



NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

TDT4252 - Enterprise Architecture for Enterprise Innovation

Redesigning digital workflows to increase social outreach



Author:

M. H. Johannessen marhjoh@stud.ntnu.no 541544

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Chapter 1: Project description

This project is part of the *TDT4252 - Enterprise Architecture for Enterprise Innovation* course [1]. The course involves modeling and analyzing a chosen organization or business using various enterprise modeling techniques to improve operational and strategic aspects. This is particularly done by using 4EM and ArchiMate. The organization I have chosen to model is Start Norge. This is a non-profit student organization that promotes entrepreneurship and innovation among higher education across Norway through different events.

1.1 Overview

Start Norge operates through a central board of eight members and collaborates with fourteen local departments at universities across Norway. The central board is responsible for managing the organization's overall strategy, coordinating national events, and overseeing digital presence. Each year, Start Norge hosts two major national events: Venture Cup, Norway's largest student pitching competition, and Start Forum, a networking event for members nationwide.

Local departments are the backbone of Start Norge's operations. They focus on organizing events and engaging students in entrepreneurship at their respective universities. Each local department operates autonomously, while aligning with the national strategy set by the central board. Given that the central board of Start Norge consists of only eight members, it relies heavily on the local departments to maintain a physical presence at universities. In essence, the local departments act as the on-the-ground promoters of Start Norge, while the central board supports them by providing resources, strategic guidance, and digital promotion.

1.2 Purpose

In enterprise modeling, defining both the problem and purpose is essential as it guides the creation of models that address organizational goals [2, p. 25]. Sandkuhl et al. (2014) describe it as particularly effective in clarifying organizational interactions, optimizing processes, identifying needed changes, aligning goals with IT systems and developing IT strategies [2, p. 9-18].

For this project, the main focus is on understanding organizational dependencies and improving business processes within Start Norge. The model aims to provide a structured view of digital workflows, particularly for social media outreach, helping to identify bottlenecks and inefficiencies. It enables the central board to better align with local departments, fostering collaboration, and supporting their operational objectives.

Although challenges such as aligning organizational strategy with IT or developing

IT strategy are valuable, they fall somewhat outside the scope of the project. Instead, the model prioritizes clear representation of roles, goals, and workflows to ensure actionable insights into Start Norge's digital operations. By targeting these specific areas, the model supports the organization's strategic objectives while remaining adaptable for future iterations.

1.3 Stakeholders

The model will benefit key stakeholders within Start Norge. Board members will gain clearer insights into challenges and opportunities, improving decision-making and planning. Local department leaders will better understand their roles, with outlined processes helping them manage tasks independently. Corporate partners will appreciate the model's transparency, seeing how their contributions support organizational goals through both digital and physical efforts. Students will benefit from more efficient resource allocation, leading to better-organized events and increased engagement. More specific examples are provided in Section 2.6.

1.4 Design

The model is structured to align with Start Norge's needs improvement and its diverse stakeholders. Following a top-down approach to define main goals, and then a bottom-up approach for sub-models, it captures goals, processes, and resources to reflect Start Norge's core activities. This structure supports strategic decision-making by providing clear insights into interactions between the central board and local chapters [2, p. 10-12].

Using the SEQUAL framework, the model emphasizes clarity, relevance, and completeness. Clarity ensures easy interpretation for stakeholders, relevance focuses on social media and collaboration needs, and completeness provides a holistic view. This design ensures quality, supporting Start Norge's operational and strategic objectives [3, p. 219].

Chapter 2: Enterprise models

In this chapter, the enterprise models and sub-models developed using 4EM and ArchiMate are presented. The model overview, illustrated in Figure 2.1, presents a high-level view of the enterprise model following 4EM. The method consists of multiple perspectives. A detailed process is presented throughout this chapter.

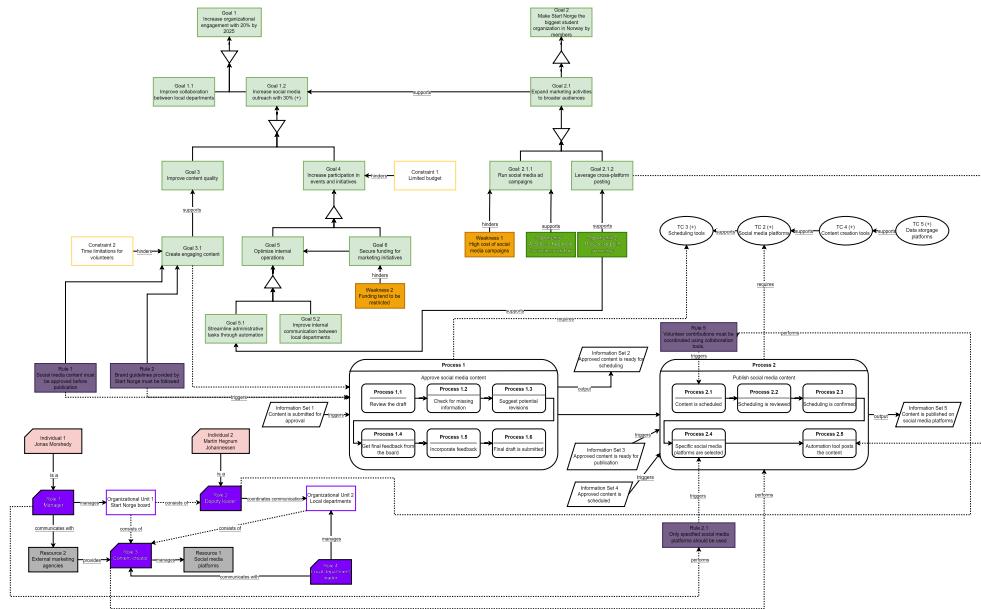


Figure 2.1: Overview of enterprise model in 4EM

2.1 Goal aspect

The main goals of Start Norge focus on increasing student engagement and expanding the organization's reach across Norway. These primary goals and their initial decompositions are illustrated in Figure 2.2.

In line with the 4EM methodology, the goal model is decomposed into sub-goals to ensure a clear path toward achieving the organization's objectives. Goal 1.1 and Goal 1.2 are connected with an OR-connector, meaning that success and Goal 2.2 are linked with an AND-connector, which indicates that both sub-goals must be fulfilled to achieve the overarching objective of expanding Start Norge's presence at universities nationwide.

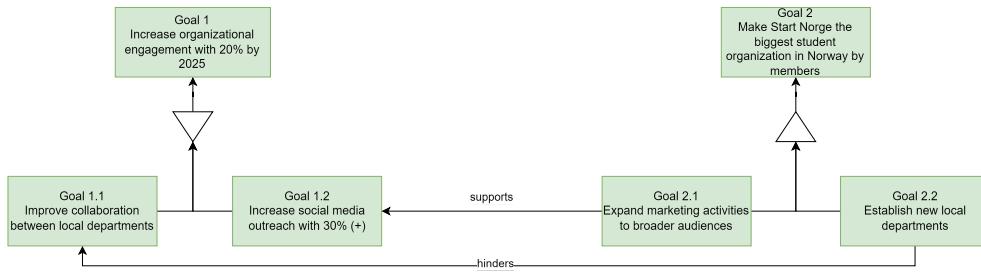


Figure 2.2: Main goals in 4EM

Start Norge aims to increase social media outreach by 30% (Goal 1.2) to facilitate the organization's growth. To achieve this, several sub-goals are identified, presented in Figure 2.3. A primary focus is expanding marketing activities to a broader audience (Goal 2.1). This involves running targeted social media ad campaigns (Goal 2.1.1) and leveraging cross-platform posting (Goal 2.1.2) to ensure greater visibility and engagement across multiple channels.

Improving content quality (Goal 3) is also essential to supporting this outreach. By creating engaging content (Goal 3.1), Start Norge can foster greater interaction with its audience. However, time limitations for volunteers (Constraint 2) hinder the ability to produce content at the desired frequency. Reducing the number of steps in promoting content (Opportunity 2) can help overcome this challenge by streamlining the promotion process.

At the same time, increasing participation in events and initiatives (Goal 4) remains important. This is considered central as in-person and digital interactions should complement each other to strengthen overall engagement. However, securing funding for marketing initiatives (Goal 6) is crucial to support both online and offline efforts. This is particularly challenging because funding tends to be restricted (Weakness 2), limiting the scale of paid campaigns.

Operational efficiency is another vital factor in achieving social media growth. Optimizing internal operations (Goal 5) through streamlining administrative tasks with automation (Goal 5.1) can free up resources, enabling the organization to focus more on strategic initiatives. Additionally, improving internal communication between local departments (Goal 5.2) ensures better alignment in executing national strategies at the local level.

Despite financial constraints (Constraint 1) and the high cost of social media advertising (Weakness 1), Start Norge can leverage free tools (Opportunity 1) to create content cost-effectively. These efforts, combined with enhanced coordination between departments, could help achieve the overall goal of increasing social media outreach.

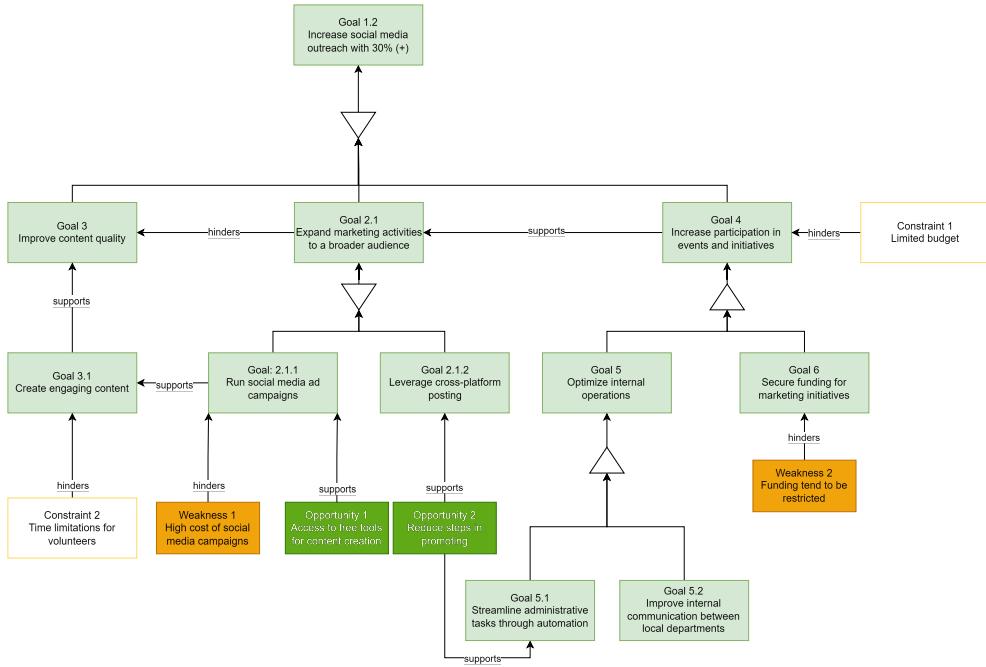


Figure 2.3: Decomposition of Goal 1.2 in 4EM

In the ArchiMate goal model, key differences from 4EM become evident. ArchiMate focuses more on linking goals to drivers that explain the motivations behind them. This helps stakeholders understand why specific goals are prioritized. In this model, outcomes, values, and assessments are intentionally excluded to avoid redundancy. Instead, the emphasis is on drivers, goals, constraints, and stakeholders.

