools" where executives were asked about their companies use of social tools regarding 18 selected business processes. The integration of social technologies into workflow for operations processes differs based on the area. They are highly integrated into public relations, customer relationship management, and marketing processes as an extension of existing tools. The least integration is noted in order to cash and demand planning processes. Executives say that the greatest impact of social technologies is created on daily customer-facing activities. Particularly in operational processes lays high potential for companies to increase the value of social technologies (McKinsey&Company, 2015).

1. Introduction

After integrating social media, companies face the challenge of measuring data because of a lack of experience. The majority of respondents had no metrics established to measure the benefits their companies gained through the usage independent of the target group (internal, customers, or partners and suppliers). It is important to know all benefits companies want to reach to identify the best measurement (McKinsey&Company, 2015). McKinsey&Company suggests to "use existing, targeted metrics for areas such as customer satisfaction, up-sell conversion, and employee engagement to measure the success of social tools by comparing changes in against control-group areas where no social tools have been used" (McKinsey&Company, 2015).

Although social media tools are already broadly in use, executives expect that their companies' investments in social tools will increase and are aware of the potential business value (McKinsey&Company, 2015). It is important to understand humans' attitude, which is "you scratch my back, and I'll scratch yours" (Gossieaux and Moran, 2010). To gain the highest profit from social media, companies need to undertake cultural changes (McKinsey&Company, 2015).

Prior research shows that the company's use of social media tools is especially common in customer facing business processes, but that retrieved data and the increase in value is not measured. This shows that companies could be supported by a structured approach to set up social media strategies and to monitor the results and effectiveness on a regular basis.

1.3. Research Questions

My thesis will research the realization of a model-based management of social media strategies. Therefore, the analysis of strategies, the identification of appropriate integration in an organization, and the establishment of an adequate measurement are essential. Based on motivation and problem statement following research questions arise as foundation for the thesis.

1. What are existing modeling approaches for social media strategies?
2. How can modeling methods support social media strategies?
3. How can modeling methods be implemented and evaluated?

The remainder of this thesis is organized as follows: First an overview of theoretical foundation is provided regarding social media combined with Web 2.0 and creative consumers, strategies in general as well as in a social media manner. Furthermore, related work as balanced scorecards and social media management tools are discussed. Based on the undertaken research a social media strategy model is introduced. Next an evaluation of the results is given. The thesis concludes with a summary and an outlook on further work.

2. Foundations and Related Work

To discuss the principles of a strategy, this chapter gives an overview of the term strategy in general. Followed by an introduction in conceptualization of modeling methods, to be able to understand the basic concept. Furthermore, social media strategy approaches are presented. The honeycomb framework, social strategy cone, balanced scorecard, and ADOscore are considered as related work.

2.1. Strategy

According to Porter (1996) a strategy is a “creation of a unique and valuable position, involving a different set of activities” (Porter, 1996, p. 68). Mintzberg (1978) points out that there are a lot of strategy definitions available that usually follow a common theme, as they are instructions that support decision making in the future. Different interpretations are

2. Foundations and Related Work

available depending on the specific area. In game theory, strategy consists of a set of rules to drive the action of participants. According to Mintzberg (1978) the strategy definition in military theory is about ensuring security and victory by managing the nation's forces independent of peace or war through planning and development. Management theory sees a strategy as definition of long-ranging goals and objectives of an organization, followed by according actions and necessary resources for fulfillment. Based on the definition, the following features apply for a strategy

- clear
- created consciously and targeted
- defined beforehand to the linked decision (Mintzberg, 1978).

In general terminology, a strategy is defined as a plan, which is seen as an incomplete definition for enterprises and nonoperational in research. It does not cover the decisional aspects of organizations (Mintzberg, 1978). Hence, Kotler et al. (2015) indicate that a historical look back reveals that numerous military leaders designed and created military strategies. Those strategies are still applicable for management strategies today, although the venue has changed. Figure 2.1 represents the historical military leaders and their basic military strategy, which is still important nowadays (Kotler et al., 2015, p.12).

The strategy's objective is to establish long-term survival on important markets and their accompanying opportunities and threats. Therefore, it is important to clearly define the relevant markets form a material,

2.1. Strategy

geographic, and temporal perspective to create a successful strategy (Kotler et al., 2015). Kotler et al. (2015) stress out that "companies need

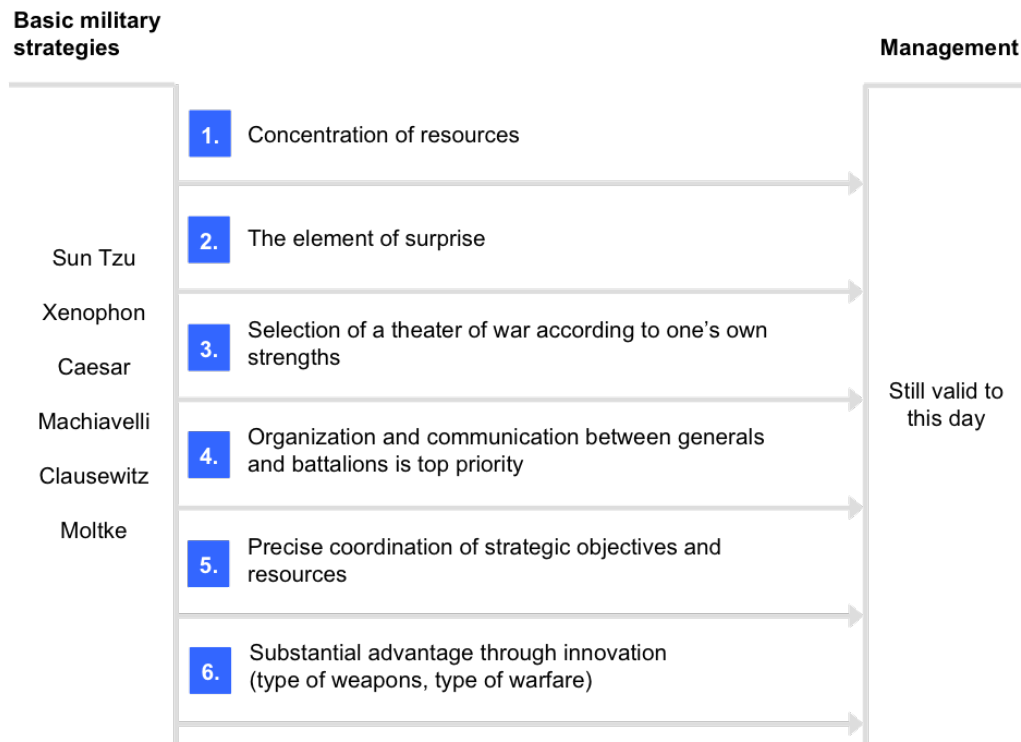


Figure 2.1.: Basic military strategies that still hold true for management today (Kotler et al., 2015)

strategies in order to set their priorities as regards resource allocation, but they also need them to be able to react to changes in their environment, to respond to competitors' behavior, or to communicate the direction of their own business to employees, customers, and shareholders" (Kotler et al., 2015, p.12). Following aspects are introduced to handle challenges of defining a strategy:

2. Foundations and Related Work

1. integrated: A strategy needs to consider overlapping aspects of a company.
2. intended: A strategy should be intentional by decision makers.
3. activity: A strategy should aim for direct actions.
4. systematic: A strategy needs to be comprehensible to third parties.
5. long-term: A strategy should focus on long-term acquisitions of objects.

Mintzberg (1987) introduced the 5 Ps for strategies to support the strategy making process, with following characteristics: plan, ploy, pattern, position, and perspective.

Plan „Strategy is a plan - some sort of consciously intended course of action, a guideline (or set of guidelines) to deal with a situation“ (Mintzberg, 1987, p.11). A strategy is created in advance and is developed consciously for a specific purpose.

Ploy A strategy can be a ploy, just a certain maneuver intended to outsmart a rival or competitor.

Pattern ”Strategy is a pattern - specifically, a pattern in a stream of actions” (Mintzberg, 1987, p.12). A certain consistency is dedicated to a strategy, independent if intended or not. Strategy in a manner of plan or pattern could be defined autonomous, as plans could not be realized,

2.1. Strategy

instead patterns could appear without preconception. With other words plans stay for the intended strategy and patterns are the carried out strategy.

Position Strategy is a position - specifically, a means of locating an organization in an "environment" (Mintzberg, 1987, p.15). This definition states that strategy is between the internal and the external environment.

Perspective "Strategy is a perspective - its content consisting not just of a chosen position, but of an ingrained way of perceiving the world." (Mintzberg, 1987, p.16). In this content, strategy is to the company what character is to the individual, with the exception that it is a shared perspective by people of a company. In this respect, Mintzberg claims that individuals unite "by common thinking and / or behaviour" (Mintzberg, 1987, p.17)

Since decades, the IT strategy has been established as a functional-level strategy that must be aligned with the business strategy. Even though the IT strategy is capable of shaping business strategy and changing business processes and business scope, the business strategy leads the IT strategy (Bharadwaj et al., 2013). According to Bharadwaj et al. (2013) the alignment of IT strategy to business strategy has been analyzed in a variety of research studies. The possibilities through new digital technologies as improvements in information, communication, and connectivity enabled

2. Foundations and Related Work

more functionalities. Traditional business strategies changed based on these technologies to "modular, distributed, cross-functional, and global business processes that enable work to be carried out across boundaries of time, distance, and function" (Bharadwaj et al., 2013, p. 472). Bharadwaj et al. (2013) introduces four themes for a digital business strategy, which are:

1. the scope of digital business strategy,
2. the scale of digital business strategy,
3. the speed of digital business strategy, and
4. the sources of business value creation and capture in digital business strategy

According to Blanchard (2011), a strategy is "a plan of action designed to achieve a particular goal of objective. Strategies are often complex and made up of many moving parts. Strategy tends to be the realm of executives who can manage a high level of operational complexity." Effing and Spil (2016) define social media strategies as "a specific part of strategic decision making based on digital resources, more specifically a group of internet based information systems" and "a goal-directed planning process for creating user generated content, driven by a group of Internet applications, to create a unique and valuable competitive position" (Effing and Spil, 2016, p. 2).

The literature stresses that a strategy is important for long-term survival independent if it is for organizational or military terms. Hence, a strategy

2.2. Conceptualization of Modeling Methods

should be unique and valuable. The importance of resource allocation, the ability to react, to respond, or to communicate is emphasized. Although aspects of a strategy making process already exist (e.g. Mintzberg's 5Ps), in my opinion a social media strategy could be narrowed down to more specific aspects. Therefore, as next step it is necessary to identify how a structured approach of planning a social media strategy could be realized.

2.2. Conceptualization of Modeling Methods

The previous chapter provided insight about strategies in general and is followed by an introduction of the main aspects of modeling method conceptualization and modeling hierarchy.

2.2.1. Modeling Method Components

The general idea of models is to abstract the reality by simplification and generalization. Therefore, some unnecessary details are withdrawn, removed or left out to simplify the model. For generalization, it is important to identify similar properties of instances and abstract or extract these from specific examples (Kramer, 2007). In an information system manner, different enterprise modeling methods are in place to abstract and represent different aspects of an enterprise. Modeling methods exist

2. Foundations and Related Work

for instance for strategically purposes (Ronaghi, 2005), business processes and organization levels (List and Korherr, 2006), and IT architectures & software systems (Aier et al., 2009). Modeling tools are used to support the definition of modeling methods by the creation of machine-processable visualizations of the models and enable services for accessing, exchanging and storing as well as querying model contents (Fill and Karagiannis, 2013; Karagiannis and Kühn, 2002). In terms of implementing a modeling method, it is inevitable to decide on design questions and how these could be realized in the modeling tool. Karagiannis and Kühn (2002) proposed a modeling method framework as shown in figure 2.2. The modeling method is divided in a modeling technique and mechanisms & algorithms. A modeling technique consists of a modeling language and a modeling procedure. The main elements of a modeling language are notation, syntax and semantics. The notation is the visualization of the modeling language and syntax. The syntax represents the grammar. The semantics define the meaning of the modeling language and are composed of semantic mapping and semantic schema. The semantic mapping refers to the semantic schema and connects the semantic and syntax, which gives the syntax elements a meaning. Hence, mechanisms & algorithms are used in the modeling language. Further, the modeling procedure defines the application of the modeling language through steps and uses mechanisms & algorithms to deliver results. Generic mechanisms & algorithms, specific mechanisms & algorithms and hybrid mechanisms & algorithms inherit from mechanisms & algorithms (Karagiannis and Kühn, 2002).

2.2. Conceptualization of Modeling Methods

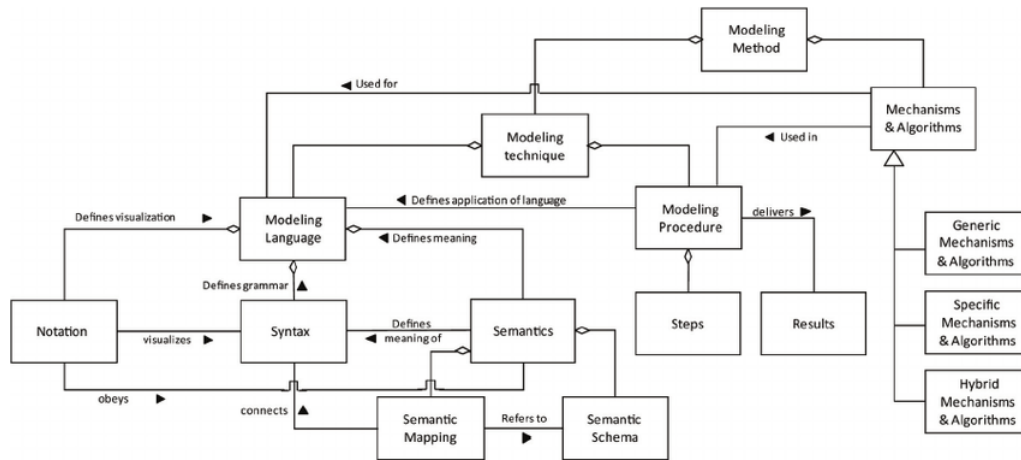


Figure 2.2.: Modeling Method Component (Karagiannis and Kühn, 2002)

2.2.2. Modeling Hierarchy

A meta model creation is based on the usage of a modeling language and is named meta modeling language. The defining model of the meta-modeling language is called meta-meta model or meta²-model (Karagiannis and Kühn, 2002; Geisler et al., 1998). Figure 2.3 shows the four layers meta model architecture, which is widely used. The lowest layer represents the original or reality. The first level is an abstract model of the reality and is created with the modeling language which is a direct model of the meta model and which in turn is realized in the meta modeling language. This could be applied on the upper levels up to a certain level where abstraction is of value. Take Unified Modeling Language (UML) as an example for the levels. For instance, a UML class diagram is used on first level to illustrate the reality. The second level, the class diagram itself,

2. Foundations and Related Work

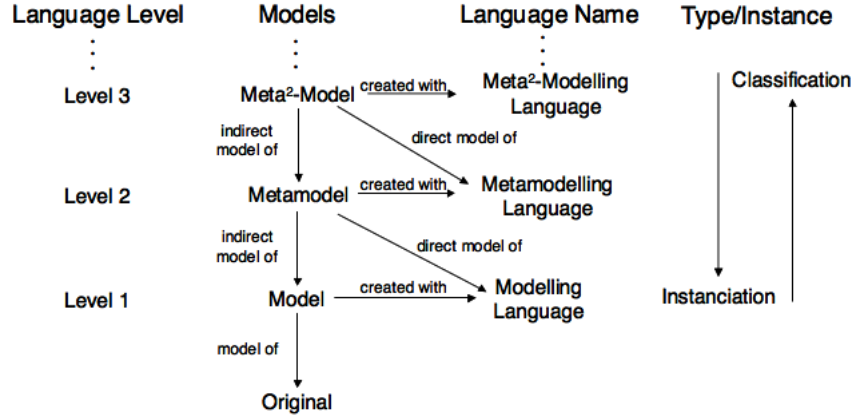


Figure 2.3.: Meta modeling based on language levels (Karagiannis and Kühn, 2002)

is realized with the UML meta model. The Meta Object Facility (MOF) is a meta-meta model of the UML meta model and represents the third level in figure 2.3 (Karagiannis and Kühn, 2002).

2.3. Social Media Strategy

The literature on social media characteristics, social media strategy approaches, existing strategy modeling approaches, and social media management tools is consolidated in this chapter. Aim of this chapter is to analyze related work and to identify business requirements for a social media strategy based modeling method.

2.3.1. Social Media Characteristics

This chapter analyzes the shift occurred through social media, Web 2.0, and creative consumers. A brief introduction in social media management tools and public perception is given.

Shift from Web 1.0 to Web 2.0

The early days of Web 1.0 enabled consumer worldwide passive interaction with companies and each other on the World Wide Web by one-way communication of information (Walsh et al., 2011; Berthon et al., 2012). Firms rushed to have an online presence and created simple websites based on their corporate brochures, named 'brochureware'. This Internet presence resulted quickly in online coordination and commerce. Different areas of content were covered, starting from entertainment to education (Berthon et al., 2012). After a time of adaption and learning companies began to feel familiar and able to manage the Internet. But not for long, since a new wave of technologies brought changes in cultural norms and new practices leaving managers confused and helpless. Especially marketing executives responsible for introducing international marketing strategies were challenged with the new invisible time zone and real time communication (Berthon et al., 2012). The new technology Web 2.0 enabled a shift from information consumer to information contributors able to communicate and to collectively create content (Walsh et al., 2011; Thackeray et al., 2008; Larson and Watson, 2011). Therefore, the knowledge of many leads

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to collective intelligence, since no one is able to know everything but everyone knows something (Thackeray et al., 2008). Further individuals reveal their opinions and interests and influence thereby others opinions about firms, products, or topics. This change in dissemination of information results in a digitized word of mouth (A. M. Kaplan and Haenlein, 2010; Benthous et al., 2016). Brand communication is directed by the consumers and does not request any confirmation by the organization. In retrospect the revolution of Internet was not so much about companies reaching out to customers by using new channels, but about customers connecting with each other through the Internet in unprecedented ways (Gossieaux and Moran, 2010). According to Berthon et al. (2012) terms Web 2.0, social media, and creative consumers are used vague and as synonyms mainly because they are linked and interdependent. Nevertheless, examining the definitions they are discrete and it is important to understand the difference. Kaplan and Haenlein (2010) define social media as “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated content” (A. M. Kaplan and Haenlein, 2010, p. 61). Figure 2.4 shows possible interpretation on Web 2.0, social media, and creative consumers. Web 2.0 provides the technical infrastructure for the phenomenon of social media and supports consumer-generated content, which differentiate in focus; as social media focuses on content and consumer generation on content maker. Summarized Web 2.0 makes it possible to create and to spread social media content. Nowadays technologies enabled three effects (Berthon et al., 2012).

