

Typology of Technology Platform Goals in Diversified Companies

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Abstract

The significance of technology platforms as networks of technological knowledge is growing in diversified companies. The reason is that technology platforms support diversified companies to handle the conflicting priorities of individualized innovations and generating synergies. Hence, the success of diversified companies can be significantly affected by the systematic design of technology platforms. Key prerequisite for such a systematic platform design is the consistent description of the various technology platform goals. In practice however, companies find it difficult to consistently describe the various technology platform goals due to a lack of methodology. As a consequence, a misalignment between the platform goals and the platform design is noticeable, leading to unsustainable technology platform concepts. Therefore, the authors introduce in this paper an approach to consistently describe technology platform goals in diversified companies. This is done by synthesizing the various variables into a single, unified typology that allows to express complicated relationships among the various variables without resorting to oversimplification. The development of the typology is performed by using a combined deductive and inductive approach on the basis of existing literature as well as knowledge about technology platforms in industrial practice. With the assistance of the typology, diversified companies are able to consistently describe their technology platform goals and design sustainable technology platform concepts.

Keywords— *technology platform, technology platform goals, diversified companies, typology, strategic technology management*

I. INTRODUCTION

Diversified companies, especially in high-wage countries such as the US or Germany, have to cope with shorter product cycles and more complex customer demands [1]. It can be observed that shorter technology life cycles and therefore greater financial uncertainties for technological innovations are often the consequence [2]. The identification of technological synergies and the consequent reduction of organizational complexity thus become a compulsory corporate action for diversified companies [3]. Simultaneously, it is necessary to exploit the technological innovations across multiple businesses and applications, in order to increase the amortization time of new technologies and therefore decrease the technology-related financial uncertainties of diversified companies ([4], [5]). That is why an increasing number of diversified companies manage their technologies within technology platforms as internal knowledge networks, independently from their products and leverage these technologies across multiple businesses to offer unique solutions for their customers ([6], [7]). Hence, the technology platform concept constitutes for many diversified companies a huge factor for their corporate success and the systematic design of technology platforms is therefore very important for diversified companies. One of the key prerequisites for such a systematic platform design is the consistent description of technology platform goals.

In practice however, many diversified companies struggle with the consistent description of their technology platform goals and an insufficient linkage between the relevant goals of technology platforms and the design elements of technology platforms is noticeable. This might lead for these companies to a loss of the full business potential of their technology platforms. Waste of resources (over-engineering) or the rejection of key requirements among existing technology platforms (under-engineering) are therefore often common in the

operational practice of these diversified companies. From the theoretical perspective, there is a lack of research regarding the description of technology platform goals in diversified companies. This is surprising, due to the huge problems in the daily practice of diversified companies and the negative economic impact of insufficiently defined and described goals of technology platforms. Thus, the authors introduce in this paper an approach to systematically describe technology platform goals in diversified companies.

Section 2 of the paper specifies the term ‘technology platforms’ and the term ‘goals’ as the relevant theoretical background of the paper. Section 3 comprises the literature review of previous research, concerning technology platform goals in diversified companies. Based on the need for further research and the explanation of the typology as the applied methodology (section 4), the results of this paper are presented in section 5. The presented typology consists of six typical goals of technology platforms in diversified companies. The conclusion and the outlook on future research in section 6 complete the paper.

II. THEORETICAL BACKGROUND

The following section addresses the definition of the terms ‘technology platform’ and ‘goal’ in diversified companies, in order to prepare the systematical description of technology platform goals in section 5.

A. Technology platform

The term ‘technology platform’ (TPF) has no consistent definition in literature [4]. Therefore, it is necessary to define the term clearly for the purpose of this paper. It is defined that technology platforms represent a unique and interconnected network of a diversified company’s internal technological knowledge base ([8], [9]). This internal network of technological knowledge stretches over multiple business units and central areas, in order to enable the exchange of relevant technological information and to enable the exploitation of a maximum amount of product applications ([10], [5]). Figure 1 illustrates exemplary technology platforms in this understanding. The first exemplary technology platform connects the technological knowledge (T) on sealing technologies within a diversified company. The interconnected network of technological knowledge consists of five individual technological knowledge areas (T1.1-T1.5). These knowledge areas include personnel and informational knowledge on materials, production processes and follow-on operations as well as non-destructive test methods. By connecting these initially separated knowledge areas, which span in total over the two business units (BU) “renewable energy” and “aviation engines” as well as the central areas (e.g. central R&D), the diversified company is able to collectively facilitate new products for their various business units. For example, the diversified company is able to improve their seal lip profiles and decrease the fuel consumption of their aviation engines with the effort of the technology platform experts. The second exemplary technology platform “digitalization” connects in total three technological knowledge areas (T2.1-T2.3) within two business units “construction & housing” and “commercial trucks” as well as the central areas.