One strength of ArchiMate is its ability to show how goals are influenced by stakeholders. For instance, the event organizers are directly linked to the goals they support, offering a clear view of who is responsible for delivering specific outcomes. This can be more implicit in 4EM models. The decomposition of Goal 1.2 is illustrated in Figure 2.4.

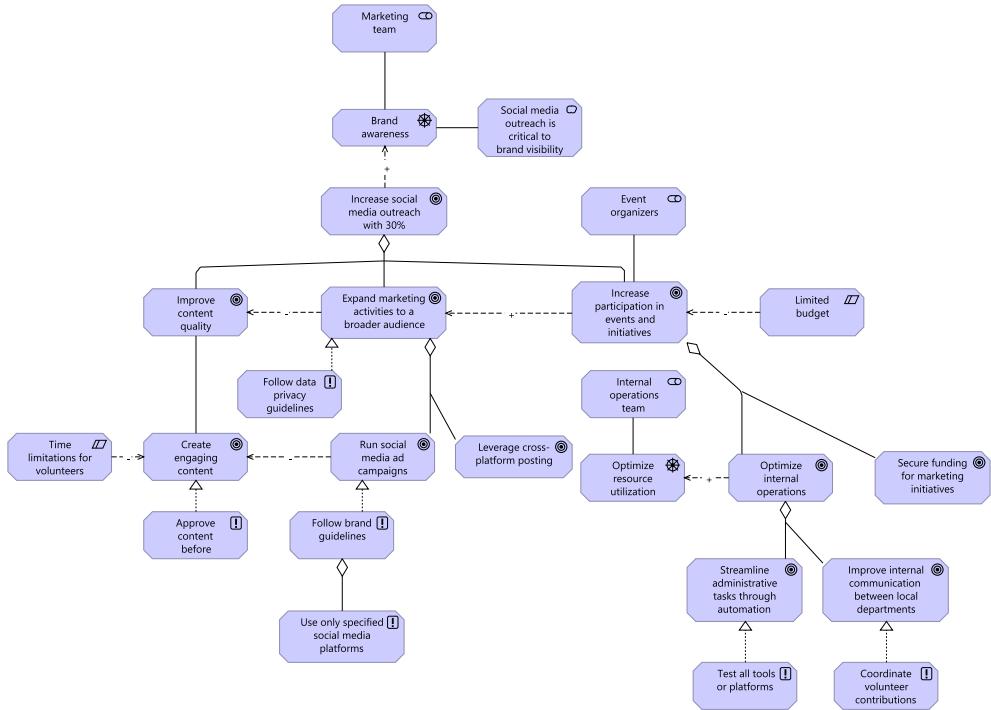


Figure 2.4: Decomposition of Goal 1.2 in Archimate

2.2 Organizational aspect

In this section, the organizational aspect is presented. It begins with the organizational view in Archimate. Then, follows the Concept model, Actor and Resource model, and the Business Rule model in 4EM.

2.2.1 Organizational view

The organizational view in Figure 2.5 outlines Start Norge's central board and local departments. National strategies and daily operations are handled by the central board. The Manager runs these operations, while the Deputy Leader oversees local department activities. Meanwhile, the Content Creator handles content creation and distribution.

Local departments are led by Local Department Leaders, who manage operations at their universities. Their Content Creators ensure that local content aligns with the central board's strategy. External marketing agencies are mainly collaborating with the central board to assist with content creation.

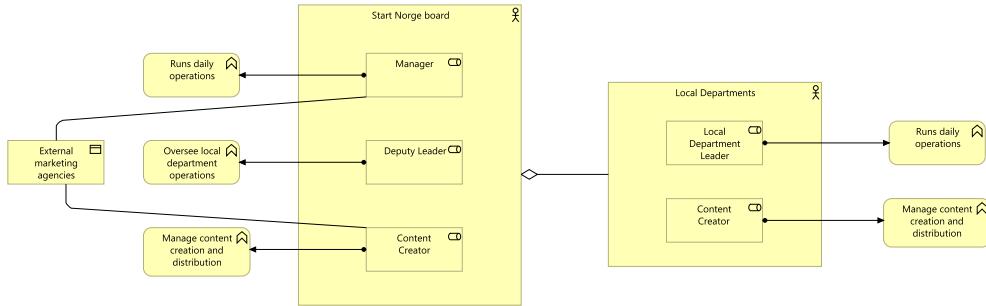


Figure 2.5: Organizational view in Archimate

2.2.2 Concept model

A concept model in 4EM provides a visual representation of how key elements in an enterprise interact. Here, the connections in the model represent how various elements interact to support Start Norge's marketing operations. Its purpose is to give an overview of these relationships - and is illustrated in Figure 2.6.

For example, Concept 9: Automation tools is linked to the social media platforms. Automating the scheduling and posting of content reduces the manual workload for content creators and aligns with Goal 5.1.

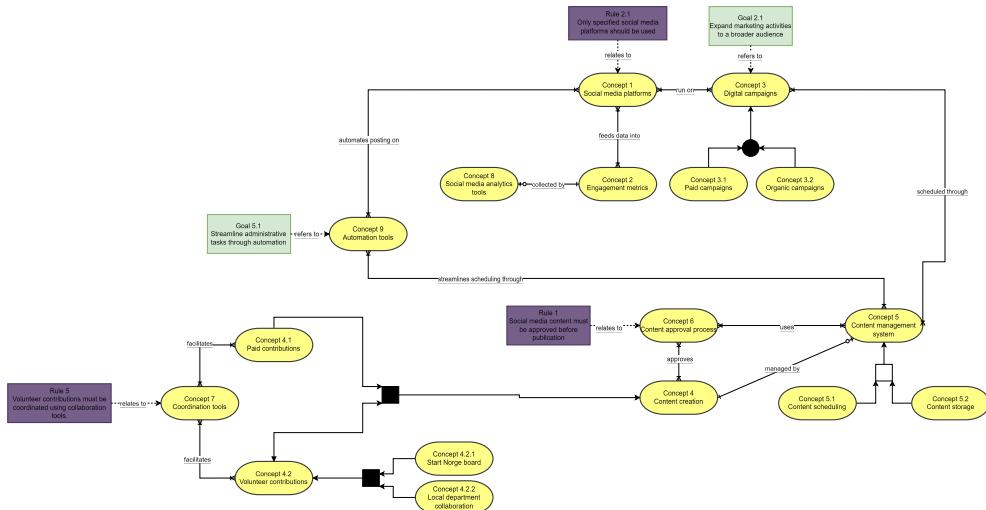


Figure 2.6: Concept model in 4EM

In this model, part-of connections show how smaller elements, such as local department content creators, are part of broader components like the content creation process. As-is connections highlight the current state of relationships, such as how automation tools interact with social media platforms to streamline content posting.

2.2.3 Actors and resources view

The actors and resources view in 4EM identifies key participants and the resources used in Start Norge's operations¹. The central board, local department leaders, and content creators are the primary actors. External partners, such as marketing agencies, also play a role. The view is shown in Figure 2.7.

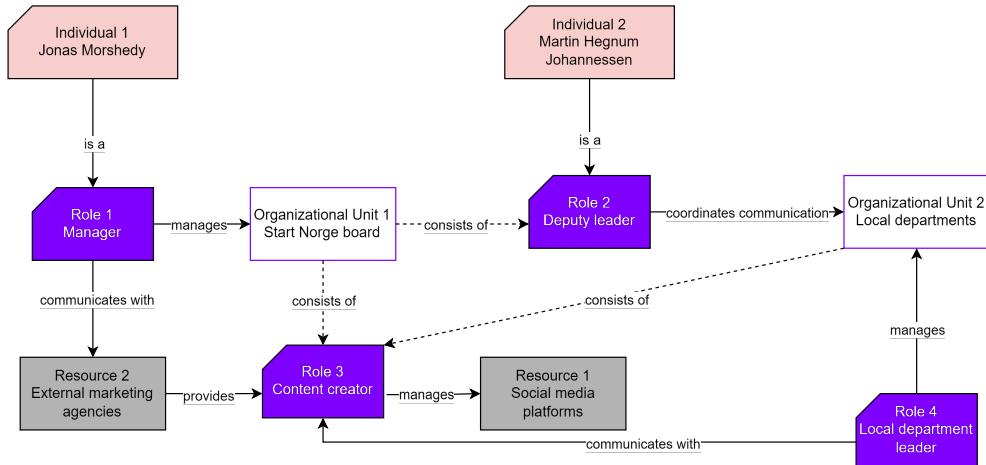


Figure 2.7: Actors and resources view in 4EM

2.2.4 Business rule model

The business rule model in 4EM establishes the key policies and procedures that must be followed to support the strategic objectives outlined in the goals model. For Start Norge, these business rules are critical to achieving Goal 1.2 (Increase social media outreach by 30%). The model is shown in Figure 2.8.

Rule 1 requires social media content to be approved by a content creator. In addition, Rule 2 requires content to align with Start Norge's branding guidelines. These rules influence Goal 3.1 (Create engaging content). Rule 2.1 mandates the use of specific platforms, managed by the Manager, which limits marketing efforts and influences Goal 2.1 (Expand marketing activities). Furthermore, Rule 3 addresses data privacy. This impacts how Start Norge collects and distributes information.

Rule 4 ensures all automation tools are tested, consuming time trying new software directly influencing Goal 5.1 (Streamline administrative tasks). Rule 5 states volunteer efforts must use collaboration tools, improving internal communication and supporting Goal 5.2.

¹It should be noted that the view focuses on the specific goal decomposition, presented earlier in Figure 2.3.

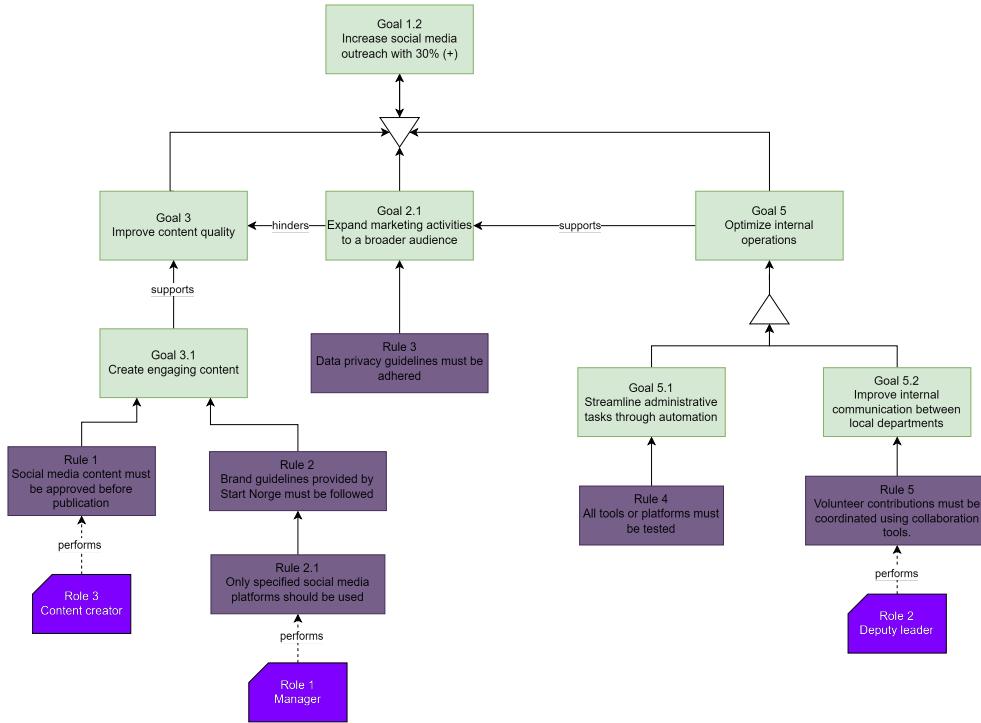


Figure 2.8: Business rule model in 4EM

2.3 Process aspect

In this section, the process aspect is presented. It focuses on mapping and analyzing the workflows within an organization. The two main processes which are modelled are the approval of social media content and the publishing itself. These are the main processes in promoting the organization.

