Ecosystem Pie Model

METHODOLOGICAL GUIDELINES

FOR THE QUALITATIVE MODELING
OF INNOVATION ECOSYSTEMS

Introduction

This document is the official online appendix to the academic paper titled 'Mapping, analyzing and designing innovation ecosystems: The Ecosystem Pie Model' (2018), authored by M. Talmar, B. Walrave, K.S. Podoynitsyna, J. Holmström and A.G.L. Romme and published at Long Range Planning

What is this manual for?

This is a methodological guidelines manual for the use of the qualitative innovation ecosystem modeling tool Ecosystem Pie Model (EPM). The EPM incorporates a graphical tool and a modeling process which enables the mapping, designing and analyzing of innovation ecosystems both for managerial and scholarly purposes. This guidelines document was created to assist with the understanding and using the EPM framework. In this manual, we cover the following topics:

For questions/comments on the EPM tool and ecosystem modeling methodology, you are welcome to contact Madis Talmar at m.talmar@tue.nl or the other co-authors of this work.

The authors would greatly appreciate if you let us know of your use of the EPM tool. This is for the purpose of following the spread of the tool and to receive your feedback.

What are innovation ecosystems?

Innovation ecosystems are networks of organizations whose (innovative) products/services combine together toward achieving an overarching (ecosystem's) value proposition (Adner, 2017). Consider the following example. As a customer, you might be interested in driving more sustainably, so you decide to buy an electric car. But the electric car alone is not enough to accomplish your greener driving experience. There must also be a network of charging points, which is typically provided by the local utility company. Before you can buy the car, it must first be developed and produced, needing high quality batteries and thousands of other components, originating from a network of suppliers to the car manufacturer. Furthermore, the car is probably sold to you as a final customer by a local dealer, and to buy it, you might need a leasing contract with a bank/leasing agency. Finally, and to return to the very beginning, governmental policy (subsidies) possibly played a large role in shifting your preference to buying an electric vehicle (as opposed to one powered by a combustion engine) in the first place. What we see is that a sustainable driving experience is much more than a car. It is in fact accomplished by the interplay of many related products/services. It is contexts like this where we speak of an innovation ecosystem as a network configuration of a number of actors that together make a complex value proposition possible.

From the example, we learn that the product or the service that a particular innovating company A is developing is often critically dependent on the availability of certain complementarities originating from other actors. Unless these complementarities become available, the specific innovation of company A is also unlikely to breach successful commercialization. Therefore, if company A is to better manage their innovation process, they might undertake an **explicit analysis of the willingness and ability of external organizations in supplying complementarities that support the commercialization of their innovation**. Such an analysis goes beyond the traditional focus in innovation where company A would mostly concern itself with the effectiveness of the innovation process within their own organization.

Such analysis also goes beyond partnerships as such. A key feature in innovation ecosystems is the frequent lack of explicit partnerships between value-creating actors and/or any formal control of actors by other actors. As such, important complementarities may originate from parties that your organization has no ties with and that your organization does not transact with. Still, the fact that these complementarities are critical to your innovation implies that they are of interest in developing an informed innovation strategy.

As per Adner (2012), in analyzing our innovation ecosystem, we should distinguish between two types of (potentially) critical complementarities: a) the willingness and ability of actors that are in between our organization and the end users to adopt our innovation (i.e., the 'adoption chain'), and thus progress its successful commercialization, and b) (novel) products/services by other actors that also need to be available for our innovation to become successful (i.e., the 'co-innovators'). In the example above, from the point of view of the car manufacturer, the local car dealers would constitute an example of necessary adopters. Meanwhile, sufficiently frequent charging points are an example of a product/service that needs also to become available for electric vehicle manufacturers to succeed in selling their vehicles.

The possibility that one or both types of complementarities are not available when a firm launches its own innovation may be a critical issue for the innovating firm. Toward tackling that issue, we speak of the necessity to analyze ones' own innovation ecosystem and ultimately to develop an explicit ecosystem (management) strategy.

Questions specific to ecosystem analysis toward strategy making include:

- what is the overarching value proposition (e.g., sustainable driving) that our innovation contributes to and who is it targeted toward?;
- which complementary contributions are necessary for that value proposition to be accomplished, both in terms of adopters and in terms of other products/services that need to be available for ours to become successful?;
- who (could) supply these other complementarities?;
are these parties willing and able to supply these complementarities?
(i.e., do they constitute a risk to our innovation?)
- how to influence external parties to align their activities to accomplishing the overarching value proposition we have in mind?;
- or perhaps the opposite: how to re-design the overarching value proposition so as to fit an existing set of industrial relationships better?;
- are there ways to accomplish the overarching value proposition with less dependence on external actors?;
- how to reduce the risk that specific critical actors are not willing or able to contribute the complementarity we expect them to contribute?;
- should we attempt to duplicate the activities of these actors who are risky from the point of view of not contributing as we expect them?

The Ecosystem Pie Model is a tool that enables the qualitative mapping, analysis and design of innovation ecosystems with such questions taken into consideration.

Who is the EPM tool for?

There are five major groups of users who can regularly benefit from modeling innovation ecosystems using the EPM tool.

Innovators: If you represent an organization that aims to introduce a new technology/product/service or a business concept to the market, you can use the EPM to consider the interdependence of your new offering with other actors and their offerings. Moreover, you can use the EPM to compare different approaches (scenarios) to taking your novelty to the market. Think of this as an exercise of organizational network design with the goal of making sure that your organization chooses the most beneficial network configuration to introduce its product/service/technology. In this respect, the EPM can be used in modeling both technology push and market pull. For instance, if you have a radically new technology, you can use the EPM to consider the required ecosystem support of placing this technology to particular different application areas and analyze the implications of each application area. Conversely, you can consider the potential ecosystem constellations required to capture a market opportunity. The key purpose for practitioners to model their innovation ecosystem is to develop an ecosystem strategy as an inherent part of a new product/service strategy.

Strategists: If you represent an organization that in creating and capturing value already is embedded into a network of ties with other organizations, you can use the EPM to analyze this existing network constellation and to develop strategies to operate more successfully within it. Such a strategy may include choices regarding what your own company should do internally, as well as choices regarding how to influence other actors around your organization to act more favorably to your goals. For instance, as a wholesaler of goods, you might have difficulties making enough margins on the products. One of the possible avenues of business model change for your organization might then be to bypass the retailers that are your immediate customers and attempt to sell to end customers directly. You can use the EPM to analyze the implication of changing your business model on the rest of the ecosystem network and understand what kind of a business model change might bring you highest benefits.

Policy-makers and analysts: If you represent a policy-maker, an innovation intermediary or similar, you can use the EPM to gain an understanding of the kinds of ecosystem constellations that exist for accomplishing certain value propositions, and/or for considering what kinds of ecosystem constellations could there be for accomplishing certain value propositions. Such analysis might point to structural deficiencies that potentially require policy intervention. In the above-mentioned example, if you wished to boost electric driving, using the EPM might bring you to the conclusion that there is a dual barrier to this value proposition in having not enough electric vehicles and not enough charging points. Either of these complementarities can be boosted by policy.

Investors: The ecosystem of an organization constitutes an important, but often underestimated source of risk for the innovation activities of that organization. The EPM enables investors to explicitly consider what are the ecosystem-based assumptions and potential risks underlying a novel value proposition. An investor can do this by using the EPM on their own, by requesting an explicit ecosystem analysis from the venture/project, or by taking part in a collective ecosystem modeling exercise involving the organization and its (prospective) ecosystem partners.

Scholars and students: As an academic or a student, you can use the EPM in order to develop descriptive knowledge on existing and future ecosystems, which can be used in contributing to ecosystem research and/or for achieving learning outcomes. For instance, you may compare the different ecosystem constellations by which certain value propositions are achieved, and use that knowledge to report on a particular industry.

