A Generic Capability Map for Professional Sport Clubs

The currently observed professionalization of the management of sport organizations involves the use of contemporary management approaches for strategy formulation and implementation. One such approach is capability-based management, rooted within the Enterprise Architecture discipline and founded on managerial theories. The main instrument of capability-based management is the capability map, which provides a structured and hierarchical overview of an organization's capabilities. At a high enough level of abstraction, organizations within the same industry or societal sector are managed based on capabilities that can be described using a generic capability map. While industry/sector-specific capability maps are used in consultancy practice, academic knowledge of how to develop such generic capability maps is lacking. Therefore, this paper addresses the question of how a generic capability map for organizations within the same industry/sector can be developed. Professional sport clubs were used as the application field for our Design Science research. The research was executed in collaboration with three major, premier league Belgian clubs that operate in the highest tier of their respective professional sport competition. After different iterations of joint development and evaluation activities with these clubs, the final design of a generic capability map was obtained, which gives managers a tool they can use to investigate strategic alignment within their professional sport clubs (i.e., the question of whether the strategic direction decided by the board is translated into a proper organizational design). The knowledge acquired for developing generic capability maps is an original contribution to the Enterprise Architecture discipline.

Keywords **-** *Professional sport club management; Strategic planning; Capability-based management; Generic capability map; Enterprise architecture*

1. Introduction

The professionalization of sport has raised awareness of the importance of strategic management for sport organizations (Ferkins et al., 2005; Ferkins & Shilbury, 2010, 2015; Shilbury & Ferkins, 2011; Dowling et al., 2014), including sport clubs that manage professional sport teams and their players. Strategic management of professional sport clubs involves, amongst others, the adoption of contemporary management approaches and conceptual structures for strategy formulation and implementation (Smith & Stewart, 2010).

One such approach is capability-based management, grounded on the Dynamic Capabilities (Teece et al., 1997) theory of sustained competitive advantage. While some aspects of the management of professional sport clubs have received the attention of researchers (e.g., performance management (Millar & Stevens, 2012; O'Boyle, 2015) and quality management (De Knop et al., 2004)), capability-based management of professional sport clubs has not been investigated. In the management of businesses, capability-based management is a strongly growing strategic planning practice (Ethiraj et al., 2005; Offerman et al., 2017). A capability refers to the ability and capacity of the organization to achieve an organizational goal in a certain context (Bērziša et al., 2015), where goals can range from the strategic level in the organization (i.e., high-level capability) to the operational level (i.e., low-level capability). Managing an organization based on capabilities allows for a smooth transition from strategy formulation to strategy implementation (Offerman et al., 2017), and further on, to portfolio, program, and project management (Aldea et al., 2015), which are all practices characterizing mature organizations in business, but with little emphasis so far, apart from some work on organizational design (Swierzy et al., 2018; Wicker & Breuer, 2014), in the professional sport sector.

The main instrument of capability-based management is the capability map, which provides a structured and hierarchical overview of an organization's capabilities (Wißotzki, 2015; Zdravkovic et al., 2017). Different information can be included in a capability map, including strategic importance of capabilities, areas of competencies covered, and accountability level of managerial decision-making. Such an overview of an organization's current state of capabilities provides a baseline for evaluating the impact and feasibility of strategic initiatives and the related planning of the changes required to address the gaps between the current and the desired state of an organization's capabilities. Capability maps thus

support formulating a new strategy, analyzing the required changes in capabilities, and planning the transformation journey needed for strategy implementation.

However, how to develop the baseline capability map that provides a complete and accurate representation of an organization's capabilities? Sometimes in consultancy practice, generic capability maps are used as a reference for developing an organization's capability map (W. Ulrich & Rosen, 2011). Organizations within the same industry or societal sector have a similar value creation purpose and therefore aim at achieving similar goals, hence need roughly the same capabilities to operate. Of course, the way and extent to which these capabilities are implemented and deployed will not be identical between organizations as otherwise, no competitive advantage is possible. However, at a high enough level of abstraction, organizations within the same industry/sector are managed based on capabilities that can be described using an industry/sector-specific capability map. Such a generic capability map can then be tailored to individual organizations' specificities and strategic choices.

As professional sport clubs are managed as businesses (Dowling et al., 2014), yet sport management has its idiosyncrasies making it different from managing organizations in other industries (Gammelsæter, 2020; Smith & Stewart, 2010; Thiel & Mayer, 2009), we investigate in this paper the question of how a generic capability map for professional sport clubs can be created as such generic capability map is missing in practice. Furthermore, most industry/sector-specific capability maps result from the work of consultants and even though their value is demonstrated by their use in practice, they are proprietary. Even when publicly available, it is still not clear how they were developed. We therefore address the question of how to develop an industry/sector-specific capability map as a research question as the current research on capability-based management has not yet produced a systematic method for developing generic capability maps.

The purpose of this paper is thus to investigate how a generic capability map for organizations within an industry/sector can be developed, independently of the specific industry/sector concerned. The rationale for selecting the professional sport clubs as an application field for our research is based on the added value a generic capability map could bring to the management practices within this sector. For sectors and industries where consultancy firms often support management practices, generic capability maps are available as we can see for example in the practitioner guide BIZBOK (Business Architecture

Guild, 2019). For other sectors and industries, generic capability maps might not be readily available. As this is the case for the professional sport industry, the creation of one would thus provide great value to this industry and in specific to the management practices within it. To scope our research, we follow (Baloga & Lazăr, 2011) and define a professional sport club as an organization that has contracts with athletes and pays them to compete in their particular sport, selling the event to live audiences and/or the rights to broadcast the event. Furthermore, we limit ourselves to team sport and assume clubs own or have access to a venue to play games.

We approach our research from the philosophical stance of Rescher's Methodological Pragmatism (Altshuler & Rescher, 1979), where the search for 'truth' is a search for 'utility'. Accordingly, our research method is Design Science (Hevner et al., 2004; Van Aken, 2004). By designing a generic capability map together with managers of three premier league Belgian soccer and basketball clubs that we used as case studies, we contribute knowledge of how such a generic capability map is developed. Apart from this procedural knowledge, which we formulate as a set of design principles for generic capability maps, the outcome of our research process is a generic capability map that professional sport clubs can use for devising their own organization-specific capability map as a starting point for adopting capability-based management as a contemporary managerial approach for strategic planning and realizing competitive advantage.

This paper is structured as follows: Section 2 presents our research's theoretical and conceptual framework and reviews related research on developing capability maps. Section 3 describes our research methodology. Section 4 reports on our research process and presents its results. Section 5 then analyses our investigation of the research question to provide insights on the implications for researchers and practitioners, the limitations of our study, and how to address these in future research. Finally, section 6 concludes the paper by summarizing our contribution.

2. Background and Related Work

This section provides background information on the theoretical perspective underlying capability thinking in management. It introduces terms and definitions related to capability-based management as a strategic planning practice, focusing on the concepts of enterprise capability, capability-based planning, and capability map. We specifically discuss the properties of capability maps and what makes a capability

map generic. The reference discipline for this conceptual framework is Enterprise Architecture, which studies a coherent combination of principles, methods, and models used in designing an enterprise's organizational structure, work processes, information systems, and infrastructure (Lankhorst & others, 2009). Enterprise in this context can refer to any kind of formal organization, part of such an organization or whole of such organizations, hence including professional sport clubs. The section ends with reviewing related work of developing generic capability maps.

2.1 Theoretical framework for capability-based management

Capability thinking originates in the Resource-Based View (RBV) (Barney, 1991) of the firm, which predicts that organizations can achieve sustained competitive advantage only if their resources exhibit certain properties. While a short-term competitive advantage can be created with valuable and rare properties, this advantage can only be sustained in the long term for resources that cannot be imitated or substituted. So, organizations that wish to successfully compete and survive in their industry, need to appropriate these so-called VRIN (Valuable – Rare – Inimitable – Non-substitutable) resources and make sure they cannot be copied or imitated by competitors. This is the essence of the Resource Dependency Theory (RDT) that explains why organizations establish relationships with other organizations (i.e., so-called coalitions), but after having obtained the VRIN resources, try to minimize their dependency upon others while maximizing other's dependency on them (D. Ulrich & Barney, 1984).

Being able to obtain (and keep) VRIN resources adds a dynamic perspective to the RBV, which is exactly the aim of the Dynamic Capabilities theory (Teece et al., 1997). A dynamic capability refers to the ability to integrate internal and external resources and to reconfigure them to address changes in the environment. Hence, capabilities are needed to (re)configure resources such that they (continue to) meet organizational needs and achieve goals.

Capability thinking is not just applicable to a strictly profit-driven business world. For instance, Service Science is an interdisciplinary field that studies service systems, which are dynamic configurations of resources – people, organizations, technology, and shared information – by means of which actors (i.e., individuals or groups of individuals) exchange services (Maglio et al., 2009). According to Service-Dominant Logic (SDL) (Vargo & Lusch, 2004), a service is the application of competences by one service system for the benefit of another service system. Basically, according to

SDL, service exchange entails that operant resources (i.e., active resources that embody competences) act upon operand resources (i.e., passive resources that require action to make them valuable). In order to obtain the required competences, all actors are resource integrators. Hence, whether in a business context or not, all actors wishing to engage in service exchange need to set up service systems which requires thinking in terms of capabilities, meaning having the right mindset, knowledge, and methods for being able to acquire resources, configure them and put them to action to create value. Gaining access to specific resources is a first condition for establishing a competitive advantage, but it does not imply an immediate advantage. It is how the organization manages to configure these resources and combine multiple capabilities that will allow it to differentiate itself from its competitors (Ahlemann et al., 2020).