2.3. Social Media Strategy

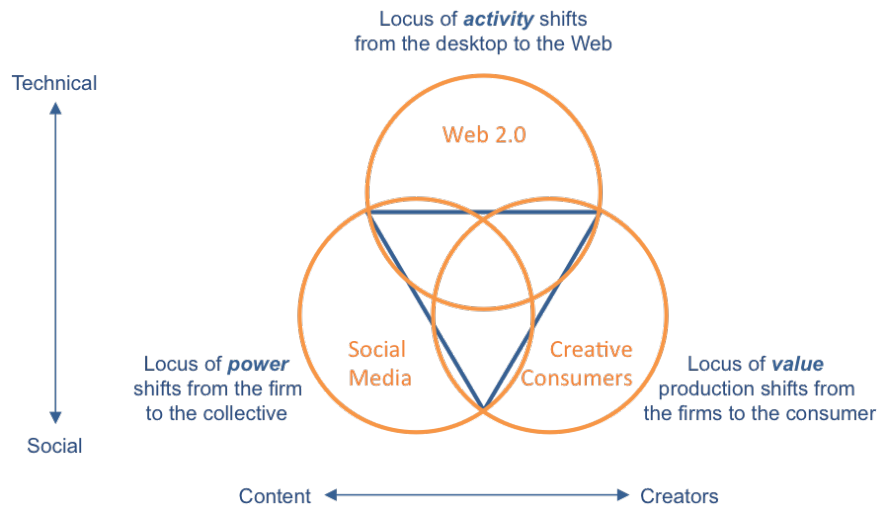


Figure 2.4.: Web 2.0, social media, and creative consumers (Berthon et al., 2012)

1. a shift in locus of activity from the desktop to the Web,
2. a shift in locus of value production from the firm to consumer, and
3. a shift in the locus of power away from the firm to the consumer.

Web 2.0

Web 2.0 could be defined as bundle of technological innovations regarding hardware and software that focus on users in terms of design, collaboration, and community instead of firms by enabling reasonable content creation, communication, and interoperability on the World Wide Web. Technologies that enabled Web 2.0 in the early days are for instance Adobe Flash (adding animation, interactivity, and audio/video streams to web pages), RSS (Really Simple Syndication, web feed formats to update stan-

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standardized content as news headlines), AJAX (Asynchronous Java Script, enables to retrieve data asynchronous from web servers, that allows to refresh the web content without disturbing the user with the update of the page) (A. M. Kaplan and Haenlein, 2010). Considering Steve Jobs essay "Thoughts on Flash" and, for instance, news from Mozilla announcing the reduction of Adobe Flash usage in Firefox gives the impression that Adobe Flash will be soon replaced by Hypertext Markup Language 5 (HTML5). Adobe Flash is criticized for being a proprietary standard, reducing battery life on mobile devices and its lack of security. Instead HTML5 is an open standard, enables enhanced security and improves battery life (Steve, 2010; Smedberg, 2016). O'Reilly (2007) describes Web 2.0 as the evolution from one-way platforms to platforms that enable interaction and contribution of users and introduced the core competences for Web 2.0 as follows (O'Reilly, 2007, p.36-37):

- services, not packaged software, with cost-effective scalability,
- control over unique, hard-to-recreate data sources that get richer as more people use them,
- trusting users as co-developers,
- harnessing collective intelligence,
- leveraging the long tail through customer self-service,
- software above the level of a single device,
- lightweight user interfaces, development models, and business models.

Kaplan and Haenlein "consider Web 2.0 as the platform for the evolution

2.3. Social Media Strategy

of social media” (A. M. Kaplan and Haenlein, 2010, p. 61). Web 2.0 in comparison to Web 1.0 created a shift in focus away from firms to consumers, ”individuals to communities, nodes to networks, publishing to participation, and intrusion to invitation” (Berthon et al., 2012, p. 262). Web 2.0 is not only about technology, it has a social, nearly revolutionary, effect that companies have to deal with.

Creative Consumers

Creative consumers are individuals rather than companies, who are responsible for the value-added content on social media they share socially with their network of friends. In the past, organizations controlled the provided information about their own brand through public relation management and press announcements (Berthon et al., 2012). Nowadays organizations could allow customers to become creators or co-creators through social media (Thackeray et al., 2008). Although it is common that social media is referred as user-generated content (UGC) or consumer-generated media (CGM) it is necessary to look at the media and the consumers separately (Muñiz and Schau, 2011). Three main characteristics of UGC are that the content is published on a website or a social networking site, a creative intention of the content must be available to a certain amount, and the user should not create the post based on professional reasons (A. M. Kaplan and Haenlein, 2010). Creative consumers are drivers of the new social media world (Muñiz and Schau, 2011). The content could be represented

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in different forms like words, text, pictures and videos. It is created by consumers worldwide and from a marketer's perspective it could be seen as value creation. Content created by users for other users could lead to a more successful impact than carefully planned campaigns (Thackeray et al., 2008). CGM is about creativity. For instance, it starts with simple discussions about goods and services on Facebook or Twitter. Followed by users who create a structured review and evaluation in form of either text or video. As a next step, consumers are part of promotion or demotion of products and services through the own created content on media. In this way consumers participate in the adjustments of proprietary products and services and the advertisement of these (Berthon et al., 2012; A. M. Kaplan and Haenlein, 2010).

Social Media

Social media works on Internet based applications using the technological framework of Web 2.0 and "comprise both the conduits and the content disseminated through interactions between individuals and organizations" (Berthon et al., 2012, p. 263). Overall it is the product of users. Through Web 2.0 technologies the communication changed from "one to many" to "many to many" dialogues. Social media content enables different types of content like text, pictures, videos, and networks. Blogs enable individuals to create content in reverse chronological order in form of regular posts (e.g. text, graphics, videos, and links to other blogs or web

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pages). A micro blog is another blog type (e.g. Twitter). This social network service allows users to communicate through very short messages that follow a limitation of characters in the post. Further, picture-sharing websites as Flickr specialized on enabling to store and share pictures. Video-sharing websites like YouTube provide the functionality to upload and share videos. Network platforms like Facebook enable users to create a personal profile, add friends to the network, communicate through messages and posts on a personal level (Berthon et al., 2012). However, LinkedIn for example, is used in a professional manner (Kietzmann et al., 2011). Based on social networks, a shift from individuals to community and a leverage effect of relationships and collective wisdom takes place (Berthon et al., 2012). Through social media new channels and ways of interaction arise. It enables communication from individuals to individuals and individuals to companies. In general is social media easily and well accessible and scalable since a large number of users could be reached. Social media converts media monologs into social dialogues. Users not only able to consume content, but also create content. According to Kaplan and Haenlein social media is "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content" (A. M. Kaplan and Haenlein, 2010, p. 61). However, there are several variants of social media applications available that request further classification. Kaplan and Haenlein (2010) introduced a categorization of social media based on the richness and self-disclosure. Table 2.1 displays the classification of social media within the categorization. The classification is build up on

2. Foundations and Related Work

theories in media research and social processes. Media research discusses social presence and media richness. Social presence theory defines the acoustic, visual, and physical contact that could be reached between two communication parties. It is affected by the medium's intimacy and immediacy. Intimacy describes the interpersonal (e.g., face-to-face) or mediated (e.g., telephone conversation) communication and intimacy the asynchronous (e.g., email) or synchronous (e.g., live chat) communication. In terms of a high social presence value the assumption is that the social influence on behavior is increasing. Media richness theory states that every communication aims to clear up uncertainties. For media it is about the information processed in a given time period. Therefore, media varies in the degree of richness for resolving uncertainty. Social processes cover self-presentation and self-disclosure. Based on the concept of self-presentation, individuals want to be able to control impressions others could get about them. The main driver for individuals to introduce a personal webpage is the intense to present himself or herself on the Internet. Typically the presentation requests conscious or unconscious shared information related to the person, called self-disclosure. Self-disclosure could appear between acquaintances and strangers, for instance by sharing a personal problem. A. M. Kaplan and Haenlein (2010) introduced self-disclosure and self-presentation as second category for the classification of social media. Different identity strategies are developed by the user, for instance, real identity versus virtual identities, or self-promotion on Facebook, or self-branding on LinkedIn. Depending on the professional area for instance photographer use a fee required Flickr account to promote their

2.3. Social Media Strategy

		Social presence / Media richness		
		Low	Medium	High
Self- presentation/ Self- disclosure	High	Blogs	Social networking sites (e.g. Facebook)	Virtual social worlds (e.g. Second Life)
	Low	Collaborative projects (e.g. Wikipedia)	Content community (e.g. YouTube)	Virtual game worlds (e.g. World of Warcraft)

Table 2.1.: Classification of Social Media by social presence/media richness and self-presentation/self-disclosure (A. M. Kaplan and Haenlein, 2010)

professional brand in their community (A. M. Kaplan and Haenlein, 2010).

Social Media Management Tools

It is important for organizations to keep an eye on the information stream shared on social media platforms, especially considering negative comments about an organization or the offered products and services (Kimmel, 2010). To gain added value from social media, organizations need to monitor social media channels and start to build up a positive relation to the community. The monitoring activity is further useful

2. Foundations and Related Work

to obtain feedback about the company and their products and could result in improvements (A. M. Kaplan and Haenlein, 2010; Larson and Watson, 2011). It enables direct communication to the customers and could decrease costs for research and development (Dong and Wu, 2015). Social media management tools help to identify the public's reaction to selected topics by using social network analyses, data mining or natural language processing. Further organizations are able to respond to negative statements of users (Benthaus et al., 2016).

Public Perception

Benthaus et al. (2016) introduced two concepts for public perception, which are "word of mouth" and "attitudinal loyalty". Word of mouth communication is known so far as direct oral communication of information from one person to another person. Through the shift in communication caused by social media, word of mouth also takes place in the cyber world (Godes and Mayzlin, 2004). It is composed by the key attributes valence and volume. Valence is about the positive or negative feature of the information. Volume describes the quantity of passed information (Chen et al., 2011). Through social media the reach of word of mouth comes with the large number of connected users (Libai et al., 2013). The valence of the information is of crucial importance for social media, since it could cause reputation damage for organizations (Dellarocas, 2003). The term "attitudinal loyalty" defines the engagement of a user

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regarding a company (Chaudhuri and Holbrook, 2001). On social media users could follow or like an organization, without necessarily purchasing an organization's product. However this could be an indicator of doing so in future. The loyalty of a customer is important, since it is the driver of sharing information and results in social media to a faster distribution because of the existing connections to other users. To create a positive impression of a company social media usage can increase the loyalty of customers and therefore the spread by word of mouth. (Clark and Melancon, 2013). In social media platforms it is advisable to identify the most influential users and to win them as advocates for the organization (Cha et al., 2010; Benthaus et al., 2016).

2.3.2. Social Media Strategy Approaches

This chapter covers social media strategies. In particular, two frameworks are introduced, the social strategy cone and the honeycomb framework. The social strategy cone identified seven key elements of social media strategies. The honeycomb framework is created to support managers and to build a better understanding of social media ecology, audience, and required engagements.

2. Foundations and Related Work

Social Media Strategy

Creating a social media program is time consuming and challenging. Social media success needs to be earned and developed as it is with friendship. This distinguishes social media from traditional forms of media. In comparison social media builds on more subtlety and commitment than the short-term oriented traditional media. Relationship, trust, and conversation are the social web's main components (Blanchard, 2011). Social media should not be seen as an own business function. It is a tool for communication that supports business functions (e.g. public relations, marketing, lead generation, customer service, and market research). Therefore, the social media strategy should be aligned with the strategic goals of the company since for those particular business functions objectives and targets are already in place (Blanchard, 2011; Benthaus et al., 2016). For instance, if a direct link of the company's revenue to the public perception is in place influencing, the public perception has a critical impact on business success (Blanchard, 2011). Blanchard (2011) emphasizes, that a separate social media strategy does not exist, as there is also no telephone strategy or email strategy. Instead existing business objectives and strategies should be used. For instance, the target should not be to acquire 25000 followers on Twitter instead it should be to acquire 25000 net new customers through Twitter. "Objectives dictate tactics" is a simple rule coming from the military but equally applicable for the business world. As a result a social media activity is not an objective. Examples for objectives are:

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- acquire net new customers
- increase reach
- build loyalty
- gain more market share
- increase net new revenue

Therefore, the related tactics could be to create content for a blog, drive online discussions, share company news, and leveraging social web channels. To add value for the business, social media programs should always be linked to business objectives (Blanchard, 2011).

Social Strategy Cone

Effing & Spill (2016) emphasize, "there is a lack of comprehensive frameworks, theories, methods and research instruments to develop and analyze social media strategies" (Effing and Spil, 2016, p. 1). Even though companies would profit from a comprehensive kenning and theoretical grounding, supporting the introduction of social media strategies. In their paper "The social strategy cone: Towards a framework for evaluating social media strategies" they presented a framework to analyze social media strategies based on the main question, how to assess the richness of social media strategies in the field. Therefore, a literature review and analysis of case studies was conducted and the key elements were evaluated. Based on their findings, the following list of seven key elements was derived:

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- target audience
- social media channel
- goals
- resources
- policies
- monitoring, and
- content activities

Target audience. For companies it is important to identify its target audience to be able to communicate through the right channels and to know to which extend they use social media. The target audience could compose of different groups and cultures (Effing and Spil, 2016).

Social media channel. Various target groups require different types of social media channels. The effectiveness and appropriateness relates to the chosen platform (Effing and Spil, 2016). Kaplan and Haenlein 2010 introduced a categorization of social media based on richness and self-disclosure (see table 2.1).

Goals. To introduce a valuable social media presence, business goals alignment with social media is important. For an effective social media strategy a clear purpose is required. Therefore, it is crucial to define concrete and measurable goals for the social media strategy (Effing and Spil, 2016).

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Resources. Competent resources are major for a successful social media strategy. Since the communication will be realized through the employees and is about the authenticity and language provided to the target audience. Therefore, resources may require additional training or education to be prepared for the upcoming tasks. For a fully professional social media level it is recommended to use paid advertising programs (Effing and Spil, 2016).

Policies. Having social media leads to unclear settings in the professional environment. To avoid uncertainties it is advisable to introduce policies to manage the organizational communication of employees and cover their free speech rights. Communication policies for social media could be highly valuable to avoid bullying, harassment and gossip. Further company's image could be damaged if employees act without clearly defined restrictions on how to work with social media (Effing and Spil, 2016).

Monitoring. Social media is nearly unmanageable since it is driven by the participation of users. Therefore, organizations should carefully follow social media channels in a continuous fashion, independent of the channels used. Recommended for monitoring channels are standard software tools such as Google Alerts, TweetDeck, Radian6 and Fisheye. Easily accessible metrics like comments, responses, visitors, likes and followers might help to analyze activities (Effing and Spil, 2016).

2. Foundations and Related Work

Content activities. To get an overview of the outstanding activities in a timely manner a content activity plan is required. The content activity plan contains the timeframe and order of upcoming activities (e.g., campaigns, projects, and monitoring). Since it is important to continuously communicate with users through several social media channels, the activity plan should be used to plan and schedule content posts. Therefore, it is important that content posts are written in a language that fits the target group - authentic, and appropriate (Effing and Spil, 2016). As next step Effing & Spil conducted case studies for further evaluation of key elements and to expand the insights reached from the literature review by testing it in several practical cases. Nine organizations were therefore selected:

- satellite company (small-sized entrepreneurial organization)
- electronic manufacturing company (medium-sized organization)
- print company (large-sized international service organization)
- university (with 4,000 employees and about 10,000 students)
- defense technology supplier (large-sized organization)
- municipality (medium-sized organization)
- malle-commerce (start-up)
- restaurant (n.a.)
- sports brand (large-sized organization)

Organizations were asked in interviews whether they recognized and how they apply the seven key elements. The case study was undertaken to find additional insights to the key elements and therefore special attention

2.3. Social Media Strategy

was spent on deviations during data collection. Based on the interviews a cross-case analysis was undertaken and three different maturity levels of social media strategies were presented:

1. Initiation stage
2. Diffusion stage
3. Maturity stage

All companies decided on social media channels but the appropriateness and richness differ within the defined maturity levels (A. M. Kaplan and Haenlein, 2010).

Initiation stage. The initiation stage covers the key elements channel choice and target audience. According to the case study, the printing company, the electronic manufacturing company, and the satellite company are in the initial stage. All of them considered the key element channel choice in their social media strategy. The printing company did not consider the second key element target audience in their strategy but are still near the diffusion stage. The other two organization use LinkedIn to look out for high quality personnel.

Diffusion stage. The diffusion stage contains additionally to the initiation stage the following key elements: goals, resources, and policies. The Municipality, the university, and the defense company reached the diffusion stage. The municipality has a set of thorough goals in place for

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four categories. The university defined marketing goals. For the defense company no particular goals are known. Neither of them aligned their social media goals with their business goals. According to Mergel and Bretschneider (2013) monitoring is useful for identification of required resources, since the allocation of resources could be challenging. As the municipality and defense company seem to have some difficulties with future resource identification. Therefore, the university created a social media department with a dedicated budget for social media activities and is able to identify resource requests. All three companies have policies in place or are about to introduce social media policies.