In a later section, we provide examples including most of these viewpoints to modeling with the EPM.

What is the EPM tool like?

The EPM consists of a graphical ecosystem modeling tool, accompanied by a number of principles that guide the process of ecosystem modeling. On Figure 1, you can see the EPM in its blank form – that is, prior to any data entry.

On Figure 2, following the electric driving example from earlier, we illustrate the end result of an ecosystem modeling exercise around the prominent electric vehicle model of Tesla Model S. We might call this the 'Tesla Model S innovation ecosystem', although one should bear in mind that the version presented is a heavily simplified model of the ecosystem that Tesla maintains around its company. This especially in recent developments, where the company is converging residential power storage (Powerwall), home power generation (Solarcity and Tesla BIPV roof) and self-driving functionality to enhance the overarching value proposition they contribute to. The rest of this guidelines document is dedicated to explaining step-by-step, how you too can perform an ecosystem analysis with the help of the EPM tool.

However, as will become clear later, at least as much as it is about the outcome of the model in a graphical form, modeling ecosystems with the EPM is about the process and the inclusiveness this process can create for the people involved in the modeling exercise.

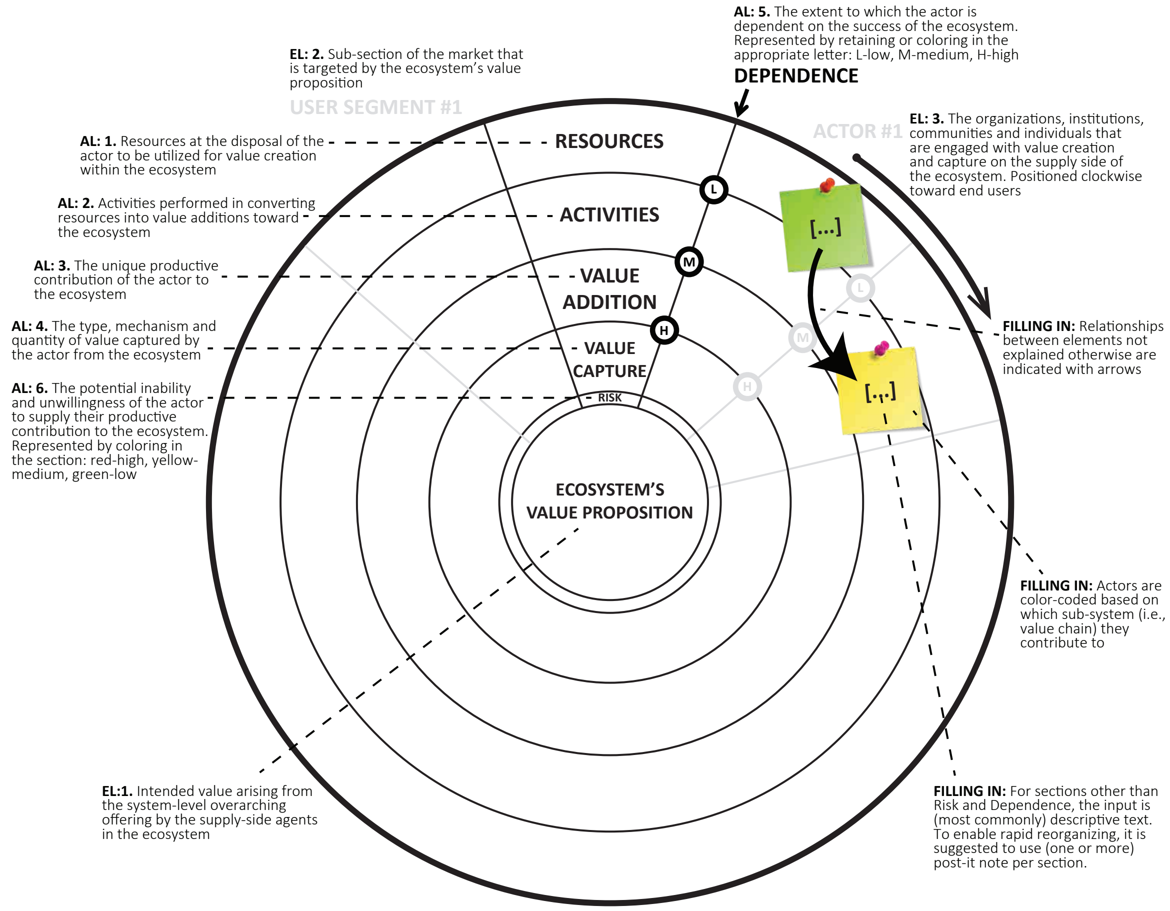

Figure 1. The EPM tool as a blank canvas

EPM and other tools

Any tool has its strengths and weaknesses and this implies that there are also more and less appropriate situations to apply a tool. In this section, we briefly reflect upon the specific positive traits of the EPM as arising from our experience in applying and facilitating the application of the tool. We do this in order to pinpoint to the types of situations where we think the EPM has the most analytical power and where it generates most value to modelers. In doing so, we also refer to several other potentially useful tools that we believe are appropriate in some use cases.

First off, the visual representation of the EPM incorporates a so-called pie-model structure used as the basis for a number of business tools. In this type of visual representation, a circle is divided into sectors based on categories/modules that are then split to sub-sections by concentric circles that represent certain characteristics of each module (e.g., Bourne and Walker, 2005; Bocken et al., 2013; Chaffer, 2010; Lüftenegger, 2014; Van Kuijk, 2012).

More specifically, the development of the EPM tool succeeds and is inspired by, among other key sources listed elsewhere, the Service Dominant Business Model Radar (SDBMR), also developed at Eindhoven University of Technology (Lüftenegger, 2014; Turetken and Grefen, 2017; Turetken, Grefen, Gilsing and Adali, 2019). The SDBMR is a tool designed to support the collaborative development of service-dominant business models. The EPM and SDBMR both use embedded circles and actor-based sectors to represent how value is created and appropriated in multi-actor systems. Both models also build on resource-based theory by considering the contributions of individual actors as rooted in actor-specific resources that enable these actors to perform productive activities for materializing a holistic value proposition.

In this respect, SDBMR focuses on enabling the alignment of (generally) technologically mature value offerings into new overarching service constellations, so that the involved actors together create and maintain a new business model. Therefore, in situations in which the problem at hand involves the aggregation of existing products/services into a new service constellation, we refer readers to the SDBMR toolbox that faciliates the process by which several actors together consider the relevant questions about how their offerings can together produce a new high-value business model (Turetken, Grefen, Gilsing and Adali, 2019).

The EPM has been designed to tackle situations in which a particular focal firm/venture is making technology commercialization choices (e.g., what product to launch, to what customer segment, in what configuration, and when), assuming that its choices inevitably dependent on whether other actors in parallel value chains are able and willing to develop and make products/services that are complementary to those of the focal firm at some point in the future. In such a situation, the question whether critical complements will be available in a timely fashion poses a major risk to the commercialization choices of the focal firm. Hence, it is strongly encouraged to model, analyze and design various scenarios for what the focal firm can change in its commercialization plan and to what extent it can influence actors across the parallel value chains to obtain the required complementary offerings. The EPM has been designed for this purpose, emphasizing the identification of the various complementary value chains and the sequencing of products within them, the level of criticality of future complementary offerings relative to each other, the level of dependence of contributing actors in the overarching system, and the risk that the lack of a particular complement eventually inhibits the development of the envisioned future product(s). These considerations are relevant for focal firms with relatively **immature technologies (i.e., TRL 4-7), where key commercialization choices are yet to be made**. Thus, the modelling horizon of the EPM generally is 2 to 10 years, which often implies that the focal firm has to make explicit assumptions about the future actions of other relevant actors, rather than to actually co-model with them. A collaborative alignment-seeking approach involving also other contributing actors is preferred, but in practice often not feasible.