2.2 Capabilities in Enterprise Architecture

The practice of Enterprise Architecture (EA) serves three purposes: value creation, enterprise coherence, and strategic alignment. EA ensures that the organizational structures and roles, processes, information, applications, and technology that an enterprise needs to fulfill its purpose are employed to create value according to that purpose. Enterprise coherence means that these different resources are integrated and aligned and form a coherent system, where different resources work together, rather than next to each other. Strategic alignment concerns the translation of the strategic choices of resources for value creation (i.e., the question of 'how' to create value) into a blueprint for the organization that allows for effective value creation in line with the strategic goals and overall vision, where resources are directed towards the common goal of value creation. This blueprint is commonly referred to as the enterprise architecture description of the organization (Zachman, 1999) and is driven by enterprise modeling, which facilitates devising models of the enterprise's future state (van der Aalst et al., 2018).

Capability-based planning is a common EA approach to strategic alignment (Aldea et al., 2015; de Spiegeleire, 2011; Walker, 2005). In the EA context, a capability exposes 'what' an enterprise does to achieve a specific purpose or outcome, without implying anything about where, when, by whom, and how this is done (Business Architecture Guild, 2019). More exactly, a capability has been defined as the ability and capacity that enables an enterprise to achieve a goal in a certain context (Bērziša et al., 2015). Both the notions of ability and capacity are essential in this definition. In line with the previously outlined theoretical framework of capability thinking, capacity refers to the availability of resources of possibly

different kinds. Ability means the competence to use the available resources to accomplish goals and to (re)configure this resource base depending on the specific context in which goals need to be achieved.

The goals referred to can range from strategic to operational and can be very diverse in terms of internal and external value creation (e.g., service delivery to customers, devising a weekly production plan, resolution of IT incidents, complying with data protection regulations), hence a multitude of capabilities are needed. Effective management of these capabilities requires a structured overview, commonly known as the capability map (Wißotzki, 2015; Zdravkovic et al., 2017), which is part of the overall enterprise architecture description of the organization. Capability-based planning employs capability maps to compare an organization's current situation (i.e., the baseline capability map) to a situation that is desired due to a strategic initiative (i.e., the target capability map). Through gap analysis, shortcomings in capabilities are identified, and a phased strategic plan is developed to fill the gaps by so-called capability increments (Aldea et al., 2015) that gradually improve and/or extend the current capabilities to realize the strategy.

2.3 Capability maps

A *capability map* is a structured overview of an organization's capabilities (Wißotzki, 2015; Zdravkovic et al., 2017). The capabilities included in the map can be mentioned for reference, planned, just desired, or be implemented to a certain extent. Further, the capability structure can be represented as a graphical map (an example is shown in Figure 1) or in a purely textual format, though the latter can also be referred to as a capability catalog or library. The capability map included in the Appendix is in textual format.

Although many ways exist to organize the capabilities included in a capability map (i.e., the 'structured' overview), the hierarchical decomposition of capabilities is a structuring dimension that we observed in all the capability maps we found in literature or have encountered in our consulting practice. Whether graphical or textual, capability maps have a tree-like structure with a capability at decomposition level N being possibly decomposed in one or more capabilities at level N+1. At the top level 1 it is common to find multiple capabilities instead of just one root capability. Further, we are not aware of capability maps with a network structure where a capability at level N+1 is decomposed from more than one capability at higher levels.

As the capability map is part of an organization's overall enterprise architecture description, capabilities in a capability map may also be shown to be related to other enterprise architecture concepts. Existing meta-models of the capability concept (Koutsopoulos et al., 2020) but for instance also the ArchiMate language specification (The Open Group, 2019), define many types of semantic relationships between capabilities and between capabilities and other concepts (e.g., according to the ArchiMate specification, resources can be assigned to capabilities, capabilities can be realized by business functions). However, different from hierarchical decomposition, the inclusion of these relationships and their possible use as a structuring dimension are very much dependent on the purpose for which the capability map is used. To the best of our knowledge, as informed by both our literature study (see sub-section 2.5) and consulting practice, the hierarchical structure of the capability map is the only structuring dimension that is always present, regardless the intended use of the capability map. An example of a hierarchically structured graphical capability map is Figure 2 (in Section 4).

A distinctive feature of the capability maps, focused on in this study, is their genericity. From a pragmatic stance, a *generic capability map* is a capability map that describes capabilities that are not specific to a single organization, meaning that they hold for similar organizations (i.e., they are generic capabilities). Our study uses the notion of industry/sector-specific capability map assuming that the generic capability map applies to organizations within the same industry or societal sector, regardless of how broad or narrow that industry or sector is defined. Further, two important comments about genericity need to be made. First, genericity is not the same as abstraction. Abstraction in the description of capabilities is achieved through the hierarchical nesting where the level of abstraction decreases with the level of decomposition. Hence, capabilities in a generic capability map are not more abstract than the corresponding capabilities in an organization-specific capability map. Second, the capabilities described in an industry/sector-specific capability map are not the capabilities that are common to all organizations within that industry or sector but are the capabilities that potentially apply to all these organizations. The absence of a particular capability in the capability map of an organization does not imply that this capability cannot be part of the generic capability map of the industry/sector to which the organization belongs.

Finally, we wish to note the difference between a generic capability map and a reference model of capabilities or *reference capability map*. A reference model is a model that can be used as a reference or base model to use, possibly after adaptation, as one's own model. A reference capability map thus refers to a particular use of the capability map. Multiple types of reference capability maps can be relevant for an organization to adopt, including generic capability maps (e.g., based on capabilities that could apply to all organizations of an industry) or company-specific capability maps (e.g., the capability map of a company that is considered as 'best in industry' can be considered as a reference model for other companies within that industry). As we conceptualize them in our study, generic capability maps can thus possibly be used as reference capability map. However, a reference capability map is not necessarily a generic capability map.

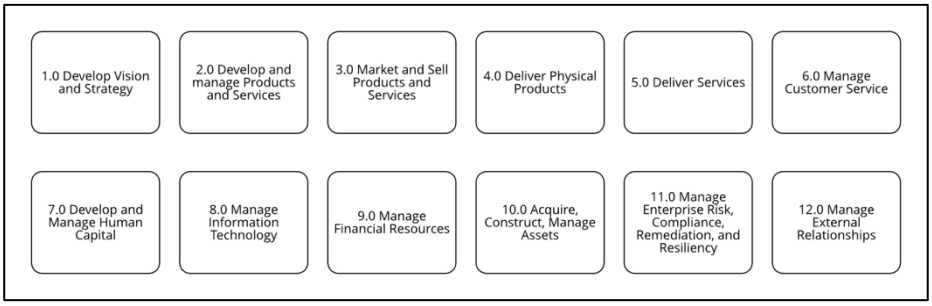

Figure 1: Example of a generic capability map showing only the highest-level capabilities and hiding any further hierarchical decomposition. The example is based on the APQC framework (APQC, 2018).

2.4 Properties of capability maps

A generic capability map is characterized by its genericity, but, apart from that, it exhibits the same properties as other types of capability maps. First, to use the capability map as a means for effective capability-based management, it needs to provide a complete, accurate, and comprehensive description of an organization's current, planned, or envisioned capabilities. It goes without saying that the capability map needs to be a valid model of the organization's capabilities. The capabilities described in the capability map should therefore be mutually exclusive**.** This means that the scope of the capabilities should not overlap, as this would lead to ambiguity and provide a less clear overview. Capabilities should also be collectively exhaustive, meaning that the collection of capabilities described in the map is sufficient to represent what an organization does to achieve its goals.

Second, the capability map should be easy to understand (W. Ulrich & Rosen, 2011). The capabilities shown in the map need to describe clearly what an organization needs to be able and capable of to conduct its operations. The map should be presented so that it can be understood by different types of people within the organization without the need for them to study first the representation formalism or modeling language used to construct the map. A capability map should thus enhance in the first place a common understanding of the organization and allow for better alignment between different parties and stakeholders in the ecosystem of the organization.

Third, a capability map should be relatively robust to changes, especially for the higher decomposition levels, as the level of abstraction at which capabilities are defined increases at these higher levels. Furthermore, it is assumed that the higher decomposition levels can therefore be defined reasonably consistently across time for organizations within the same industry or societal sector. This inherent property of a capability map provides a favorable condition for creating industry/sector-specific capability maps.

2.5 Developing generic capability maps

To summarize, a capability map serves as a base for analysis related to capability-based management as a strategic planning practice as it allows visualizing outcomes of different analytical exercises such as heat mapping (e.g., highlighting the strategic importance of specific capabilities) and allocation of resources (such as information, processes, and people). Developing a generic capability map thus allows the creation of a generic structure that is more persistent to constant change and allows different organizations to adopt the model. Therefore, it could work as a framework within which these organizations can create their own blueprint for realizing their strategy. Organizations adopting such a generic capability map can tailor the capabilities to their needs, meaning that they need to decide what the desired capacity and ability to obtain, use, and to (re)configure resources will be. However, it is expected that this tailoring increases with the level of decomposition on which the capabilities in a generic capability map are defined.

To the best of our knowledge, a method for developing generic capability maps has not been researched before. We searched the literature with a sole criterion to select a paper; does it mention the capability map as a concept? The performed search action was a focused literature review (Vom Brocke

et al., 2009), comprising the Web of Science and Google Scholar databases using the search term "capability map" on different search fields (title, abstract, author keywords, and Keywords Plus). The search was performed iteratively and was concluded in December 2020. This search action resulted in a limited number of papers. Therefore, several additional papers exploring the capability map concept and concepts similar to capability mapping, were added through backward and forward snowballing.

Table 1 presents the papers that we selected as potentially relevant to our reserarch. We reviewed these papers to discover a description of the method used to develop capability maps, specifically looking for a method to develop generic capability maps (e.g., industry/sector-specific capability maps). We only found directives and guidelines (e.g., (Business Architecture Guild, 2019; W. Ulrich & Rosen, 2011; Wißotzki, 2015)) and a single method for building company-specific capability maps (Bondel et al., 2018), but nothing that comes close to a systematic or formalized method for developing generic capability maps. Hence, we identify the absence of such method as a research gap.