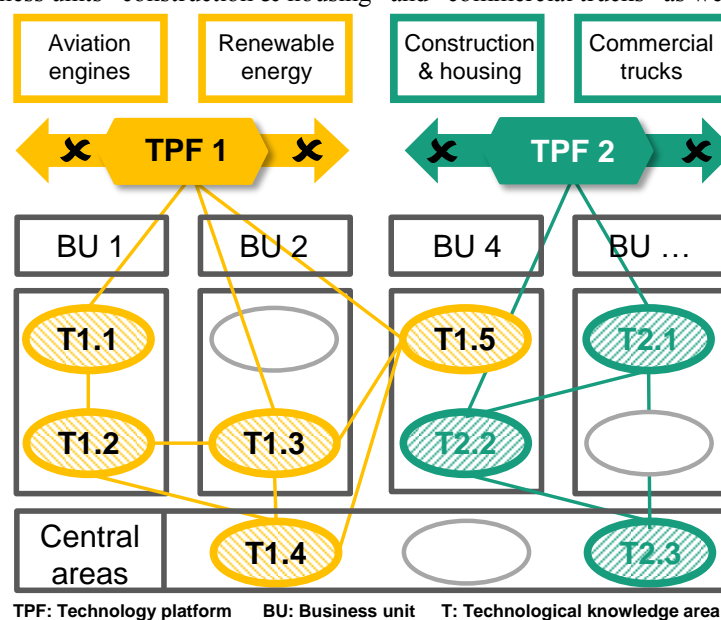


Fig. 1 Schematic excerpt of exemplary technology platforms in diversified companies

B. Goal

The term 'goal' can be defined in general as a desired or planned result in the future that is achievable through an active effort [11]. Organizational goals are formulated on different hierarchical levels within a diversified company, as shown in figure 2 [12]. The highest level is the general value perception, or corporate philosophy, which works as an orientation for the employees and written policies for the company's vision. Second highest is the corporate purpose (mission and vision) and it sets the direction for the firm in a long-term perspective. Both these two levels are in nature very abstract and vague. Company goals (third level) are a specification of the mission and vision in more concrete goals that applies for the entire organization. Divisional goals are formulated on the fourth level. Here the goals are division specific and written at a more operational level. Action field goals are formulated on the fifth level and consist of assigned targets that need to be met in order to fulfill the divisional goals. The sixth level is determined by the instrumental goals that constitute the highest level of concretion [12]. Technology platform goals are formulated on the level of company goals and span over the divisions of a diversified company. Therefore, it can be concluded that technology platform goals have strategical relevance for a diversified company and need to be regarded as strategical goals. Strategical goals are categorized in literature in the following three sub goals [13]:

- Potential-driven goals
- Market success-driven goals
- Economical goals

While potential-driven goals address the activation of potentials on an abstract level, market success-driven goals focus on the exploitation of real market success, e.g. sales [13]. Finally, economical goals specify these abovementioned goals with the articulation of quantitative target figures [13]. In this paper, technology platform goals are considered as potential-driven goals that have strategical relevance for a diversified company and are formulated on the level of company goals (see figure 2).