2.3.1 Business process overview

The overview is presented in Figure 2.9². An Archimate overview is presented as well, which can be seen in Figure 2.10.

²The technical component 2 is modeled here. Its relevance will be shown in greater detail later in this chapter.

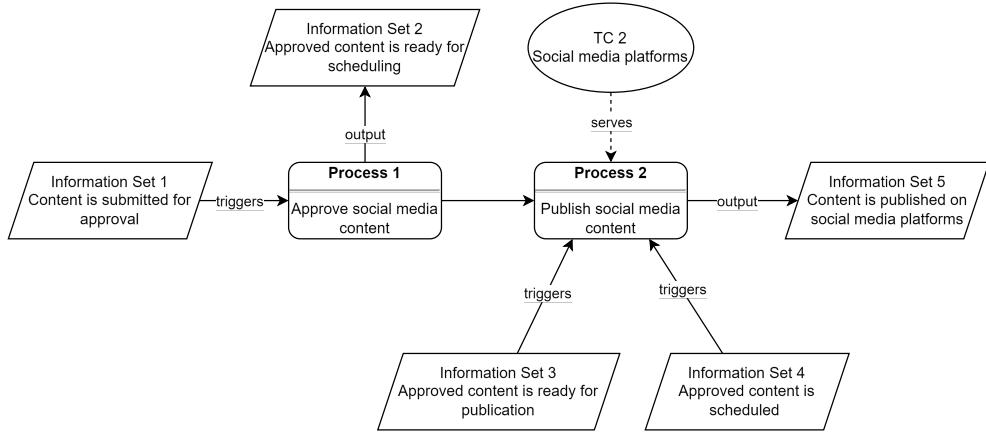


Figure 2.9: Business process overview view in 4EM

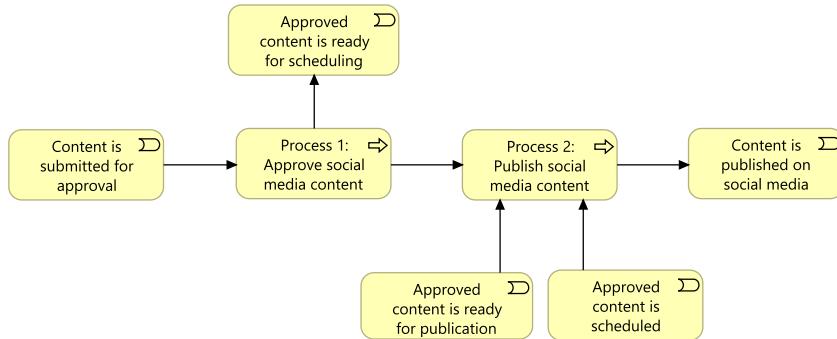


Figure 2.10: Business process overview view in 4EM

The processes for approving (Process 1) and publishing (Process 2) social media content can be broken down into clear sub-processes.

For social media content approval, the content creator — whether from the central board or a local chapter — creates a draft for the post. Once the draft is ready, it is submitted to the designated approver for review. This is usually the content creator on the board. The approver checks for missing information, suggests revisions, and collects feedback from the board. After this the feedback is incorporated by the content creator. Then, the updated draft is submitted. Once approved, the content is ready for scheduling³. The entire process is captured in Figure 2.11, modeled in 4EM.

³This involves preparing it for publication across the relevant platforms.

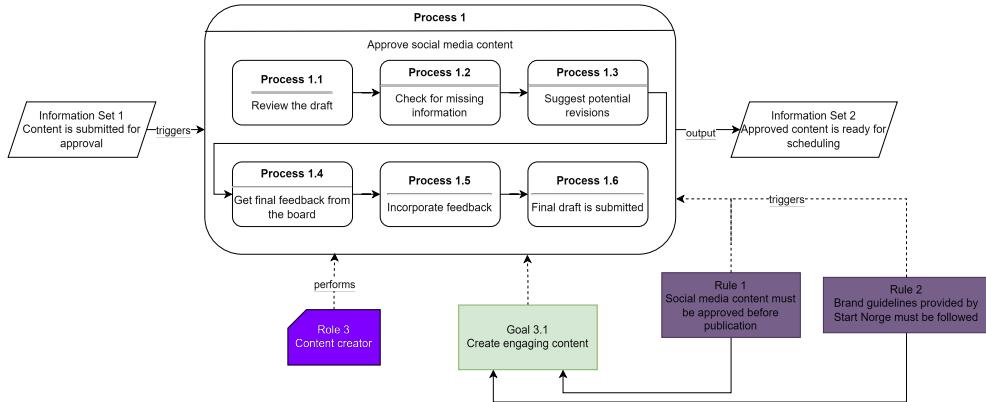


Figure 2.11: Approval process in 4EM

The approval process is also modeled using ArchiMate, as shown in Figure 2.12. Here, ArchiMate's distinct layers are represented: the business layer, which is supported by the application layer, and ultimately realized by the technology layer⁴. This is detailed further in the following section.

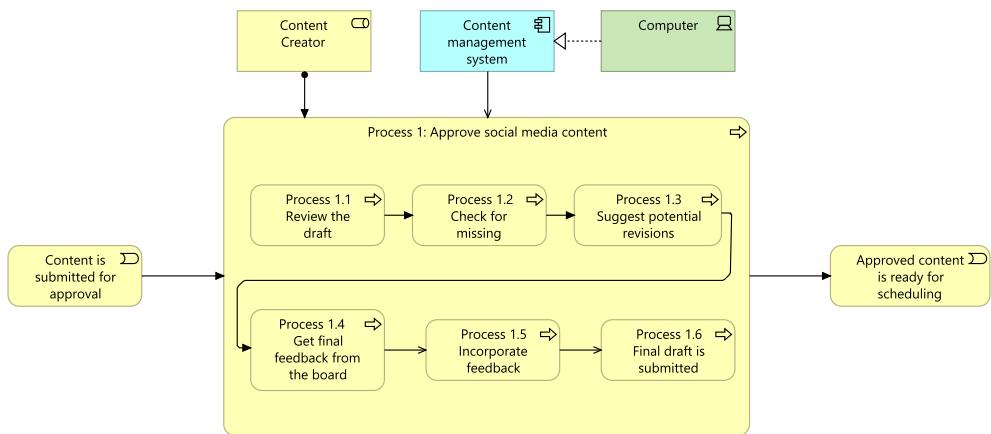


Figure 2.12: Approval process in Archimate

For the process of publishing social media content, the approved content is scheduled for publication. The process is initiated by the deputy leader by scheduling the publishing of the social media content. The scheduling is then review, and after this confirmed. The specific social media platforms where the content will be posted are selected by the manager. After the platforms are chosen, the content is posted using automated tools. The entire process is depicted in Figure 2.13, modeled in 4EM, illustrated in Figure 2.14.

⁴The *Content management system* represents the various tools and systems used for managing content. It simplifies the model by grouping multiple tools, as there is no single tool used for all tasks.

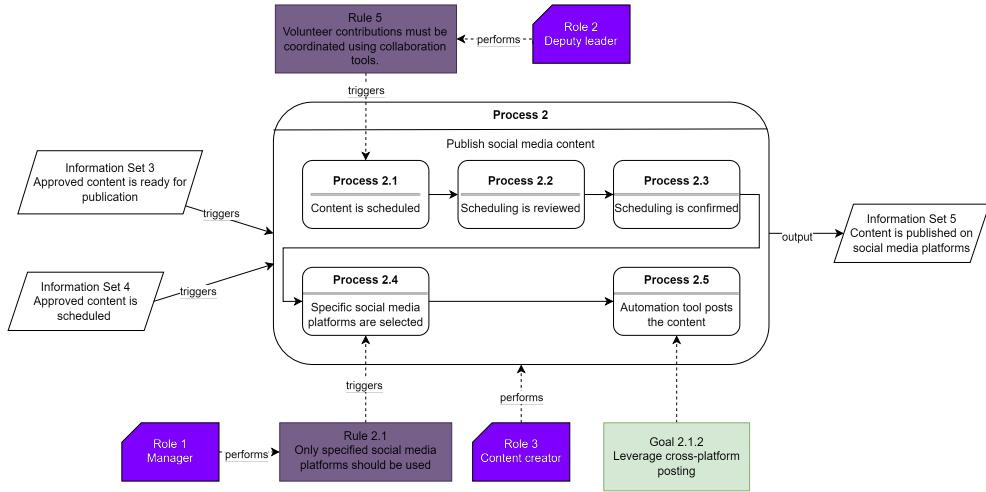


Figure 2.13: Publishing process in 4EM

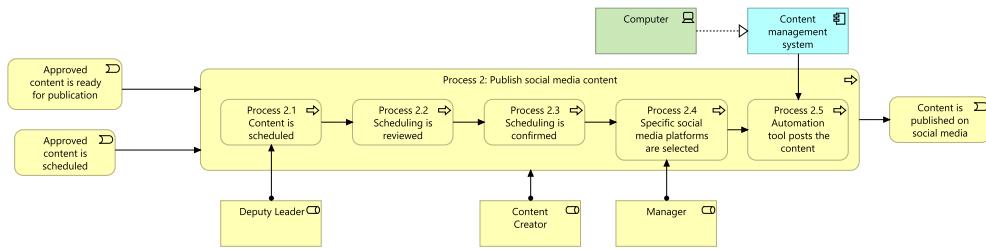


Figure 2.14: Publishing process in Archimate

2.4 Technical components and application aspect

The approval and publishing of social media content at Start Norge rely on several technological components and applications. Instead of a single integrated system, the organization uses multiple tools. These could be split into four application components: *social media platforms*, *scheduling tools*, *content creation tools* and *data storage platforms*.

The scheduling tools facilitate internal communication and coordination, while social media platforms handle external outreach. These tools work together to support the operational workflows across different areas of the organization. The full technology aspect is presented for 4EM in Figure 2.15 and for Archimate in Figure 2.16.