Table 1: Overview of literature mentioning the capability map concept and the inclusion or absence of a formal method for the development of industry/sector-specific generic capability maps

Title	Reference	Description of method to build a generic capability map
Capability-oriented Modeling of the Firm	(Beimborn et al., 2005)	Mention of decomposition, related to one specific organization, contains no formal method or mention of the development of industry/sector-specific generic capability maps.
Business Capabilities Centric Enterprise Architecture	(Barroero et al., 2010)	Not included; The research aims to adapt some TOGAF phases, extend the core TOGAF meta-model and add architectural contents related to capabilities. Contains no formal method or mention of the development of industry/sector-specific generic capability maps.
A Method for Business Capability Dependency Analysis	(Freitag et al., 2011)	Not included; The research presents a three-phase method to systematically identify dependences between business capabilities and to other elements of the Enterprise Architecture, but contains no formal method or mention of the development of industry/sector-specific generic capability maps.
The business capability map: the" rosetta stone" of business/it alignment	(W. Ulrich & Rosen, 2011)	Contains practitioner guidelines on how to create a company-specific capability map, but not a formalized method; Contains no formal method or mention of the development of industry/sector-specific generic capability maps.
Enterprise Architecture for Business Network Planning: A Capability-Based Approach	(Bakhtiyari et al., 2015)	Not included; The research presents a method to conceptualize a multi-partner network using the capability concept, but contains no formal method or mention of the development of industry/sector-specific generic capability maps.
Modeling resources and capabilities in enterprise architecture: A well-founded ontology-based proposal for ArchiMate	(Azevedo et al., 2015)	Not included; Contains an ontological analysis of resource, capability and competence for EA, but no formal method or mention of the development of industry/sector-specific generic capability maps.
The Capability Management Process: Finding Your Way into Capability Engineering	(Wißotzki, 2015)	Not included; The chapter provides introduces a general process for identifying, improving, and maintaining capabilities in an enterprise, but contains no formal method or mention of the development of industry/sector-specific generic capability maps.
Using Capability Models for Strategic Alignment	(Keller Wolfgang, 2015)	Not included; The chapter describes methods that help manage a portfolio of operational capabilities, such as so-called heat mapping, or the use of capability footprints, and provides hints on how to obtain a capability map for an enterprise in some

		given industry, but contains no formal method or mention of the development of industry/sector-specific generic capability maps.
An Architectural Approach for Capability Mapping and Gap Analysis	(Yang et al., 2017)	Not included; The proposed method for capability mapping does not lead towards a capability map.
Key Performance Indicators for a Capability-Based Application Portfolio Management	(Khosroshahi et al., 2017)	Not included; The research defines three key performance indicators (KPI) to measure the health of application portfolios (AP) and uses the business capability map (BCM) as a visualization lens, but it contains no formal method or mention of the development of industry/sector-specific generic capability maps.
TOGAF® Series Guide Business Capabilities	(The Open Group, 2018)	Contains practitioner guidelines on how to create a capability map, but not a formalized method. It contains no formal method or mention of the development of industry/sector-specific generic capability maps.
Overview of Capability-Driven Development Methodology	(Grabis et al., 2018)	Not included; The research presents the Capability-Driven Development (CDD) methodology which supports development, delivery, and management of organization and information system capabilities. It contains no formal method or mention of the development of industry/sector-specific generic capability maps.
Business Capability Maps: Current Practices and Use Cases for Enterprise Architecture Management	(Khosroshahi et al., 2018)	Not included; Contains use cases of capability mapping, but no formal method or mention of the development of industry/sector-specific generic capability maps.
Reporting from the Implementation of a Business Capability Map as Business-IT Alignment Tool	(Bondel et al., 2018)	Contains a structured approach for creating a completely new organization-specific capability map. It contains no guidelines or no mention of the development of industry/sector-specific generic capability maps.
Realizing strategic fit within the business architecture: the design of a Process-Goal Alignment modeling and analysis technique	(Roelens et al., 2019)	Not included, there is a mention of Capability Heat Mapping, but no method for capability mapping that leads towards a capability map.
A Guide to the Business Architecture Body of Knowledge (BIZBOK Guide)	(Business Architecture Guild, 2019)	Contains practitioner guidelines on how to create a company-specific capability map, but not a formalized method. It contains no formal method or mention of the development of industry/sector-specific generic capability maps. It does however contain some industry reference models, but not for the professional sports industry.
Building a Robotic Capability Map of the Enterprise	(Sobczak, 2019)	Contains an approach for creating a reference Robot-Processing Automation capability map. It contains no guidelines or no mention of the development of industry/sector-specific generic capability maps.
Capability Management of Digital Business Ecosystems – A Case of Resilience Modeling in the Healthcare Domain	(Tsai et al., 2020)	Not included; The research investigates the suitability of capability management for the purpose of analyzing digital business ecosystems (DBEs) to support resilience and demonstrates capability models for a digital health use case in the healthcare sector. It contains no formal method or mention of the development of industry/sector-specific generic capability maps.

3. Methodology

For our investigation, we undertook design-based research following the research methodology of Design Science (Hevner et al., 2004). This methodology originates in the Engineering disciplines and has been adopted by other disciplines like Management Studies (Van Aken, 2004) and Information Systems, where it is also known as Design Science Research (Peffers et al., 2007).

The premise of design-based research is that knowledge of how to build artifacts (e.g., algorithms, methods, systems, conceptual frameworks) takes the form of design theories. These are normative theories of how to design effective solutions for problems for which it was not known before how to solve them. The prescriptive knowledge articulated in a design theory is then created through

reflection and learning from the iterative process of designing a solution for a particular problem instance – what worked? what didn't work? and how to generalize this for a class of similar problem instances?

As defined and scoped in the Introduction section, the professional sport industry is the application field for our design-based research. We investigate how to design a generic capability map for this application field through case studies. In other words, we involve different professional sport clubs as case study organizations in our research. The application field and its case studies provide us with a problem instance for which we design a solution that is a 'situated implementation of artifact' according to the types of Design Science Research contribution defined by Gregor & Hevner (2013). This artifact is the generic capability map for professional sport clubs. By reflecting on the artifact's design process and theorizing about the underlying design principles, our research contributes to the articulation of a method, in the form of a set of design principles, for developing industry/sector-specific capability maps as a 'nascent design theory' according to the same typology.

We organized our design-based research in design cycles, where each new design cycle built upon what was learned in the previous cycle(s). Each design cycle consisted of planning (i.e., designing an intervention), action-taking (i.e., changing reality by intervening), evaluation (i.e., observing the impact of the change), and reflection (i.e., assessing whether the impact was as expected/desired) activities (Susman & Evered, 1978).

The process was started by first defining our design objectives – what are the requirements for a good solution? Based on literature of capability-based management, and to some extent also sport management (e.g., (Pepitone et al., 2019)), but also drawing on the experience of one of the authors in developing company-specific capability maps as an Enterprise Architecture consultant, we defined the objectives to be used as guiding principles for the design of a generic capability map for professional sport clubs.

Next, we initiated the first design cycle. We reckoned that to design a generic capability map several case study organizations had to be involved in our research. Within each case study organization, a senior management team member was selected to serve as a subject matter expert and representative of the case study organization. Our strategy was to invite for each design cycle a different professional sport club (hereafter referred to as α, β, γ, δ, etc.) that was selected using a theoretical sampling approach

(Gentles et al., 2015). The order in which we selected and invited professional sport clubs to participate (i.e., our theoretical sampling approach) was carefully deliberated to create the potential for such convergence and to avoid being stuck in a continuous design process. Table 2 provides information on all professional sport clubs we collaborated with, including the motivation for selecting them.

Table 2: Overview of involved case study organizations

	Case study organization α	**Case study organization β**	**Case study organization γ**
Name	Royal Sporting Club Anderlecht (RSCA)	Antwerp Giants	Leuven Bears
Sport discipline	Football/Soccer	Basketball	Basketball
Location	Anderlecht (Brussels), Belgium	Antwerp, Belgium	Leuven, Belgium
Founded	1908	1940 (as Racing Club Mechelen)	1999
General description	RSCA is often considered as one of the most successful and surely most professionally organized Belgian football clubs, with a track record of having won the Belgian first (highest) division championship title 34 times and the Belgian Cup 9 times. RSCA is currently active in the Belgian first division.	Antwerp Giants is often considered as one of the most successful and surely most professionally organized Belgian Basketball clubs, with recent successes such as winning the championship title in the first (and highest) Belgian Basketball division, the Belgian cup and a 3rd place in the European Basketball Champions League.	Leuven Bears is a relatively young organization compared to other teams in Belgium and has played in the Belgian Pro League (first division) for almost 20 years straight now.
Motivation for selection	RSCA is considered a successful and well professionally organized organization, with one of the highest available budgets in the highest Belgian football division. Football is considered the most professionalized and lucrative sport industry in Belgium, making it an ideal first reference candidate for the generic capability map.	Antwerp Giants is considered a successful and well professionally organized organization. Basketball is considered, after Football, as one of the more professionalized and lucrative sport industries in Belgium. However, it should be noted that the budget of a Belgian Basketball club is only a small number compared to Belgian Football clubs. Given that Antwerp Giants is considered very successful in the Belgian Basketball league, but in a different sport discipline than RSCA and acting on a smaller budget, they were selected as an ideal candidate to function as second case study organization.	Compared to Antwerp Giants, this is considered a smaller organization with a different focus than the Antwerp Giants. A different type of team in the same sport discipline provides for an interesting third case study organization.
Role of the involved practitioner	General Counsel (Legal, Data & ICT) and Secretary of the Board	General Manager	General Manager and Board Member

Each design cycle consisted of an open interview and a validation after the interview. During each interview the capability map, which was the result of the previous design cycle (except for the first design cycle – see sub-section 4.2.1) and thus was the most recent version of the generic capability map being designed, was presented to and analyzed by the representative of the case study organization. The analysis involved mapping the capability map to the own organizational reality, which reflects the process of adopting a generic capability map and adapting it as a capability map for the own organization. Suggested changes were logged and used to develop a new version of the capability map. Changing the capability map meant that new capabilities were integrated or the structure of the capability map was modified. This was done when capabilities were found to be relevant in a new case study organization, and they were not (yet) described in that most recent version of the capability map or when a structural

change was needed (i.e., splitting or moving capabilities). The new version of the capability map was then presented to the same representative to validate it. The purpose of the validation was to confirm that the new version represented the representative's view of the capabilities and capability structure of the case study organization. The validation could result in some final changes to the capability map before using it as the base artifact in the subsequent design cycle.