Maturity stage. The maturity stage is reached if content activities are in place and social media channels are monitored. The analysis shows that these two elements only appear in the maturity stage. Klang and Nolin (2011) state that for successful social media strategy activity planning and monitoring is essential. The sports brand, restaurant and start up managed to reach the maturity stage. According to the sports brand, they defined success factors that enabled them to monitor their activity plans. They also use standard software tools for monitoring. The restaurant uses Facebook to monitor their soccer bets and free gifts activities. Malle-commerce defined social media strategy success according to growing fan numbers, interactivity, and reach. They have no exact activity plan in place but do monitor growing number ratio and possible monthly changes. According to the case study the sports brand has following goals defined:

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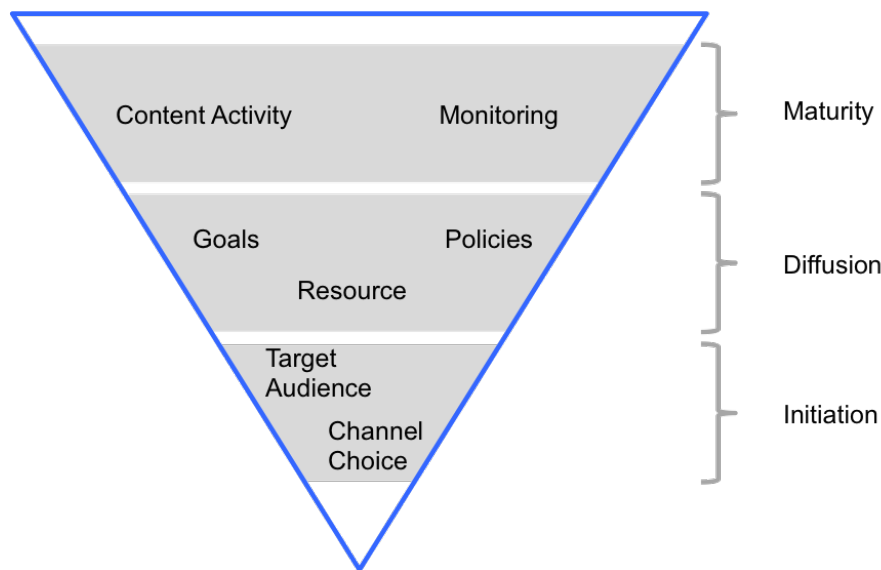


Figure 2.5.: The social strategy cone (Effing and Spil, 2016)

”increase sales, customer support, creating awareness of new products, brand loyalty, brand advocacy and reputation building” (Effing and Spil, 2016, p.6). The restaurant wants to reach to the target audience of people of the age from 30 till 50. The e-commerce start-up has set their goal to extend reach. The sport brand and start-up introduced a dedicated department to reach the goals. For the restaurant the actual execution of the activity is not clearly defined. Only the goals of the sports brand are definite measurable (Klang and Nolin, 2011). Regarding policies the sport brand introduced a code of conduct. The restaurant announced: ”our personnel cannot ‘like’ another restaurant”. The malle-commerce has some guidelines in place.

Berthon et al. (2012) analyzed the challenges and opportunities of social

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media, web 2.0, and creative customer in general and regarding an appropriate strategy. Furthermore, they provided five axioms to support international marketers to leverage benefits of social media and to manage possible disadvantages. Following axioms are introduced:

1. Social media is a function of the technology, culture, and government of a particular country.
2. In the age of social media, local events seldom remain local.
3. In the age of social media, general issues seldom remain general; that is, macro issues tend to be (re)interpreted locally.
4. The actions and creations of creative consumers tend to be a function of the technology, culture, and government of a particular country.
5. Technology tends to be historically dependent; that is, technologies in different countries evolve along unique trajectories due to inertia rather than because they are the optimal solution.

Further Berthon et al. (2012) concluded based on the axioms #2 and #3 that social media has several functions in the international area, as they are: (1) they aid the fast dissemination of information; (2) they enable the speeded up distribution and connection of interpretive frameworks "that make sense of that information" (Berthon et al., 2012, p. 267); and (3) they enable the fast coordination of inter-action (see figure 2.6).

2.3. Social Media Strategy

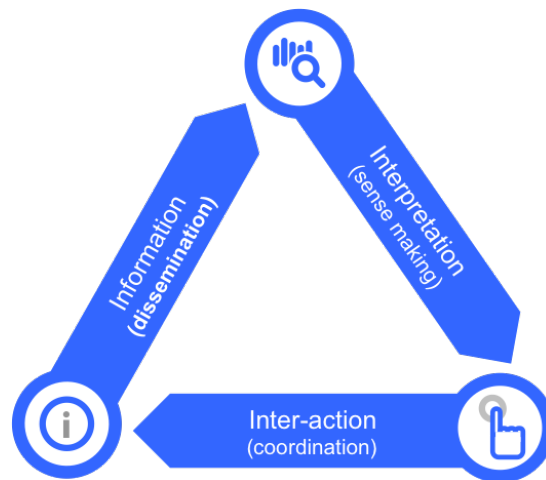


Figure 2.6.: The functions of social media in an international context (Berthon et al., 2012)

Honeycomb Framework

Kietzmann et al. (2011) The honeycomb framework consists of seven building blocks, which are identity, conversation, sharing, presence, relationships, reputation, and groups. It is created to support managers to understand the social media ecology, audience, and required engagements by using them consistently or separately. Figure 2.7 shows the functionalities of social media on the left side and on the right side it represents the associated implications of these functionalities managers have to handle.

Identity in this regard is about the extent of self-presentation in the community and could represent information about the name, age, location,

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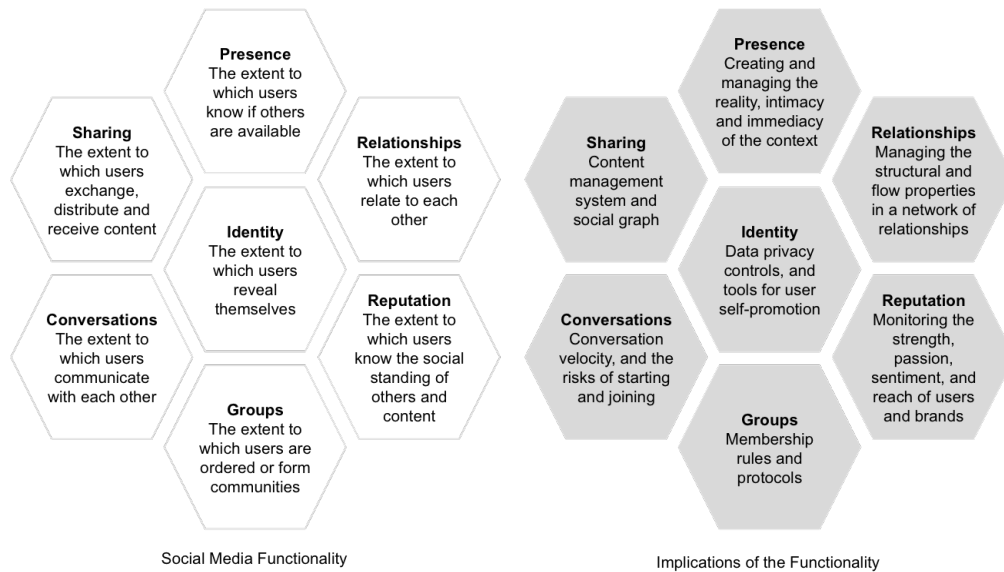


Figure 2.7.: The Social Media Honeycomb (Kietzmann et al., 2011)

thoughts, likes and feelings. The identity information depends on the social media platform and their preferences and aims. Therefore, privacy is an important topic. Even though users share information on their free will it does not imply that they have no concerns about security issues. Therefore, data privacy controls, and tools for user self-promotion are essential (Kietzmann et al., 2011).

Conversation covers the way of communication users are able to choose at the social network platform. Usually social media platforms are designed to support conversation. Those conversations could be to individuals or groups. Several motivating factors could drive to tweet or post. For instance, to be part of a community and meet like-minded individuals, to

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look for a partner in life, or to stay up to date about trends and new ideas. Further people might want to point out environmental problems or critical political issues. Twitter in comparison to other social media channels is more focused on conversation rather than identity. Blogs are more focused on lengthy conversations than networking. The huge amount and variety of conversations requires format and protocol implications to provide and track conversations (Kietzmann et al., 2011). Content and frequency of conversations are influencing organization monitoring and interpretation activities. Two main points are important for organizations to keep track of in conversations, which are the rate and direction of change. Rate of change implies the new started conversations in a defined time period. The direction of change is about a conversation's continuity or discontinuity. Organizations have to consider when it is useful to interact within a conversation and when just to watch how the conversation proceeds (Kietzmann et al., 2011).

Sharing indicates the amount users exchange, distribute, and receive content. The shared content depends on the functional objective of the social media channel and on these objectives it is possible to build relationships. Examples for shared content are pictures on Flickr, videos on YouTube, and careers on LinkedIn. Two main implications are identified for social media sharing that organizations should consider. Firstly, shared or new objects, which users have in common or could have in common should be analyzed. The shared object is what connects the user and

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thrives to an active network. Secondly, it should be checked whether the content can or cannot be shared, which could be seen as the degree of sharing. For instance, taking into account copyright laws, as YouTube had to consider after users started to upload not only self created homemade videos, but also content of third parties. Further, videos with offensive content need to be identified and removed. Therefore, it is essential for YouTube to monitor and to enable users to flag such content. Terms of use for users to agree on are necessary to manage users shared content to a certain extent (Kietzmann et al., 2011).

Presence is about knowing to which extent and where (in the virtual world and real world) another user is available. Users are nowadays able to be online almost everywhere, what bridges the virtual world with the real world. For example it is possible to check in to a location on Facebook and post this so it is visible to other users. Hence, if the setting is not deactivated, it is possible to see who is online and to start a conversation based on the availability. In other social media platforms (e.g., LinkedIn) the availability and actual location is not of relevance. For organizations it is important to know the implication of presence for appropriate interaction. Users might desire real-time interaction and require a presence line indicator and the functionality to contact other users. On the other hand some users prefer selective presences that enables them to also be hidden. The presence building block is linked to the building blocks conversations and relationships (Kietzmann et al.,

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2011).

Relationships represent how users can be related to each other. The relation could have several characteristics and starts by list someone as friend or fan after request confirmation, to converse through social media, share content, and might end even with meeting up. Kietzmann et al. (2011) identified that social media platforms with focus on identity also value relationships. LinkedIn enables to see a chain of users that illustrates how one person is connected to the other. Blogs enable relationship management informal and without structure (Kietzmann et al., 2011). To describe relationships in a social media manner the properties structure and flow are considered from social network theory (Borgatti and Foster, 2003; Granovetter, 1973). The structure of the relationship covers the number of connection of a user and their position within the network. To identify an influential user, the density, size, and centered position in the network are considered. The flow property describes the intensity of a relationship between two users, whether the conversations are frequent or not. Multiplicity of relationships is also covered under the flow property and is the case if users have several relationships, for instance if users are friends and they work together. Organizations need to understand relations in social media content to efficiently use, maintain and build relationships. Authenticity processes help to introduce regulated relationships, while users have to request and confirm relations (Kietzmann et al., 2011).

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Reputation is about the trustworthiness of content or users and might have several interpretations on social media platforms. LinkedIn for example measures the reputation of a user based on endorsements from the community. On other social media channels, not the user but the content reputation is important. For instance, on YouTube the content reputation relates to the view count and ratings, for Instagram and Facebook it would be likes (Kietzmann et al., 2011). Organizations need to identify the right metrics to measure the reputation of the community's social media activities. Social media services are in place that support to measure and monitor social media engagement. Social Mention, for instance, supports organization by searching social media platforms with specified metrics as strength (how often mentioned), sentiment (positive or negative mentions), passion (repeated conversations of certain users), and reach (amount of different users mention, e.g., one brand) (Kietzmann et al., 2011).

Groups represent the possibilities to create communities and subcommunities. Two main categorizations of groups are applicable. Either user are allowed to create lists and sort through their existing contacts, or groups could be set as open, closed, or secret. This grouping should enable users to label contacts without noticing (Kietzmann et al., 2011). Group settings may influence the framework block sharing (data is shared only between explicitly determined groups), identity (different identity information is available), and presence (availability status is restricted to

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specified groups). Organizations need to consider membership, rules and protocols (Kietzmann et al., 2011).

The 4 Cs Kietzmann et al. (2011) describe four important steps in developing a strategy to manage social media activities using the honeycomb framework, which are known as the 4 Cs: cognize, congruity, curate, and chase. Cognize is the process of getting to know the available and relevant social media platforms in order to get a better understanding of customer behavior and their interactions on social media platforms. In this context it is also important to find out factors that influence these platforms and to closely watch competitors activities (Kietzmann et al., 2011). As a next step, congruity needs to be considered and could be seen as the planning stage. According to the strategy, social media channels should be identified and used as well as appropriate metrics for measurement of the goal achievement. To identify customer winning activities, the honeycomb framework could be consulted to identify potential areas (Kietzmann et al., 2011). Since social media interactions are unpredictable an organization needs to be prepared for curate activities. Therefore, clear guidelines or policies need to be in place, that states by whom the company is represented on the Internet and when it is useful to take part in a conversation. It is essential for organizations to monitor social media channels and to analyze potential future risks or opportunities (Kietzmann et al., 2011). Kietzmann et al. (2011) describe it as chase of information. For this purpose, social media management tools could be

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used, for instance, TweetDeck, Social Mention, and Google Alerts.

2.3.3. Existing Strategy Modeling Approaches

ADOscore is a strategy performance management tool and is a model-based realization of balanced scorecards. This chapter provides a brief overview of balanced scorecards and explains the concept of ADOscore. Since it is a model-based realization of a strategy approach and covers the foundation pillars of a strategy modeling method, it is considered as related work.

Balanced Scorecard

R. S. Kaplan and Norton (1996) developed the concept of balanced scorecard in the context of a research project at Harvard Business School. Balanced scorecard is a framework for transforming a company's strategy into a correlative set of performance measures. It enables top managers to get an overview of the business in a fast and comprehensive way. Hence, "it complements the financial measures with operational measures on customer satisfaction, internal processes, and the organization's innovation and improvement activities - operational measures that are the drivers of future financial performance." (R. S. Kaplan and Norton, 1996, p.71). This is realized by giving information based on four different perspectives: financial, customer, internal business process, and learning and growth.

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The use of balanced scorecards as strategic management system enables to link long-term strategies with the corresponding short-term activities (R. S. Kaplan and Norton, 1996).

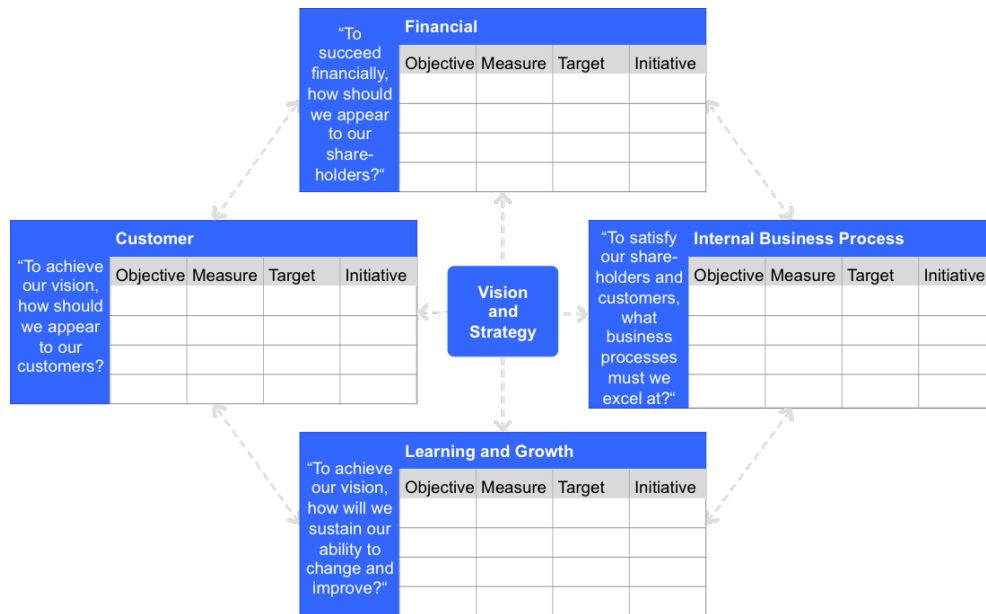


Figure 2.8.: Translating vision and strategy: Four Perspectives (R. S. Kaplan and Norton, 1996))

ADOScore

ADOScore is a product of the BOC Management Office by BOC Products & Services AG. Key characteristic of ADOScore is the consequent linkage of strategy and performance management. Main elements are goals, key performance indicators, and initiatives (Lichka et al., 2002; Seidel, 2006). Those core elements are fundamental for the strategy and

2. Foundations and Related Work

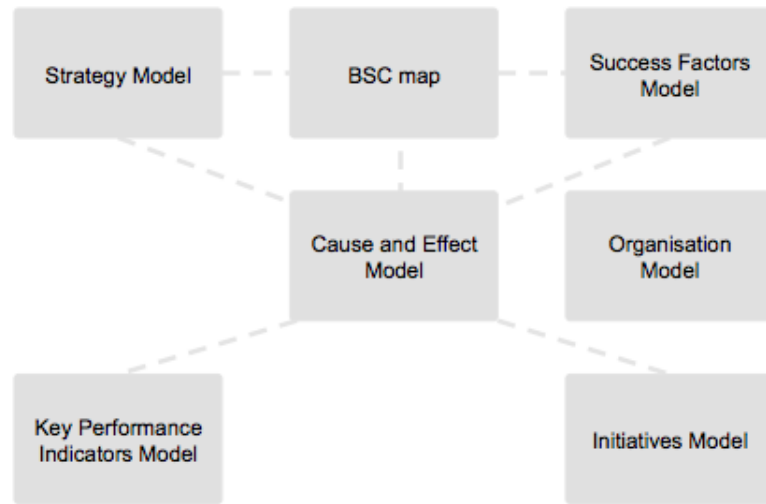


Figure 2.9.: Model types in ADOscore (Seidel, 2006)

performance management. Balanced Scorecard is through IT-supported tools next to an indicator system, also a management system, together with hierarchy, organizational structure, and data structure (Lichka et al., 2002). It enables a flexible controlling system because of customizable key performance indicators for business strategy goals within the balanced scorecard. Each goal is linked to an initiative and enables therefore continuous improvement management (Lichka et al., 2002; Seidel, 2006).