Second, as originally emphasized by Adner (2006; 2012), each step in the value chain that your organization is embedded in, as well as each step in necessary parallel value chains that eventually flow into yours' (even if just at the customer) can be a major source of risk for your innovation project. The crux of ecosystem modeling is thus **risk management** with risk being the ultimate measure in analyzing every actor in the innovation ecosystem. EPM measures risk in much the same way as the parsimonious Value Blueprint tool by Adner (2012) that includes just two key elements: the industrial structure (i.e., the modules in the ecosystem and the flows between them) and a risk assessment for every flow within it. If your purpose of ecosystem modeling is to quickly generate and convey the structure of the modules (and the actors producing them) in the ecosystem, and to mark down the potential risks in that structure, we highly recommend the Value Blueprint tool. What the EPM adds to the benefit received from the Value Blueprint tool is a detailed description of each actor by the key characteristics that influence what the risk assessment for them would be. Put otherwise, much more of the argument justifying the motivations and abilities of the other actors are featured on the EPM. Corresponding to this feature, the modeler that benefits most from using the EPM is one that is either in the process of new product/service development, or funding someone who is. The main benefit gained is a thinking 'path' to systematically and in detail consider the industrial structure that the product/service will be part of and the potential risks in that industrial structure to the success of the product or service.

These points together then set the modeler up for making well-informed ecosystem strategy choices as part of the new product/service development process.

Third, building on the argument of innovation ecosystems as 'structures' (Adner, 2017), the EPM is tuned to assist at developing ecosystem strategy in industrial contexts with **several distinguishable value chains that (ultimately) flow together**, enabling a coherent overarching value proposition of some kind. The analytical power of the EPM is lower if the modeler specifically aims to understand how to build and manage platforms. A platform in this case should be understood as a set of technologies, typically sponsored by a particular entity, that enable either entrepreneurial action among other actors, or transactions among distinct groups of users (Jacobides et al., 2018). Modeling a platform-based ecosystem using the EPM is possible, but especially in cases where the platform facilitates many diverse types of user value (e.g., operating system with many types of applications), the way the EPM is designed may limit the number of complementors that can be meaningfully modeled. Furthermore, the EPM does not feature elements to help a modeler make sense of platform-oriented design and governance choices such as openness, lock-in mechanisms, network effects, and transaction cost reductions mechanisms. For explicitly modeling platform ecosystems, we suggest considering the Platform Design Toolkit (www.platformdesigntoolkit.com).

Fourth, the EPM is **neutral to the industrial position of the entity of interest**. This means that the intended innovation of the modeler may be positioned far upstream in a value chain, in direct interaction with the user, as well as anywhere in between. The only difference in ecosystem modeling across that spectrum would be in the number of actors to be considered as constituting the adoption chain vs. as (necessary) co-innovators. Furthermore, modeling can also proceed without any entity in focus at all, for example in educational or research settings.

The EPM is also **neutral to the level of power that the entity of interest has within the ecosystem structure**. In alignment with the argument that other actors in the ecosystem are often a source of risk to accomplishing the overarching value proposition, the EPM effectively assumes a limitation to the power of any actor. The purpose of the EPM then is to help the modeler become aware of and navigate around their limitations. Meanwhile, in case the context of modeling includes a particular end customer oriented focal actor that seeks to integrate offerings from other actors into a coherent boundary-spanning business model, we suggest considering either the Business Model Connect tool (Brehmer et al., 2018), if focus is to be placed on the specification of flows between parties; or the Service Dominant Business Model Radar (Lüftenegger, 2014) mentioned earlier, if focus is to be placed on the characteristics of the involved partners.

Finally, the EPM is **neutral to the environmental or social sustainability effects** achieved as result of innovation activities. Any such potential effects are neither neglected nor explicitly included and instead it is dependent on the choice of the modeler whether to include these effects in characterizing some of the actors or not. However, if the modeler has specific interest toward understanding or designing multi-actor value systems that give rise to either environmental or social sustainability, there may be merit in considering the Business Model Connect Tool (Brehmer et al., 2018), or the Cambridge Value Mapping Tool (Bocken et al., 2013).

Components

The real-world performance of an ecosystem emerges in the interplay of features held by individual actors in the ecosystem, and the structure by which these individual actors interact in creating and capturing value. Correspondingly, mapping, designing and analyzing ecosystems assumes that we simultaneously consider properties on both levels: on the level of the ecosystem and on the level of each of the contributing actors.

Ecosystem-level building blocks

In the previous sections, you were already briefly acquainted with the three main components of the EPM that lie on the level of the whole ecosystem. These are Actors, an overarching value proposition, which we refer to as the Ecosystem's value proposition (EVP), and User segments. It is with these components that we start to develop an understanding of what an ecosystem constellation is like and how value is created and captured in a particular ecosystem. Note, that while we present these components in a certain sequence here, depending on the particular ecosystem it may be a good idea to switch the order of considering the Actors, the EVP and the User Segments. This choice depends for example on whether you are modeling an ecosystem to perform a technology push, or a market pull. In the case of the former, it often makes sense to start modeling first by considering the Actors (most prominently, your own organization); while in the case of the latter, you might start with considering first who are the User segments and what kind of value could be proposed to them.

(1) Actors. Innovation ecosystems are networks of organizations that supply certain complementary offerings that in their interaction create user-oriented value. In that sense, the organizations within an ecosystem are dependent on each other, although at the same time each generally constitutes a separate legal entity. In the EPM, to represent the separation (boundaries) of involved parties, each Actor is represented by a sector of the 'ecosystem pie' as shown in Figure 3.

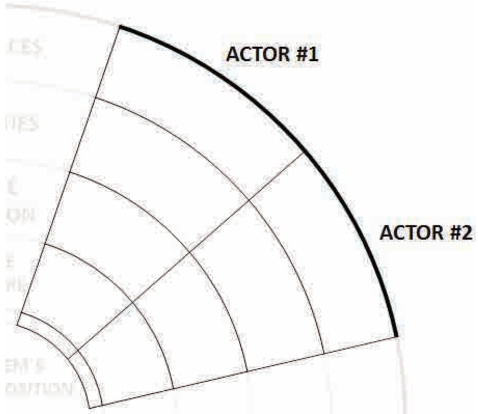

Figure 3. Representing actors in the EPM

In the 'pie', the Actors are presented clockwise in a sequence that follows their distance from the end user, starting with the most distant (the so-called upstream) Actors. So, for example, the battery producer for the electric car would come earlier than the car producer, who in turn is followed by the local car shop/maintenance center who actually sells the car to the user and later takes it in for maintenance. These Actors constitute a value chain where each subsequent actor takes the product/service of the previous one as input and produces an output that incorporates some value-added element from that Actor.

In most ecosystems, there are in fact several such value chains, which run in parallel and complement each other. Think again of the example of electric driving where it is minimally necessary for there to be a value chain around accomplishing the vehicle and another one providing the possibility to charge the vehicle. In such a case where the ecosystem encompasses several value chains, each of the value chains follows the same logic of moving clockwise from upstream Actors towards downstream actors. There is no one rule for considering how the several value chains position against each other in the EPM, although a modeler may want to keep in mind best readability of the graphical model. Read also on parallel value chains in the section titled 'Relationships'.

To keep the number of modeled Actors limited and the model less complex, some Actors can be pooled together to a single sector on the basis of similarity. For example, the suppliers of standard components (wheels, breaks, doors, windows etc.) to the electric car can be pooled to a single sector because they add value to the ecosystem by a similar logic – i.e. by developing and supplying components to the car producer. By the same principle, a contributing community (e.g., Kickstarter) would also best be represented on the EPM as a single Actor.