This process was repeated until we reached theoretical saturation (Gentles et al., 2015), meaning that the intervention in the last case study organization did not require adding capabilities or further structural changes. The most recent version of the capability map as obtained in the previous design cycle was thus validated as representing the capabilities and capability structure of the last case study organization. When this condition was met, the iterative design process could be ended, so no new design cycle needed to be initiated. This last version is the generic capability map that is ultimately proposed as the solution.

At this point, two important research design choices need to be emphasized. Conform to Design Science guidelines and principles, the design of the first version of the capability map was based on insights that were gained from the literature (i.e., the 'knowledge base' – research rigor guideline (Hevner et al., 2004), theory-ingrained artifact principle (Sein et al., 2011)) and our own practical experience in developing capability maps (i.e., practice-inspired research principle (Sein et al., 2011)). It was decided not to involve α in the initial design, otherwise there would be the threat of the first version being too much tailored towards the specificities and context of α. The motivation for this design choice was twofold. First, this was done with the intention to inject a certain level of objectivity in the first version, which was based on field experience and mostly literature findings rather than the vision of one organization. The second motivation was achieving a certain level of pragmatism, as it was deemed that discussing a tangible model would lead to far better results much quicker than starting from a blank page.

Regarding the second design choice, in each subsequent cycle after the first, capabilities found to be relevant for the previous cycle(s)' organization(s), but not for the current cycle's organization, were not a priori excluded from the newly designed version of the capability map. An organization might deliberately choose not to adopt a certain capability (e.g., as not applicable to the specific context, or not in line with strategic choices, or even just because no budget for that capability is available). However,

such a choice does not suggest that the capability is irrelevant to other organizations – in fact, the capability was already shown to be relevant for at least one other organization in a previous design cycle. Only if one organization would truly challenge the adoption of a specific capability in the map, this challenge would be discussed with previous case study organizations.

Additionally, within this research process, the method for adopting a generic capability map was explored. Each design cycle required a case study organization to analyze and challenge the latest candidate of the generic capability map. By doing so, we aimed to indicate missing capabilities, improve the existing ones, and validate the others. This process of analysis, improvement, and validation reflects the process of analysis, tailoring, and decision-making an organization wishing to adopt a generic capability map as the foundation for devising their own organization-specific capability map would have to follow. They would merely have to analyze the generic capability map and its capabilities, tailor the names/labels of the capabilities and finally decide which capabilities are in scope and which are out of scope for their specific individual situation, thereby adapting the generic capability map to their own needs. In the event that an organization should identify a specific capability missing on the generic capability map, it can easily be added to their own organization-specific capability map, in the same way as was done in our iterative design of the generic capability map during the different design cycles.

As it turned out, the successive candidate versions of the generic capability map converged after three cycles as the version confirmed in the design cycle with γ was not substantially different to that of β (despite relevant differences between β and γ regarding age and size as found in Table 2), meaning that the only minor remarks expressed by γ were related to nuances regarding the description of the capabilities (on level 2 and 3). The capabilities itself and the structure of the capability map that resulted from the design cycle involving β were thus validated by the representative of γ. Therefore, it was decided not to select and contact a case-study organization δ to initiate a fourth design cycle.

4. Results

Developing an industry/sector-specific capability map entails two aspects. The first one, focuses on building a capability map that can serve as a generic capability map, fit for similar organizations within an industry or societal sector. This part of the development includes several iterations, which were

executed as design cycles (sub-section 4.2), and calls upon a second aspect, being the actual creation of the capability map as an artifact, within each of those iterations (sub-section 4.3). As the current research on capability-based management has not yet produced a systematic method for developing generic capability maps, the approach that we applied for the development of the generic capability map for professional sport clubs, and some style guidelines that we used, were conceived specifically for the purpose of this research. We start by describing the guiding principles for our design process, defined as our design objectives.

4.1. Design objectives

We defined six guiding principles (GPs) to create a generic capability map for professional sport clubs. These guiding principles were derived by carefully selecting guidelines found in literature, such as (Business Architecture Guild, 2019; W. Ulrich & Rosen, 2011), and drawing from our own practical experience in building capability maps, while considering the properties of the capability map as covered in sub-section 2.4 and Design Science guidelines and principles.

GP1. Iterative approach. The generic capability map should be built in an iterative way to be in line with the Design Science methodology (i.e., design as a search process guideline (Hevner et al., 2004)). We could not imagine designing a generic capability map using a single case-study approach as we needed to search for generic capabilities and a generic capability structure valid across an industry. This consequently necessitated a process of interactive artifact building and testing involving several professional sport clubs.

GP2. Level one size limitation. Finding the right level of abstraction to describe the highest-level capabilities is important for managing the understandability of the capability map. Based on our industrial experience in developing capability maps, organizations developing a capability map should aim to limit level one to ten (plus or minus three) capabilities. This guideline is similar to the advice of the provider of a prominent EA tool, who indicates that *"an analysis of the top 100 workspaces shows that companies typically use around 7 - 10 Capabilities on the highest level"* (LeanIX, n.d.).

GP3. Naming convention. According to (W. Ulrich & Rosen, 2011), capabilities should be named with nouns, not verbs. This seems a rather unnecessary limitation, although the noun appears the more important defining part of the name. Therefore, a combination of both (if possible) might be the most

promising approach. If the verb is omitted, one can assume that it is the management of that specific domain.

GP4. Capabilities are defined in business terms, not technical terms. Different people within an organization, from the front lines to the executive suite, should be able to look at one or more capabilities and immediately understand what they mean (W. Ulrich & Rosen, 2011). This also follows from the focus of Design Science on solving problems relevant to practice (i.e., problem relevance guideline (Hevner et al., 2004), practice-inspired research principle (Sein et al., 2011)).

GP5. Capabilities are stable, not volatile. A capability must be defined so that its scope and purpose (i.e., what organizational goal it helps achieve) will remain relatively stable over time. However, its underlying operating model, meaning how the capability is deployed in practice by combining specific resources (e.g., technology, information, processes), can change more often (W. Ulrich & Rosen, 2011).

GP6. Capabilities are not redundant. This follows from the properties of the capability map stated in sub-section 2.4, mentioning that they should be mutually exclusive and collectively exhaustive.

4.2. Design cycles

Three design cycles were executed, each with a specific intermediate result in the form of a *candidate generic capability map*. The final cycle produced the industry/sector-specific capability map that was accepted by all organizations involved. Table 3 shows an overview of the design cycles.

Table 3: Overview of different design cycles

	Design Cycle 1	**Design Cycle 2**	**Design Cycle 3**
Input version/starting point for iteration phase	Version 0.1 based on the APQC process classification framework	Version 0.2	Version 0.4
Case Study Organization α - RSCA	Application of version 0.1, validation and adaptation to version 0.2	Validation of version 0.3 and confirmation as version 0.4	No action needed
Case Study Organization β - Antwerp Giants	N/A	Application of version 0.2, validation and adaptation to version 0.3	No action needed
Case Study Organization γ - Leuven Bears	N/A	N/A	Application of version 0.4, validation, and confirmation as version 0.5
Outcome	Version 0.2	Version 0.4	Version 0.5 = final version 1

4.2.1 Design cycle 1 – Initial design and intervention in α

Multiple foundations were considered to design the first base model for the generic capability map, including Porter's Value Chain model (Porter, 1985). The option ultimately chosen was to start from the

highest classification level of the APQC cross-industry process classification framework 7.2.1 (APQC, 2018). We opted for the cross-industry version of the framework to avoid bias which could have been introduced if we would have opted for one of the industry-specific APQC frameworks. Besides, at the time of writing, no industry-specific version of the APQC framework exists for the professional sports industry.

Process classification frameworks are essentially hierarchically structured lists of all the key processes performed in an organization. On the highest level of classification, process groups, such as 'deliver services', are represented. These process groups are abstract collections of processes that serve a similar purpose. The next levels gradually decompose these process groups into operational processes that can be implemented in an organization.

The level of abstraction that process groups have on the highest level of a process classification framework, makes them very similar to capabilities on the highest level of a capability map as they emphasize what needs to be done to achieve a certain goal. Like APQC process groups, high-level capabilities need to be further decomposed until a level is reached where capabilities can be operationalized in terms of work procedures that are similar to operational processes in the APQC framework. However, on the lower levels of process classification frameworks and capability maps, processes differ from capabilities as capabilities involve the deployment of resources like information, people, technology, and process flows where multiple processes can be deployed for the same capability. Therefore, as of level two, multiple processes on some level of the process classification framework can be assigned to just one capability on the corresponding level of a capability map, implying that as of level two, the further decomposition of capabilities will not map one-on-one to the further decomposition of processes.

Since the APQC process groups were explicitly created with the purpose of classification in mind, the first level of the APQC framework can be considered a valid and robust starting point for designing top-level capabilities in a generic capability map. As the APQC cross-industry process classification framework 7.2.1 is a widely recognized process reference model, we reckoned that this highest classification level could be considered relatively stable across an industry, following our guiding principle GP5 (see sub-section 4.1). Finally, the labels of the APQC process groups adhere well to the

guiding principle GP3. In conclusion, it seems fair to argue that, even though APQC is a process classification framework, the highest level in the classification appears to be a valid classification for capabilities on the highest level of the first candidate version of the generic capability map for the professional sports industry.

In our initial design, the APQC process group 'Develop and Manage Business Capabilities' was not included because this more abstract, second-order notion of capability might confuse users of the capability map who are not familiar with Enterprise Architecture. The resulting number of level-one capabilities was twelve, which respects guiding principle GP2. Also, these capabilities were defined and labeled more specifically for professional sport clubs (following GP3 and GP4) based on our own insights and understanding of the professional sport industry, realizing that nothing was definite, and everything was susceptible to change in the current and upcoming design cycles (in line with GP1).