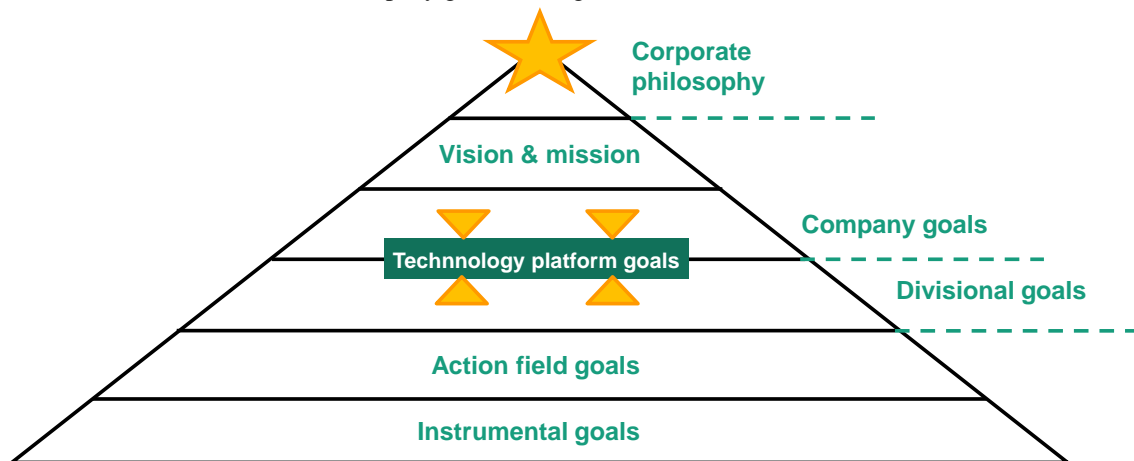


Fig. 2 Pyramid of organizational goals [11]

III. LITERATURE REVIEW

The following section comprises the review of literature, illustrating the status of the goal research in the context of technology platforms in diversified companies. The existing literature can be divided into two streams. The first stream addresses potential frameworks for technology platform goals and the other stream comprises individual goals of technology platforms within the context of diversified companies. The section closes with the illustration, which contributions and deficits are made within the investigated papers.

A. Framework for technology platform goals

Breuer as well as Rosier discuss a framework for technology platforms on a strategic level. They state that the framework consists of the market potential, technology potential and synergy potential of a technology platform. According to the authors, all the potential-driven goals need to be aligned with the abovementioned potentials ([8], [9]). However, their presented framework is formulated too broadly and needs to be broken down into manageable strategical goals, in order to offer a valid framework for the industrial practice.

Stig focuses on a framework for technology platforms on an operational level by illustrating the goals for the documentation of technology platform knowledge [10]. For this purpose, the author defines three different levels of knowledge documentation, based on different operational structures within a diversified company [10]. Even though he introduces a framework for describing technology platform goals, he fails to put his results in a broader and more strategic perspective that could be usable for the top management of a diversified company.

B. Individual technology platform goals

Many authors that deal with technology platforms in academia mention the following three individual technology platform goals. This is why, these exemplary goals will briefly introduced hereinafter:

- Generate technology leveraging
- Share technological knowledge
- Create transparency among technologies

The generation of technology leveraging is regarded by the authors of this paper as one of the most frequently stated strategic technology platform goal in literature ([14], [15], [4], [16], [6], [17]). Technology leveraging is defined as a goal to maximize the exploitation of the company’s technologies for as many markets and applications as possible [4]. When core technologies are gathered in a platform that is accessible for all business units, it becomes easier to identify market opportunities and use the leverage from the technologies. Kim & Kogut suggest that a firm has a tendency to focus on entering markets where familiar technology can be used instead of entering those markets where new technology is needed [14]. Besides this market orientated goal, many authors focus on technology platform goals that concern the internal technology base of a diversified company. One of the two most prominent goals regarding this technology base perspective in literature concern the sharing of technological knowledge and the creation of transparency among the technologies ([18], [19], [20], [21], [22], [23]). The authors state that a technology platform can increase the sharing and transparency of technological knowledge by both coordinating the collaboration and codifying the technology in an organizationally common way.

C. Findings and deficits

The findings and deficits of the vast amount of literature regarding technology platform goals are summed up in figure 3. The main findings of the literature review include the fact that a valid framework for strategic technology platform goals is existing ([8], [9]). Another finding comprises the fact that plenty of literature about individual goals exists as well.