In ADOscore, the balanced scorecard is illustrated in several modeling types (see figure 2.9). The strategy model is distinguished in strategy, vision, guiding principle, slogan and strategic direction. Three different ways of visualization are available, which are standard, pyramid top, and pyramid building blocks. As next step relevant information for the perspectives financial, customer, internal business process, and learning

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and growth are collected according to the strategic variables and assigned to success factors. This is done within the Success Factor Model (Seidel, 2006). Further the Cause and Effect Model is seen as central model type and documents the objectives, measures, targets, and initiatives. It is not necessary to use all four perspectives suggested by the balanced scorecard approach within this model (Lichka et al., 2002). The balanced scorecard Map (BSC Map) enables to visualize relations between strategic business units. Key performance indicators are realized in the same-named model, which holds the possibility to use databases or Microsoft office excel tables as data source. Key performance indicators model creation is followed by the definition of the organization model, where the assignment to business units, employees and their respective role is done. Employee details as well as availability could be added to the model (Seidel, 2006).

2.3.4. Social Media Management Tools

The helpful usage of social media management tools was already described in chapter 2.3.1. In addition, this section provides two examples of social media management tools.

Social Mention

The chapter 2.3.2 provided information about the platform Social Mention under the paragraph Reputation, which is a real time searching tool for

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social media channels (e.g., Twitter, Facebook, FriendFeed, YouTube, Digg, and Google).

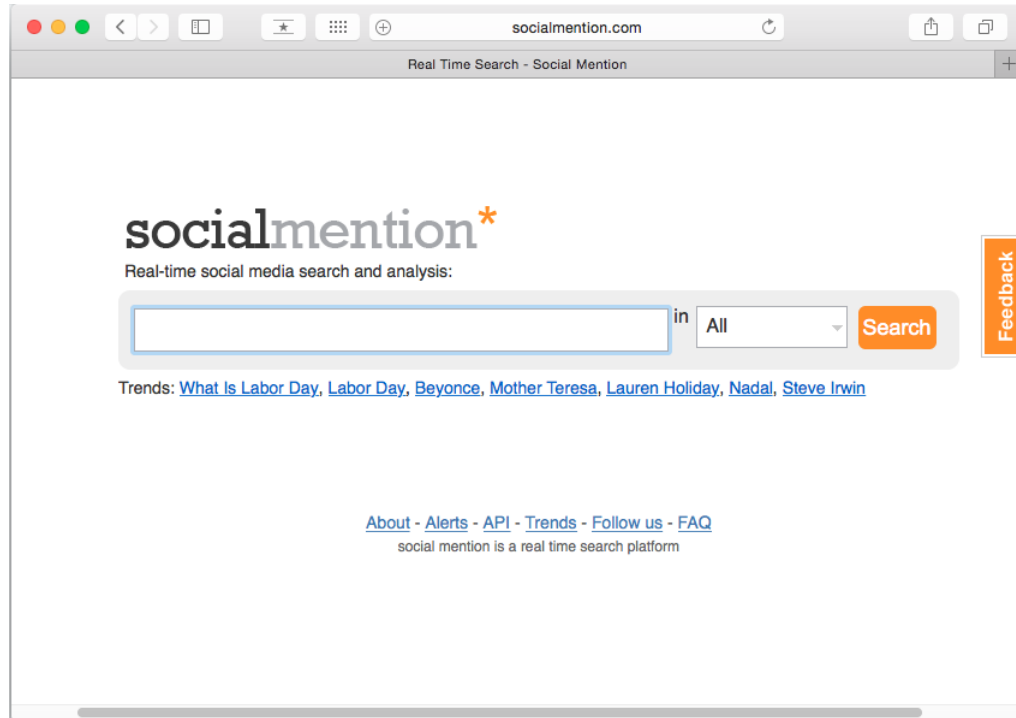


Figure 2.10.: Social Mention start page (retrieved from *Social Mention* (2016a))

It is used to search user-generated content and it summarizes the result in one stream. In addition, it allows following the general atmosphere about a brand, service, or product. Figure 2.10 is a screenshot of the Social Mention start page. Social Mention provides an overview of trendy topics under the search field as well as the possibility to select the category of platforms to be searched (Kietzmann et al., 2011; Lawrence, 2014).

2.3. Social Media Strategy

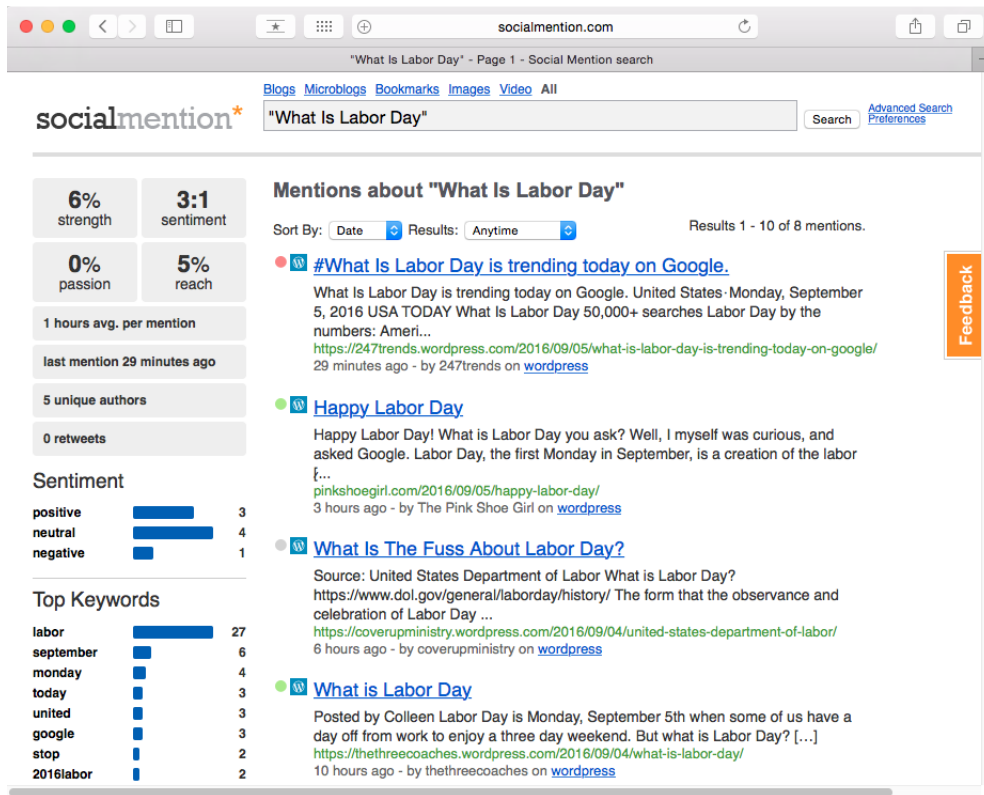


Figure 2.11.: Social Mention search result (retrieved from *Social Mention* (2016b))

As previously described, Social Mention provides several metrics (see figure 2.11). Social Mention describes the metrics within the help text as follows (*Social Mention* 2016b):

- **Strength:** represents the likelihood of discussion within social media. The calculations are based on mentions in the last 24 hours divided by total mentions.

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- Sentiment: gives information about the proportion of the generally positive to the generally negative mentions.
- Passion: is about the possibility of repeatedly mentioning the topic, e.g., in case mentions are of different users, the passion score is low, on the other hand if a group of users discuss a topic, a higher passion score is achieved.
- Reach: describes the influence range and is calculated by taking the mentions of unique authors and dividing it by the total number of mentions.

Following limitations regarding Social Mention should be considered. There is no detailed information about the data gathering process available on Social Mention's homepage (Lawrence, 2014). According to Lawrence (2014) using Twitter's API version 1.1 enabled to collect far more data than Social Mention presented. In addition, the available explanations of calculating metrics did not lead to the same result as provided by Social Mention. Therefore it is recommended to treat the results as a rough indication (Lawrence, 2014).

Hootsuit

Hootsuite enables functions for many social media platforms as Twitter, Facebook, Google+, and Instagram (Primbs, 2016). A free version exists next to a paid premium version for individuals, blogger, small editorial, and corporate solutions. The latter enables next to administration, planning

2.3. Social Media Strategy

and publication of social media content, and moderation of comments also user administration. Therefore, it is possible to post parallel and to plan social media tasks for several social network channels. Further tasks and questions could be assigned to employees or teams to manage the status of completion. Tools to monitor hashtags and create statistics are also provided. Other tools with similar functionalities are for instance Radian 6, Adobe Social, Facelift, Falcon Social, Buffer (Primbs, 2016).

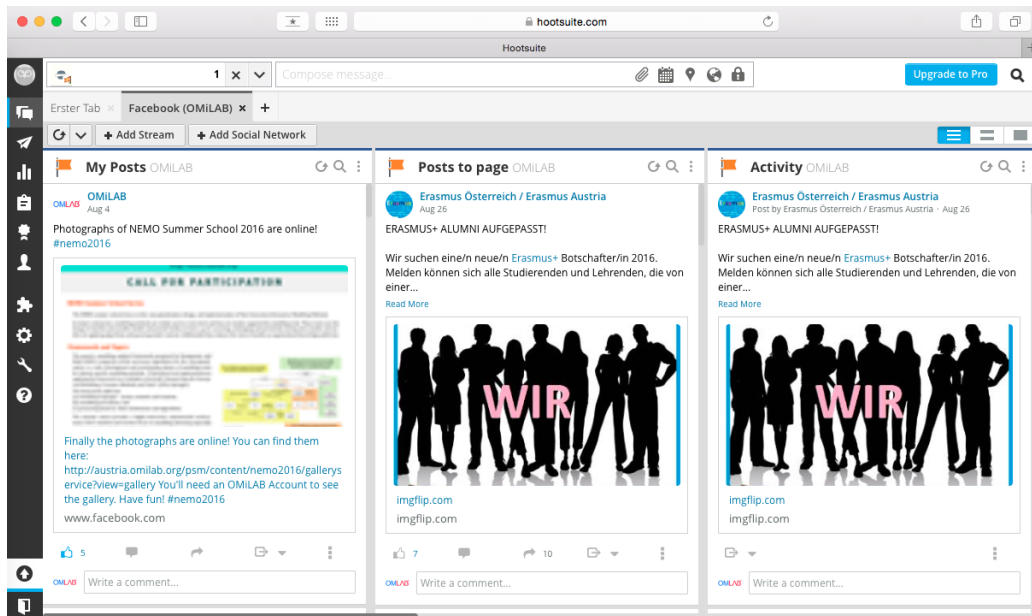


Figure 2.12.: Profile on Hootsuite (retrieved from *Hootsuite* (2016a))

Figure 2.12 shows the Hootsuite webpage set up for the Open Models Laboratory's (OMiLAB) Facebook page. OMiLAB was established by the Department of Knowledge Engineering of the Vienna University for research of conceptualization, development, and deployment of modeling

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methods and models (*OMiLAB Global Network* 2016). It is possible to create different streams based on the social media platform. For instance, available streams for Facebook are: events, scheduled, messages, unpublished, posts to page, my posts, and activity. Hootsuite enables to schedule posts for one or more platforms, although the free user is restricted to three social media channels (*Hootsuite Academy* 2016).

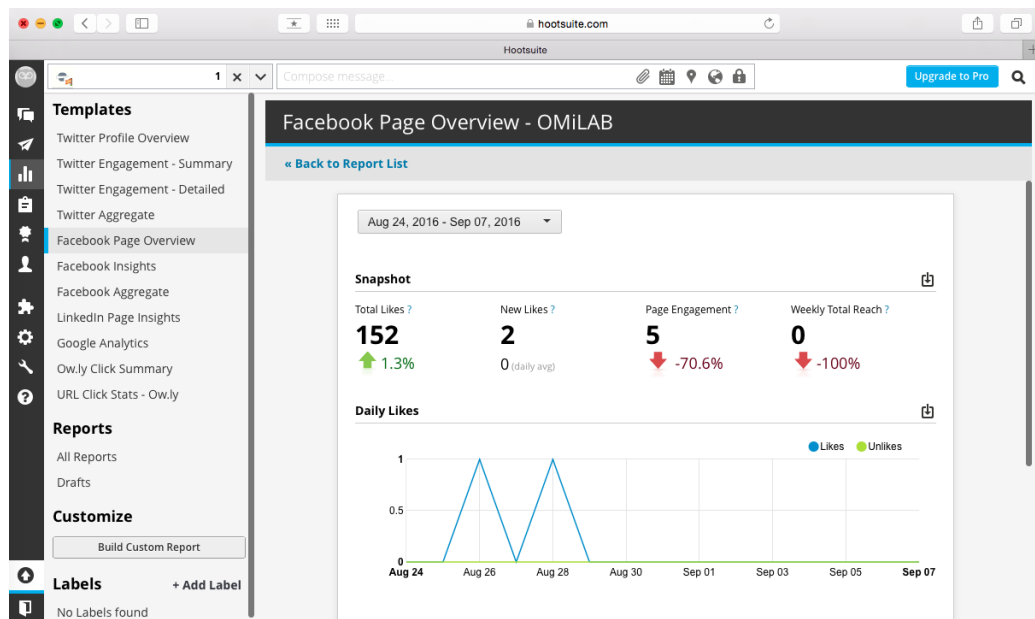


Figure 2.13.: Hootsuite report example (retrieved from *Hootsuite* (2016b))

Next figure 2.13 represents the analytical tab where the free report template "Facebook Page Overview" is displayed for a specified time period. The report consists out of three report modules: Snapshot, Daily Likes, and Daily Post Feedback. Snapshot gives an overview of total likes, daily average of new likes, page engagement (any click or story created),

2.3. Social Media Strategy

and weekly total reach (individuals that saw content associated with the page). Daily likes shows for a given time period the new daily likes. Daily post feedback shows next to new daily likes the daily number of comments and shares. Further reports are "Facebook Inside", "Facebook Aggregation", and custom reports. To run these reports points (equals to money), a pro upgrade, or an enterprise account is required (*Hootsuite Academy* 2016).

Social media management tools provide only numbers without any interpretation. For a meaningful interpretation, employees are required, who are familiar with the fans and the content of the social media appearance (Primbs, 2016).

3. A Modeling Method for Social Media Strategies

This chapter's objective is to elaborate a modeling approach for social media strategies based on the related work of the previous chapter. It starts with the chosen methodology for this research. Followed by the identified procedure for implementing a model-based management of social media strategies. Furthermore, the solution approach of the modeling method is introduced and the concept of the modeling method is discussed. This chapter concludes with a detailed explanation of the technical realization.

3.1. Methodology

According to Kothari (2004) the main purpose of research is to discover new insights by applying scientific procedures to identify answers to research questions. For this thesis a simulation research approach was

3. A Modeling Method for Social Media Strategies

chosen since it is necessary to create an artificial environment for analysis. Wilde and Hess (2007) published scientific methodologies applicable for Business Information Systems. Out of the suggested methodologies, three approaches are considered as suitable for the thesis.

Logical-deductive Reasoning. Logical-deductive reasoning is divided in mathematical formal models, semi-formal models, or pure argumentative approaches. Semi-formal models and the argumentative method are relevant for this thesis to analyze how modeling methods could support social media strategies.

Prototyping. The definition of prototyping is to develop and evaluate a prerelease of an application system. Aim of the thesis is to develop and evaluate a modeling method prototype in ADOxx to gain new insights based on the knowledge, which has been acquired through the research analysis.

Case Study. To analyze identified strategies, measurement and the culture of communities, it is considered to have a test run on social media. Ideally, the results will be integrated in the prototype and are used to confirm or improve the developed modeling method.

3.2. Procedure

The knowledge gained from the chapter 2 enables the conception of a process model and the derivation of functional and technical requirements for the model implementation. Based on the seven key elements identified by Effing and Spil (2016) (see chapter 2.3.2), the process model represented in figure 3.1 was created.



Figure 3.1.: Process Model for Social Media Strategy Management

Blanchard (2011) identified, that a social media strategy should be based on existing business objectives and strategies. To cover this aspect, in addition to the seven key elements (target audience, social media channels, goals, resources, policies, monitoring, and content activities) the general

3. A Modeling Method for Social Media Strategies

definition of the vision and strategy is considered as fundament of social media strategies. Therefore, the vision and strategy is selected as a starting point to create successful strategies. Well-defined policies should be set up to give guidance and to strengthen the awareness of each employee. Apart from policies, it is essential to know the available resources for a responsible execution of the derived activities of a strategy. Vision and strategy, policies and resources build the framework of the process model. The next step is to identify goals, which help to move towards the previously defined vision. Goals need to be assigned to an appropriate target audience and respectively to a social media channel. For this thesis, Twitter will be implemented exemplary as social media channel to an initial evaluation of the developed prototype. Furthermore, content activities are defined to plan upcoming activities. A content activity is then divided into content items, which contain the Twitter content. These content items can be used to track the social media activities via an update functionality (see chapter 3.4.3).