Next to this highest level of capabilities, we made an initial proposal of a capability decomposition to levels two and three, considering the guiding principle GP6. The initially designed capability map thus consisted of three capability levels. Due to the difference between capabilities and process groups as of decomposition level two, as stated above, the APQC framework was not used to define the lower-level capabilities. Based on our own understanding and insights of professional sport organizations and our experience with capability mapping, the level two and three capabilities were added. They were used to compose a capability map that would serve as the base version (0.1) used in search of the generic capability map.

Version 0.1 was subsequently used as a starting point to conduct an in-depth interview with the involved manager of α, during which the capability map was compared to the actual reality of α. This intervention aimed to evaluate the applicability of the capabilities (i.e., verify whether they are present in α), improve the proposed capabilities in name, scope, and description, and add missing capabilities or change the capability structure. During the interview, the capability map was evaluated level by level in a top-down manner. We felt it was crucial to first evaluate the applicability of the top level of the capability map to ensure horizontal completeness of the top-level capabilities. Then, following the decomposition hierarchy, we evaluated the applicability of the lower-level capabilities, first level two, and next level three. Discussing these lower-level capabilities ensured the vertical completeness of the capability map

for each higher-level capability. During this process, when missing capabilities were added, we ensured that there was no overlap with existing capabilities.

The changes made as a result of the intervention in α are listed in Table 4. Some changes entailed improvements of capability labels to reflect reality better. However, most changes required the addition of new capabilities at levels two and three. It is noteworthy that this first intervention did not change the capabilities at level one. After validation of the changes with the manager, the intervention in α resulted in version 0.2 of the candidate generic capability map, which served as the new base model for the second design cycle.

Table 4: Changes made in design cycle 1

Level	Action	Capability label	Level 2 Parent Capability	Level 1 Parent Capability
two	Addition	Touchpoint development & management	N/A	2.0 Products and Services development & management
two	Addition	Virtual, Interactivity & connectivity off-site	N/A	4.0 Product delivery & material management
two	Addition	Rolling assets & machines	N/A	10.0 Asset/Infrastructure Acquisition, Construction and Management
two	Addition	Unions	N/A	12.0 External Relationships Management
two	Addition	Government	N/A	12.0 External Relationships Management
two	Addition	Authorities & …	N/A	12.0 External Relationships Management
two	Addition	Community	N/A	12.0 External Relationships Management
two	Addition	Academics	N/A	12.0 External Relationships Management
two	Review	Legal & case management	N/A	11.0 Enterprise Risk, Compliance, Remediation, and Resiliency Management
three	Addition	Youth dream development	Brand strategy implementation	3.0 Marketing and Sales Management
three	Addition	Manage framework agreements	Procurement	4.0 Product delivery & material management
three	Addition	Manage materials/consumables for internal use	Inbound logistics & stock	4.0 Product delivery & material management
three	Addition	Accreditation/area control	Physical game or event delivery	5.0 Gameday Match/Event Delivery
three	Addition	Loyalty program	Retention & Fan engagement	6.0 Customer/Fan services and relationship management
three	Addition	Digital APP management	Touchpoint management & online presence	6.0 Customer/Fan services and relationship management
three	Addition	Fan profile/ID management	Touchpoint management & online presence	6.0 Customer/Fan services and relationship management
three	Addition	Individual Training	Youth Management & Development	7.0 Staff, Player and Team Development/Management; Human Capital Management
three	Addition	Medical & fitness tracking	Youth Management & Development	7.0 Staff, Player and Team Development/Management; Human Capital Management
three	Addition	Contract & membership management	Youth Management & Development	7.0 Staff, Player and Team Development/Management; Human Capital Management
three	Addition	Team representatives (youth)	Volunteer Management	7.0 Staff, Player and Team Development/Management; Human Capital Management
three	Addition	Sport licensing	Compliancy	11.0 Enterprise Risk, Compliance, Remediation, and Resiliency Management
three	Review	Marketing of B2B hospitality and arrangements	Marketing Management	3.0 Marketing and Sales Management

4.2.2 Design cycle 2 – Intervention in β and additional validation in α

Cycle 2 entailed a similar iterative design step, where version 0.2 of the candidate generic capability map was applied, evaluated and adapted during an intervention in β. The suggested changes made to the capability map, based on an in-depth interview with the general manager of β, are listed in Table 5. As shown in the table, the only adaptations were new capabilities at level three, with one exception of a new capability required at level two. After validation with the general manager, these new capabilities were included in version 0.3 of the candidate generic capability map.

Table 5: Changes made in design cycle 2

Level	Action	Capability label	Level 2 Parent Capability	Level 1 Parent Capability
two	Addition	Accessibility and traffic control	N/A	10.0 Asset/Infrastructure Acquisition, Construction and Management
three	Addition	Preparing the field/pitch/venue	Physical game or event delivery	5.0 Gameday Match/Event Delivery
three	Addition	Whereabouts tracking and personal guidance	Player Management	7.0 Staff, Player and Team Development/Management; Human Capital Management
three	Addition	Whistleblower facilitation	Player Management	7.0 Staff, Player and Team Development/Management; Human Capital Management
three	Addition	Management of other volunteer categories	Volunteer Management	7.0 Staff, Player and Team Development/Management; Human Capital Management
three	Addition	Parking maintenance and management	Training facility management	10.0 Asset/Infrastructure Acquisition, Construction and Management
three	Addition	Catering and leisure area management	Training facility management	10.0 Asset/Infrastructure Acquisition, Construction and Management

As an additional validation step, we decided to have version 0.3 reevaluated by α, to make sure that the changes compared to version 0.2 were also supported by this professional sport club. Although not initially foreseen in the research design (and therefore not described in section 3), the main reason for this additional validation was to verify whether our approach to designing a generic capability map makes sense. As part of the theoretical sampling approach explained in Table 2, the choice of taking α as the first case study organization in the design process was deliberate. After all, it was anticipated that it would have the broadest scope of capabilities given that it was the most professional and by far the wealthiest club in the research pool, therefore disposing of the most resources and, hence, potentially more able to organize more capabilities compared to the others. To get insights into whether the adaptations made as a result of the intervention in β have the potential to reflect an industry consensus, we thus validated them with the involved manager of α. During this interview, all capabilities in version 0.3, not included in version 0.2, were confirmed to be relevant for α as well. Also, the structure of the

version 0.3 capability map was validated in this process. To formalize the end of design cycle 2, we created version 0.4 of the candidate generic capability map, identical to version 0.3, to be used as input to design cycle 3.

4.2.3 Design cycle 3 – Intervention in γ

Version 0.4 of the generic capability map candidate was now applied to γ. An interview with the general manager (who is also a board member) of γ, resulted in the entire capability map being confirmed as relevant. The formal outcome of this intervention, after validation, was version 0.5, which did not have any new capabilities compared to version 0.4, nor any changes to the capability structure of version 0.4. The refinements to the description of some capabilities made by γ are listed below in Table 6.

Table 6: Changes made in ADR design cycle 3

Level	Action	Capability label	Level 2 Parent Capability	Level 1 Parent Capability
two	Refinement in description	Strategy Development	N/A	1.0 Club strategy management
two	Refinement in description	Digital currency/cashless & cash payments	N/A	4.0 Product delivery & material management
three	Refinement in description	Management of other volunteer categories	Volunteer Management	7.0 Staff, Player and Team Development/Management; Human Capital Management

Therefore, it was concluded that theoretical saturation was achieved and that version 0.5 could be considered the final version of the generic capability map. Hence, it was decided that neither additional reevaluations of the map were necessary (as both α and β already validated near-identical versions of the map) nor an additional design cycle with a case study organization δ was required.

4.3 Design Artifact

The final version of our design artifact (i.e., the generic capability map for professional sport clubs) is shown in Figure 2. The language used to articulate the model is ArchiMate, for which the initial proposal to include capability as a modeling concept has been researched by (Azevedo et al., 2015). The building block icon shown in the top right corner of each capability is the ArchiMate symbol for a capability. The decomposition of capabilities is represented by nesting lower-level capabilities within the boundaries of their parent capability, automatically ensuring guiding principle GP6, as defined in subsection 4.1. The effect of guiding principles GP2, GP3, and GP4 is also visible in the model, whereas GP1 and GP5 helped, respectively, shape the method used to design the generic capability map and make proper

choices regarding the selection of capabilities in both the initial design and the interventions in the case study organizations. A description of all capabilities across the three hierarchical levels can be found in the Appendix to ensure the reproducibility of our design-based research.