Furthermore, a modeler can choose to exclude some contributing parties without jeopardizing analytical power, provided that these parties contribute from the point of view of the ecosystem complementarities that are entirely generic. Generic in this context means that compared to the standard product/service of the Actor, the Actor does not have to perform any modifications for the complementarity that they offer to be applicable in a particular ecosystem (Jacobides et al., 2018). Examples of generic complementarities would include parcel delivery services, bank credit, electricity and water. In the context of most ecosystems, these (and similar) complementarities can be assumed to be available at normal market conditions so much so as not to become problematic for the success chances of the ecosystem. Conversely, modeling should focus on actors that, in order to be part of the ecosystem, have to customize their offering at least somewhat in comparison to what they supply as standard, meaning that the complementarity they provide is to an extent non-generic. In the most standard case, this means that in order to supply their complementarity to a particular ecosystem, an Actor needs to engage in some product/service (re-)development of their own.

(2) Ecosystem's value proposition (EVP). The EVP is the integrated output of the whole ecosystem, as targeted to end users. In distinguishing what constitutes the EVP, authors recommend thinking what 'job' does the combination of complementary products/services in the ecosystem accomplish for the end users; or what exactly is the problem that is solved for the end user. The EVP is at the center of the EPM to mark that all Actors represented on the EPM are either directly or indirectly involved in accomplishing it. Note, however, that it is important to understand the EVP as it is perceived by the end user. This implies that the 'job' an EVP does to the user may be different than what the Actors think it is. Many argue for example that a significant proportion of Tesla Model S cars are not bought for an intrinsic desire to be green, but rather for the status symbol they represent. Market and user research can provide some cues as to the methods used for research what perceived 'job' an EVP accomplishes. Figure 4 represents the core of the EPM: the EVP.

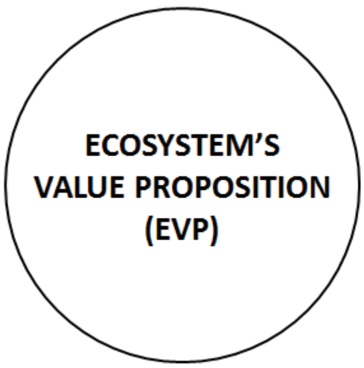

Figure 4. The EVP as the core of the Ecosystem Pie Model

(3) User segments. Classical marketing theory posits that a value proposition is more effective on the marketplace when targeted to sub-sections of the market referred to as User segments. This component of the EPM therefore specifies who the target audiences of the EVP are. For example, for Tesla Model S, the User segments originally were tech-savvy above average wealthy individuals living mostly in California.

Note that we speak here of 'users', rather than customers because the latter implies an explicit transaction (a purchase). While in most occasions the users are indeed expected to pay for a product/service, not in all instances do User segments have to buy the value offering. For instance, in the case of Google's search engine, the value offering of the search is available to users for free, but its existence enables Google to receive revenue elsewhere from a set of actors other than the users of the search engine (i.e., selling advertising space to businesses).

User segment(s) constitute a separate sector (or if there are several distinct segments, more than one) in the EPM. These sectors are positioned last in the clock-wise sequence of the ecosystem pie, representing the positioning of the user as the ultimate target of the networked value creation and delivery logic of the entire ecosystem. Figure 5 depicts the positioning of a User segment.

Users constitute a separate Actor in the ecosystem for three reasons. First, users are important co-creators of value. Namely, it is not rare nowadays for users to be involved early in the product/service development process, providing frequent feedback to how the product/service is developed. Additionally, users can enhance the ecosystem with additional functions such as promoting the offering of the ecosystem to new potential adopters, within, or across User segments. Second, in many ecosystems, users have some degree of choice with regard to which Actors participate in supplying value in their particular instance of use/consumption. In the sustainable driving example, users may choose to be customers of the power grid in public charging spots, charge at the charging spot at their office parking lot, or alternatively purchase their own charging hardware and load their cars up at home. As power prices are typically different in all these three use cases, the dominant choice of users between these three options influences greatly the amount of income to the power retailer and to the electricity supply value chain that is part of the sustainable driving ecosystem. Finally, users can generate transactable value, such as usage data, that some ecosystem Actors can use in providing further value elsewhere in (or outside) the ecosystem. In an ecosystem, value transfer can thus be bi-directional, moving both toward and away from the User segments. In that sense, users contribute often with much more than purchasing power, and value as such can be moving both toward and away from the User segments.

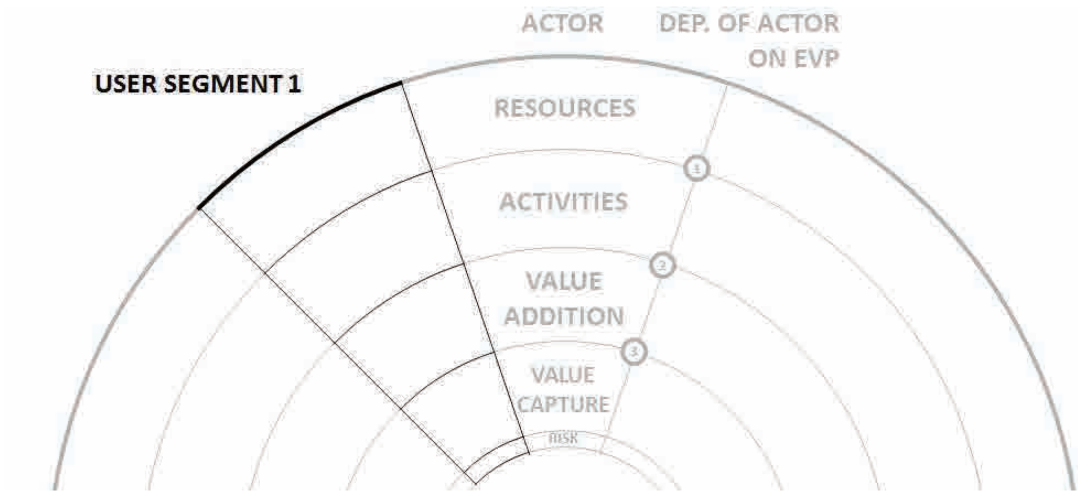

Figure 5. Representing User segments

Actor-level building blocks

Sequencing the Actors, considering what is the EVP they accomplish, and to whom it is targeted delivers to the modeler a key part of understanding what the composition of the ecosystem is (expected to be). But ending the exercise at this stage would have its clear limitations. Most significantly, we have gained little understanding of what exactly is the individual complementarity provided by each Actor; how each Actor accomplishes their contribution to the ecosystem; and how reliable we can expect that contribution to be. Or put another way, it is unclear at this point whether our assumption that the ecosystem composes of these particular Actors is actually sufficient and realistic, or not. In order to increase our analytical power on understanding the ecosystem, as well as to develop real-world implications (such as an ecosystem strategy), it is necessary to learn significantly more about each of the Actors in the ecosystem. Furthermore, in each ecosystem, there are a number of ways that the individual Actors use to interact with each other in activities targeted to creating and capturing value. To represent these important elements of an ecosystem and ultimately to draw implications from the ecosystem modeling exercise, we complement the ecosystem-level building blocks with Actor-level building blocks which are: Value addition, Resources, Activities, Value capture, Dependence and Risk. Again, the exact sequence of considering each of these constructs may differ depending on the particular ecosystem in question. First time ecosystem modelers are advised to consider first either the element of Value addition, or the element of Resources.

(4) Value addition. The EVP is realized as a combination of the complementary offerings provided by the Actors in the ecosystem. From the viewpoint of the whole ecosystem, each of the Actors therefore has a particular contribution to the EVP, which we refer to as the Value addition of that Actor. The Value addition element incorporates the products/services (or support of other kind, such as funding) provided by the Actor, but also the 'job' these accomplish from the viewpoint of the EVP. As a quick test to know if your model is approaching consistency with regard to the overall modulation (i.e., division into individual distinguishable complementary contributions) of the ecosystem, when considering each of the individual value additions provided by the ecosystem Actors, one should get a full list of the complements that together accomplish the EVP. This test should be applied both to considering if each individual value chain within the ecosystem has all necessary elements in place, as well as to whether the ecosystem as a whole has all necessary value chains represented.