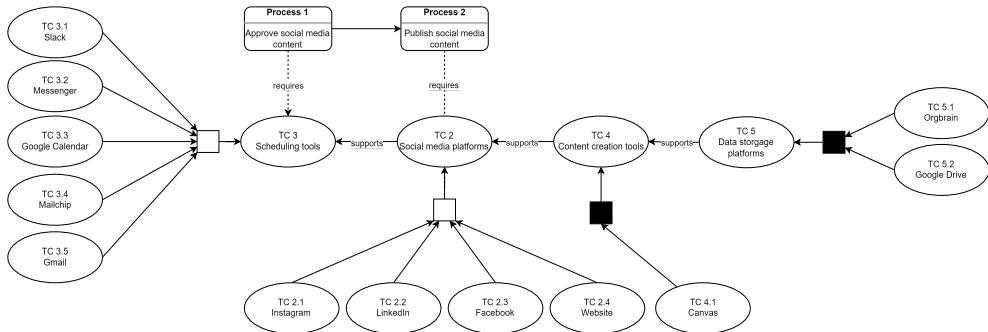


Figure 2.15: Technical components and application view in 4EM

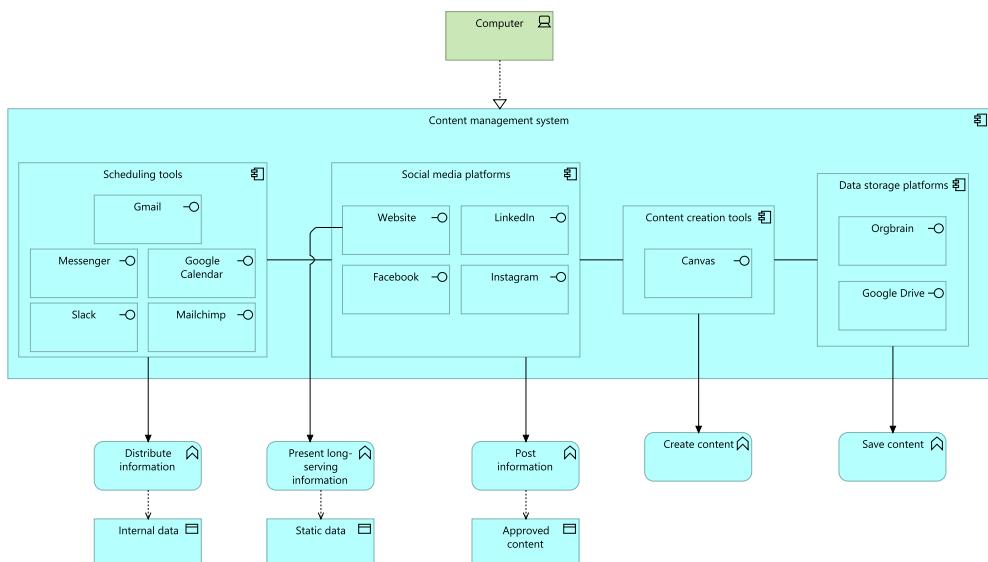


Figure 2.16: Technical components and application view in Archimate

2.5 Choosing a modeling language

In the process for choosing a modeling languages two approaches has been employed: 4EM and ArchiMate. Both were used to model various aspects of Start Norge's operations. While modeling in both languages provided valuable insights, some models may appear redundant. However, using both approaches added value by presenting different perspectives.

For example, the Business Approval Process in 4EM, shown in Figure 2.11, provides clarity on task structure. When modeled in ArchiMate, as seen in Figure 2.12, the application and technology layers illustrate how tools like the Content Management System support this process. This clearly displays ArchiMate's emphasis on coherent, integrated model representation across business, application, and technology layers [4].

Despite the value each modeling language offers, the decision was made to primarily adopt 4EM moving forward. This choice was influenced by time constraints and 4EM's capability in offering a holistic view capturing the complex interrelations between several aspects. This makes 4EM more intuitive and accessible for all organizational stakeholders [2, p. 195-196], [5, p. 43-45]. While ArchiMate's layered approach is useful, it can be more complex [6, p. 17-20].

2.6 Using the model

The enterprise model developed for Start Norge offers a comprehensive overview crucial for strategic planning and system integration. It improves decision-making across the organization by providing several views for stakeholders [2, p. 23]. Experienced members clarify responsibilities and align tasks with strategic goals using the model, as shown in Figure 2.5. For new volunteers, the model speeds up onboarding by replacing traditional shadowing with a comprehensive overview in Figure 2.1 and detailed content creation processes in Figures 2.11 and 2.13, alongside clearly defined roles in Figure 2.7.

Managers can use the model for strategic analysis to evaluate tool alignment with objectives, as shown in Figures 2.16, 2.3. This helps identify inefficiencies and improvement areas [7, p. 974]. IT managers and strategic planners also use the model to integrate new technologies, ensuring that processes effectively support organizational growth [8, p. 22-23].

Two detailed 4EM views that focus on specific aspects of the social media process has been created to show how different parts of the model connect. These views go beyond the general enterprise model to provide clarity on how tools, roles, and processes interconnect for the content creator.

Figure 2.17 outlines the process of approving social media content in a daily manner. Throughout the process, the content creator collaborates with the manager and the Start Norge board to ensure content aligns with organizational guidelines. This is done through Slack (TC 3.1) and Messenger (TC 3.2). When content is submitted for approval this is sent with Gmail (TC 3.5). After the process of approval is finished, the content is ready for scheduling, which is done with Google Calendar (TC 3.3).

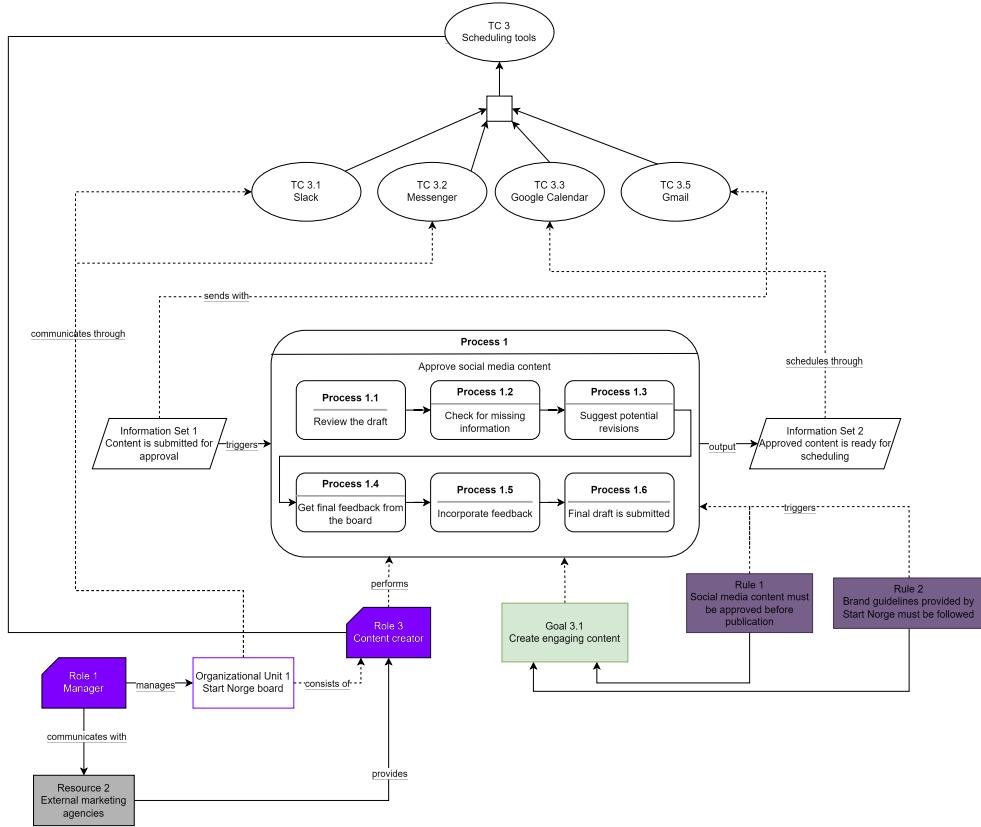


Figure 2.17: 4EM View: Approving content

The publishing process in Figure 2.18 illustrating how content transitions from approval to public release. It begins with the approved content from the previous workflow, ready for scheduling. At the center of the workflow is the content creator, which is responsible for that content is actually posted. Suitable social media platforms are selected (TC 3) strategically to maximize audience reach, aligning with Goal 2.1 (Expand marketing activities to broader audiences). The other involved actors, the manager and the deputy leader, focus on maintaining adherence to business rules, including the mandatory use of collaboration tools (Rule 5) and posting only on specified social media platforms (Rule 2.1).

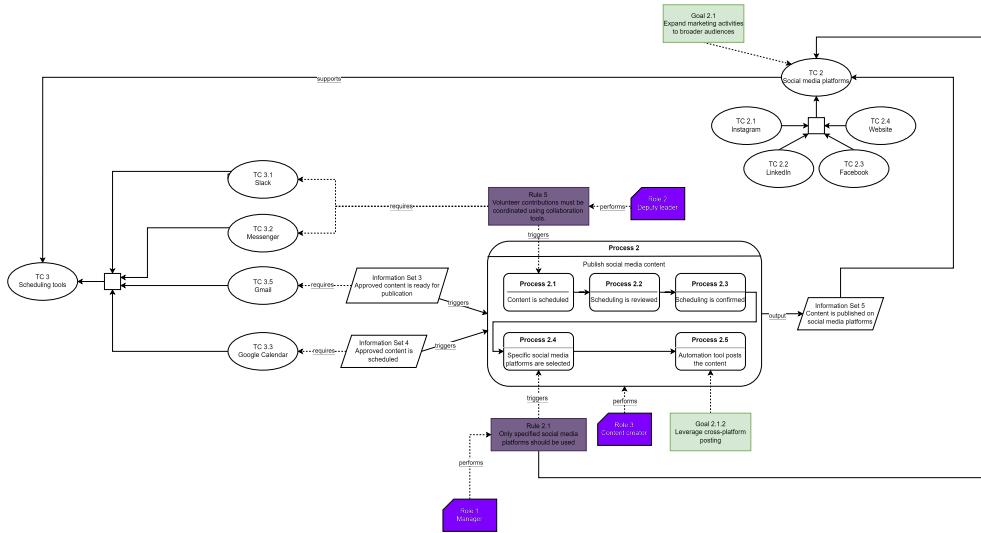


Figure 2.18: 4EM View: Publishing content

These models primarily support the content creator within the Start Norge board. However, they are also beneficial for other board members to clarify responsibilities. Local chapters can use them as examples to refine their own processes and structures. Additionally, other stakeholders may find them valuable for identifying and suggesting potential improvements.

2.7 Evaluating the model

For evaluating the enterprise model, I initially considered several methods. These methods included TOGAF's Architecture Compliance Review, competency questions, SEQUAL, and Moody's Quality Criteria framework. The latter was used initially on the model for Checkpoint 1, described in Appendix A. However, the SEQUAL framework was used to evaluate the one presented in Figure 2.1. The approach evaluates the model from seven dimensions, including physical, empirical, syntactic, semantic, pragmatic, social, and deontic perspectives [3, p. 404].

2.7.1 Physical quality

Physical quality of the model evaluates its availability, persistence, and currency. The enterprise models were created in draw.io and are accessible through any modern web browser. However, to access them you need to have a draw.io user. Thus, are they also stored on Google Drive with appropriate sharing permissions to ensure universal access. Automatic cloud-saving further guarantees data persistence. Although overlapping lines and poorly aligned elements could present usability challenges, the physical quality is deemed to meet all criteria.

2.7.2 Empirical quality

Empirical quality assesses the model's readability, layout, and consistency. Initial feedback from the Start Norge board and peers revealed a consistent understanding of the model's overall structure and objectives. However, overlapping paths created challenges in interpreting certain relationships. The empirical quality is considered good based on feedback; however, reducing clutter in the model could further enhance its clarity.