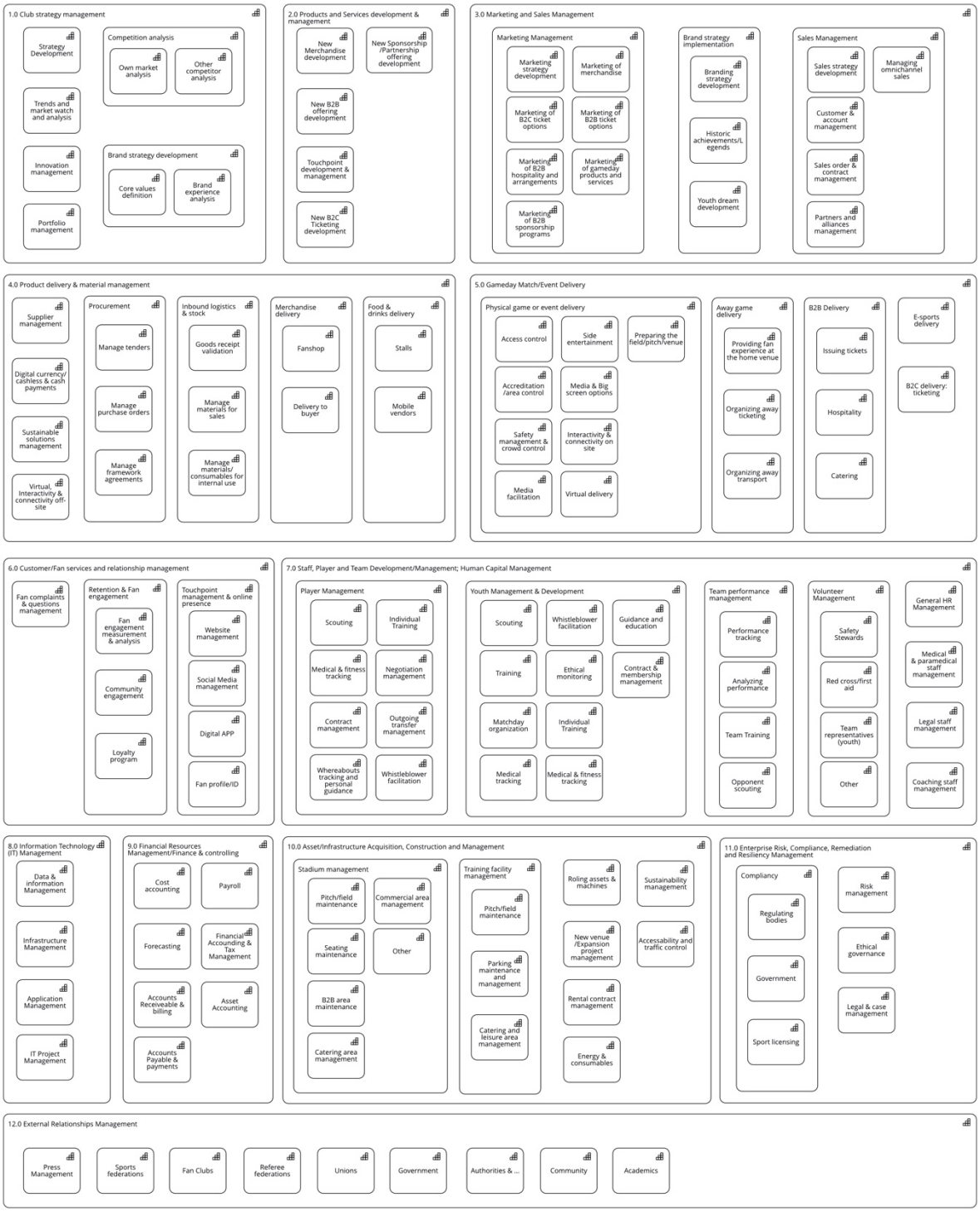

Figure 2: The final version of the generic capability map for professional sport clubs

5. Discussion

While the generic capability map for professional sport clubs is the tangible outcome of our research, we also contribute procedural knowledge of creating industry/sector-specific capability maps. Our contribution is discussed in sub-section 5.1. This is followed by a discussion of the implications for research and practice (sub-section 5.2), threats to validity (sub-section 5.3), and future research ideas (sub-section 5.4).

5.1. Contributions

The generic capability map for the professional sport industry (see Appendix for a full description and Figure 2 for the visualization as a graphical capability map) is a model type of artifact (Hevner et al., 2004) resulting from our design-based research in this application field. Its practical relevance is discussed in sub-section 5.2.

However, our main contribution is an answer to our research question of how to design generic capability maps that are industry/sector-specific. We formulate this contribution here as a set of operational principles for designing industry/sector-specific capability maps. This is a design principles type of artifact (Gregor & Hevner, 2013) that results from reflection on our design-based research in the application field of professional sport clubs and generalization to similar clusterings of organizations at the level of industries and societal sectors. The methodology we crafted for our design-based research and that we iteratively refined through learning and reflection in the succession of design cycles (i.e., case studies) provides the basis for a 'nascent design theory' (Gregor & Hevner, 2013) that can be formalized in future research (see sub-section 5.4) as a method for designing generic capability maps.

Finally, we wish to note that following these design principles also holds the key to the adoption of the generic capability map by individual organizations. A capability map, developed based on these principles, represents the common view of the capabilities in organizations belonging to the specific industry or societal sector. Thus, it merely needs to be decided what capabilities are in or out of scope. It is expected that adaptations will thus mainly be limited to the labeling and description of the capabilities. Table 7 is a synthesis of these design principles which are formulated independently of any application domain.

Table 7: Operational principles for designing generic capability maps

Design principle	Prescription
Domain scoping	Define the domain for which the generic capability map is intended (i.e., industry, societal sector, other clusterings of similar organizations) using clear criteria that allow deciding whether organizations are in scope.
Domain understanding	Study the domain using available information (e.g., academic literature, industry reports, expert interviews, own observations) to obtain a thorough understanding of the value creation purpose and goals shared by the different organizations in the domain. Focus on what these organizations do to create value.
Knowledge base grounded initial design	Develop an initial design of the candidate generic capability map based on the top-level process groups of the APQC cross-industry process classification framework. Do this by making an initial selection to develop level 1 and decompose these high-level capabilities (to levels 2 or 3), based on the domain understanding and following guiding principles G2 – G6 (see sub-section 4.1). Instead of APQC, another model may be chosen as the foundation for the initial design if deemed more suitable. Be aware that the initial design is completely open for discussion, and no definite choices regarding capabilities and capability structure are made at his point in the design process.
Convergence-targeted case study sampling	Select case study organizations that can be considered representative for the domain and are well-organized by industry standards. Contact within these organizations relevant stakeholders for capability-based management (e.g., managers with strategic responsibilities, chief enterprise architects) and seek their commitment to engage in the research. Vary the organizations to be selected in terms of properties like size, age, country/region, and subdomains (e.g., sport disciplines in our case) but start the design cycles with organizations that are expected to have the broadest scope of capabilities and continue with organizations that are expected to have a narrower scope of capabilities. Be prepared to select new organizations until stability conditions are reached (see stability conditions design principle).
Iterative application, refinement, and validation	Following the guiding principle GP1 (see sub-section 4.1), apply the most recent version of the candidate generic capability map to a new case study organization. First, have interviews with relevant stakeholders to discuss which capabilities apply to the organization and whether the decomposition structure of the candidate generic capability map holds for the organization. If needed, extend the candidate generic capability map with missing capabilities and change the capability structure. Next, validate the new version with the stakeholders by jointly developing an organization-specific capability map and discussing capability labels and descriptions. Finally, finalize the new version to be used in the subsequent design cycle. Consider revalidation in previous case study organizations only if changes in the capability structure affect the top two levels of the candidate generic capability map.
Stability conditions	Define clear criteria for deciding when the generic capability map's design is stable so that the design process can stop. These criteria are based on a combination of heuristics regarding the robustness of the candidate generic capability map relative to the previous design cycle: no new capabilities in the top two levels (1 and 2); no change in the capability structure of the top two levels (1 and 2).
Design process documentation	Clearly document all changes applied to the initial design and intermediate versions of the candidate generic capability map, for the sake of traceability (to case studies) and verifiability (of the design process). Also, clearly document the final generic capability map (i.e., label, description, and decomposition level of each capability; and parent capability if not on level 1).

5.2. Implications for research and practice

Researchers can use the proposed design principles (Table 7) for developing generic capability maps for other application fields. We even suggest in sub-section 5.4 investigating whether these design principles can be further generalized to other generic EA artifacts (e.g., reference process architectures (Heinrich et al., 2009)). Besides researchers, consultants in strategy, management, and EA can use the design principles to guide their search for industry/sector-specific capability maps, which they can reuse in their consultancy practice. We believe that using the presented design principles will benefit the rigor employed in creating capability maps and the transparency in communicating about them with clients.

The practical implications of our research for the management of professional sport clubs are more related to the tangible artifact produced by the research. The generic capability map gives managers

a tool to investigate strategic alignment within their professional sport clubs (i.e., the question of whether the strategic direction decided by the board is translated into a proper organizational design). For instance, if a club's strategy includes using data analytics to track player performance during games, then the generic capability map advises to develop capabilities like 'Performance tracking' and 'Analyzing performance'. For researchers interested in sport management, the generic capability map allows clubs to be compared in terms of their capabilities and it might trigger ideas to develop and test hypotheses about the relationship between specific capabilities and club performance. More from a design-based research perspective, the generic capability map can also become a source for developing an industry-wide sport governance and quality assurance framework, where the responsible management of capabilities like 'Youth management & development' could be a major facet.

Regarding the use of the generic capability map in practice, we wish to note that there are two perspectives to consider. The first one is the implementation of the generic model by clubs entailing the definition of the scope of capabilities that properly reflects the organization (i.e., how to go from the generic capability map to the organization-specific capability map?). The second one is the use of the model by club managers for capability-based planning and capability-based management (i.e., how can the organization-specific capability map be used for analyzing the club's current and desired capabilities?). In the following paragraphs, we provide some insights into these two perspectives, which are meant to support the adoption of the proposed generic capability map.

The first action towards adopting the generic capability map is to define the organization's scope in terms of its capabilities. The advantage of having a generic capability map, is that an organization can make sure it has at least considered all capabilities relevant for professional sport clubs. However, some of the capabilities included in the model might be out of scope for the organization in question. For instance, a capability might be addressing the achievement of a goal, which is not a goal of the organization. This does not mean that such capabilities are obsolete for professional sport clubs in general, but rather that they are irrelevant for a specific organization at this time. In other words, club management decides that it will not organize such out-of-scope capabilities at this moment.

Once the baseline organization-specific capability map has been established, it needs to evolve to reflect the organization's situation accurately. We believe that the same design objectives that guided the

development of the generic capability map during the research (see sub-section 4.1) may also offer guidance to add new or adapt existing capabilities in case the organization would conclude that the capabilities defined in the baseline capability map are not sufficient. However, the need to add additional capabilities should be critically assessed, given the generic and stable nature of the capability map.

As a final note regarding the use of capability maps by professional sport clubs, there are different applications in the domains of strategy execution and organizational design for which the use of a capability map would be beneficial. First indications of the actual use of the organization-specific capability maps that were developed during the design of the generic capability map for professional sport clubs, were found in case study organizations α and β, when we contacted the stakeholders that participated in our research.