(5) Resources. This building block describes the most important assets that form the basis for value creation of a particular Actor. Resources should be perceived in the broad sense here including all kinds of tangible and intangible assets, capabilities, organizational processes, firm attributes, information and knowledge that are available to the Actor for performing value creating activities. Particular Resources can be owned by the Actor in question, but they can also be acquired through other Actors, for example by means of licensing intellectual property. See more about Resource acquisition in a later section 'Relationships'.

Here, it is also important to bear in mind that in considering the building block Resources, as well as subsequent building blocks in this chapter, one should think which elements of the Actor are actually relevant within the particular ecosystem. As such, we would for example include into the Resources section of an electric vehicle battery developer (e.g., Panasonic) not all the resources of that Actor, but only these resources that are basis for developing and manufacturing batteries. That point is particularly important to keep in mind when characterizing larger organizations that maintain many parallel business lines.

(6) Activities. The building block Activities encompasses the mechanisms by which an Actor uses the Resources available to it and generates its productive contribution to the ecosystem. Put another way, we map here the (sets of) activities by which the organization generates its Value addition and insures that it has an opportunity to earn sufficient returns in the process. Activities often cross Actor boundaries and combine with Activities of other Actors. See more about this in the section 'Relationships'.

(7) Value capture. In exchange for subjecting their Resources and Activities (resulting in a Value addition) to accomplishing a particular EVP, Actors are interested in receiving a gain of some kind. This gain can be either financial or non-financial. For example, for a (local) government, welfare of their citizens is a gain that might justify support to a particular ecosystem. On the other hand, for-profit organizations typically assume financial gains, or at least gains that they can ultimately monetize in some way. An example of a direct financial gain might be the sales price received from selling an electric vehicle to a local dealership; while an example of a gain that is not directly financial but monetizable elsewhere might be the usage data that an ICT company acquires within one application, but uses in another application (potentially in a different innovation ecosystem).

The building block Value capture represents what kind of return is the Actor gaining, how does the Actor gain that return, and how much of the return can the Actor gain from participation in the ecosystem. The aim of this building block is essentially to show the mechanism by which the Actor is gaining returns, which can then be assessed whether it is sufficient to insure their participation. In evaluating the sufficiency, the Value capture opportunity for the Actor should be compared to the costs (including opportunity cost) associated with accomplishing the Value addition. This means that Value capture is inherently related to the other Actor-level building blocks. As a rule of thumb, the more an Actor would have to customize their Resources, Activities and Value addition to contribute to the ecosystem, the higher their demand for Value capture is expected to be. For instance, if a software application requires thousands of hours of re-development to be adjusted from one operating system to another, a software development company would likely need a high level of confidence that they can earn significant revenue from their association to the new operating system.

Especially for prospective (yet non-operational) ecosystems, the section Value capture might include thus information in a conditional form, reflecting the minimum expectations of the Actor. An example of considering in the Value capture section simultaneously the questions of what kind, how and how much value an Actor can capture in a conditional manner might for example state:

- What kind: monetary
- How: earning revenue from unit sales to local distributors
- How much: in order for the business to be lucrative, at least 10,000 units per month should be sold

(8) Dependence (on the EVP). Ecosystems are networks which often include Actors of a variety of profiles (e.g., small and large, private and public). For some of these Actors, accomplishing the EVP may be of utmost importance. For instance, if a company produces parts only for Caterpillar tractors, they are highly dependent on the success of these tractors. For others, contributing to a particular EVP is just a small share of the total operation of the Actor. For example, if you consider a car workshop that installs tires from Goodyear, Bridgestone, Cooper, Hankook, Michelin, etc., their dependence on the new products of any of these companies is low, which means that any single tire manufacturer would have to seriously consider how to influence the workshop to invest in new installation equipment that is specialized to just one brand. We speak thus of the level of dependence that an actor has on whether the particular EVP is accomplished or not. In the EPM, this is measured by three levels: L - low dependence, M - medium, and H - high dependence. On the graphical EPM template, the respective grade is marked on the right-side separation line of the Actor by filling in the relevant circle as depicted on Figure 6.

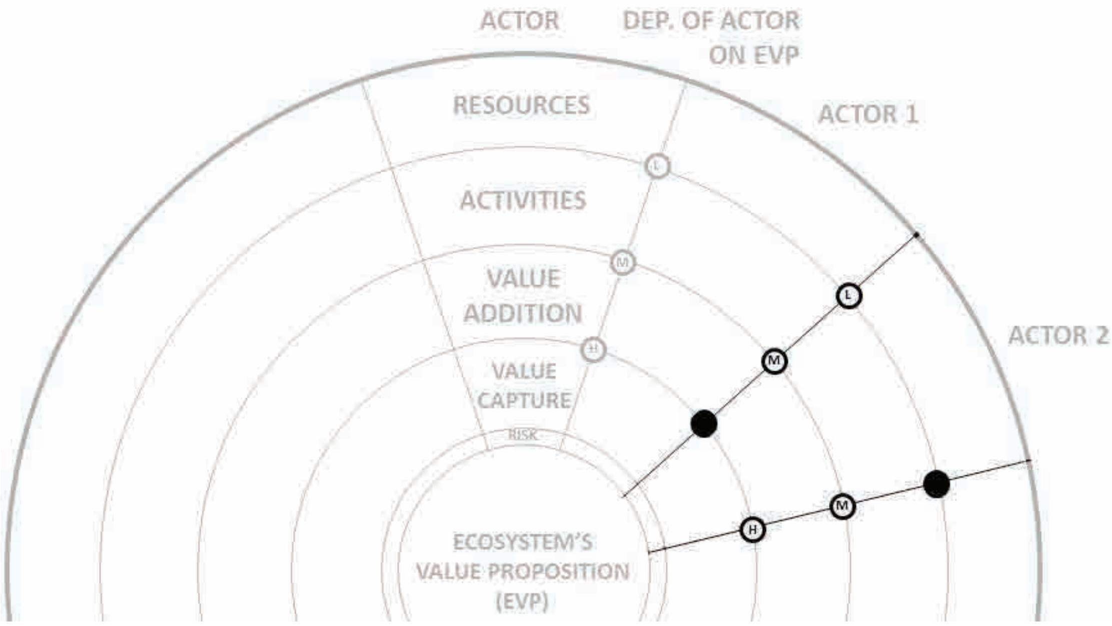

Figure 6. Marking the dependence of actors (on the EVP)

(9) Risk. From the viewpoint of the whole ecosystem and its other complementors, it is critical that all the important Value additions required to accomplish the EVP are indeed accomplished. This condition assumes that the Actors expected to deliver these are both willing and able to provide their productive contribution to the ecosystem. However, unless the assumed contribution is entirely generic (see section 'Actors' for explanation), neither of these conditions should be assumed to exist automatically. Reasons for the assumed contribution of an Actor not to become accomplished include the following. Inability as a dominant reason may arise for instance because the assumed technological solution is too difficult to accomplish, because the Actor experiences restrictions to their freedom to operate from an intellectual property point of view; or perhaps because the Actor has cash flow, staffing or legal problems. Meanwhile, potential sources of unwillingness span at least three categories, including a) low effort (i.e., disinterest) of the Actor, corresponding usually to a low Dependence of that Actor on the ecosystem, b) the necessity of the Actor to invest in resources, activities and/or products/service configurations that are specific to that particular ecosystem and that they could not redeploy elsewhere (i.e., so-called fungibility of the resources or activities) with the associated cost (incl., opportunity cost) outweighing the prospective return of these investments (Jacobides et al., 2018), and c) a mismatch between the characteristics of the ecosystem and the strategic interests of the Actor. An example of the latter might include for instance a disagreement on which Actor establishes the technological (or relational) standards in the ecosystem, how the ecosystem as such is likely to change the competitive landscape in the industry and/or even whether the facets of the particular ecosystem match the vision of the entrepreneurial team of the Actor on the positioning of their organization in the industrial landscape. As such, Risk is in fact influenced by all the other Actor-based components.