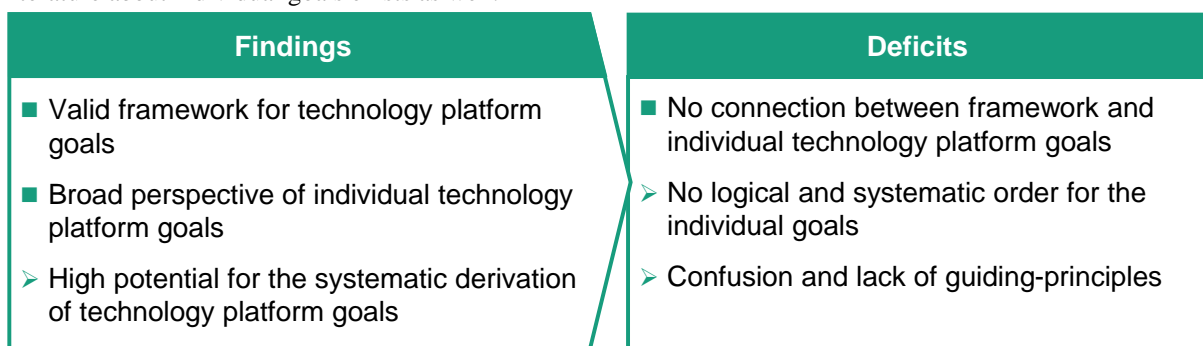


Fig. 3 Findings and deficits of the literature review

However, it seems that the literature on technology platform goals in diversified companies has not picked up yet the prevalent potential for the derivation of technology platform goals. The reason is that the existing framework has not been specified yet and no systematic connection between the framework and the individual technology platform goals has been conducted. Therefore, academics in the scientific community are not able to bring the existing individual technology platform goals in a logical order. Confusion and a lack of guiding-principles for the practitioners are the consequence. The purpose of the paper is to address this need for research and to develop a cohesive set of technology platform goals in a systematical way.

IV. METHODOLOGY

As shown in the literature review, the existing approaches do not systematically describe the technology platform goals and overwhelm the user due to their granularity and their lack of connection to a higher-level framework. For this reason, the research approach of the typification is used as a valid method for solving this theoretic deficits. The aim of the research approach of typification is to reduce the complexity of reality and to resort to certain type-defining dimensions, which are used to categorize the essential characteristics of the objects of the study [24]. In this respect, the types are guidelines, which focus on the essentials of an object scope and are used to achieve statements that have a necessary degree of generality [25]. According to Welter (as shown in figure 4), five process steps have to be applied, in order to define types [26].

In the first step, the general area and the specific objects of the study have to be analysed and determined. On this basis, the relevant dimensions of the determined objects of the study are selected in the second step. In the third step, suitable attributes have to be determined. The definition of types is carried out in the fourth step of the process by combining the dimensions and attributes. It is important that the combinations are logical, empirically verifiable and of practical use [26]. The typology process ends in the fifth step with the graphic representation of the types [26].

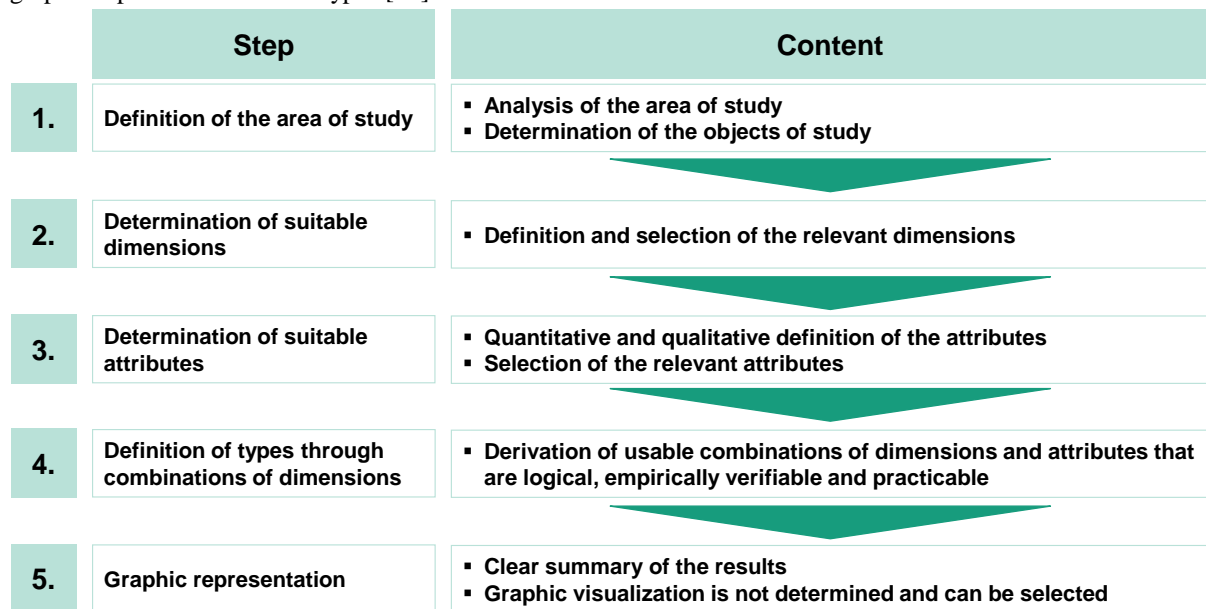


Fig. 4 Typology process according to Welter [36]