2.7.3 Syntactic quality

Syntactic quality is concerned with the model's adherence to 4EM notation rules. Although 4EM offers flexibility with minimal restrictions, this flexibility can result in minor syntactical inconsistencies. For example, the improper hierarchical numbering of sub-goals (e.g., goals 2.1, 3 and 4 under goal 1.2) in Figure 2.19 deviates from standard conventions. Addressing these issues and implementing clear numbering systems would make the syntactic quality good.

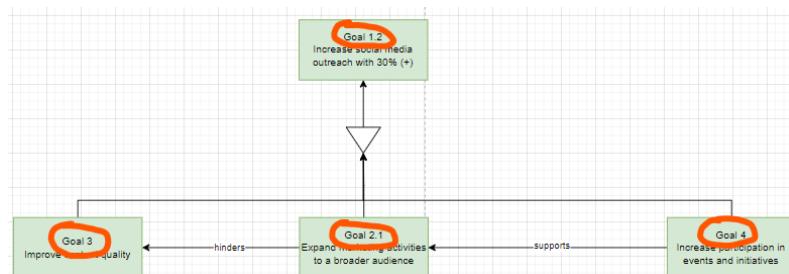


Figure 2.19: Improper hierarchical numbering of sub-goals

2.7.4 Semantic quality

Semantic quality focuses on the model's validity and completeness in relation to its purpose. The current model captures Start Norge's processes, goals, and roles effectively. However, some meaningful connections were omitted to improve clarity. For instance, technical components like scheduling tools (TC1) are insufficiently integrated into workflows, such as scheduling and content management processes. This was addressed through linking that the processes requires the technical components. Though, addressing these omissions could improve its semantic quality, preserving visual clarity is essential. Despite these gaps, the model demonstrates a reasonable level of semantic quality.

2.7.5 Pragmatic quality

Pragmatic quality considers how effectively the model communicates its content to stakeholders. Feedback highlighted that overlapping lines (as shown in Figures

2.20a and 2.20b) reduced readability. While the left-to-right layout generally supports a logical flow, better alignment and spacing are necessary to enhance clarity, as depicted in Figure 2.20c. Addressing these visual barriers will significantly improve pragmatic quality. However, the overall feedback stated the model was of reasonable pragmatic quality.

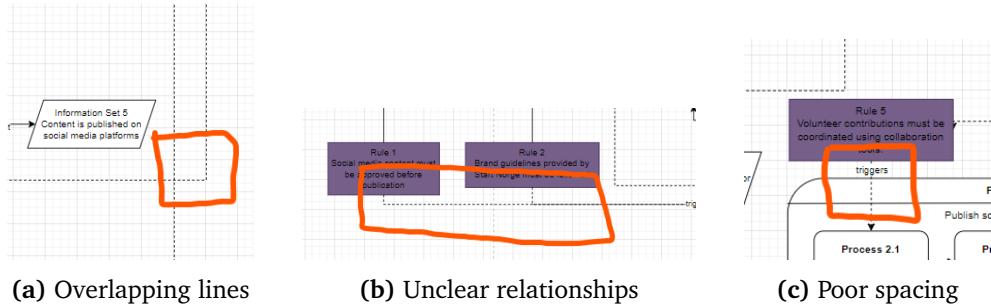


Figure 2.20: Examples of issues impacting pragmatic quality

2.7.6 Social quality

Social quality assesses stakeholder agreement and understanding. The Start Norge board, which was involved throughout the modeling process, stated that the model succeeds in its purpose. Thus, the model was deemed of good social quality.

2.7.7 Deontic quality

Deontic quality measures how well the model serves its purpose. The purpose of the case was to provide an overview and identifying process bottlenecks at Start Norge. Since the model effectively addresses these areas, it fulfills its intended purpose. Therefore, I evaluate it as having good deontic quality.

2.7.8 Overall quality

The evaluation shows that the model meets high standards across most SEQUAL dimensions. It is accessible, well-understood by stakeholders, and effectively represents Start Norge's processes and goals. While minor issues, such as overlapping elements, inconsistent numbering, and incomplete connections, were noted, these do not hinder its usability. The model achieves its primary purpose of providing a clear overview and identifying bottlenecks. With small refinements, it could reach even higher quality.

Chapter 3: Open service innovation and service design

Start Norge, like many student-driven organizations, faces challenges related to efficient operation and effective communication. Especially, considering that maintaining strong student engagement and operational consistency are the main focus. To address these challenges, we leverage *Open Service Innovation and Service Design* to enhance the digital presence and operational collaboration of the organization¹, allowing to quickly adapt to changing business and technological landscapes [9, p. 5]. By aligning with distributed innovation theories [10, p. 564], the strategy aims to optimize operations, thereby supporting UN Sustainable Development Goals.

3.1 Double Diamond Design

The Double Diamond Design approach was used to guide a structured progression from problem identification to solution development. It is based on the principles outlined by Norman [11, p. 220-221] and includes four phases: discover, define, develop, and deliver. For this project the focus is on the first three phases².

3.1.1 Discover

The discover phase is centered on gaining insights into the problems faced by Start Norge. By gathering data, observing challenges, and identifying areas that require improvement, the aim is to resolve this through service innovation later. Specifically, problem-driven innovation is used to pinpoint areas for improvement [12, p. 2-3]. To deepen understanding and explore all possible solutions, systemic ideation strategies are also applied [13, p. 36].

In the case of Start Norge, a key challenge identified was the fragmented digital communication between the central board and local chapters. Local departments struggled to keep up with the creation of social media content due to a lack of centralized tools. This resulted in time-consuming manual processes for content scheduling, tracking engagement, and ensuring alignment with Start Norge's branding guidelines.

For instance, a local department was unable to post content in a timely manner for an upcoming event. This led to lower attendance. The delay occurred because the local team had to manually coordinate with the central board, which slowed down approvals and content revisions.

¹The preference for open innovation is driven by the collaborative dynamics of Start Norge.

²The delivery phase is excluded as it involves long-term considerations [11, p. 221].

3.1.2 Define

The Define phase focuses on arranging the information gathered during the discovery phase to pinpoint the core issues and define the scope of the service innovation. In this phase, the problem is clearly outlined, and goals are set for addressing the identified challenges. Constraint-driven innovation is applied to encourage the development of creative solutions [12, p. 3-4], while the goals are informed by insights from business model transformations in sensing enterprises [14, p. 2-3].

For Start Norge, the core issue was the need for a streamlined system that enables better collaboration between the central board and local departments, while automating routine tasks. The content approval process in specific was identified as a bottleneck. Local chapters had to wait for feedback from the central board, which delayed social media posts. A clear system for automation and real-time collaboration was defined to overcome this challenge.

The following goals were defined:

1. Improve content management by integrating tools for content creation, scheduling, and approval.
2. Automate the social media posting process across platforms to reduce manual labor.
3. Enhance coordination between local departments and the central board by introducing standardized collaboration tools.

3.1.3 Develop

The Develop phase involves designing the solution to meet the goals defined in the previous phase. This phase includes ideation, prototyping, and testing new solutions. For Start Norge, the end-solution was a digital platform integrating multiple existing tools. Opportunity-driven innovation is employed for the development of the solution [12, p. 4].

One of the core components of the solution was automated scheduling and posting. Using platforms such as Buffer or Hootsuite, the social media posting process would be automated, allowing posts to be scheduled in advance. This would ensure timely posting, even when local departments are busy with other tasks.

Additionally, commonly used collaboration tools like Slack and Google Calendar will be integrated into the system to ensure real-time communication. Utilizing these tools aim to better coordination between the central board and the local chapters allowing a smoother content approval process. In the end, reducing delays and ensuring better alignment with Start Norge's objectives.

To support content creation and approval, a simplified content management system should be integrated as well. This could allow both local chapters and the central board to draft, review, approve, and archive social media content. Tem-

plates can be stored, saving time, while ensuring consistency across all communication platforms.

3.2 Customer touch points and journeys

Customer journeys map out the experiences a customer has with an organization across different touch points [15] [5, p. 130]. In this context, the *customer* refers to the content creator, the primary actor affected by the innovation. Start Norge's board and local departments will also benefit indirectly through increased consistency and saved time. Additionally, followers may receive more frequent content with shorter delays. While the innovation benefits various stakeholders, the primary goal is to streamline the content creator's workflow.

Figure 3.1 shows the customer touch points before the innovation. Before approval and publication, content must first be created and submitted. After submission, it is reviewed for approval. Once approved, the post is manually prepared and published. After publishing, the content's performance is tracked. The key issues occur before and during the journey. The process is manual and time-consuming. Additionally, the workflow lacks predictability, making it inefficient.

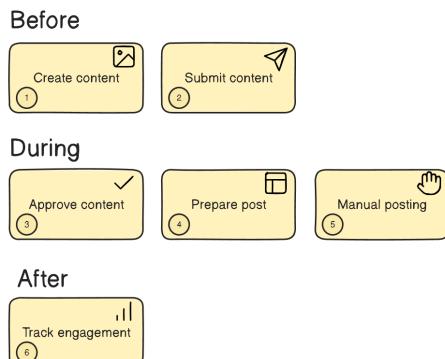


Figure 3.1: Customer touch points before innovation

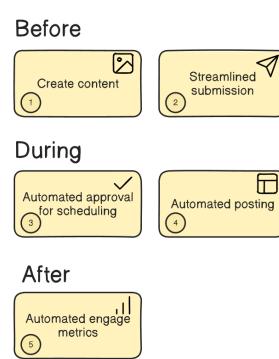


Figure 3.2: Customer touch points after innovation

Figure 3.2 shows the customer touch points after the innovation. There is one less step than in Figure 3.1, and the total steps for before and during are evenly distributed. An additional model has also been created to visualize the customer journey for the content creator. This is displayed in Figure 3.3.

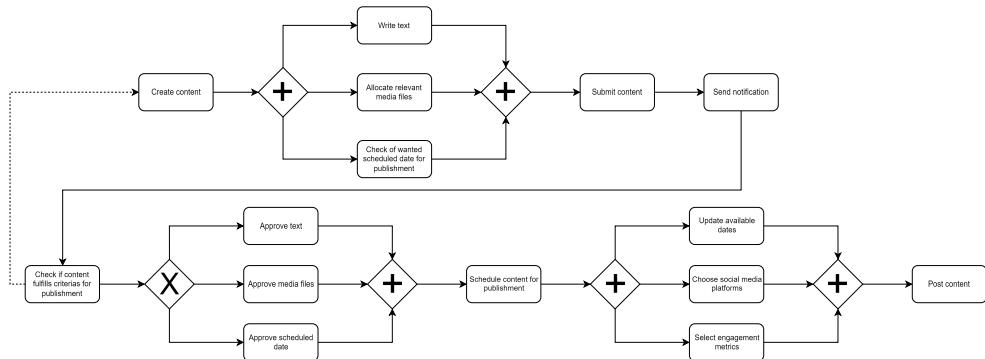


Figure 3.3: Customer journey after innovation

Content creators use a centralized content management system to draft posts. Templates and formatting are standardized within the system to ensure consistency. The content is submitted through the system, and the central board is automatically notified for approval. Approved content is then auto-scheduled for optimal posting times across platforms without manual intervention, and engagement metrics are automatically tracked. This automation centralizes data for performance analysis, reduces workload, streamlines operations, and allows Start Norge to focus on strategic activities.