With regard to the potential inability of the Actor to accomplish their value addition, we advise modelers to focus on considering if the Resources and Activities of that Actor really correspond to the assumed Value addition. Meanwhile, in assessing the willingness of the Actor to contribute, one should consider whether the Actor possesses a Value capture mechanism that enables the Actor to reap enough gain from the ecosystem; and whether the actor is sufficiently interested in accomplishing their respective Value addition for sake of the particular ecosystem in comparison to the other alternatives available to that Actor (consider here their Dependence on the EVP). In doing so, one should also keep in mind that even though there may be a viable Value capture mechanism that would allow a particular Actor to reap gain from the ecosystem, they may be able to capture even more value from complementing to a a different ecosystem.

Across the willingness and ability evaluation, the building block Risk is a compound assessment about the likelihood of the Actor to be contributing the Value addition that accomplishing the EVP would assume from them. Risk is represented on the EPM by filling the respective section in with a specific color (e.g., red - high risk, yellow - medium risk, green - low risk), although it can further be specified in words, or by a percentage-based grade which stands for the likelihood of the Actor to be both committed and able to contribute to the EVP in the assumed way.

Adequate risk assessment is among the most critical inputs to developing an ecosystem strategy. Thus, if there are Actors characterized by high or medium Risk, it may be a good idea to mark down a separate explanation aside of the graphical EPM on how a particular color code was assumed. This generally helps greatly at later managerial decision making on necessary action. The works of Ron Adner (Adner, 2006 and 2012) are especially valuable in operationalizing the Risk construct in ecosystem strategy-making. In particular, Adner established that once we have assessed the Risks of all the critical Actors in the ecosystem, the overall likelihood of the EVP to come together is calculated by multiplying the individual likelihoods of each critical Actor to accomplish their part. For example, in an ecosystem consisting of six critical Actors whose contributions are necessary for the EVP to be accomplished, if each of the Actors has a likelihood of 80% to contribute their Value addition, the ecosystem as a whole only has a 26.2% likelihood (i.e., 0.8^6) of accomplishing the EVP. In performing analysis of this kind, it is important to think twice if indeed an Actor is critical to the EVP, or it provides a contribution that enhances the value of the EVP without really being critical. On the EPM, those Actors supplying critical complements are marked with a red asterisk (*). For the sake of actually calculating Risk mathematically, an ecosystem modeler would have to convert the initial green (low Risk), yellow (medium Risk), red (high Risk) assessment to a numeric %-value. This, however, constitutes an advanced level of ecosystem analysis which assumes a very good understanding of the Risk profile of each involved Actor.

Finally, note that a common mistake in modeling ecosystems is to think of Risk in the meaning of 'risk of the ecosystem TO THE ACTOR' (i.e., whether it is risky to be involved in the ecosystem). This, however, is not the correct way to conceptualize Risk. In modeling the ecosystem by EPM, the Risk grade stands for the 'risk OF THE ACTOR to achieving and maintaining the EVP'.

All the Actor-level building blocks are represented in Figure 7.

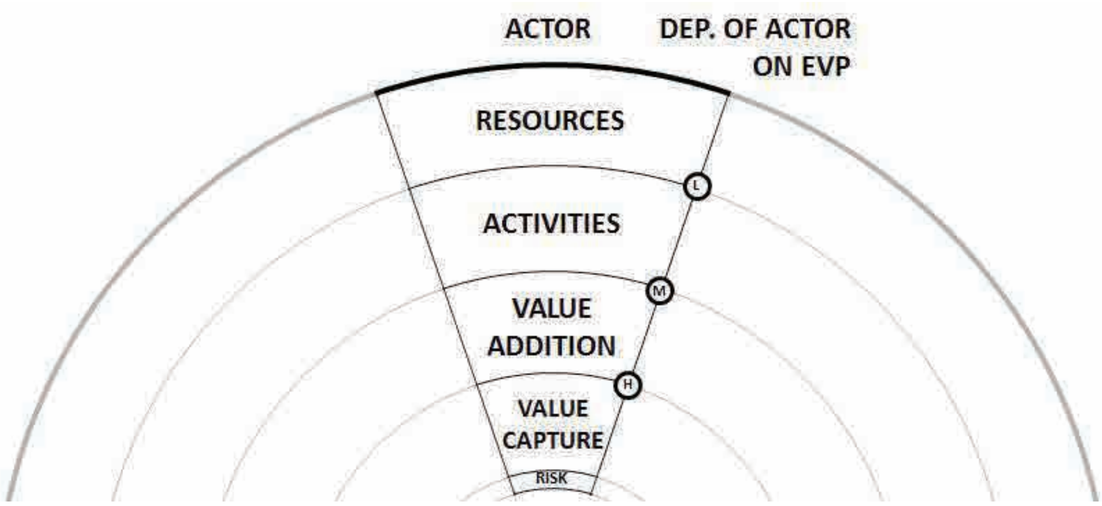

Figure 7. Actor-level building blocks of the EPM

Relationships

As was perhaps evident already in previous sections, the building blocks of the EPM influence each other across Actors, as well as within the boundaries of each Actor. To make these relationships more explicit, we represent here first all the intra-actor relationships on Figure 8; and proceed then to review how certain Relationships connect ecosystem building blocks by spanning Actor boundaries.