The derivation of types can be made by a logical derivation or statistical methods, specifying hereinafter detailing the fourth step [27]. While the statistical methods (e.g. cluster analysis) need a large base of empirical data points for defining the types, the logical derivation makes use of intuition and/ or construction in the form of a retrograde approach or a progressive approach [28]. The retrograde approach is applied in a backward-oriented manner by using intuition and by resorting to a pre-understanding of already existing types to derive dimensions and attributes that characterize these types [29]. In comparison, the forward-oriented approach uses the progressive construction of dimensions and their attributes to define types [27]. Based on an argument of Welter that only a combination of both approaches leads to valid types, an iterative approach (both retrograde and progressive) is applied for this paper [26]. Thus, the identification and definition of the typical technology platform goals in this paper is strongly based on a close interaction and discussion with the relevant managers and practitioners of technology platforms in diversified companies.

V. RESULTS

The following section comprises the specification of the results of this paper. For this purpose, the typology process of Welter is applied for technology platform goals in diversified companies. Paragraph 1 of this section addresses the determination of the relevant scope for the typology and thus corresponds with the first step in the typology process of Welter. The second paragraph within this section deals with the definition of suitable dimensions and attributes for the typology. Therefore, paragraph 2 corresponds with step 2 and 3 of the

typology process of Welter. Finally, the fourth and fifth step of Welter's typology process is carried out in the last paragraph of this section by identifying and visualizing the typology.

A. Determination of the relevant scope for the typology (step 1 according to the typology process of WELTER)

It was detailed in section 2 that technology platform goals are considered as potential-driven goals that have strategical relevance for a diversified company and are formulated on the level of company goals. In addition, it was specified in section 3 of this paper that Breuer as well as Rosier already developed a valid framework for technology platforms on a strategic level. This framework is therefore applied in this paper and consists of the following potentials:

- Market potential
- Technology potential
- Synergy potential

Here, the technology potential is the essential starting point to define technology platforms goals [8]. This is because technology potentials are the significant potentials that can be influenced through the strategic technology management and therefore through the concept of technology platforms [30]. In general, the term technology potential can be understood as the possibilities resulting from the use of available product, production and material technologies to create new or also modified products or services for the market respectively production processes [11]. In contrast to the term technology potential, the term market potential describes the theoretically maximum possible sales volume (absorption capacity) of certain markets [31]. The market potential is closely linked to the platform specific technology potential (external relationship of technology platforms). This is due to the fact that either the market potential can be influenced through the active shaping of the technology potential or the market potential itself acts as the input for the influence of the technology potential. Synergy potentials can be seen in the internal relationship of a diversified company. In general, synergy potentials are advantages that are created, when elements interact with each other [32]. The three abovementioned potentials of technology platforms determine the relevant scope for the definition of the typology. The typology of potential-driven goals needs to be therefore aligned with the abovementioned potentials.

B. Definition of suitable dimensions and attributes for the typology (step 2 & 3 according to the typology process of WELTER)

For the description of market potential-driven goals, the general development directions of diversified companies are relevant. These directions are articulated on the top-level hierarchy of a diversified company. Usually, the development directions of technology-driven, diversified companies are characterized by the dimensions 'technology' and 'market' [33]. The first dimension 'technology' is divided into the two attributes 'existent' and 'new' [33]. Existent technologies are those technologies, which are already applied in the company. New technologies refer to unknown engineering knowledge. The second dimension 'market' is also divided into the attributes 'existent' and 'new' [33]. In this context, the attribute 'existent' indicates that it is possible to target markets that are already addressed or have a strong similarity to the already addressed markets (see figure 5). In contrast, the attribute 'new' indicates the addressing of markets, which have not yet been affected [33]. Due to the purpose of the paper to identify fundamental types of technology platforms goals, it is sufficient to formulate the attributes on this abstract level.