The modeling method for social media strategy was derived from the process model. The use case diagram in figure 3.2 represents the modeling method. It enables a division in four model types, which are considered as relevant for modeling social media strategies. Namely a model type for Vision and Strategy, Policy, Resource, and Strategy Plan. The Strategy Plan should cover goal, target audience, content activity and content items definition, as well as monitoring. The realization of the modeling method will be done on the ADOxx Meta Modelling Platform. ADOxx provides

3.2. Procedure

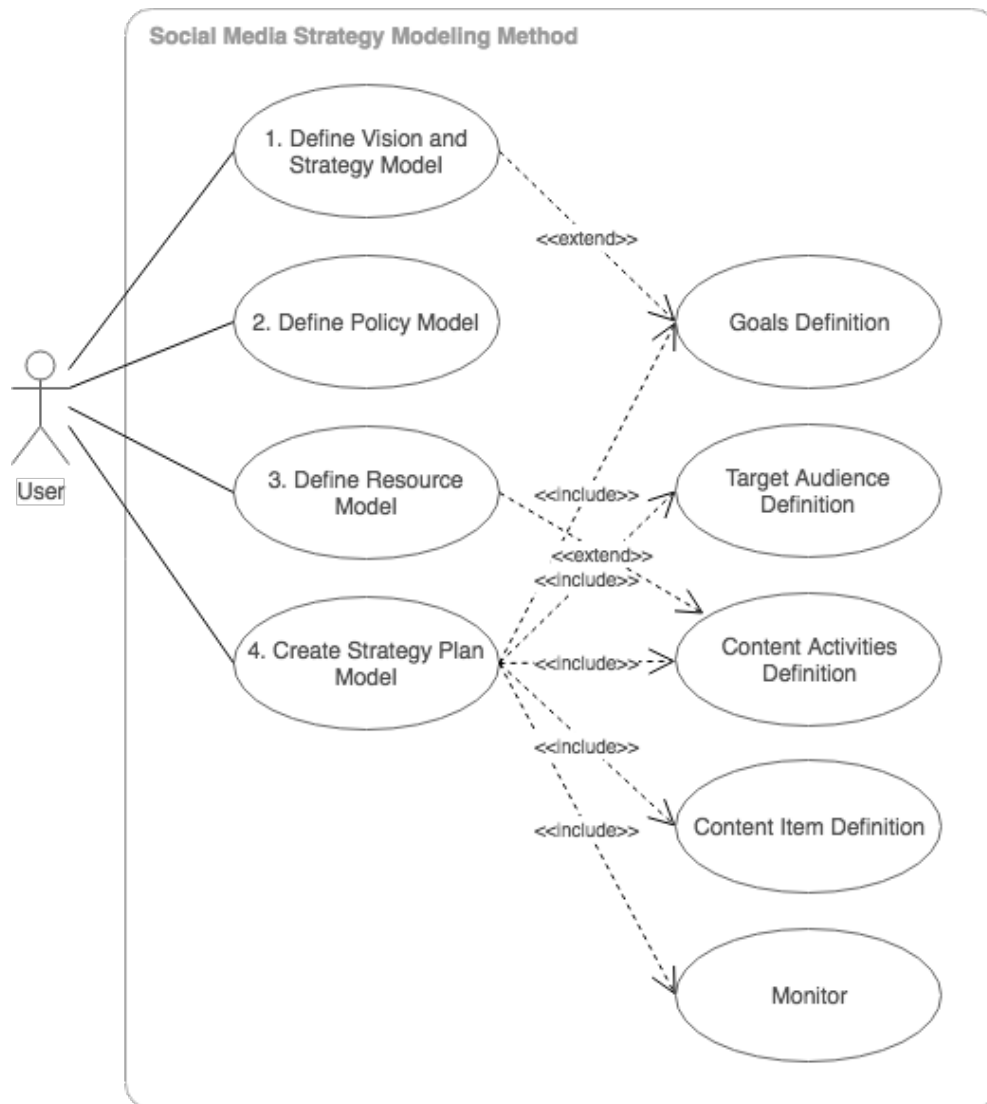


Figure 3.2.: System Use Case Diagram

3. A Modeling Method for Social Media Strategies

the necessary toolkit as it contains an environment for development, conceptualization, and modeling. To be able to monitor a defined social media strategy, recent data from Twitter is necessary, which can be retrieved by the use of Twitter's Application Programming Interface (API) within a Java program. The Java program can then directly be embedded and used by the modeling method in ADOxx.

3.3. Solution Approach

As mentioned under chapter 3.2, for the initial realization of the modeling method the social media channel Twitter is used. According to the process model and the use case diagram outlined in the previous chapter, the solution approach consists of four model types:

1. Vision and Strategy Model
2. Policy Model
3. Resource Model
4. Strategy Plan Model

The purpose of creating a Vision and Strategy Model is to name the vision and to describe the resulting strategy. This enables the user to concretize and finalize the vision. It is used to align further steps of the modeling method to the vision. The Policy Model represents all relevant policies for social media activities and helps to store regulatory information in one place, providing more efficiency for the user. The Resource Model is

3.3. Solution Approach

used to define employees who are responsible for the execution of social media strategy activities. This model contains information about the name, personnel ID number, role, contact data, and the availability of an employee. This data is useful to plan activities and should be provided by the user. Resources, policies, vision and strategy model have to be set up by the user as they serve as a prerequisite for the creation of a Strategy Plan Model. As described in chapter 3.2, this model consists of goals, target audience, content activities and content items. The objective of the model is to plan necessary actions based on defined goals. It is intended to start the model using the goal element by defining the name, description, and whether the goal aims to get information, to interpret data or to inter-act (Berthon et al., 2012). Next step is to set up a target audience by the user, covering the target gender, age, marital status, and level of education. The target audience links to the content activity, which holds information about the time frame, planned budget, actual budget and the responsible person. The element content item in turn is mainly for the tweet content and to track the actual status. It enables the user to define the target amount of likes that are planned to reach with the tweet. This also applies for the retweet target. In addition, it is possible to set a start date, end date, and status of the tweet, which indicates whether the tweet was already posted or not. After the user posted the tweet on Twitter, it is possible to update the Strategy Plan Model with the actual amount of likes and retweets the tweet reached so far. This is done via the Java library of the Twitter API, which requires authentication via OAuth protocol. This will be explained in detail in the next chapter. The

3. A Modeling Method for Social Media Strategies

update can directly be embedded in the model with ADOScript, which can execute runnable Java Archive (JAR) files. By executing the update, data is retrieved from Twitter and stored in the model. At this point, the only relevant data from Twitter for the modeling method are likes and retweets.

3.4. Concept of the Modeling Method

This chapter covers the meta model, notation, syntax, and mechanisms and algorithms of the modeling method. Hence, the functions Update Strategy Plan and Create Content Item are explained.

3.4.1. Meta Model

Figure 3.3 represents the class diagram of the model and visualizes classes, relations, and cardinalities. The syntax of the Vision and Strategy Model intends that a Vision has none or more Strategy elements and that a Strategy element belongs to none or one Vision. A Strategy Plan Model starts with a Goal. A Goal could hold a reference to a Strategy element and has none or more Target Audiences and a Target Audience belongs to none or one Goal. A Target Audience element has none or more Content Activity elements and a Content Activity refers to none or one Target Audience element. Further a Content Activity element includes one or

3.4. Concept of the Modeling Method

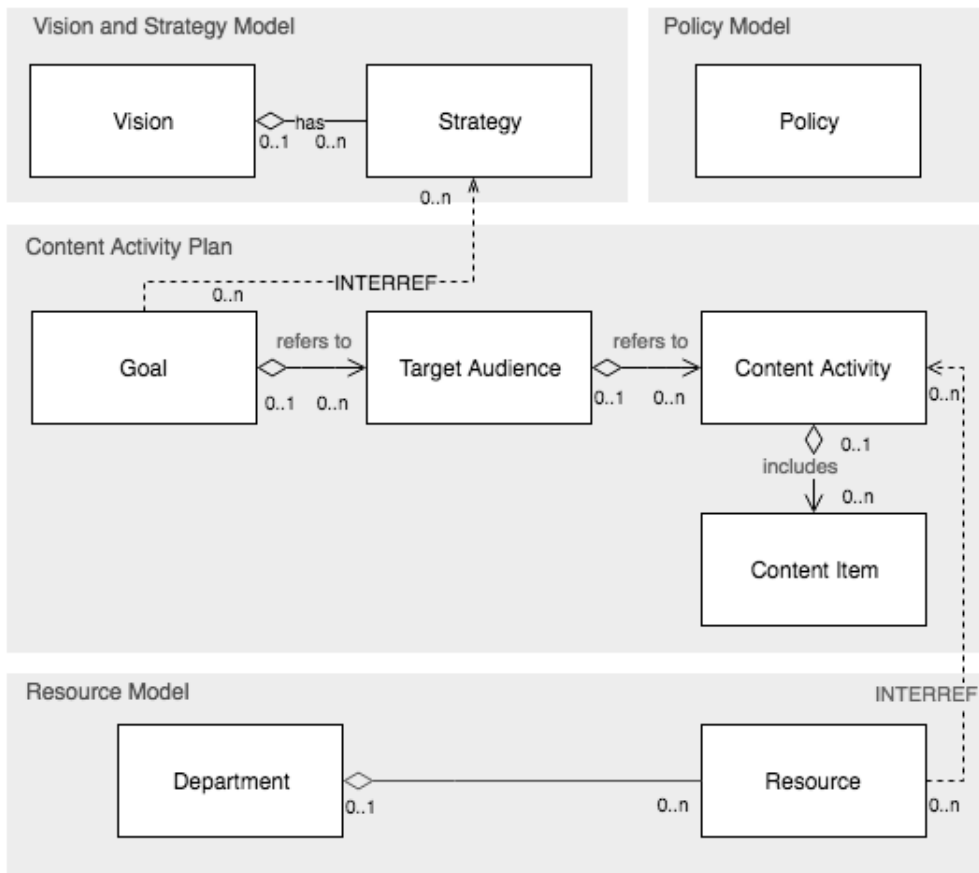


Figure 3.3.: Class Diagram of the Modeling Method

more Content Items and a Content Item element is part of none or one Content Activity. The Resource Model enables to create more than one Resource elements within one Department and more than one Department elements in a Resource Model. A Policy Model consists of one or more Policy elements, which are created without any relation.

3. A Modeling Method for Social Media Strategies

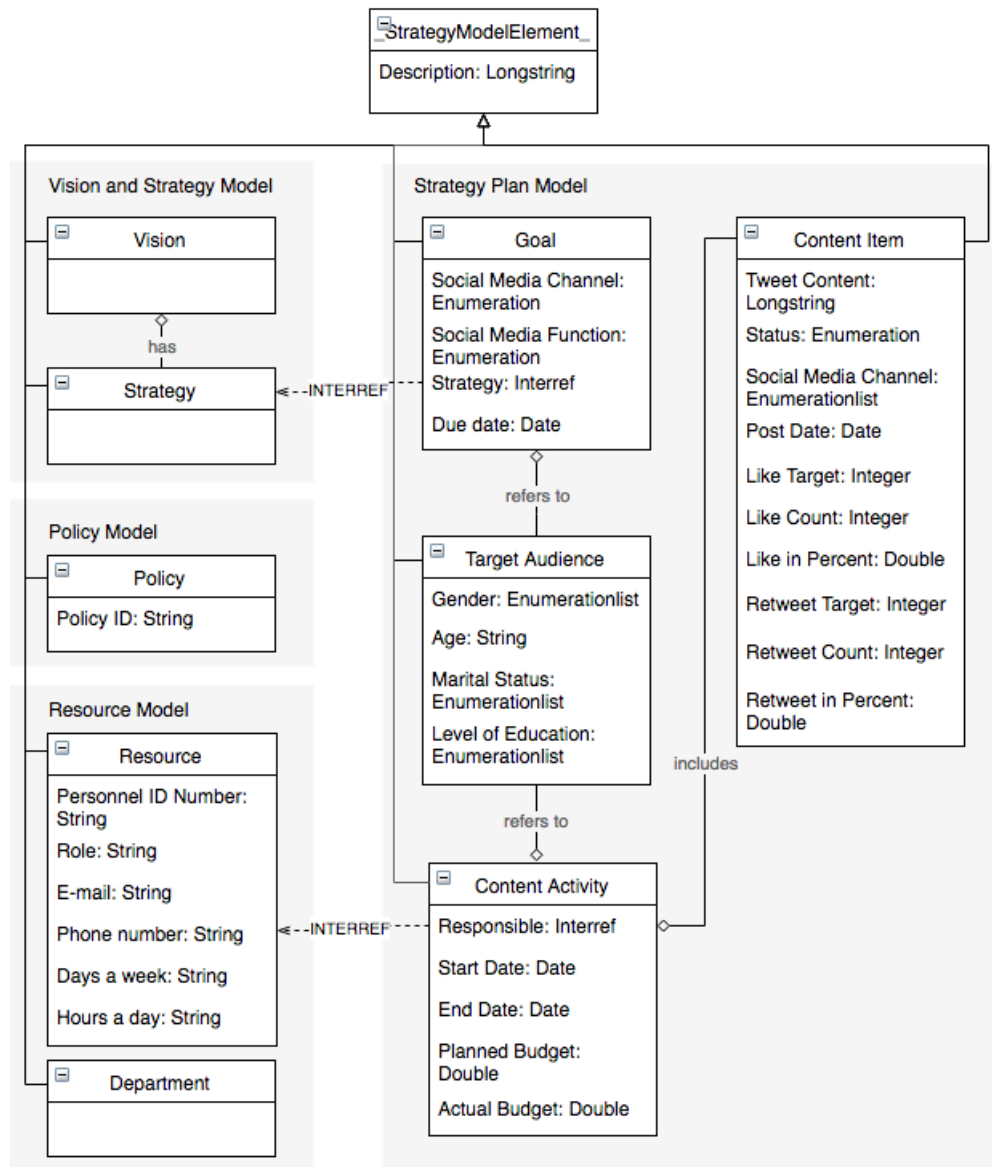


Figure 3.4.: Meta Model of the Modeling Method

The meta model of the modeling method is represented in figure 3.4. The

3.4. Concept of the Modeling Method

classes are clustered in the four model types described in chapter 4. The abstract class `_StrategyModelElement_` consists of the attributes name and description and are inherited by Policy, Vision, Strategy, Resource, Department, Policy, Goal, Target Audience, Content Activity, and Content Item. The class Vision is connected to Strategy through the relation has. A cross-reference between the model types Vision and Strategy and Strategy Plan is done by the reference from Goal to Strategy. A Goal has a reference to Strategy elements to be able to track down which Goal fulfills the purpose of which Strategy. The model type Strategy Plan intends that a Goal refers to none or more Target Audiences and Target Audience in term refers to none or more Content Activities. A Content Activity includes none or more Content Items and holds also a reference to a Resource of a Resource Model. This enables the user to assign a responsible person to a Content Activity. In the Resource Model the class Department is used for a structured representation of the Resources. It enables to cluster Resources according to classifications, for instance departments or roles (see chapter 4). The Policy Model consists of the class policy and does not require any relation.

3. A Modeling Method for Social Media Strategies

3.4.2. Notation of Classes and Relationclasses

Following tables are categorized by model type and visualize the notation of each class that is covered in the model type, including the according attributes and data types. An explanation is provided for each attribute.

The Vision and Strategy Model covers the classes Vision and Strategy. The instance of the class Vision should be filled with information about the long-term vision of the social media strategy, with a significant name and description (see table 3.1).

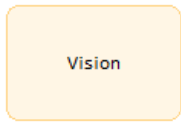
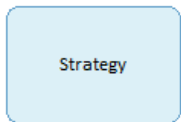
Class	Attribute	Type	Description
	Name	String	Name of the vision.
	Description	Longstring	Free input field for vision definition.
	Name	String	Name of the strategy.
	Description	Longstring	Free input field for strategy definition.

Table 3.1.: Class Notation of Vision and Strategy Model in ADOxx

The Resource and Department class are building the Resource Model. A resource could be set up with the name, personnel ID number, assigned role, additional information in the description field, contact data, and the availability by defining the working days a week and hours a day (see table 3.2). The department is defined by the name and an description.

3.4. Concept of the Modeling Method

Class	Attribute	Type	Description
 Resource	Name	String	Name of the resource.
	Personnel ID Number	String	Official Personnel ID Number.
	Role	String	Role of the resource.
	Description	Longstring	Free input field for resource definition.
	E-mail	String	E-mail address of the resource.
	Phone number	String	Phone number of the resource.
	Days a week	String	Available days per week of the resource.
	Hours a day	String	Available hours per day of the resource.
 Department	Name	String	Name of the department.
	Description	Longstring	Free input field for department definition.

Table 3.2.: Class Notation of Resource Model in ADOxx

The Policy Model covers the class Policy. It is intended to create policies without any relation to enable flexibility. A policy can capture the name, the policy ID and the description (see table 3.3).

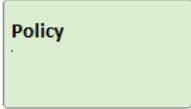
Class	Attribute	Type	Description
 Policy	Name	String	Name of the policy element.
	Policy ID	String	ID of the Policy.
	Description	Longstring	Free input field for policy definition.

Table 3.3.: Class Notation of Policy Model in ADOxx

3. A Modeling Method for Social Media Strategies

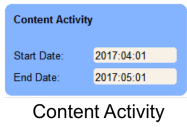
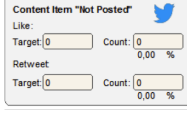
The following table 3.4 shows the notation of the Strategy Plan model type. The Strategy Plan includes most of the functionality of the model method. The class Goal enables to create a goal with a name, description, a pre assigned social media channel, a social media function, a reference to the strategy the goal relates to, and the due date. Target Audience is defined as class, to store information about name, gender, age, marital status, level of education, and to capture an additional description. The Content Activity class is mainly the frame for the steps and holds next to the name, description, start date, end date, planned budget, and actual budget the information about the responsible resource as a reference to the Resource Model. The tweet data is stored in the Content Item with a tweet name, the exact tweet content, the likes wanted and actually reached in absolute and in percent, the retweets target and actually reached in absolute and in percent, post date, status of the post, and description. The Content Item has several notations based on the attributes "Status", "Like in Percent", and "Retweet in Percent". Those specifications of the notations and the characteristics of the attributes are described in the table below (see table 3.4).