3.3 Service blueprint canvas

Service Blueprint Canvas improve process efficiency by providing a clear structure for roles, workflows, and their interactions [5, p. 131]. As shown in Figure 3.4, where gold midsummer interactions highlights the content creator role's significance of the new service, the blueprint presents the integration of new tools and processes that optimize the workflow. This approach is supported by frameworks that align Information and Communication Technology (ICT) with business objectives, ensuring the system is both effective and secure [9, p. 6-7].

Each lane in the blueprint represents a distinct component of the service flow [5, p. 131-133]. Online/physical evidence refers to visible elements that users interact with, like Canva. Customer actions are the steps taken by customers, including drafting and submitting content. Front-stage interactions involve direct, customer-facing activities, such as notifications triggered by submission. In contrast, back-stage interactions cover the behind-the-scenes processes, like automation in scheduling. Finally, support processes involves the systems and tools that enable service delivery, such as strategic goals.

The true value of the service lies in the back-stage processes and support systems. Tailored systems, such as the CMS and scheduling tools, automate repetitive tasks, significantly reducing delays and freeing resources for creative and strategic activities [10, p. 564]. These improvements are reinforced by software upgrades and

data management strategies that ensure secure and reliable operations [8, p. 46].

From an enterprise architecture perspective, these tools streamline collaboration between local chapters and the central board. They clearly delineate roles and responsibilities, ensuring smoother workflows. Front-stage interactions, such as notifications, are directly supported by back-stage processes. This integration ensures smooth communication. Engagement metrics are incorporated into the system to inform future content strategies. This approach improves scalability and workflow efficiency while aligning ICT tools with Start Norge's strategic goals.

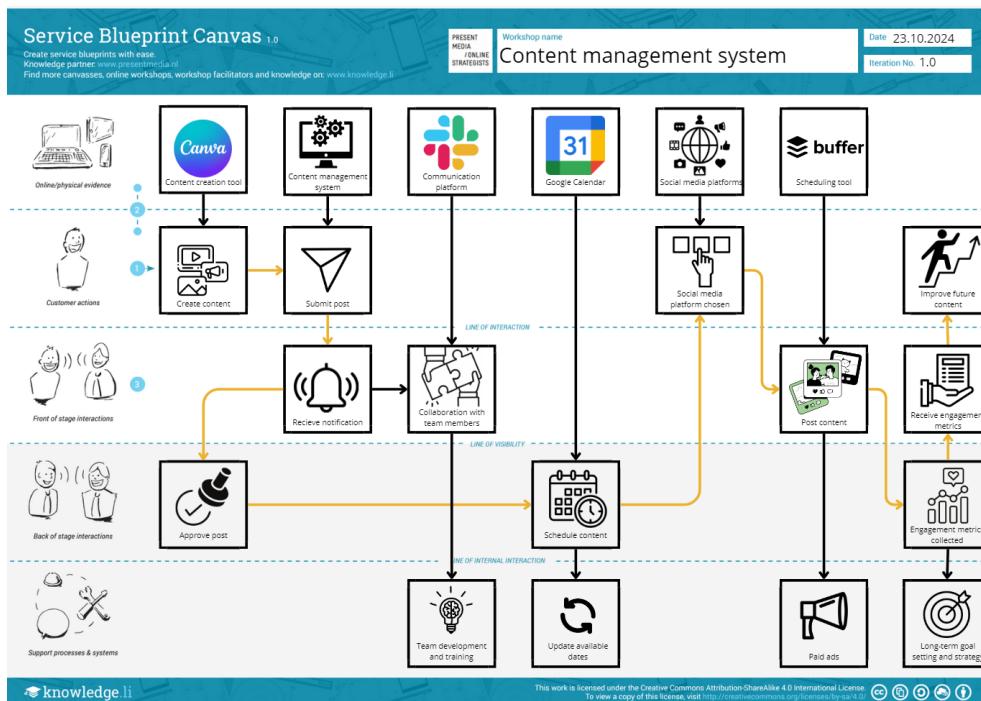


Figure 3.4: Service blueprint canvas

3.4 Reflections

Examining Start Norge's open service innovation and service design highlights how operational improvements paired with a strong digital presence can sustain and expand member engagement. As a student-driven, non-profit organization, Start Norge must innovate continuously to deliver member value. Competing student groups create a dynamic environment, pushing Start Norge to stay relevant and appealing [12, p. 6]. Expanding reach goes beyond retaining current members. It also involves attracting a broader audience across campuses and businesses.

This chapter's focus on service design tools clarified how Start Norge can optimize media outreach and streamline processes. For instance, mapping customer

journeys showed how digital interactions and automated systems can simplify content creation and approval. Creating before-and-after journeys identified key areas for improvement and resource optimization. The service blueprint detailed front-stage and back-stage interactions, revealing how each role and tool supports the overall goal of increasing engagement [5, p. 130-133].

The digital innovation model adopted by Start Norge focuses on sustainability in financial and operational aspects. Employing automated systems free up resources, allowing for scalability without overextending [14, p. 5]. This approach not only supports Start Norge's sustainability goals but also aligns with the UN Sustainable Development Goals, specifically *quality education* (Goal 4) and *decent work and economic growth* (Goal 8) [16].

For Goal 4, Sub-goals 4.4 and 4.7 are addressed. Sub-goal 4.4, which focuses on building skills for employment and entrepreneurship, is met by providing students with hands-on experience in digital content creation and workflow automation. Sub-goal 4.7, which promotes skills for sustainable development, is supported by Start Norge's collaborative structure, which encourages sustainable business practices across chapters.

Aligned with Goal 8, Sub-goals 8.3 and 8.6 are also supported. Sub-goal 8.3, which promotes productive policies, is reflected in Start Norge's supportive environment for student entrepreneurship. By freeing resources, the organization fosters creativity and innovation, contributing to economic growth. Sub-goal 8.6, aims at reducing disengagement among youth, is supported through the model's purpose, and provide more students with valuable experience to keep them active in education and work.

Chapter 4: Business modeling

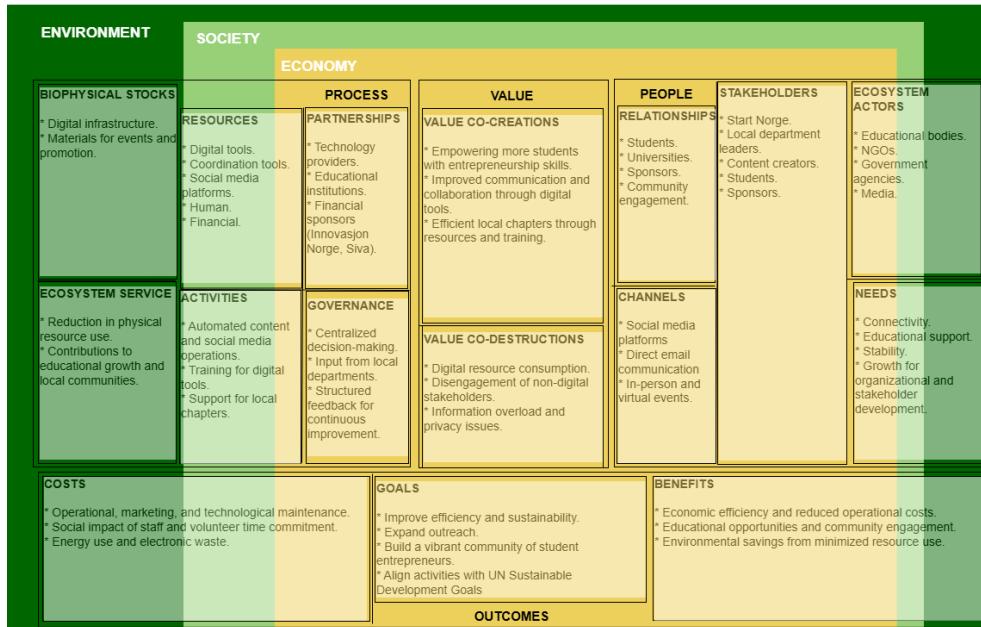
As part of developing a sustainable approach to service innovation, a business model were designed. This business model focuses on how the new service innovations, particularly the automated social media content management and enhanced collaboration tools, create value for the organization, its members, and external stakeholders.

4.1 Flourishing Business Canvas

For this purpose the Flourishing Business Canvas (FBC) were adopted. It was selected for its holistic approach to sustainability, integrating environmental, social and economic considerations across all business aspects. The model outperforms other models, like the *Traditional Business Model Canvas*, the *Lean Business Canvas* and the *Value Proposition Canvas*, in terms of systemic sustainability integration.

It's worth noting that the FBC includes aspects that could have been addressed by adopting another triple-layered approach. The concept is discussed in the *Triple Layered Business Model Canvas* paper [17]. This approach adds environmental and social layers to the traditional business model framework, ensuring that business models create, deliver, and capture multiple forms of value. However, the FBC already incorporates these elements effectively, ensuring comprehensive coverage of processes, values, people, and outcomes in a structured, layered manner.

Figure 4.1 illustrates the developed FBC. The subsequent subsections will provide an explanation of its components.

Flourishing Business Canvas v2.0**Figure 4.1: Flourishing Business Canvas**

4.1.1 Process

This section describes the various components that define how Start Norge operates on a day-to-day basis.

Biophysical Stocks

Refers to the tangible assets that Start Norge uses in its operations. Start Norge utilizes digital infrastructure such as computing devices, along with physical materials for promotional events. These assets support routine communications and the management of major events, forming the operational backbone of the organization.

Ecosystem Services

These are the benefits that Start Norge's operations provide to the natural environment by minimizing physical resource use. The organization's shift to digital-first initiatives helps minimizes the use of tangible materials and diminishes Start Norge's carbon footprint. In turn, this reduce waste and energy consumption, which supports broader ecological sustainability by lessening the impact on natural ecosystems.

Activities

Cover the core actions taken by Start Norge to achieve its mission. Central to our operational model are activities such as automated content management for

streamlined communication, extensive social media engagement, and continual training to ensure members effectively use digital tools. Thereby, these activities enhance operational efficiency and support development.

Resources

Digital resources include software and platforms for content management and communication, while human resources cover both the volunteer and financial support that allows for general operations.

Partnerships

Pertains to the collaborative relationships or formal partners Start Norge has established in order to operate. Technology providers grant access to cutting-edge tools, educational institutions provide students, and sponsors allocate financial support, all of which enhance the organization's capabilities and outreach.

Governance

Refers to the decision-making structures and processes within Start Norge. Governance at Start Norge involves centralized decision-making with significant contributions from local departments, ensuring alignment with organizational goals. This structure supports structured feedback and continuous improvement, aiming to provide an adaptable and effective environment.

4.1.2 Value

This section outlines the benefits and potential drawbacks of the organization's operations.

Value Co-Creations

Highlights the positive impacts of Start Norge's services. Start Norge enhances member capabilities by providing essential entrepreneurship skills and digital tools necessary for effective collaboration and innovation. This focus enriches the educational experience and equips members with skills to succeed in professional environments, preparing them for modern workforce challenges.

Value Co-Destructions

Acknowledges the potential negative impacts. The digital-first approach, while advantageous, raises the organization's energy consumption and potentially increases its carbon footprint. Additionally, this strategy may exclude less tech-savvy members, creating disparities in engagement and participation, which could impact the community environment and communication effectiveness.

4.1.3 Outcomes

This section addresses the results and impacts of Start Norge's business model.