At case study organization α, the organization-specific capability map was used for different purposes. The first observed use was the assignment of specific roles to capabilities. The aim was to make people's responsibility and accountability, for specific capabilities, explicit. Another use was the practice of heat mapping. By indicating which capabilities are of strategic importance on the capability map, the organization created a capability heat map, similar to the practice described by (Aldea et al., 2015). Additionally, a focus for optimization was created by indicating which capabilities were overperforming or underperforming compared to the expectations. The previous actions provided a reference point for discussions and decisions regarding investments or improvements in resources. The last reported use was mapping IT functionality and applications to the capability map, including a performance indication. The aim was to understand better how well the organization's IT was performing compared to expectations. Case study organization β indicated that the generic capability map would be adopted mainly for alignment between senior management and the board of directors regarding investment strategy and budget planning, which is similar to the use as a heat map observed at case study organization α.

Another possible application, though not observed at any of the case study organizations, would be related to the translation of the vision and strategy of an organization. These are formulated on the highest level, meaning the board level, and are hard to translate towards the rest of the organization, which would be the responsibility of executive management. Using the capability breakdown provided by the capability map, a strategy team could decide with relevant stakeholders what the vision means for the

different capabilities. Other possible uses of the capability map for supporting managerial decision-making include, but are not limited to, investigating which capabilities have processes that are customer facing and identifying ethically sensitive capabilities (e.g., 'Whereabouts tracking & personal guidance', 'Whistleblower facilitation'). More use cases that professional sport clubs could possibly consider are presented in (Khosroshahi, 2018).

5.3. Threats to validity

In our research design and execution, we considered threats to construct validity, internal validity, and external validity. The *construct validity* of both our contributions depends on the clear and accurate definition of the concept of a generic capability map. Our definitions of capability map, industry/sector-specific capability map as generic capability map, and the capability map properties are based on academic literature, practitioner literature, and first-hand experience of the first author as EA consultant. Also, the scope of the professional sport industry as the application field for our design-based research has explicitly been defined in line with the definition of professional sport clubs by (Baloga & Lazăr, 2011). Hence, we believe that possible threats to construct validity were judiciously addressed.

We are aware that the main threat to the validity of our research results is that, after observing theoretical saturation, as it happened during the design cycle with γ, we assume that the generic capability map covers the relevant capabilities of any professional sport club. Our research employed an iterative approach to gradually extend the generic capability map during the design cycles. We expected this to lead to an ever slower-growing or refining artifact when increasing the number of iterations/case studies. Therefore, our theoretical sampling strategy was to carefully select the professional sport clubs to collaborate with and to deliberately decide the order in which they would participate in the design cycles, aiming to mitigate the threat of not converging towards a generic capability map. However, we acknowledge that it was 'a priori' hard to predict when this growth would stop. Furthermore, even after the convergence that we observed in the third design cycle, inviting a new professional sport club δ to perform a fourth design cycle could possibly have led to divergence again (e.g., when δ is a club active in another sports discipline than those represented in the other case studies) and we acknowledge that we cannot fully control this threat to *internal validity*. However, we emphasize that, given our research's

philosophical stance of Methodological Pragmatism, it was not a quest for the 'true' generic capability map that would be 100% complete and accurate for all possible professional sport clubs that exist and could exist. Instead, the intended outcome was the design of a generic capability map with evidence of validity (which we obtained at least for the professional sport clubs involved in our research) and potential for utility (which is evidenced by the actual use that is made of the capability map as described in sub-section 5.2). Therefore, as in Qualitative Case Study Research (Yin, 2014), we strived for analytical generalizability rather than statistical generalizability.

Finally, the *external validity* of the design principles for industry/sector-specific capability maps could be threatened if they depend on the application field in which we conducted our design-based research. When formulating these design principles by reflecting on our design objectives, our research design, and how we executed the design cycles in the case studies, we took great care in generalizing beyond this application field. We believe that our design principles are therefore domain-independent as they do not depend on specific properties of the professional sport industry.

5.4. Future research

Given this discussion, it is clear that future research is required to elevate the level of abstraction, completeness, and maturity of the knowledge embedded in the operational principles formulated in Table 7 to the level required for a well-developed design theory (Gregor & Hevner, 2013) for which it is known why, how and when it works. First, the design principles should be articulated as a more formally defined and generally applicable method. Next, the validity and usefulness of this method need further testing in other application fields, which would also allow verifying the claimed domain independence of the underlying design principles. Such research can also test our assumption that the design principles are independent of the industry and societal sector's scope (i.e., broadness or narrowness) if this scope is well delineated. A further extension of our research would be a generalization to the design of other generic artifacts which can possibly be used as reference models in EA practice (e.g., industry process maps).

In our own future research, we will explore the use of capability maps and capability-based management to support organizations' strategic transformation. We will investigate how managing an organization on capabilities can guide such transformation trajectories. Our focus will thus shift from the development of capability maps to their use as a strategy implementation instrument. We believe that a

considerable amount of practitioner knowledge is available in this area, yet it is largely undocumented, untransparent, and unverified, such that organizational learning and knowledge transfer are inhibited. Scientific inquiry is needed to address these gaps.

6. Conclusion

Professional sport clubs are facing several challenges today. As the industry grows, so must the level of professionalism of the organizations operating within this industry. With this in mind, this research applied the concept of capability mapping, rooted within the Enterprise Architecture discipline and founded on managerial theories of capability thinking, to provide a first ground that can be used by club management to manage their organizations based on capabilities. The proposed generic capability map for the professional sport industry is an instrument of strategic alignment and organizational design that could serve as an initial enterprise architecture description for introducing Enterprise Architecture practice in professional sport clubs.

In the absence of a systematic method for developing generic capability maps, we designed our own approach to develop the generic capability map for the professional sport industry. This approach was guided by design objectives derived from the literature on capability-based management, specifically looking into the desirable properties of capability maps and definitions. Our design objectives and process were also inspired by our own experience in developing capability maps for businesses. The initial design of the generic capability map was grounded on the top-level process groups of the APQC cross-industry process classification framework. In addition, the hierarchical decomposition of these high-level capabilities was guided by our domain understanding, based on our own experience in working with professional sport club managers and on insights on the organization and management of clubs for professional team sports obtained from industry reports. This initial design was then iteratively refined and validated through case study research in three major, premier league Belgian clubs that manage professional sport teams.

The generic capability map that we obtained through our design-based research is a practical contribution. Furthermore, the design principles for generic capability maps that we derived through reflection and generalization from our design process is an academic contribution to the Enterprise Architecture discipline. Future research should look into how to formalize these design principles to

articulate a well-defined method for designing generic capability maps and applying them to develop organization-specific capability maps.

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Appendix – Full description of the capability map and overview of all capabilities refined or added since initial design

Level	Capability label	Description
1	**Club strategy management**	
2	**Strategy Development**	Developing and maintaining the strategy (how do you position your sport in a context of a country, how can you organize the clubs to leverage the sport branch in a country/region? Which actions do you take to leverage your community impact?)
2	**Competition analysis**	
3	Own market analysis	Watching and analyzing other direct competitors.
3	Other competitor analysis	Watching and analyzing other sport, other leisure activities that are competing for the same customer.
2	**Trends and market watch and analysis**	Watching and analyzing trends and changes in the same or similar markets (e.g. same sport market, different country). Market testing etc.
2	**Brand strategy development**	
3	Core values definition	Defining the core values of your brand.
3	Brand experience analysis	Measuring and analyzing general brand perception in the market. How do you want to be perceived?
2	**Innovation management**	Managing innovation and new initiatives, either optimizations of current activities or outside of the current core activities. Either on club level or on league level.
2	**Portfolio management**	Managing the investment portfolio: where to spend (or cut) budget?
1	**Products and Services development & management**	
2	New Merchandise development	Development of new merchandise, like shirts etc.
2	New B2C Ticketing development	Development of new ticket formulas
2	New B2B offering development	Development of new B2B arrangements
2	New Sponsorship /Partnership offering development	Development of new sponsorship arrangements/options
2	Touchpoint development & management	Development of new and better customer service delivery and customer experience
1	**Marketing and Sales Management**	
2	Marketing Management	
3	Marketing strategy development	Developing a strategy on how to market the different products and services
3	Marketing of merchandise	Marketing merchandise and other fan facing products
3	Marketing of B2C ticket options	Marketing of tickets/ticket packages/seasonal tickets, including parking for consumers. Segmentation.
3	Marketing of B2B ticket options	Marketing of tickets/ticket packages/seasonal tickets, including parking and special services like hospitality arrangements for Businesses
3	Marketing of B2B hospitality and arrangements	
3	Marketing of gameday products and services	Marketing of food and drinks; up- and cross-selling
3	Marketing of B2B sponsorship programs	Marketing of ad space and other sponsorship programs (banners, billboards, shirts, match-ball…)
2	Brand strategy implementation	
3	Branding strategy development	Develop a strategy on how to grow the brand. This includes the relation with and impact on the community.
3	Historic achievements/Legends	Develop the narrative, manage the legends (old merchandise, books, ex-player involvement, museum…)
3	Youth dream development	Develop the narrative of youth players realizing their dreams through the organization.
2	Sales Management	
3	Sales strategy development	Developing a strategy on how to sell the different products and services
3	Customer & account management	Managing customers and B2B accounts
3	Sales order & contract management	Managing Orders (Hospitality, tickets, merchandise, sponsorship/partnership)
3	Partners and alliances management	Managing relations with different partners and alliances with 3rd parties.
3	Managing omnichannel sales	Web shop, on site… Both for tickets and other products.
1	**Product delivery & material management**	
2	Supplier management	Manage supplier selection and contracts
2	Procurement	
3	Manage tenders	Managing tenders by inviting bids for a project of purchase order, accepting formal offers, selecting the best offer…
3	Manage purchase orders	Creating and approving purchase orders
3	Manage framework agreements	Managing framework agreements for procurement
2	Inbound logistics & stock	
3	Goods receipt validation	Matching purchase orders to delivery slips and/or invoices.
3	Manage materials for sales	Stocking and managing products for sale such as merchandise, food, drinks…
3	Manage materials/ consumables for internal use	Stocking and managing materials and consumables such as shirts, socks, medication…