Class	Attribute	Type	Description
	Name	String	Name of the goal element.
	Description	Longstring	Free input field for goal definition.
	Social Media Function	Enumeration	Enumeration allows to choose: information, interpretation, and inter-action

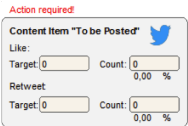
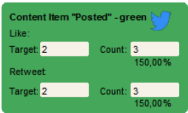
3.4. Concept of the Modeling Method

Class	Attribute	Type	Description
	Social Media Channel	Enumerationlist	This attribute is a placeholder for future extension (e.g., Facebook and LinkedIn). The enumerationlist holds the values Twitter, Facebook, and LinkedIn. At the moment Twitter is preselected.
	Strategy	Interref	Reference to the according Strategy.
	Due date	Date	Expected date for goal completion.
 Target Audience	Name	String	Name of the target audience element.
	Description	Longstring	Free input field for target audience definition.
	Gender	Enumerationlist	Enumerationlist allows to choose the gender of the target audience: female or male.
	Age	String	Definition of an age range, e.g., 20-35.
	Marital Status	Enumerationlist	Enumerationlist allows to choose the marital status of the target audience: single, married, divorced, and widowed.
	Level of education	Enumerationlist	Enumerationlist allows to choose the level of education of the target audience: lower secondary education and lower, upper secondary education, post secondary non-tertiary education, short-cycle tertiary education, bachelor or equivalent level and higher.

3. A Modeling Method for Social Media Strategies

Class	Attribute	Type	Description
	Name	String	Name of the content activity element
	Description	Longstring	Free input field for content activity definition.
	Start Date	Date	Start date of the activity content.
	End Date	Date	End date of the content.
	Planned Budget	Double	Planned Budget for the activity content realization.
	Actual Budget	Double	Actual budget spent for activity content realization.
	Name	String	Name of the tweet element.
	Status	Enumeration	Is a dropdown field that enables to select whether a tweet is already posted, not posted, or should be posted. This notation represents the Content Item with the status "Not Posted".
	Post Date	Date	Date of the post.
	Description	Longstring	Free input field for tweet definition.
	Social Media Channel	Enumeration	This attribute is a placeholder for future extension (e.g., Facebook and LinkedIn). The enumeration holds the values Twitter, Facebook, and LinkedIn. At the moment Twitter is preselected.
	Tweet Content	Longstring	The tweet content shows the actual tweet and needs to be the exact tweet on Twitter, since it is used to identify the correct tweet.

3.4. Concept of the Modeling Method

Class	Attribute	Type	Description
	Like Target	Integer	Enables to set the amount of likes the tweet should reach.
	Like Count	Integer	Displays the actual amount of likes the tweet holds. It is automatically updated after using the function Update Strategy Plan and is write-protected.
	Like in Percent	Double	Calculates the proportion of the like target achievement, after the content item was posted.
	Retweet Target	Integer	Enables to set the amount of retweets the tweet should reach.
	Retweet Count	Integer	Displays the actual amount of retweets the tweet holds. It is automatically updated, after using the update function and is write-protected.
	Retweet in Percent	Double	Calculates the proportion of the retweet target achievement, after the content item was posted.
 Content Item To be Posted	Status	Enumeration	Is a dropdown field that enables to select whether a tweet is already posted, not posted, or should be posted. This notation represents the Content Item with the status "To be Posted".
 Content Item Posted	Status	Enumeration	This notation represents the Content Item with the status "Posted" and the code of the Content Item depends on "Like in Percent" and "Retweet in Percent".

3. A Modeling Method for Social Media Strategies

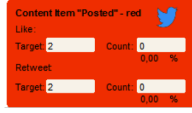
Class	Attribute	Type	Description
	Like in Percent	Double	"Like in Percent" is above 88% and "Retweet in Percent" is above 88%.
	Retweet in Percent	Double	"Retweet in Percent" is above 88% and "Like in Percent" is above 88%.
 Content Item Posted	Status	Enumeration	This notation represents the Content Item with the status "Posted" and the code of the Content Item depends on "Like in Percent" and "Retweet in Percent".
	Like in Percent	Double	"Like in Percent" is between 33% and 88% or "Retweet in Percent" is between 33% and 88%.
	Retweet in Percent	Double	"Retweet in Percent" is between 33% and 88% or "Like in Percent" is between 33% and 88%.
 Content Item Posted	Status	Enumeration	This notation represents the Content Item with the status "Posted" and the code of the Content Item depends on "Like in Percent" and "Retweet in Percent".
	Like in Percent	Double	"Like in Percent" is below 33% or "Retweet in Percent" is below 33%.
	Retweet in Percent	Double	"Retweet in Percent" is below 33% or "Like in Percent" is below 33%.

Table 3.4.: Class Notation of Strategy Plan Model in ADOxx

3.4. Concept of the Modeling Method

The model method consists of two relations that are shown in table 3.5.

Relation Class	Name	Description
	has	Creates a relation from the Vision element to the Strategy element within the Vision and Strategy Model.
	includes	Creates a relation from Content Activity to Content Item within Strategy Plan Model.
	refers to	"Refers to" is used in the Strategy Plan Model to create a relation between Goal and Target Audience as well as between Target Audience and Content Activity.

Table 3.5.: Relation Class Notation in ADOxx

3.4.3. Mechanisms and Algorithms

Modeling types as Vision and Strategy, Policy and Resource are the basic setup for creating a Strategy Plan. The Strategy Plan is considered as strategic instruction on activities in social media to achieve a goal by setting metrics to serve the purpose of a Strategy in the Vision and Strategy Model. The metrics are likes and retweets, since for now the function is only implemented for Twitter. The model enables the user to set target likes and target retweets in a Content Item and to track with the actual count of likes and retweets how much is left to reach the goal. The notation of a Content Item changes based on the parameters

3. A Modeling Method for Social Media Strategies

Status, Like in Percent, and Retweet in Percent. Status "not posted" is represented with a grey background and a grey border. If the status "To be Posted" is selected, a red line is displayed with the words "Action required" in addition to the notation of a not posted Content Item. The status "to be posted" also implies, that after the function Update Strategy Plan is triggered, the Content Item is automatically posted on Twitter and the status is set to "Posted". In terms of a posted Content Item, the background color changes to light grey and parameters Like in Percent and Retweet in Percent are considered for the color. If both parameters are below 33 percent, the color is red. A percentage range from 33 percent to 88 percent is represented in orange. The color is green if a percentage of 89 or higher is achieved for both parameters. A Content Activity clusters Content Items and enables to assign a responsible person, who takes action after analyzing the actual status of Content Items. A resulting action could be to create a new Content Item with the tweet content and to set the status to "To be Posted" so that the post will be automatically posted after using the function Update Strategy Plan (for further details on the function Update Strategy Plan see chapter 3.5). The Update Strategy Plan function is used to update the Content Item attributes Like Count, Retweet Count, Post Date and Status of Strategy Plan Models with recent data from Twitter. In addition, the function allows posting tweets on Twitter, which have not yet been posted. Create Content Item enables to automatically create Content Items. Based on a predefined timeline, Twitter tweets are selected and imported to the Strategy Plan Model.

3.5. Technical Realization

Several components are required to update Strategy Plan Models with Twitter data. Figure 3.5 shows the architecture of the modeling method and visualizes the collaboration of ADOxx, Extensible Markup Language (XML), Java, OAuth, and Twitter's API. The user interacts with ADOxx. ADOxx exports models to an XML file and executes the Java application, which was converted to a runnable JAR to be able to execute the Twitter API call out of an AdoScript file.

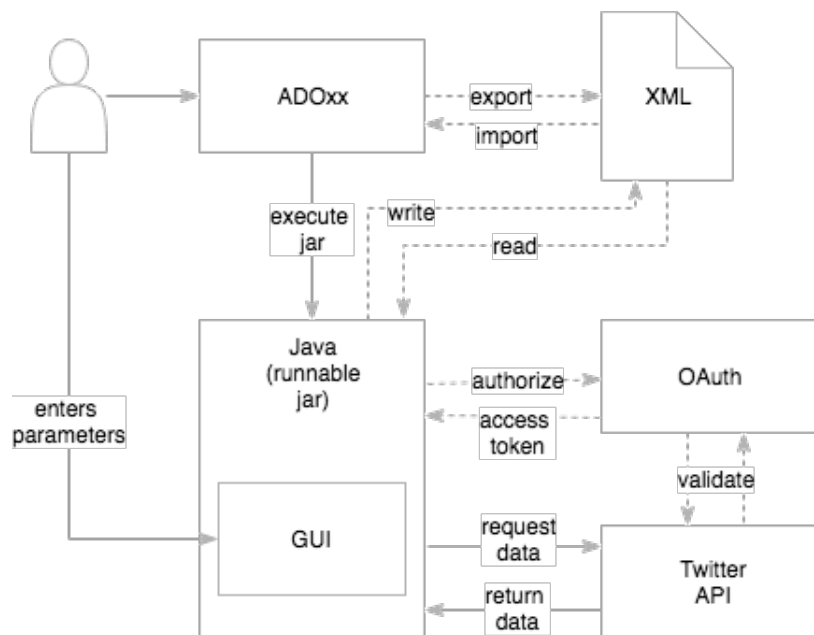


Figure 3.5.: Modelling Method Architecture

The Java application covers the library Twitter4J, a graphical user in-

3. A Modeling Method for Social Media Strategies

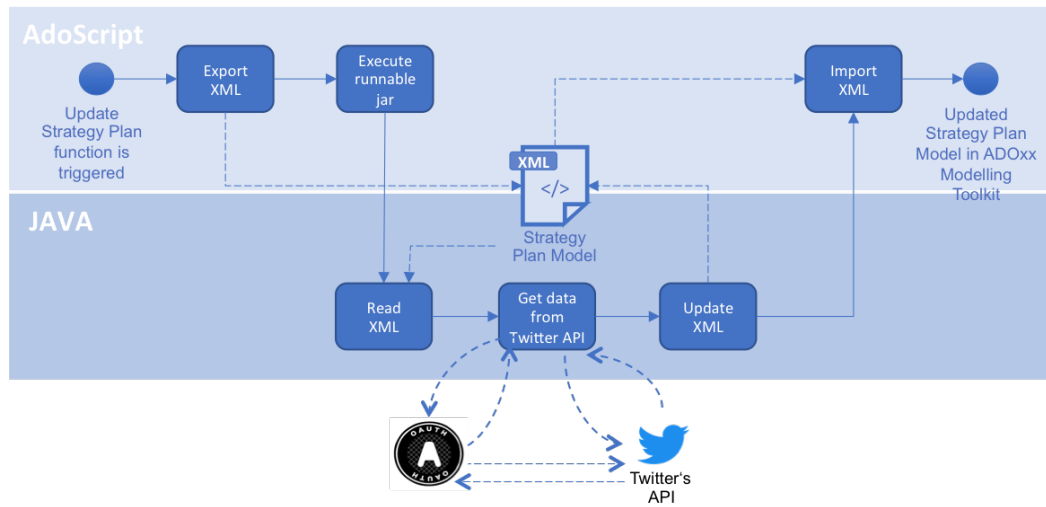


Figure 3.6.: Strategy Plan Update Function Process

terface (GUI) for parameter settings, and the authentication data for OAuth. After the user chose parameters, the Twitter API is called with the specified parameters and returns data accordingly to the Java application. The Java application then writes the returned data in the XML file, which is imported to ADOxx afterwards. The detailed procedure for both functions is described below.

The functions Update Strategy Plan and Create Content Item are available in the ADOxx Modeling Toolkit and are located under Process tools. The AdoScript of both functions can be divided into three main steps: export XML, execution of the runnable JAR, and import XML. The difference between both functions is given by parameters that call different methods in the JAR file. Figure 3.6 visualizes the process steps of the Strategy Update Function. Furthermore, the main steps and the difference of

3.5. Technical Realization

the Strategy Update Function and Create Content Item are explained below.

XML Export. The first step of the Update Strategy Plan function is the export of data from ADOxx in XML format. ADOxx provides a built in function to export models in XML format, which is also available as AdoScript file. To be able to automatically export a selected model, the standard AdoScript export function of ADOxx was copied and adapted to meet the requirements. The adapted version of the export uses the current selected model, which in turn should be exported, as input variable. The XML file is saved to a pre-defined directory, which is created at runtime, if not yet available.

Update Strategy Plan Java. The export of the XML is followed by the execution of the runnable JAR file from AdoScript. It requires two input parameters, which are the path to the XML file and the value false. When executed, a GUI opens where a user can choose the Twitter username and a date range, from which tweets should be selected. The implemented Java application reads the XML file and extracts the relevant elements, which carry Content Item information. For each Content Item, a Tweet object is created. Tweet objects carry all information required in the model and also handle the calls of the Twitter API. Before being able to retrieve data from Twitter, the application has to sign in to Twitter via OAuth, which requires the knowledge of Consumer Key, Consumer

3. A Modeling Method for Social Media Strategies

Secret, Access Token and Access Token Secret. After successful login, the application takes all tweets with the status "To be Posted" and posts them on the users personal timeline and sets the status to "Posted". Following that, each tweet from the XML is searched in the Twitter timeline of the respective user, based on the tweet content. In case the tweet is found, all values are retrieved from Twitter and updated in the Tweet object. These values are Like and Retweet Count, Like and Retweet in Percent of the target and Post Date. In case the tweet contains URL links or media links (e.g., from an uploaded picture), Twitter replaces the original links with a shorter version of it, but provides both links via the Twitter API. Therefore, the Java application also handles these links, replaces them with the link provided by Twitter and updates the tweet content in the Tweet object. The final step of the application is to write the updated XML to the original location.

Create Content Item Java. Create Content Item works similar as Update Strategy Plan, but the second input parameter is set to true. The Java application then executes one additional step, which is the creation of elements in the XML file. This is done, by comparing the tweets contained in the XML and all tweets found in the selected user timeline for the chosen date range. For each tweet not available in the XML, an additional Content Item is created.

3.5. Technical Realization

XML Import. After the runnable JAR has finished, an import of the XML file to ADOxx is triggered via AdoScript. Similar to the XML export, ADOxx provides a built in function to import models in XML format, which is also available as AdoScript file. To be able to automatically import all models contained in the XML file, the standard AdoScript import function of ADOxx was copied and adapted to meet the requirements. The adapted version of the import overrides the previously selected model. The XML file is taken from the export path.

4. Use Case Evaluation and Results

This chapter represents the modeling method based on two fictitious use cases. The first section describes the use case theoretically. Followed by a realization in the modeling method. Tweets shown in the modeling method are original tweets, although information about vision and strategy, staff, and goals are fictitious. This chapter ends with an evaluation of the results.

4.1. Use Cases

In the following, two fictitious use cases are introduced. The first use case discusses tweets of OMiLAB and the second use case is created considering the tweets of the Faculty of Computer Science of the University of Vienna.

4. Use Case Evaluation and Results

4.1.1. Fictitious Use Case OMiLAB

OMiLAB hosted the Next Generation Enterprise Modelling Summer School (NEMO Summer School) in the year 2015. Part of the NEMO Summer School was an online presence on several social media channels, including Twitter.

Long-term vision of OMiLAB is to be a world class research group with high quality teaching. Its main aim is to create a network environment and to establish NEMO Summer School by expanding the reach on social media. Also important is to strengthen the name NEMO as brand. Furthermore, research projects and topics regarding next generation enterprise modeling should be supported and presented as part of NEMO Summer School. Hence sponsoring by organizations is fundamental for the overall success. Therefore, sponsors should be attracted and are invited to present how modeling approaches are used in practice in their organizations. Additionally the presentation of gaps or open points in practice is of great value. Ideally based on presented topics, solution development in hands-on session should be realized. In the long run, achievement of knowledge growth through exchange of ideas is pursued. Innovative research topics on social media should be published to reach a broad audience. More visibility and credibility should be gained with guest lectures on renowned universities.

OMiLAB is represented by the Department of Knowledge Engineering of the University of Vienna (DKE). The head of research group is Professor

4.1. Use Cases

Dimitris Karagiannis, who is supported by the office staff Verena Lisa Kleinschmid and Gabrielle Kaiser. Further the DKE is composed by research and teaching staff, who are Dominik Bork, Wilfried Grossmann, Vimal Kunnummel, Michael Walch, Elena-Teodora Miron, Nikolaos Tantzouris, and Benedikt Pittl. The main responsibility of the research and teaching staff for the NEMO summer school was the development of hands-on workshops, presenting it to the audience and guiding through exercises. Verena Lisa Kleinschmid and Elena-Teodora Miron are managing, next to other tasks, the online presence of NEMO Summer School.

When it comes to communicating in the name of the research department, only certain employees are empowered to report in the name of the research department. Still it is important to protect the privacy of the user and it is therefore recommended to publish only necessary personal information. It is requested to act foresighted as any person could provide feedback online, which potentially reaches out to many users. The content of the communication should always follow the law and consider copyright, data privacy, and trademark rights. Confidential information is not determined to be published. In terms of uncertainties, the supervisor should be asked for approval.

Main purpose of the Internet presence is to reach out to students and professors by increasing the visibility of NEMO Summer School. Therefore, speakers should be presented online. Also the hands-on spirit of NEMO Summer School should be demonstrated as well as the internationality and general impressions of the NEMO Summer School. Responsible for

4. Use Case Evaluation and Results

the topics mentioned is Elena-Teodora Miron. Hence sponsor shipment should be acknowledged. Hence, Verena Lisa Kleinschmid should link organizations to the NEMO Summer School presence.