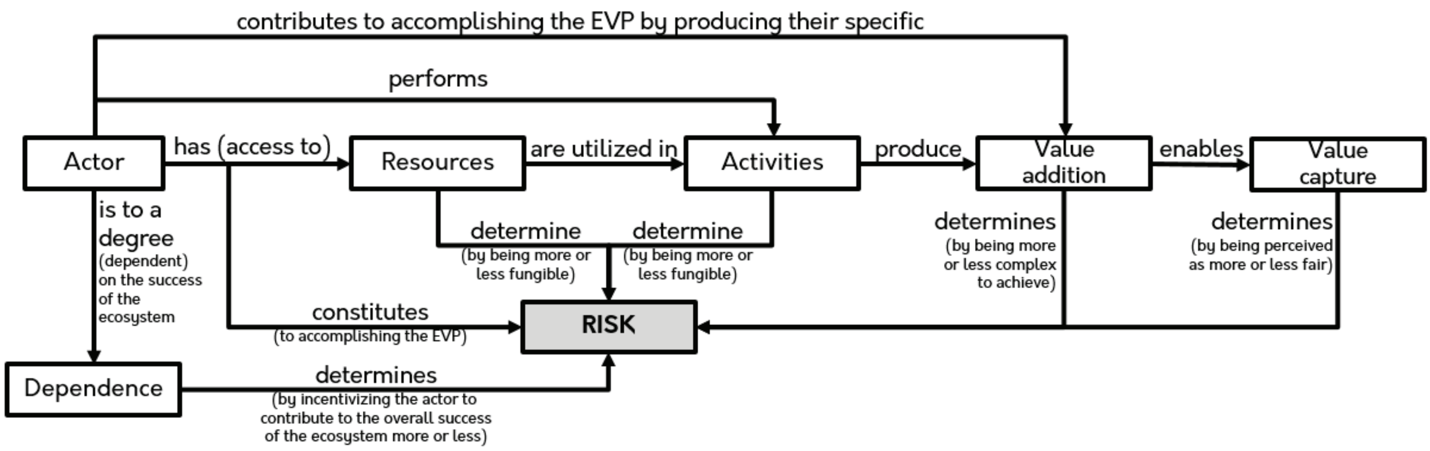

Figure 8. The relationships between actor-specific building blocks

Across Actor boundaries, the building blocks can be related in the following ways. First, the Value additions of the actors combine to the EVP either by the end user, such as the charging grid and the electric vehicle; or in the exchange of the Actors in the ecosystem, such as when the battery is incorporated in the electric vehicle. Second, Resources from different Actors can be shared or combined to enhance the ability of any particular Actor(s) to create value. Third, the Activities of an actor are typically boundary-spanning, combining with the Activities of other actors. For example, the activity of developing a higher capacity battery associates with the efforts of the electric vehicle manufacturer in developing the technical specifications of the rest of the vehicle; in which case there is a bi-directional information flow between the two actors. Fourth, because the finite amount of value created in the ecosystem is distributed based on the individual revenue model of each Actor and the ability of an Actor to enforce their revenue model in the face of the other Actors, the Value capture of an Actor is influenced by the Value capture of other Actors. For instance, toward a particular target price per cup of coffee, the revenue model for a coffee machine producer and the revenue model of coffee capsules (as coming from another producer) are interdependent. There is thus potential struggle between the parties to capture more value to themselves. Finally, the Risk level of Actor(s) may influence the Activities of other Actors and consequently the Value addition and Value capture properties of Actors, and the whole ecosystem.

On the EPM, both the intra- and the inter-actor relationships can be indicated by uni- or bidirectional arrows that connect elements of the model, emphasizing a relationship between them. However, representing all the applicable relationships with arrows is clearly excessive for two reasons. First, in each value chain in the ecosystem within which components are incorporated or transformed into new products/services, transfer of value is already indicated in the positioning of Actors in a clockwise manner. Second, in most cases, the content input in a particular element would already explain related Relationships. For instance, you might write into the Activities cell of a biogas factory: “using biologic waste in their refinery, biogas is produced” referring to the Relationship that the refinery takes biologic waste as input. Arrows have a tendency to complicate the model, so we suggest limiting the number of represented relationships to the most relevant and/or these potentially least comprehensible without explicit representation. A good test here is to consider if a particular relationship would already be implicit in the general principles of modeling by the EPM tool. An example of how relationships might be shown on the EPM is presented in Figure 9, based on the Tesla example from previous sections.

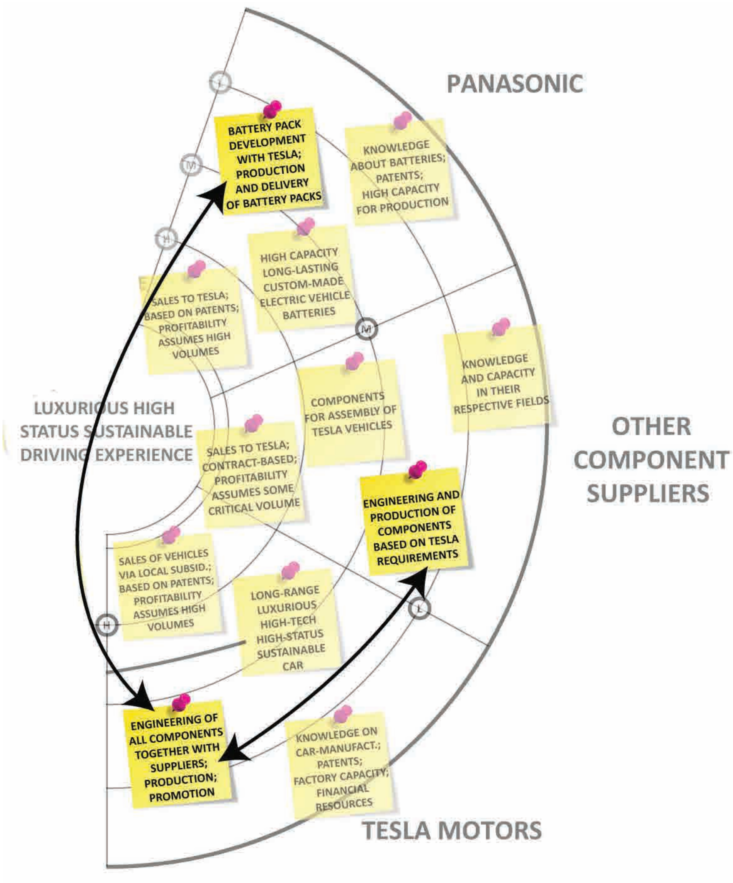

Figure 9. An example of relations between the Activities of Actors

A second example (Figure 10) shows how the transfer of Value additions might be represented by arrows as well. Here we see that there are two critical complementary value chains that together achieve a green driving experience – accomplishing the car and the charging infrastructure; and that these value chains are combined by the end user where they together enable the EVP. This would probably also be intuitive to a reader, but since the point is vital to analyzing the ecosystem properly, it might be worth explicating with arrows.

It is worth paying attention also to something else featured on Figure 10. Namely, that the Actors involved in achieving these **two complementary value chains are color-coded respectively to yellow and green**. Depending on the complexity of the ecosystem, there may be any number of such value chains. You can distinguish each value chain by color-coding with the same color these Actor sequences where Value additions are being carried from upstream Actors towards the User segments by transfers between Actors. On Figure 10, we have separated the electric mobility ecosystem into two distinguishable value chains since the vehicle value chain does not have any transfers with the local grid companies supplying the electricity and the charging points.