Costs

Details the financial, social, and environmental costs incurred by Start Norge. These include operational expenses for maintaining digital platforms, marketing, and technological infrastructure, alongside social costs of volunteer time investment for daily operations. Environmental costs involve energy consumption and electronic waste from digital activities, managed to align with sustainability principles.

Goals

Defines the strategic objectives of Start Norge. The organization's goals aim to enhance operational efficiency, expand outreach, foster a vibrant community of student entrepreneurs. Activities are to align with the UN Sustainable Development Goals, defining success in terms of environmental sustainability, social impact, and economic viability.

Benefits

Describes the varied advantages that arise from Start Norge's operations. Benefits from Start Norge's business model include improved operational efficiencies and reduced costs due to digital technologies. Educationally, it offers substantial opportunities for students. Socially, the model fosters community engagement, while environmentally, it reduces reliance on physical resources, contributing to conservation efforts.

4.1.4 People

This section explores the human element of Start Norge's operations.

Relationships

Emphasizes the importance of maintaining strong, interactive, and supportive relationships with all stakeholders. For Start Norge this done through social media, direct communication, and interactive events. The organization is dependent on relationships with students, universities, and sponsors, thereby the channels aims to keep stakeholders actively involved and to meet their needs.

Channels

Includes the mediums Start Norge communicates with its stakeholders. To enhance these relationships, Start Norge uses multiple communication channels, including digital platforms for broad outreach and personal interactions during events.

Stakeholders

Identifies the key participants involved in or affected by Start Norge's activities. Core stakeholders includes students, educational partners, sponsors, and com-

munity members. These play essential roles within the organization's ecosystem, contributing to its success and direction.

Ecosystem Actors

Expands on the broader network of entities interested in or impacted by Start Norge's existence. Beyond immediate stakeholders, Start Norge engages with ecosystem actors like government agencies, NGOs, and the media, which influence initiatives.

Needs

Covers the essential needs of the mentioned actors. Start Norge addresses fundamental needs for connectivity, educational support, and community development. These are elements that are crucial for the growth and stability of its stakeholders, ensuring the organization's impact and relevance.

4.2 Sustainable business innovation

The organization's value proposition is uniquely structured around empowering students with entrepreneurial skills that are essential in today's fast-evolving landscapes. This proposition is rooted in the commitment to not only enhance the practical skills of students but also a robust sense of innovation and self-initiative. In turn, preparing them for future challenges and opportunities.

Start Norge's sustainability efforts are included in every aspect of its operations, reflecting a commitment to achieve economic, social, and environmental goals.

- *Economic* sustainability is achieved through strategic partnerships with technology providers, educational institutions, and sponsors. These collaborations ensure a steady flow of resources and expertise, which are vital for sustaining long-term initiatives and expanding both reach and impact.
- *Social* sustainability is addressed by fostering a community-centric model that emphasizes education, collaboration, and engagement. Start Norge actively works to create an inclusive environment where all members can thrive and contribute to collective goals.
- *Environmental* considerations are included in all of Start Norge's operations. This effort supports the UN Sustainable Development Goals, specifically those mentioned in Section 3.4. These practices are not just about compliance but are a core part of Start Norge's mission.

These efforts illustrates Start Norge's commitment to a holistic and responsible business model. It reflects a forward-thinking approach that ensure that the organization remains a relevant and influential force in promoting sustainable entrepreneurship. Through this model, Start Norge delivers both value to its stakeholders and contributes positively to the broader societal and environmental goals.

Chapter 5: Redesigned enterprise model

This chapter presents the modifications made to the enterprise model to support the service innovation. The redesign focuses on two key sub-models: the Business Process Model and the Actors and Resources Model. These adjustments are aimed to facilitate for the goal regarding 30% increase in social media outreach, without requiring structural reorganization. While technical aspects were reviewed, the Actors and Resources Model provided sufficient support for the innovation. New parts are highlighted with bright lime green borders.

An evaluation of the updated model are applied to ensure it meets quality standards and Start Norge's goals. Relevant similarities between Enterprise Architecture (EA) and Enterprise Modeling (EM) are reflected upon to contextualize these changes.

5.1 Redesigned business process model

The redesigned business process model is shown in Figure 5.1. This updated model supports the service innovation by streamlining steps and eliminating redundant processes. Previously, certain tasks, such as manual approval and content scheduling, required significant time and coordination. The redesign introduces automation, as conceptualized earlier, to simplify these steps. For instance, automated approval checks, real-time updates of available dates, and the collection of engagement metrics are now incorporated to enhance content optimization and efficiency.

With automated tools in place, content creators can submit content directly into a centralized system for approval¹. This innovation removes bottlenecks by enabling real-time notifications. Additionally, the redesigned process incorporates new technology to automate scheduling and posting. Once content is approved, it's automatically queued for optimal posting times across platforms. This ensures consistency and outreach.

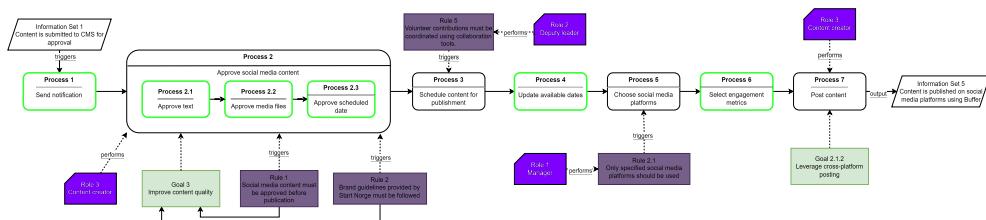


Figure 5.1: Redesigned Business Process model

¹Local department content creators can also do this. This role is revised in the redesigned actors and resources model.

5.2 Redesigned actors and resources model

The redesigned actors and resources model is presented in Figure 5.2. With the automation of social media workflows, several adjustments in roles and resources were introduced. Content creators now have new responsibilities, including managing the automated content approval and scheduling system. Other roles, such as the deputy leader, have been assigned clearer responsibilities, particularly regarding the coordination platform. To reduce confusion and improve collaboration, a clear distinction between central and local chapter content creators has also been established.

In this new model, the content creators collaborate more seamlessly through a centralized content management system (CMS). This applies for both the central and local levels. The IT-responsible² is now in charge for managing this system and ensuring integration with external social media scheduling tools. This change supports the innovation by maintaining system uptime and troubleshooting issues.

The redesigned model removes redundant manual tasks. This frees up resources to focus on strategic and creative functions. Roles previously assigned to these manual processes are now available to concentrate on their core responsibilities.

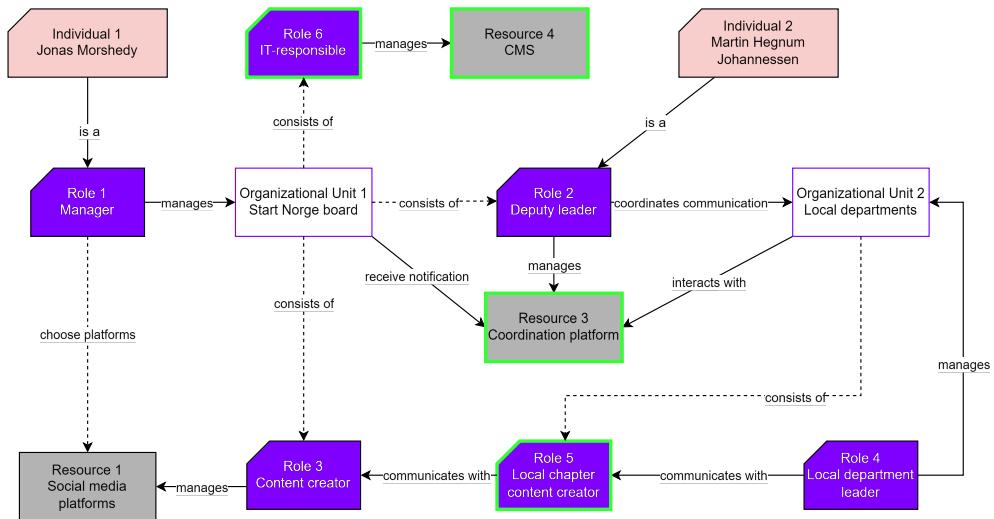


Figure 5.2: Redesigned Actors and Resources model

5.3 Redesigned enterprise model

The redesigned enterprise model in Figure 5.3 incorporates changes introduced by the service innovation. This model promotes a more efficient process flow. It focuses on increasing social media outreach, thereby enhancing operational ef-

²This role was excluded from the initial model due to lack of relevance.

fectiveness. Simplified, goal-driven adjustments support timely, effective service while reducing redundancies. Resources are now allocated strategically, aligning the model's purpose with Start Norge's primary objectives.

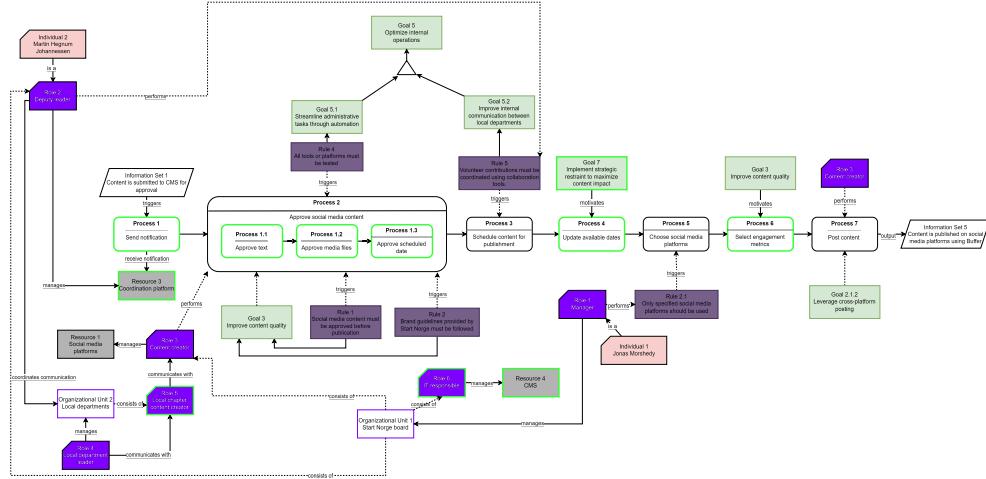


Figure 5.3: Redesigned Enterprise model

5.4 EA and EM Reflections

This section examines the redesigned enterprise model through the lenses of Enterprise Architecture (EA) and Enterprise Modeling (EM).

EA aims to align all organizational components cohesively to support strategic goals. It is often focused on IT and infrastructure to optimize processes across the enterprise. Defined as a set of principles and methods for organizational structure, processes, and information systems, EA helps in achieving an integrated, change-responsive environment supportive of business strategy [5, p. 3].

In contrast, EM focuses on creating a unified model that captures the necessary organizational aspects for the current modeling purpose. It is often applied in assessing processes, roles, and dependencies to foster shared understanding and decision-making [2, p. 29].

This redesign reflects the dual benefits of EA and EM. EA components, like the Actors and Resources Model, illustrate the support from the IT-responsible role in streamlining social media workflows. EM aspects, particularly the goal-oriented and process models, emphasize how these improvements align with Start Norge's strategic objective of expanding digital reach. Integrating both perspectives, the redesigned model is capability-centric, emphasizing opportunities for more effective technology use and process efficiency.