Besides the NEMO Summer School representation of OMiLAB, the publication of the book Domain-Specific Conceptual Modeling should be announced and promoted.

4.1.2. Fictitious Use Case Faculty

Following fictitious use case is based on assumptions. Although the fictitious use case is derived from real Tweets of the Faculty of Computer Science of the University of Vienna, a verification of the underlying strategy is outstanding.

The Faculty of Computer Science of the University of Vienna wants to analyze tweets that they published from January 2017 till April 2017. Same policies as for the OMiLAB are applicable for the Faculty of Computer Science as well as the Resource Model.

Vision of the faculty is to be a world class faculty with high quality teaching. To gain more visibility as world class faculty, the Faculty of Computer Science will contribute in local media. Further, acknowledgement of outstanding achievements is pursued. To ensure high quality teaching, innovative research topics are supported. Additionally international guest lectures should be invited.

As next step the Faculty of Computer Science is about to import all tweets posted in the time period from January 2017 till April 2017. The result is described in chapter 4.2.2.

4.2. Result

The previous described use cases of OMiLAB and the Faculty of Computer Science are realized in the introduced modeling method and are represented in this chapter. Concluded with an analysis of the fictitious use cases.

4.2.1. Result OMiLAB Use Case

Following section represents the OMiLAB use case described in chapter 4.1.1 embedded in the modeling method introduced in chapter 3.

The vision and strategy model in figure 4.1 visualizes the written ambitions of the OMiLAB, categorized in two visions "world class research group" and "high quality teaching". The vision "world class research group" results in several strategy elements, which are "establish NEMO Summer School", "integrate organizations", and "knowledge growth through exchange of ideas".

4. Use Case Evaluation and Results

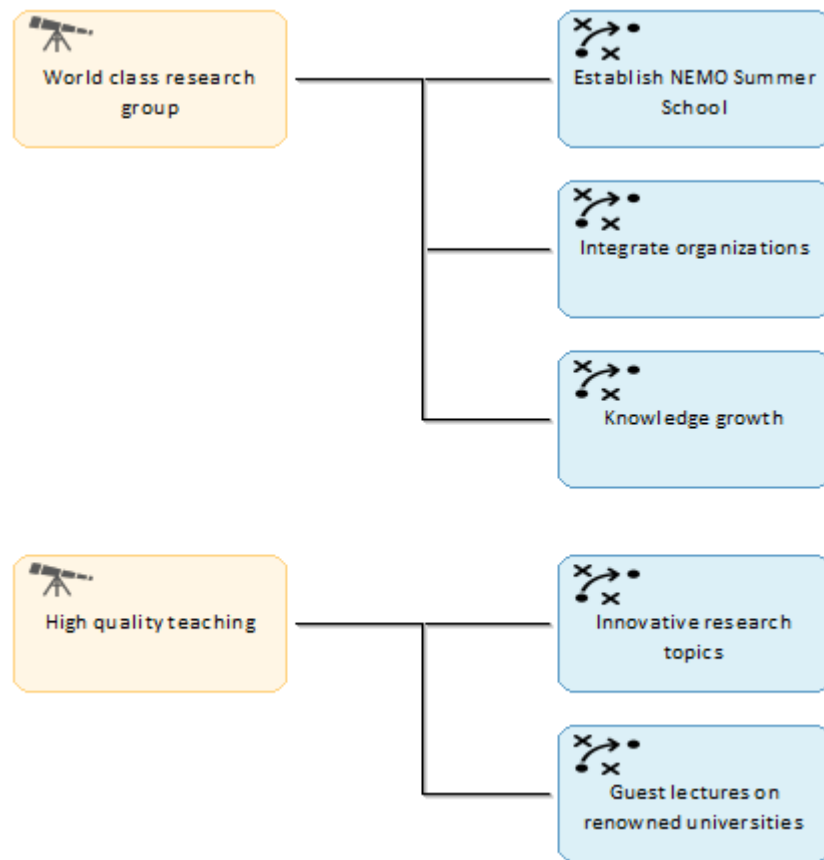


Figure 4.1.: Vision and Strategy Model OMiLAB

More details are available in the description of the strategy element "establish NEMO Summer School" as "expand reach on social media", "strengthen name "NEMO" as a brand", "create a network environment", and "support and present research projects and topics" (see figure 4.2).

4.2. Result

Establish NEMO Summer School (Strategy)

Name:
Establish NEMO Summer School

Description:
Establish NEMO Summer School by:
- expand reach on social media
- strengthen name "NEMO" as a brand
- create a network environment
- support and present research projects and topics

Close Reset

Figure 4.2.: Strategy Element Establish NEMO Summer School

Figure 4.3 shows the description of the strategy element "integrate organizations". Vision "high quality teaching" has two strategy elements. First is "innovative research topics" for publishing innovative research topics on social media to reach a broad audience. Second "guest lectures on renowned universities" to gain more visibility and credibility.

4. Use Case Evaluation and Results

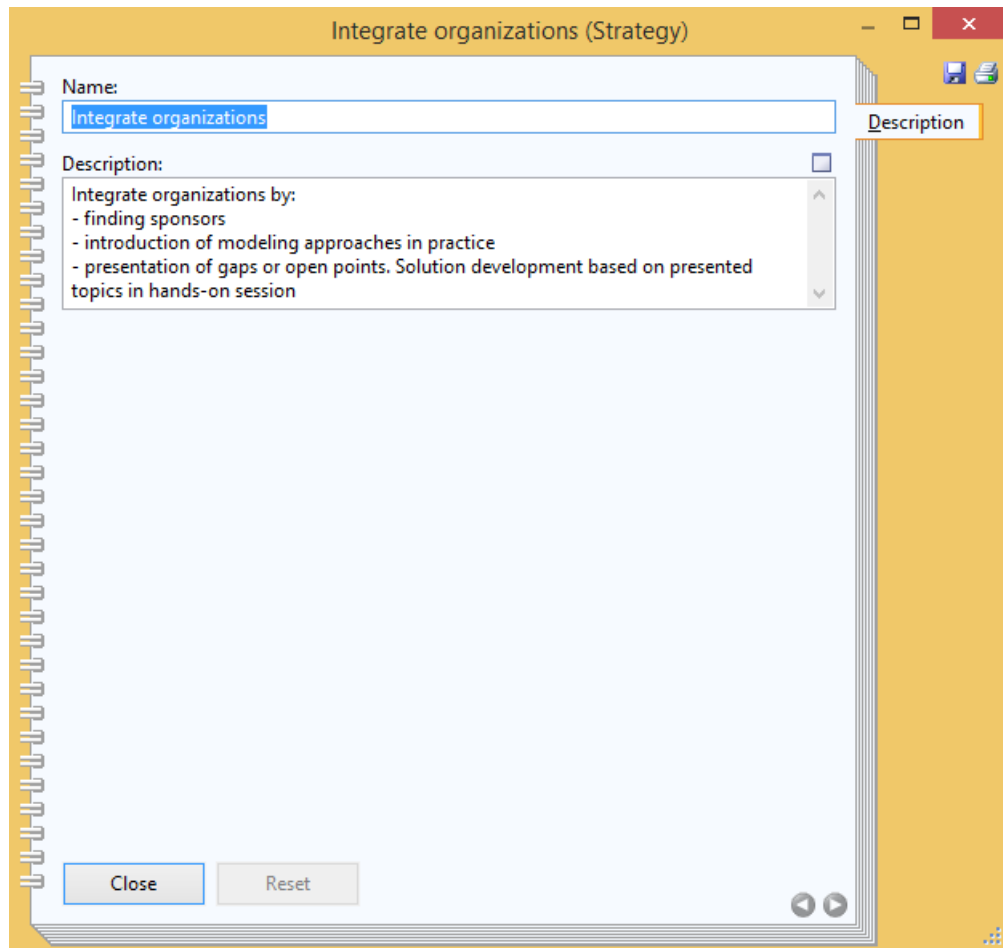


Figure 4.3.: Strategy Element Integrate Organizations

To represent staff of the DKE, the resource model is used. For role visualization, the department element was chosen. This enables a structured view (see figure 4.4).

4.2. Result

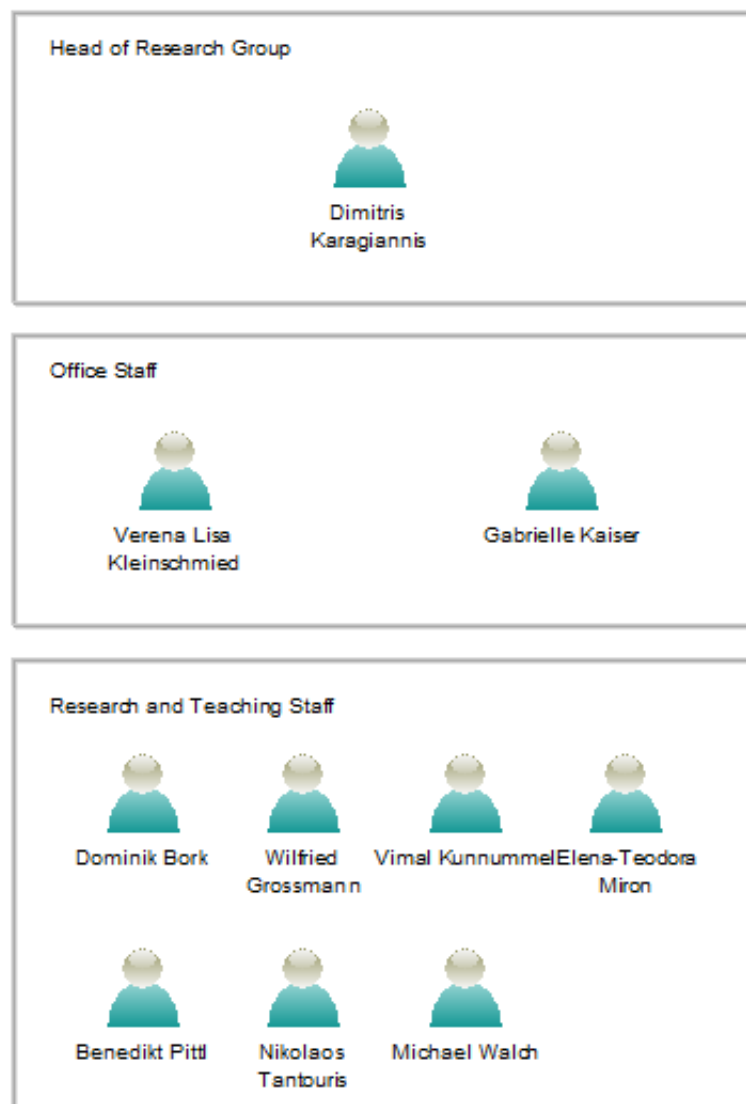


Figure 4.4.: Resource Model of OMiLAB

4. Use Case Evaluation and Results

Points to consider when it comes to communication in public are captured in the policies in the Policy model (see figure 4.5).



Figure 4.5.: Policy Model of OMiLAB

4.2. Result

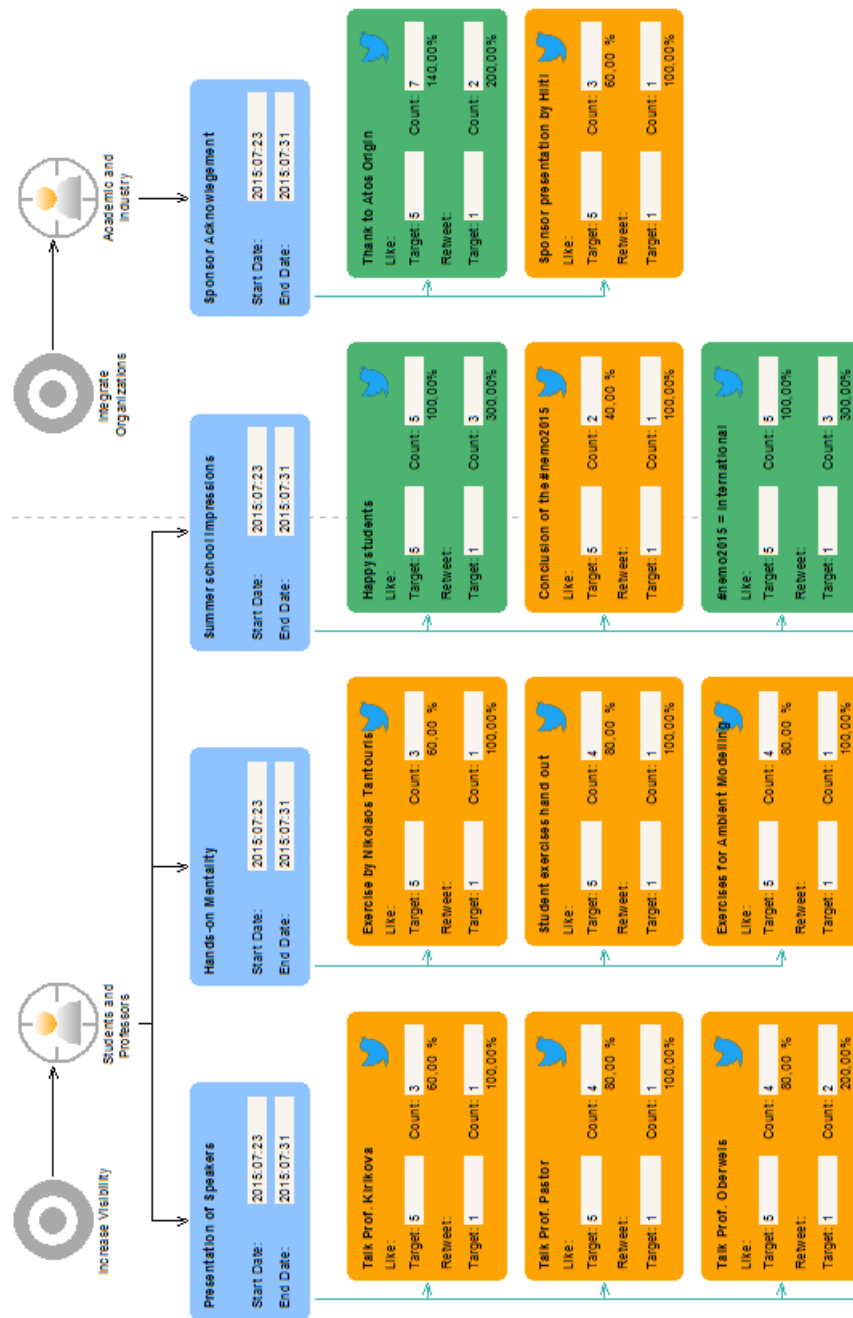


Figure 4.6.: Strategy Plan Model of NEMO Summer School 2015

4. Use Case Evaluation and Results

The strategy plan covers 34 tweets of OMiLAB regarding the NEMO Summer School 2015. Figure 4.6 shows a screenshot with a subset of the total tweets. Those tweets are assigned based on the content to one out of four Activity Items, which could be "Presentation of Speakers", "Hands-on Mentality", "Summer school impressions", and "Sponsor Acknowledgement". First three Content Activities are assigned to the Target Audience Students and Professors, which in turn is assigned to the goal "Increase Visibility". As described in the use case, Elena-Teodora Miron is responsible for those Content Activities. The Content Activity "Sponsor Acknowledgement" is assigned to the Target Audience "Academic and Industry" with Verena Lisa Kleinschmid as responsible and serves the goal "Integrate Organizations". The goal "Increase Visibility" is linked to strategies "Establish NEMO Summer School" and "Knowledge Growth". "Sponsor Acknowledgement" is also linked to "Establish NEMO Summer School". Further the strategy "Integrate organizations" is covered.

Figure 4.7 represents the strategy plan for promoting the new book on Domain-Specific Conceptual Modeling. The goal of the strategy plan is to increase the book popularity for students and professors by presenting the book online. Verena Lisa Kleinschmid is responsible for the online presentation.

In my opinion, deriving a strategy based on already given tweets without insight on how and why tweets were created was challenging. That led to assumptions in the creation of the Vision and Strategy model. I realized that automatically importing tweets by use of the Create Content Item

4.2. Result

function was an efficient way to incorporate real Twitter data in the model. However, renaming the Content Items in a meaningful way and defining realistic like and retweet targets was time-consuming. After categorization, the Strategy Plan Model provides a good overview of all relevant tweets and their status for the user and is easily updated by applying the Strategy Plan Update function.



Figure 4.7.: Strategy Plan Model of Domain-Specific Conceptual Modeling book

4. Use Case Evaluation and Results

4.2.2. Result Faculty of Computer Science Use Case

According to the fictitious use case the Resource Model and Policy model of the OMiLAB use case is also applicable for the Faculty of Computer Science use case (see chapter 4.2.1).