2	Merchandise delivery	
3	Fan shop	Delivery of merchandise through the fan shop
3	Delivery to buyer	Delivery of merchandise to the fan's house/office…
2	Food & drinks delivery	
3	Stalls	Organizing stalls to deliver food and drinks to the fans on match/event days
3	Mobile vendors	Organizing vendors with bags/carts/… to deliver food and drinks outside of the stalls
2	Digital currency/cashless & cash payments	Providing a cashless option for the fans to use. In some cases, non-digital options are provided. Either through manned stalls or through automated machines.
2	Sustainable solutions management	Green and eco-friendly solutions
2	Virtual, Interactivity & connectivity off-site	Providing content products 24/7 (e.g. Minnesota Vikings)
1	**Gameday Match/Event Delivery**	
2	Physical game or event delivery	
3	Access control	Physical access control
3	Accreditation/area control	Allowing staff and people with badges in the right areas.
3	Safety management & crowd control	Managing the safety of the people present at the event
3	Media facilitation	Providing a good and safe place for media presence (spots, press conference…)
3	Side entertainment	Cheerleaders, half-time event (kiss-cam)…
3	Media & Big screen options	Big screen on site and other media experiences
3	Interactivity & connectivity on site	Wifi, App, …
3	Virtual delivery	VR/AR experience/Regular video delivery or Broadcasting
3	Preparing the field/pitch/venue	Preparing the field/pitch/venue for game or events.
2	Away game delivery	
3	Providing fan experience at the home venue	E.g. Big screen
3	Organizing away ticketing	Making sure the right fans get the right tickets to away games.
3	Organizing away transport	Making sure fans get to the away games.
2	E-sport delivery	
2	B2B Delivery	
3	Issuing tickets	Providing the actual tickets to the game (Digital card, smartphone, print-at-home, print-on-site…)
3	Hospitality	Receiving B2B fans/customers, providing additional services such as guided tours, meet the player…
3	Catering	Catering for B2B customers (part of hospitality as commercial offering, but separate as capability).
2	B2C Delivery: ticketing	
1	**Customer/Fan services and relationship management**	
2	Retention & Fan engagement	
3	Fan engagement measurement & analysis	The organization needs to be able to measure the fan engagement and be able to predict the retention ratio/grade.
3	Community engagement	Presence of the club in the community (e.g. schools, children institutions etc.)
3	Loyalty program	Loyalty program for fans, including saving 'miles' to spend in the club shop, encouraging yearly renewals of season tickets and so on.
2	Fan complaints & questions management	Managing complaints and questions of fans.
2	Touchpoint management & online presence	
3	Website management	Managing the website, not from a technological point of view but from the customer journey point of view.
3	Social Media management	Managing the Social Media, not from a technological point of view but from the customer journey point of view.
3	Digital APP management	Managing the smartphone/tablet APP, not from a technological point of view but from the customer journey point of view.
3	Fan profile/ID management	Digital avatar of the fan, allowing to track the fan's behavior etc.
1	**Staff, Player and Team Development/Management; Human Capital Management**	
2	General HR Management	Includes general administration of players and other employees.
2	Team performance management	
3	Performance tracking	Tracking the performance of the entire team, not the individual player.
3	Analyzing performance	Analyzing the performance of the entire team, not the individual player.
3	Team Training	Scheduling and executing team trainings.
3	Opponent scouting	Scouting the direct opponents. The results of this can be used for Team Training.
2	Coaching staff management	
2	Player Management	Can be expanded for different types of teams (e.g. men's team, women's team, disabled team…)
3	Scouting	Scouting new players.
3	Individual Training	Individual and personalized training of players.
3	Medical & fitness tracking	Tracking the fitness and medical status of individual players.
3	Negotiation management	Negotiating transfer prices and wages/compensation packages.
3	Contract management	Managing and maintaining contracts.

3	Outgoing transfer management	Putting up players for sale, loan or trade. Providing a correct exit procedure.
3	Whereabouts tracking and personal guidance	Keeping track of players is a very important focus, required by anti-doping agencies. Onboarding and personal guidance.
3	Whistleblower facilitation	Whistleblower facilitation for adults needs to be provided and is a different focus than that for youth players.
2	Youth Management & Development	
3	Scouting	Scouting new youth players.
3	Training	Training youth teams.
3	Matchday organization	Organizing match days for youth teams.
3	Medical tracking	Tracking the fitness and medical status of individual youth players.
3	Whistleblower facilitation	Can be seen as part of ethical governance, but there should be a no-barrier possibility for youth players to signal any unwanted or unethical behavior with an independent/trustworthy person.
3	Ethical monitoring	Given the fragile position youth players have, specific governance needs to be in place to make sure these players can grow in a safe environment.
3	Individual Training	Individual and personalized training of youth players.
3	Medical & fitness tracking	Tracking the fitness and medical status of individual youth players.
3	Guidance and education	Youth players need to be guided and it needs to be made sure they find a good balance between sport, school and social/family time.
3	Contract & membership management	Managing and maintaining contracts with youth players and their parents. In some cases, managing the administration of membership fees (when a fee has to be paid by the youth players to become a member of the organization).
2	Volunteer Management	
3	Safety Stewards	People who make sure events and matchdays are going safe and well on the floor. They need to be organized and managed.
3	Red cross/first aid	Similar to the stewards, but for medical assistance. They need to be organized and managed.
3	Team representative(youth)	Similar to the stewards, but for guiding youth teams and taking up the administrative tasks. They need to be organized and managed.
3	Management of other volunteer categories	Other categories of volunteers (finding volunteers, organizing volunteers…)
2	Medical & paramedical staff management	Doctors, physiotherapists, nutrionists. They need to be organized and managed.
2	Legal staff management	Legal advisors and lawyers. They need to be organized and managed.
1	**Information Technology (IT) Management**	
2	Data & information Management	Can be a very elaborate capability, but in its core, it's important that data and information are managed and structured, in line with IT solutions and the IT strategy.
2	Infrastructure Management	Can be a very elaborate capability, but in its core, it's important that the IT infrastructure such as the network, servers, computers etc. are managed and structured, in line with IT solutions and the IT strategy.
2	Application Management	Can be a very elaborate capability, but in its core, it's important that applications are managed and structured, in line with IT solutions and the IT strategy.
2	IT Project Management	New IT solutions should be built through project management. Having a PMO or PM practice is an important part of realizing successful IT implementations.
1	**Financial Resources Management/Finance & controlling**	
2	Cost accounting	Cost or management accounting allows to capture costs (and revenue in extension) where it is caused. It allows for analytical analysis of the financial streams and thus to make directed decisions, based on real evidence.
2	Forecasting	Forecasting is an important part of Financial planning.
2	Accounts Receiveable & billing	Customer invoices and payments need to be organized and processed.
2	Accounts Payable & payments	Vendor invoices and payments need to be organized and processed.
2	Payroll	Employees need to be paid.
2	Financial Accounding & Tax Management	Legal accounting, according to local rules.
2	Asset Accounting	Managing different assets in an organization and making sure they are processed correct from a financial point of view. Related to investments.
1	**Asset/Infrastructure Acquisition, Construction and Management**	
2	Roling assets & machines	Cars, pitch machinery etc. needs to be maintained and managed.
2	Training facility management	
3	Pitch/field maintenance	The training facility needs to be maintained and managed.
3	Parking maintenance and management	Parking needs to be provided and maintained
3	Catering and leisure area management	A place where drinks/food can be provided or sold and a place where players or others can relax can be provided.
2	Stadium management	
3	Pitch/field maintenance	The main pitch of field needs to be maintained and managed.
3	Seating maintenance	The seating area for fans needs to be maintained and managed.
3	B2B area maintenance	The B2B/VIP area for fans needs to be maintained and managed.
3	Catering area management	The catering area and kitchen for fans needs to be maintained and managed.
3	Commercial area management	The commercial area (stalls, shops…) for fans needs to be maintained and managed.

3	Other	
2	New venue/ Expansion project management	New venue solutions/areas should be built through project management. Having a PMO or PM practice is an important part of realizing successful expansions or new ideas.
2	Rental contract management	Facilities/buildings/… are often rented. This needs to be managed properly.
2	Energy & consumables	Electricity, water, other facilities
2	Sustainability management	Providing an eco-conscience and friendly event environment (LED, Green energy use…)
2	Accessibility and traffic control	Together with local government and law enforcement, the accessibility and traffic streams towards venues need to be managed. Parking needs to be organized etc.
1	**Enterprise Risk, Compliance, Remediation, and Resiliency Management**	
2	Risk management	Managing risks is a proactive and important domain.
2	Compliancy	
3	Regulating bodies	There are different regulating bodies of which the rules and guidelines need to be met.
3	Government	The government has laws that need to be respected.
3	Sport licensing	Meeting mandatory financial standards. Showing that the club can meet standards when it comes to transparency and financial fair play.
2	Ethical governance	Making sure that there are procedures for inclusion and diversity, against racism and other negative actions. Providing controls on ethical finance, whistleblower procedures and mechanisms against power abuse.
2	Legal & case management	The legal department/Lawyers, making sure that full compliance with legal guidelines are met.
1	**External Relationships Management**	
2	Press Management	Managing relations with the media/press.
2	Sport federations	Managing relations with the sport federations.
2	Fan Clubs	Managing relations with fan clubs.
2	Referee federations	Managing relations with referee federations.
2	Unions	Managing relations with the unions.
2	Government	Managing relations with the government.
2	Authorities & …	Managing relations with the fire brigade (1st line), Police (2nd line), Hospitals (3rd line).
2	Community	Managing relations with the local community/city/village/…
2	Academics	Managing relations with the academic sector.