The dimensions of a technology strategy are relevant for technology platforms and the description of the technology potential-driven goals [33]. This results from the fact that technology strategies are the central strategic instrument for shaping a company's technology potentials and thus have to be taken into account when defining technology platform goals ([8], [21]). It can be distinguished between 'normal performance' and 'high performance' for the technological performance level, see figure 5 [34]. Obtaining the 'high performance' position of a specific technology implies to display a major advance to the concurrent technological state of the art on the market [34]. On the contrary, a 'normal performance' position implies a technologically lower performance level. The technology timing represents the second dimension. The point in time when a technology reaches the level of maturity for a potential market application is the designated criterion, in order to evaluate a leader or follower position for the timing [34].

Potential	Dimension	Attributes		
Market potential	Technology	existing	new	
	Market	existing	new	
Technology potential	Technological performance	Normal performance	High performance	
	Technology timing	Follower	Pioneer	
	Technology source	internal	cooperative	external
Synergy potential	Transparency	maintaining	increasing	
	Avoidance of redundancy	maintaining	increasing	
	Know-how transfer	Leave out of consideration	enable	

Fig. 5 Describing dimensions and attributes for the typology of technology platform goals

Finally, the technology source is the third relevant dimension of the technology potential-driven goals [34]. There are mainly three different options for sourcing technologies, namely external (e.g. acquisitions etc.) and internal (own R&D department) as well as cooperative sources (e.g. contract research).

Finally, the synergy potentials that are relevant for the paper are technological synergy potentials and are found in the R&D and in the production of diversified companies [9]. However, technological synergy potentials only emerge if platform-specific knowledge areas are characterized by a certain degree of complementarity and/ or homogeneity [35]. The goals that are linked to the interaction of platform-specific knowledge areas are thus also dependent on the extent of complementarity and/ or homogeneity. In the case of perfect homogeneity of the platform knowledge areas, the interaction of them can aim at creating transparency about a technology topic and additionally at avoiding technology-specific redundancy [36]. In contrast, the interaction of complementary knowledge areas can enable the transfer of know-how between complementary elements [35].

C. Identification and visualization of the typology (step 4 & 5 according to the typology process of WELTER)

In the following paragraph the types of technology platform goals are developed and visualized through a combination of the previously defined dimensions and attributes. As shown in section 4, the definition of types is carried out in an combined manner, consisting of a retrograde (intuition) and progressive (construction) approach. This approach results in six typical goals of technology platforms in diversified companies, which are described in more detail below.

Type 1: 'Outperformer'

The typical goal ,outperformer' is characterized by the intention to bundle all relevant knowledge areas within the company, in order to perform coordinated and focused technology development as a technology platform. The intended high increase in technological performance aims to provide new or enhanced differentiation features on already addressed markets [5]. Hence, in terms of the technology potential-driven goal, it is characteristic to strive for a leadership in the technological performance and for a pioneer position in technology timing. In addition, the type ,outperformer' can be characterized by the selection of cooperative sources for the development of the aspired technological novelties, in order to obtain an outside perspective at the technology development and create high-performance technologies (see figure 6). Finally, the ,outperformer' aims internally at avoiding redundancies during the development of new technologies and thus creating synergy potentials.

Potential	Dimension	Attributes		
Market potential	Technology	existing		new
	Market	existing		new
Technology potential	Technological performance	Normal performance		High performance
	Technology timing	Follower		Pioneer
	Technology source	internal	cooperative	external
Synergy potential	Transparency	maintaining		increasing
	Avoidance of redundancy	maintaining		increasing
	Know-how transfer	Leave out of consideration		enable

Fig. 6 Characterizing visualization of the type 1, 'Outperformer'

Type 2: 'Leverager'

The second type of technology platform goals is described as ,leverager'. Characterizing for this type is it to create the technological prerequisites that enable the multiple use of existing technologies in a maximum possible number of new fields of application and markets. Based on an existing technology potential, the aim is to exploit the resulting market potentials and to address new markets [30]. As shown in the literature review in section 3, this type is well accepted and described in academia. In terms of the technology potential, it is characteristic for the ,leverager' to use a technology on a high performance level and apply it timing-wise as a follower on so far not exploited markets. As a technological source, it is the goal to integrate the internal R&D, in order to adapt the platform technology minorly (if necessary) to the requirements of unaddressed markets. Synergy potential wise, it is the goal of the type 'leverager' to avoid redundancy during the analysis and search for possible diversification options of the technology. Additionally, it is intended to encourage the different knowledge areas within a diversified company to collaborate and exchange platform specific technological know-how. Figure 7 summarizes and illustrates the characterization of the type ,leverager'.