5.5 Evaluation

Here, the redesigned enterprise model is re-evaluated using the SEQUAL framework. This is done to ensure that it fulfills its intended purpose, which is detailed in Section 1.2, and meets quality standards. The SEQUAL framework is used to evaluate it effectively. The approach evaluates the model from seven dimensions, including physical, empirical, syntactic, semantic, pragmatic, social, and deontic perspectives [3, p. 404].

5.5.1 Physical quality

The model is created and stored in Draw.io, a widely accessible platform, ensuring availability for the organization. Backups are stored on Google Drive, GitHub and locally, providing persistence and security. Regular updates maintain the model's relevance, with minimal effort required to keep it current. Thus, the model's physical quality is evaluated as strong.

5.5.2 Empirical quality

The redesigned model is presented on a single page for easy readability, with color-coded components for goals, processes, and roles to enhance structure visibility. While the model's complexity posed challenges, such as long arrows, careful placement of elements and removing crossing arrows has mitigated readability issues. In Figure 5.1, *Content creator* is included twice to simplify the layout. Slight improvements could be made by increasing font size and placing the views more like they should be read. Overall, the empirical quality is solid, with minor adjustments possible for improved readability.

5.5.3 Syntactic quality

The model follows these rules accurately, representing all elements clearly. This ensures that the syntactic structure is consistent with 4EM standards, making the model's syntactic quality high.

5.5.4 Semantic quality

The model successfully captures relevant goals, roles, and processes needed to support Start Norge's digital outreach objectives. No unnecessary elements are included, ensuring the model remains focused. Each element contributes to the model's purpose, fulfilling the intended overview of Start Norge's workflows and innovation goals. Thus, the semantic quality is rated as strong.

5.5.5 Pragmatic quality

As 4EM is intuitive and straightforward, stakeholders without modeling experience can understand the model easily. Labeling and clear arrows further improve interpretability. However, overlapping connections between roles and processes create occasional visual clutter, which reduces readability in certain areas, as shown in Figure 5.4a. To address this, these connections should be reorganized. Additionally, duplicate instances of the *Content Creator* role are typically discouraged. However, as shown in Figure 5.4b, this duplication is deemed appropriate here to reduce clutter. Overall, the pragmatic quality is evaluated as good, with minor challenges that can be easily addressed.

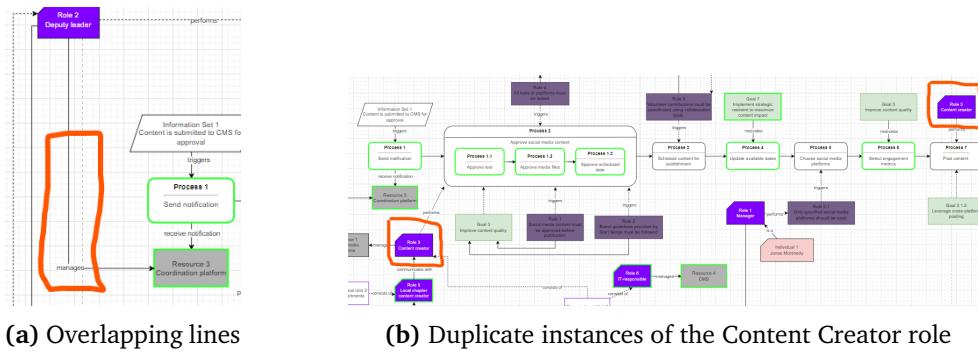


Figure 5.4: Examples of issues impacting pragmatic quality

5.5.6 Social quality

This model has been reviewed by Start Norge's manager, two local chapter members with varying levels of experience, and a partner from SIVA. Feedback from these diverse perspectives confirms the model's clarity and coherence. Their feedback suggests that the model meets the social quality expectations, indicating that interpretations align well across audiences.

5.5.7 Deontic quality

The model achieves its goal by providing an overview of processes, roles, and goals that supports Start Norge's objective of improved digital outreach and efficient social media workflows. It identifies areas for process optimization, ensuring the model is a valuable analysis tool. Therefore, the deontic quality is high.

5.5.8 Overall quality

Based on the SEQUAL framework, the redesigned model demonstrates strong overall quality. Minor improvements in empirical and pragmatic quality could enhance readability. However, the model successfully provides a structured and comprehensive view, aligning with the purpose of the modeling.

Chapter 6: Reflection

This chapter reflects on the modeling experience, process, and lessons learned. The journey began with uncertainty, as enterprise modeling was initially challenging due to my limited experience. However, over time, I found it increasingly engaging as my understanding deepened and the models evolved to meet Start Norge's needs.

At the outset, I realized the importance of flexibility in modeling. The first model was far from the final version; new issues and insights surfaced as I progressed, necessitating revisions. This iterative process, though time-consuming, significantly enhanced my modeling skills. The initial lack of a thorough case description led to frequent redesigns, underscoring the need for well-defined parameters before modeling. With more preparation, the modeling process would have been more streamlined.

The concept model was particularly helpful for establishing a foundation. This was especially valuable given Start Norge's limited experience in standardizing social media processes. The model enabled clearer communication of goals and rules. It also provided a structured approach for transferring knowledge across departments, addressing a recurring challenge from previous years.

Service innovation also presented an insightful challenge. Entering with a pre-conceived innovation idea may have made my discovery phase less open-minded, as I was focused on specific improvements. A more thorough and exploratory discovery phase would have broadened my perspective, allowing me to uncover more diverse innovation opportunities within Start Norge's structure. Next time, I would consider a case without prior knowledge and consider an unfamiliar approach. An alternative approach like Root Cause Analysis (RCA) could have helped to pinpoint underlying issues in social media engagement. Alternatively, Participatory Action Research (PAR) would have allowed active collaboration with Start Norge's stakeholders.

Business modeling was an engaging part of the process. This enabled me to examine how Start Norge could create, deliver, and capture value. This perspective emphasized the connection between enterprise structure and value generation, reinforcing the strategic impact of enterprise modeling.

In retrospect, I am satisfied with the final models, case study, and the skills acquired throughout the course. If I were to repeat this project, I would invest more in the initial case description to avoid frequent redesigns. While the iterations refined my skills, a clearer foundation could have provided a more efficient path forward.

Chapter 7: Conclusion

This project highlights the value of enterprise modeling in improving Start Norge's social media workflows and digital presence. By applying the Double Diamond Design process, key bottlenecks were identified. This led to the creation of streamlined, goal-driven models. Using 4EM and ArchiMate aligned organizational goals with digital workflows. The integration of the Flourishing Business Canvas, Customer Journey, and Service Blueprint added additional perspectives. These tools captured customer experience and outlined sustainable business practices. Evaluated through the SEQUAL framework, the redesigned models meet essential quality standards. They effectively support Start Norge's objectives. Overall, this work provides Start Norge with valuable insights and tools for fostering greater engagement and sustainable growth.

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Chapter A: Additional Material

A.1 Checkpoint 1

Figure A.1 represents the first iteration of the model, which was reviewed once after *Checkpoint 1*. Further elements were added after the initial review, like the *Processes Model*.

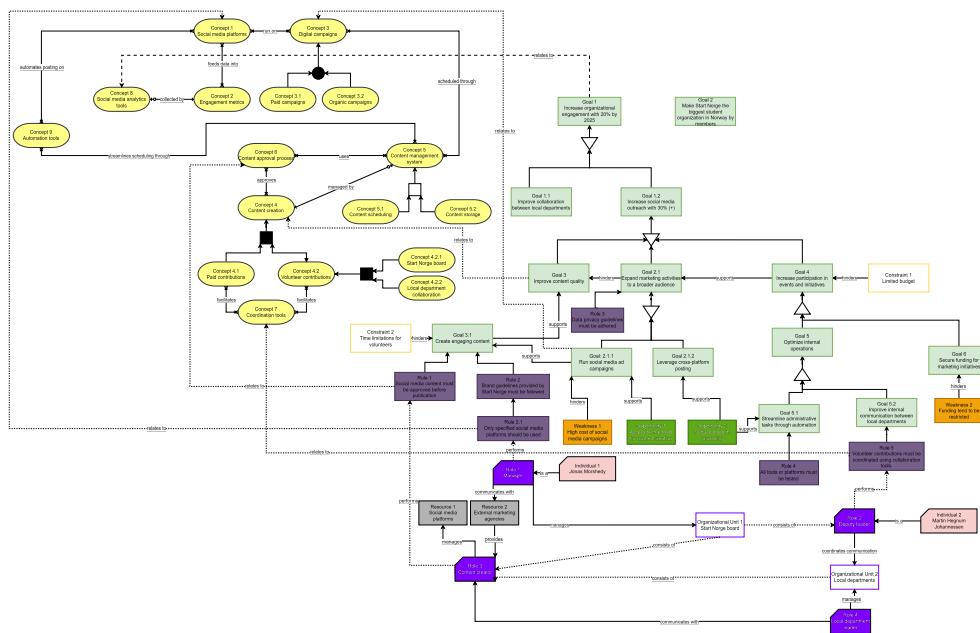


Figure A.1: Checkpoint 1: Overview of enterprise model in 4EM

For checkpoint 1, I initially selected the modified quality criteria for enterprise modeling by Larsson and Segerberg (2004), based on Moody and Shanks' (2003) framework. These criteria, adapted for enterprise models, assess completeness, correctness, flexibility, integration, simplicity, understandability, and usability [2, p. 205]. This approach was personally considered as suitable given the need to create a straightforward, accessible model, though I had to evaluate it with SEQUAL instead since it was not a part of the syllabus.

A.1.1 Completeness

Completeness measures how well the model includes all relevant elements of the problem domain. Here, the enterprise model does not fully addresses the aspects of Start Norge's social media workflows due to the absence of certain elements, like business processes. However, the inclusion of roles, business rules, goals, and concepts helps compensate for this gap.

A.1.2 Correctness

Correctness refers to adherence to the rules and conventions of the chosen modeling technique. 4EM were applied consistently, so correctness is considered good.

A.1.3 Flexibility

Flexibility assesses the model's ability to adapt to changes in the enterprise's goals or processes. Given Start Norge's evolving objectives, the model was designed to allow easy updates. For instance, if Start Norge were to shift focus areas. The model could incorporate these changes without significant restructuring, making it flexible. However, this flexibility comes with some trade-offs in completeness.

A.1.4 Integration

Integration evaluates consistency and coherence among the different sub-models within the enterprise model. This model demonstrates a high degree of integration, linking goals with specific rules, roles, and resources seamlessly. This consistency across sub-models helps stakeholders understand the complete picture.

A.1.5 Simplicity

Simplicity emphasizes minimal use of modeling constructs while still representing essential information. The enterprise model was created to serve as an overview to prevent unnecessary complexity. By focusing only on relevant social media elements and related actors, the model maintains simplicity.

A.1.6 Understandability

Understandability is considered to ensure that all stakeholders can interpret the model. The model uses clear labels, color-coded elements, and logical organization. Some lines cross due to the model's complexity, which affects readability. However, feedback from peers confirmed that the model remains straightforward to interpret overall.

A.1.7 Usability

Usability measures the model's practical applicability for its intended purpose. As intended, it served as a reference for process optimization and innovation enhancement. However, it is not fully usable for understanding all of Start Norge's processes, due to the absence of process details.

A.1.8 Overall evaluation

Overall, the enterprise model meets most quality standards. Even though it to some degree achieves its intended purpose, further iterations are needed.