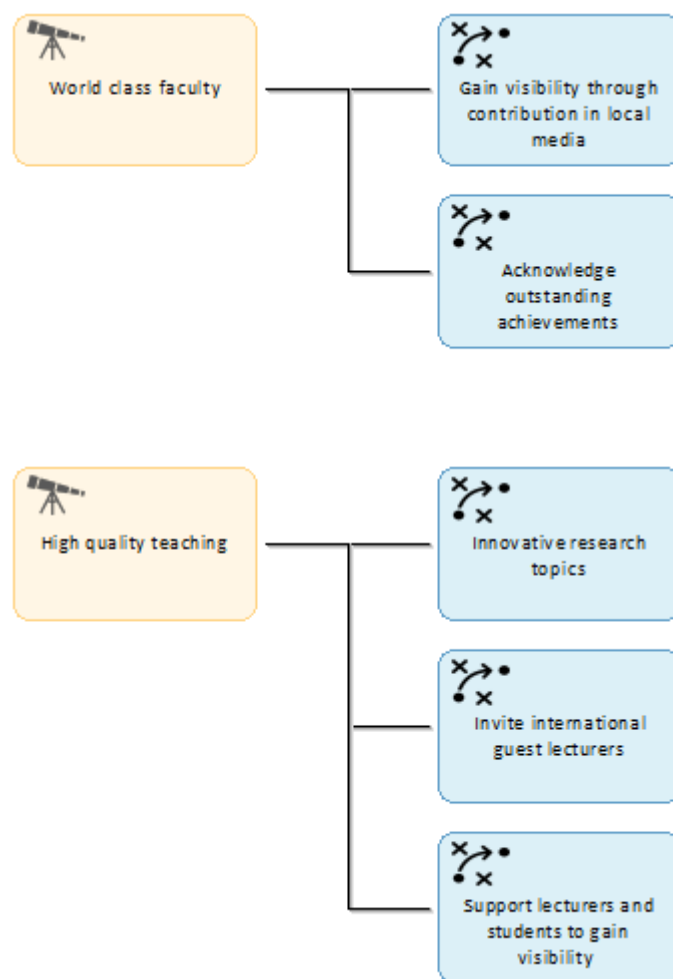


Figure 4.8.: Vision and Strategy Model of Faculty of Computer Science

4.2. Result

Figure 4.8 represents the Vision and Strategy Model of the faculty. The model shows the vision "World class faculty" with strategy elements as "Gain visibility through contribution in local media" and "Acknowledge outstanding achievements". Strategies as "Innovative research topics", "Invite international guest lectures", and "Support lectures and students to gain visibility" are in place to accomplish the vision of high quality teaching. As mentioned in chapter 4.1.2 the Faculty of Computer Science will run an analysis of already posted tweets from January 2017 till end of April 2017. Therefore, the Create Content Item function of the Strategy Plan Model is used. That enables the user to import all tweets of a specified time period of a username. Those tweets are represented in Content Items and enable to set target likes and retweets. Considering the reach of a tweet by now, the target like and retweet is set to two. After execution of the function, a categorization of overall 24 Content Items in four Content Activities was done. As next step the Content Activities are linked to a goal through a target audience (see figure 4.9). Content Activities "Inaugural lecture Prof. Plant" and "Visitors" serve the goal "Strengthen visibility of professors and visitors" and should reach University staff, students, and future students. This goal is linked to the strategy element "Support lecturers and students to gain visibility". The Content Activity "Research Topics and Interviews" should help to reach the goal "Strengthen visibility of research topics" and is supposed to get the attention of professors, students and readers. Besides, acknowledgement of achievements is a goal that is addressed to professors and students with the Content Activity "Congratulations".

4. Use Case Evaluation and Results

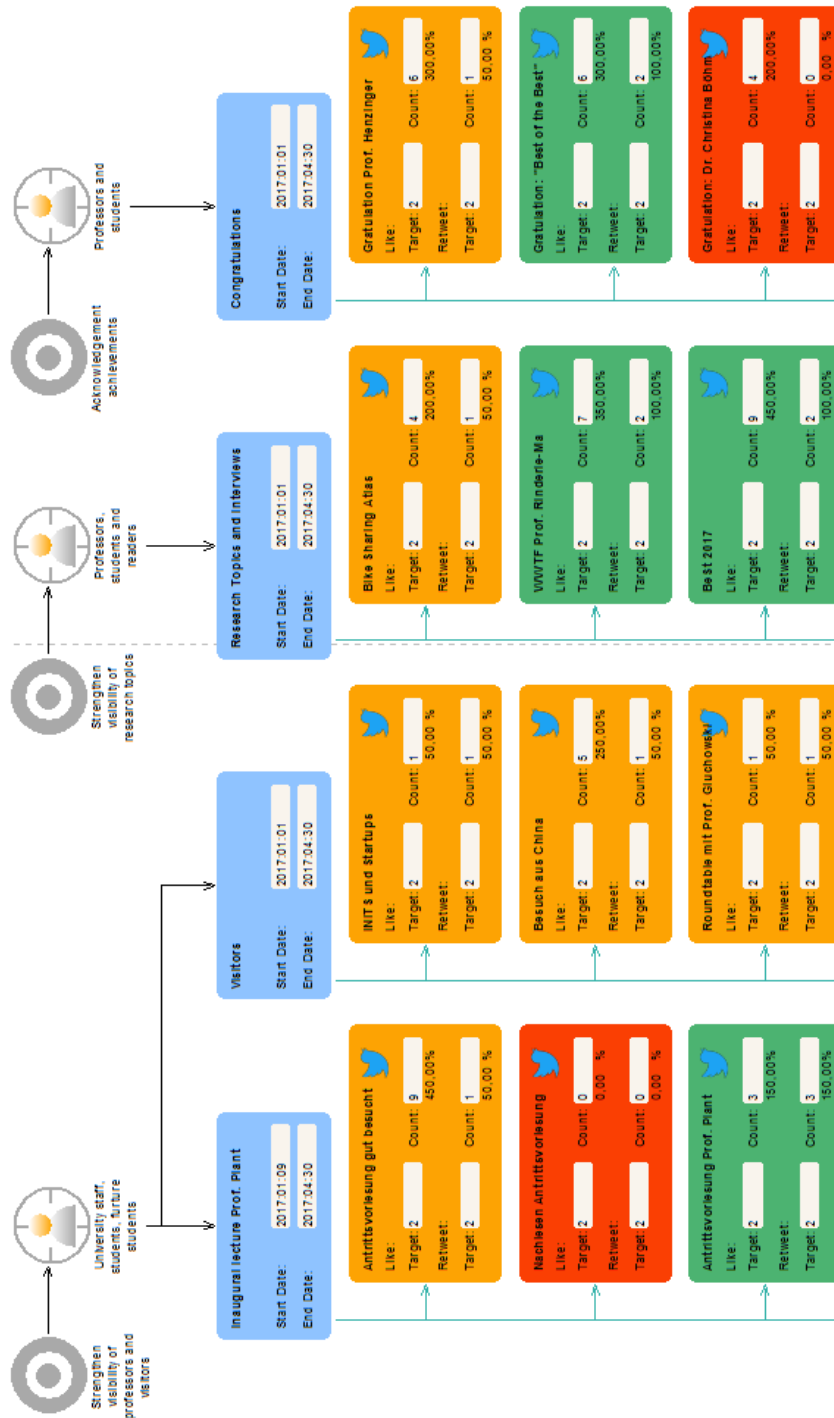


Figure 4.9.: Strategy Plan of Faculty of Computer Science

4.2. Result

Same as outlined in the use case in chapter 4.2.1, the ex-post definition of a strategy based on given tweets was difficult. Different to the first use case where all tweets were related to NEMO Summer School, I realized that there was no recurrent theme in the tweets of the Faculty of Computer Sciences, which made clustering of tweets to Content Activities challenging. After updating the results of the respective tweets, I noticed that there is an equal weighting between likes and retweets and that the color coding might signalize an unsuccessful tweet although it could be successful in terms of only one metric (e.g., many likes, but not retweets).

4.2.3. Result Analysis

The analysis of the use cases mentioned in chapters 4.2.1 and 4.2.2 showed that none of the Content Activities were successful based on the status of all Content Items. The Strategy Plan of the Faculty of Computer Science covered 24 Content Items, out of those, two Content Items were not successful, twelve partially successful, and ten were successful. NEMO Summer School's Strategy Plan captured 34 tweets. No Content Item was not successful, 23 partially successful, and eleven were successful. A look at the Strategy Plan of the book shows that two Content Items were successful and two partially successful. The success of a Content Item is based on the target like and target retweet set. It is challenging to choose a reasonable target that represents an improvement and is still reachable. Even if the target like is exceeded but the retweet target is not reached,

4. Use Case Evaluation and Results

the color coding of the Content Item is set to orange. Therefore, it is important for an organization to commit to an appropriate success rate. Table 4.1 represents tweets of the Faculty's Strategy Plan, which have the most likes of all tweets of the introduced Strategy Plan Models.

Tweet	Likes	Retweets	Link
"4 Tage auf der BeSt 2017 (@bestinfo_at): 100e Beratungsgespräche & 1 Vortrag von Prof. Rinderle-Ma & Möller. Interesse an Informatik ist da!"	9	2	https://twitter.com/csunivie/status/838764329537318916
"RT @univienna: Informatiker Peter Reichl: Der Mensch muss zurück ins Zentrum der Technologie! #Internet #SEMESTERFRAGE @csunivie"	10	6	https://twitter.com/univienna/status/826031067094216705
"Erich Neuwirth (@neuwirthe) erhält den Gerhart-Bruckmann-Preis 2017. Die Fakultät gratuliert!"	25	14	https://twitter.com/csunivie/status/827969818112425986

Table 4.1.: Tweets with a high like rate

Those tweets have in common that they are related to a specific person and have a reference to another Twitter user. In comparison the tweets with the lowest like rate are partially referring to another specific person and all miss a reference to another twitter user. The tweets with a low like rate are shown in table 4.2. Posting a picture could not be seen as a guarantee for success, since tweets with the most likes and worst likes are having both pictures and no pictures.

4.3. Evaluation

Tweet	Likes	Retweets	Link
""Cheese, wine and Startups": INiTS und Startups an der Fakultät für Informatik."	1	1	https://twitter.com/csunivie/status/856544959528398850
"20. März — TDWI Roundtable mit Prof. Peter Gluchowski (TU Chemnitz) — Thema: "Quo vadis, Business Intelligence?""	1	1	https://twitter.com/csunivie/status/839472166416625664
"FALTER Thema: "Die Technik ist weiblich" — Dekanin Rinderle-Ma zum Thema "Fünftausend freie Stellen" (S. 8ff)."	1	1	https://twitter.com/csunivie/status/836234912986464256

Table 4.2.: Tweets with a low like rate

Using the modeling method facilitated the analysis of the tweets and enabled a well-arranged structured model based social media strategy approach. Chapter 4.3 provides a detailed evaluation of the modeling method.

4.3. Evaluation

The introduced modeling method has been applied in practice for the Twitter presence of OMiLAB and the Faculty of Computer Science based on a fictitious use case. The following evaluation is categorized in strengths, weaknesses, opportunities and threats of the modeling method itself.

4. Use Case Evaluation and Results

Strengths. Using the modeling method, a structured approach of a social media strategy with a link to the tweets posted on Twitter is enabled. Through the Strategy Plan Model tweets of one topic could be visualized and linked to one Content Activity. This makes the comparison of similar tweets easier. Furthermore, the overview of Content Items gives insight about the success of tweets by color codes. On Twitter instead, tweets of one category are spread on the timeline based on the post date. This makes it difficult to track the success of tweets of one category and visualize them at a glance. To incorporate tweets in the Strategy Plan Model, the modeling methods provides a function to create Content Items based on a specific time range and user timeline. This prevents that users would have to manually create all tweets in the model manually. Additionally, the Update Strategy Plan function of the modeling method enables to get the actual like count and retweet count of all tweets with a few clicks from Twitters API, providing an up-to-date status of the success of a social media strategy.

Weaknesses. In terms of visualization, the color coding is defined in the Content Item and cannot be chosen freely by a user. The coding is furthermore dependent on metrics, likes and retweets, with an equal weighting. Therefore, a user cannot specify on whether the focus lies on likes or retweets or that reaching one of both targets is enough to fulfill the goal.

4.3. Evaluation

Opportunities. The Strategy Plan Model currently incorporates one social media channel, which is Twitter. The model can be extended by other social media channels like Facebook or LinkedIn to provide a holistic view of all social media activities. Furthermore, the Strategy Plan Model could be extended by a modeling method to support the derivation and formulation of a social media strategy. The clustering of Content Items is based on expert judgment, but could be supported by using common hashtags in tweets. The analysis of the use cases revealed that most of the tweets have no common hashtag or hashtag at all.

Threats. The Strategy Plan Model enables the user to post a new tweet on Twitter by use of the status “To be Posted” in a Content Item. This feature could cause unintended or double postings in case the status is not carefully chosen by the user. Targets also must be chosen carefully in the Content Item as a too low target can lead to misleading judgments and actions based on color coding. In both cases, clearly defined policies and rules for employees regarding social media should minimize the risk.

5. Conclusion

This thesis investigated in a model based management of social media strategies. Below a summary of the thesis is provided as well as an outlook on future work.

5.1. Summary

Although many companies use social media tools, executives expect further rise of investments in social media tools (McKinsey&Company, 2015). A study conducted by Harvard Business Review Analytic Services showed that more than half of the conducted companies are represented on social media are about to introduce social media appearances (Gillan, 2010). The arising set of new technologies and communication opportunities within social media redefines the way of cooperation with all parties such as customers, partners and employees (Magee, 2010). The research showed that social media success needs to be earned and requests ongoing development, same as it is with friendship. Therefore, in chapter 2 several

5. Conclusion

social media strategy approaches are shown, for instance, the social strategy cone framework or honeycomb framework. At this moment the research analysis did not identify any existing modeling approaches for social media strategies. Instead, ADOscore, a modeling method based on balanced scorecards, is considered as a related modeling method. The social strategy cone framework identified seven key elements for successful social media strategies. To support social media strategies with a modeling method it is seen as essential to cover the seven key elements, which are target audience, social media channel, goals, resources, policies, monitoring, and content activities. Hence to be able to track the seven key elements, a vision and strategy perspective is useful, to enable to link the social media strategy to existing business objectives and strategies (Blanchard, 2011). Those requirements are the fundament of the resulting model based approach for social media strategies. Based on the knowledge gained in chapter 2 the modeling method introduced in chapter 3 was developed. The Social Media Strategy Model provides a framework to elaborate structured social media strategies for Twitter. Several model types as Vision and Strategy, Policy, Resource and Strategy Plan enable to cluster information, to visualize strategic goals, and to monitor the achievement. To evaluate the modeling method, two fictitious use cases were introduced and realized within the modeling method. The analysis showed that the structured approach enabled to categorize tweets and keep track of the actual success of a content activity by updating the like and retweet count of Twitter tweets. Furthermore, comparison of tweets, respectively Content Items is simplified through color-coding.

Nevertheless, identifying similarities of successful tweet contents and applying these consistently to other tweets is no guarantee for success.

5.2. Future Work

For future work it would be important to implement further social media channels, e.g. Facebook, LinkedIn, or Instagram. The modeling method already provides social media channel attributes that could be extended for social media channel determination (e.g., Goal and Content Item classes). The notebook of the Content Item is clustered in a general chapter and a Twitter chapter. Furthermore, chapters could be created based on the provided social media channels and could therefore cover specifics of social media. Next, the models Vision and Strategy and Resource could be extended through more specialized existing approaches. Fill et al. (2011) introduced an approach to support performance management of public health authorities that covers a treemap model to visualize available resources. This helps on decision making for resource allocation. Moreover, the modeling method takes into account strategic perspectives by providing a success factor model and a cause effect model (Fill et al., 2011) that could enhance the expressiveness of the vision and strategy model. To improve data analysis, statistical analysis tools are used for efficient data processing and are valuable for further implementations. Statistical analyses imply next to calculations also generation and visualization of diagrams for data inspection (Fill and Johannsen, 2016).

5. Conclusion

Therefore, the open source R tool could be used.

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Acronyms

AJAX	Asynchronous JavaScript and XML
API	Application Programming Interface
BSC Map	Balanced Scorecard Map
CGM	Consumer-Generated Media
CRM	Customer Relationship Management
DKE	Department Knowledge Engineering
ERP	Enterprise-Resource-Planning
GUI	graphical user interface
HTML5	Hypertext Markup Language 5
JAR	Java Archive
MOF	Meta Object Facility
NEMO	Next Generation Enterprise Modelling
OMiLAB	Open Models Laboratory
RSS	Really Simple Syndication
UGC	User-Generated Content
UML	Unified Modeling Language
XML	Extensible Markup Language

Appendix

Appendix A.

Zusammenfassung

Die Literaturanalyse ergab, dass Erfolg in Social Media, ähnlich wie Freundschaft, verdient und laufend weiterentwickelt werden muss. Hierfür werden in Kapitel 2 Social Media Strategie Ansätze vorgestellt, wie das Social Strategy Cone oder Honeycomb Framework. Derzeit hat die Analyse keine existierenden Modellierungsansätze für Social Media Strategien identifiziert. Aus diesem Grund wird als verwandte Arbeit die, auf Balanced Scorecards basierende, Modellierungsmethode ADOscore herangezogen. Im Social Strategy Cone werden sieben Key Elemente vorgestellt, die relevant für eine erfolgreiche Social Media Strategie sind. Diese sieben Key Elemente wurden bei der Umsetzung der Modellierungsmethode berücksichtigt, welche da sind Zielgruppe, Social Media Channel, Ziele, Ressourcen, Policen, Überwachung, und Content Aktivitäten. Zusätzlich ist eine Einbindung von Vision und Strategie

Appendix A. Zusammenfassung

vorgesehen die eine Verbindung zwischen den Unternehmenszielen und der Social Media Strategie erstellt. Im Kapitel 3 wird die erarbeitete Modellierungsmethode vorgestellt. Die Modellierungsmethode stellt ein Rahmenwerk zur Erstellung von Social Media Strategien für Twitter zur Verfügung. Verschiedene Modell Typen wie „Vision and Strategy“, „Policy“, „Resource“ und „Strategy Plan“ ermöglichen Informationen zu gruppieren, strategische Ziele zu visualisieren, und die Erreichung zu überwachen. Zur Evaluierung der Modellierungsmethode, wurden zwei fiktive Anwendungsfälle vorgestellt und umgesetzt. Die Analyse hat ergeben, dass der strukturierte Ansatz ermöglicht Tweets zu kategorisieren und ein Überblick des aktuellen Erfolgs der Content Activities gewährt wird. Durch die Funktion „Update Strategy Plan“ wird sichergestellt, dass aktuelle Daten mit wenigen Klicks bezogen werden können. Weiterhin, wird der Vergleich von Tweets durch die Farbkodierung der Content Items vereinfacht. Dennoch ist die Identifizierung von Gemeinsamkeiten bei erfolgreichen Tweets und daraufhin die Anwendung dieser, bei der Erstellung von neuen Tweets, keine Garantie für Erfolg.