Potential	Dimension	Attributes		
Market potential	Technology	existing		new
	Market	existing		new
Technology potential	Technological performance	Normal performance		High performance
	Technology timing	Follower		Pioneer
	Technology source	internal	cooperative	external
Synergy potential	Transparency	maintaining		increasing
	Avoidance of redundancy	maintaining		increasing
	Know-how transfer	Leave out of consideration		enable

Fig. 7 Characterizing visualization of the type 2, 'Leverager'

Type 3: 'Standardizer'

A technology platform with the typical goal ,standardizer' is characterized by targeting markets that are already addressed with existing technologies in the company. In this way, a technology platform with this goal bundles only those homogeneous knowledge areas that are ultimately necessary to achieve the goal and standardizes them for the entire company [30]. Technology potential wise, the ,standardizer' type is therefore not aiming for high performance but standardization. Hence, this typical goal of technology platforms is

characterized by aiming for a normal level regarding the technological performance and a follower position regarding the technology timing. Additionally, it is characteristic for this type to select cooperative sources for the technology sourcing. Synergy potential wise, the goal is to create transparency about the technology platform related knowledge areas that need to collaborate, in order to generate technological standards. As shown in figure 8, this type therefore also aims at avoiding redundancy during the creation of technology standards. Besides, a technology platform with the typical goal ‘standardizer’ can increase the negotiating power towards technology suppliers by bundling and increasing the standardized purchasing volume [35]. However, the exploitation of this synergy potential is part of the core business of technology purchase and thus not shown in figure 8 [37].

Potential	Dimension	Attributes		
Market potential	Technology	existing	●	new
	Market	existing	●	new
Technology potential	Technological performance	Normal performance	●	High performance
	Technology timing	Follower	●	Pioneer
	Technology source	internal	●	cooperative
Synergy potential	Transparency	maintaining	●	increasing
	Avoidance of redundancy	maintaining	●	increasing
	Know-how transfer	Leave out of consideration	●	enable

Fig. 8 Characterizing visualization of the type 3, ‘Standardizer’

Type 4: ‘Translator’

Another typical goal of a technology platform is to create a general understanding of such technologies that are company-wide unknown, but have complementary character to these internally known and available technologies that are contributing significantly to the success of the entire company (see figure 9). Thus, a technology platform with the typical goal ‘translator’ aims to answer the question what an internally unknown complimentary technology means for the own technology base. Hence, the goal is to prevent each relevant technology area from independently and divergently assess the technological relevance of the complementary and unknown technology. By bundling the homogeneous knowledge areas and technology experts in the technology platform, an intra-corporate hub is created that enables the coordinated know-how transfer from outside the company to the inside.

Potential	Dimension	Attributes		
Market potential	Technology	existing	●	new
	Market	existing	●	new
Technology potential	Technological performance	Normal performance	●	High performance
	Technology timing	Follower	●	Pioneer
	Technology source	internal	●	cooperative
Synergy potential	Transparency	maintaining	●	increasing
	Avoidance of redundancy	maintaining	●	increasing
	Know-how transfer	Leave out of consideration	●	enable

Fig. 9 Characterizing visualization of the type 4, ‘Translator’

Regarding the technology potential-driven goal, it is characterizing for this type to maintain a leadership position in the performance level for the platform technology that is contributing significantly to the success of the entire company. By systematically translating the unknown, complementary technologies, it is strived to ensure a technological leadership position and assert the significant contribution to the success of the entire company with this technology. With respect to the technology timing, however, only a follower position is reachable, since it is no longer possible to achieve a pioneer position due to the already existent complimentary technology. Technology sourcing wise, it is furthermore typical for the ‘translator’ to target a cooperative form of knowledge gathering about the complementary technologies. In terms of market potential, it is the goal to exploit the enhanced technology potential by gathering knowledge about complementary technologies for the application in existing or new markets.

Type 5: ‘Networker’

The ‘networker’ is a typical goal of a technology platform in diversified companies that is characterized by simply connecting widely spread knowledge areas and technology experts of a specific technology within a diversified company. Thus, the aim is primarily to create transparency about the internal technology landscape. Also, it is the goal of this type to facilitate the collaboration between the bundled homogenous technologies and other complementary technology experts inside the company. Regarding the technology potential-driven goals, this type is different compared to the abovementioned types. The reason is that in contrast to the abovementioned types, the ‘networker’ does not intend to actively shape the relevant technology potential. Rather it is intended to leave the sovereignty about the development of the technology potential decentralized within the dedicated technology units [2]. Finally, market potential wise this goal of a ‘networker’ is to address existing markets with existing technological solutions. Figure 10 shows the characterization of the typical goal ,networker‘.

Potential	Dimension	Attributes		
Market potential	Technology	existing		new
	Market	existing		new
Technology potential	Technological performance	Normal performance	←	→ High performance
	Technology timing	Follower	←	→ Pioneer
	Technology source	internal	←	→ cooperative → external
Synergy potential	Transparency	maintaining		increasing
	Avoidance of redundancy	maintaining		increasing
	Know-how transfer	Leave out of consideration		enable

Fig. 10 Characterizing visualization of the type 5, ‘Networker’

Type 6: ‘Liquidator’

The type ‘liquidator’ is characterized by the goal to systematically liquidate the further development intensions of existing platform technologies in already addressed markets. This shifts the sourcing of the relevant technology to external acquisition. The typical goal of the ‘liquidator’ becomes relevant when market-related requirements in the currently addressed markets supersede an own further development of the existing platform technology. Then it is the intension to minimize the existing technology potential until the external acquisition of the platform technology is systematically established. Synergy potential wise, the ‘liquidator’ goal is characterized by the intension to avoid that every relevant technology unit independently liquidates the platform technology. The purpose of the type ‘Liquidator’ is therefore to exploit synergy potentials by avoiding redundancies. The following figure 11 illustrates the definition of the type ‘liquidator’.

Potential	Dimension	Attributes	
Market potential	Technology	existing	new
	Market	existing	new
Technology potential	Technological performance	Normal performance	High performance
	Technology timing	Follower	Pioneer
	Technology source	internal	cooperative external
Synergy potential	Transparency	maintaining	increasing
	Avoidance of redundancy	maintaining	increasing
	Know-how transfer	Leave out of consideration	enable

The diagram shows orange dots and lines connecting specific attributes across different dimensions. The connections are as follows:

- From 'existing' (Technology) to 'existing' (Market).
- From 'existing' (Market) to 'Normal performance' (Technological performance).
- From 'Normal performance' (Technological performance) to 'Follower' (Technology timing).
- From 'Follower' (Technology timing) to 'cooperative' (Technology source).
- From 'cooperative' (Technology source) to 'external' (Technology source).
- From 'external' (Technology source) to 'maintaining' (Transparency).
- From 'maintaining' (Transparency) to 'increasing' (Transparency).
- From 'maintaining' (Transparency) to 'increasing' (Avoidance of redundancy).
- From 'increasing' (Avoidance of redundancy) to 'enable' (Know-how transfer).
- From 'Leave out of consideration' (Know-how transfer) to 'enable' (Know-how transfer).

Fig. 11 Characterizing visualization of the type 6, 'Liquidator'

VI. CONCLUSION AND FUTURE RESEARCH

In this paper, the typical goals of technology platforms in diversified companies have been derived in accordance to the typology process of Welter. The application of this process resulted in total to six types, which can be uniformly described using systematically defined dimensions and attributes. Despite a uniform description of these six types, it has been achieved at the same time that these types show a sufficient diversity in their content. Therefore, it can be stated that these types cover all the possible characteristics of technology platform goals, starting with the type 'translator', which is relevant for a relatively new technology and finishing with the type 'liquidator', which is relevant for the end of life of a technology. The developed systematization is applicable for any diversified company and provides a clear guideline in structuring the goals of technology platforms in diversified companies. Practitioners, responsible for the strategic orientation of technology platforms, are given a framework and therefore a valuable input that enables the systematization of the technology platform goals. Based on this framework it is also possible to select the suitable organizational implementation of technology platforms in diversified companies and allocate the relevant resources accordingly. However, future research in the form of more empirical case studies is necessary to further validate the proposed results. Also, the integration of these results in the overall strategy process for technology platforms would further promote the understanding of technology platform goals in the context of diversified companies.

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