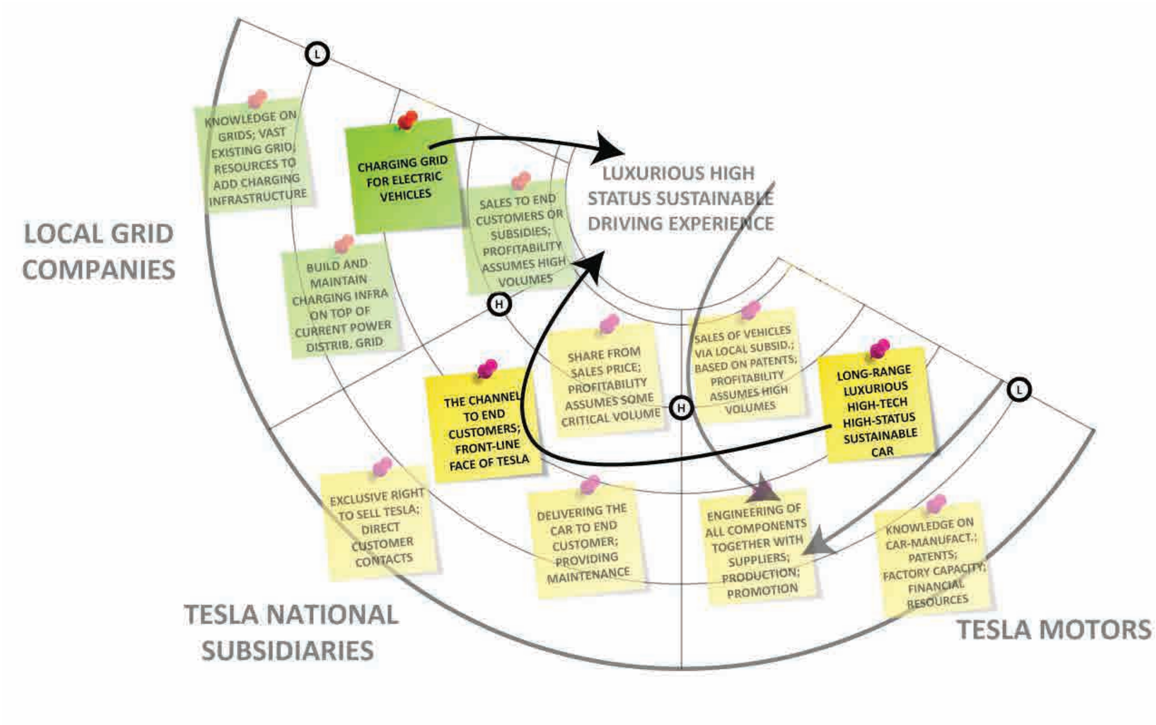

Figure 10. An example of product/service flows

The final EPM on Tesla with all the components present is seen on Figure 11. Because this is already a functional ecosystem that has been operational for several years, there is little concern over the Risk of individual Actors. This with one exception. Namely, we have still coded the Risk assessment for Local Grid Companies as yellow. While electric vehicle are adopted more and more, the existence of a sufficient charging grid appears to be one of the issues still hampering vehicle adoption in many geographies. The grid companies around the world are currently not always incentivized enough to develop a full charging grid because in the absence of a major fleet of electric vehicles, their immediate revenues from electric vehicle charging would not be worth it. Furthermore, EVs are known to create grid imbalance, which is a major problem in the electricity supply chain. Therefore, grid companies are generally cautious in enabling additional EV charging points. And yes, to provide a way out of this 'chicken-egg' problem, some governments have already heavily subsidizied charging infrastructure set-up, but that may be a shaky revenue source for local grid companies because subsidies are subject to policy and policy can change. Hence also the yellow assessment.

In fact, on the question of charging, Tesla provides an example of how ecosystem analysis can influence innovation strategy. Namely, because the public charging infrastructure often is underdeveloped, Tesla has chosen to internalize the offering of the necessary complementary good of EV power supply by innovating in two additional directions: a) they have developed a home charging unit for Tesla owners, and b) they have developed a proprietary fast charging network which is operations in some select geographies.

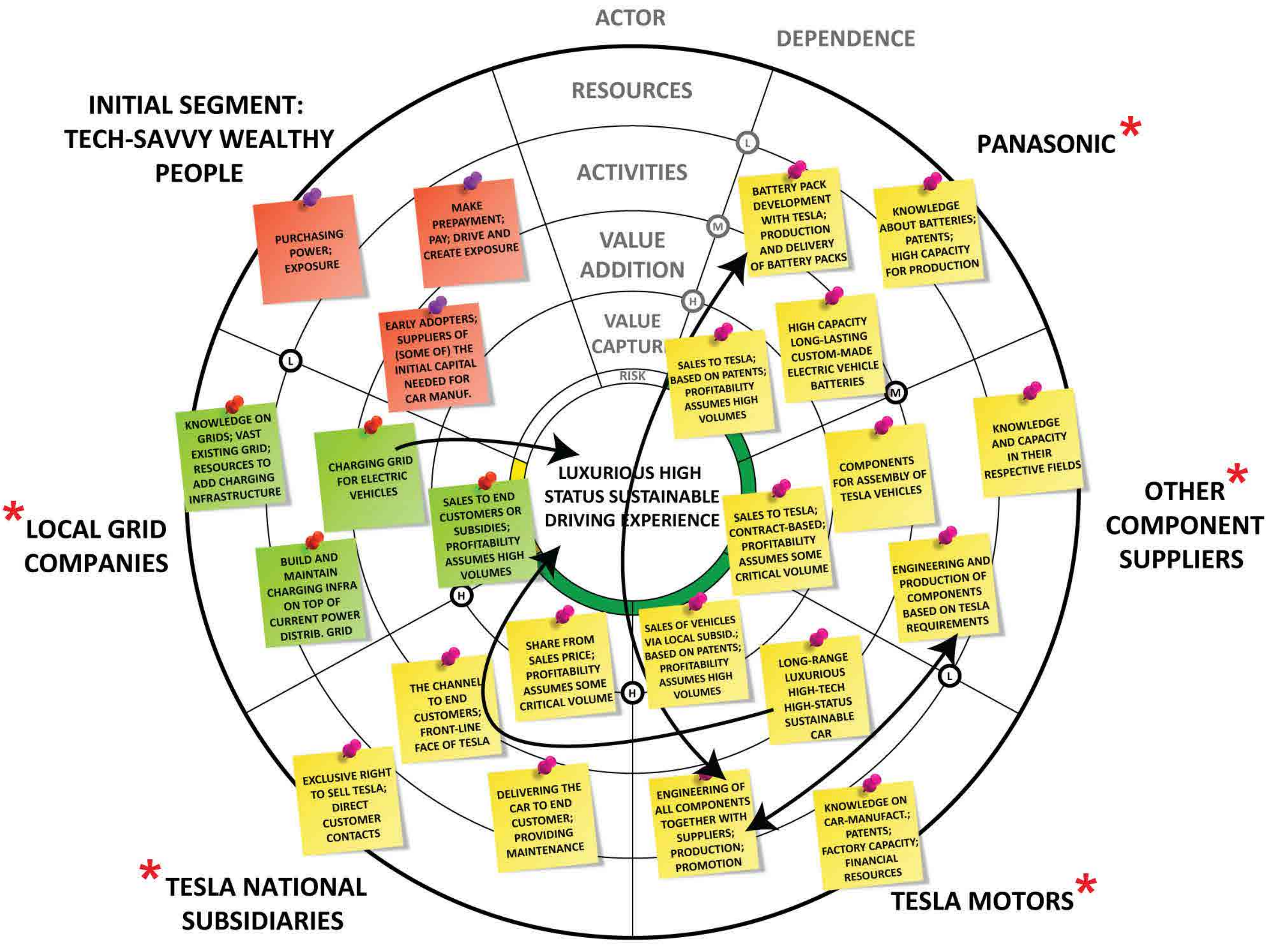

Figure 11. Full EPM for Tesla Model S (this is a repeat of Figure 2)

EPM examples

In this section, we present three additional examples of EPMs.

Example #1 – modeling ecosystems prospectively

The first example involves a novel process for storing (renewable) power in liquid form, developed at a Dutch university. The generic nature of this technology made it possible to commercialize the invention in a number of different application areas. However, it was also clear that in all of these possible applications, wide-scale adoption of the technology could only be achieved with a substantial shift in the activities of incumbent actors. The team developing the technology considered this to be a major barrier. Nevertheless, a spin-off from the university was created to (try to) bring the technology to the market in such a way as to increase the chances of its adoption. The team engaged in ecosystem modeling by using the EPM, with a focus on considering multiple ecosystem alternatives for the commercialization pathway of the technology. Three of these alternatives were positioned within the domain of mobility (i.e., using the technology in city public transport, in trucks, or in boats) and another one in power storage for use in buildings. We focus here on modeling one of these applications and present a sequence of graphs (Figures 12-18) which follow the thought process of the technology team at modeling that scenario. The seven steps taken by the team in using the EPM are outlined in Table 1.

Table 1. Steps in the EPM process

Steps in process	**Description of step**	**Addition to EPM**
Step 1 (Figure 13)	The team considers first its own characteristics and openly asks: what could our technology be used for?	General characteristics of our organization as related to the new technology.
Step 2 (Figure 14)	In this scenario they decided to test out a potential ecosystem design of potential uptake of the new technology in public transportation. This implies a market segment of local inhabitants.	Potential EVP and corresponding User segment. Dependence for focal Actor considered high.
Step 3 (Figure 15)	Choosing public transportation also implies the existence of operator companies, who receive their mandate from a particular municipality. For that purpose, municipalities typically organize a tender. The team realized here that for the focal venture, the potential sustainability conditions in that tender may provide an opportunity for eventual uptake of their technology.	Characteristics of the customer-facing final Actor in the adoption chain (operator), and the actor to provide their mandate (municipality). Focal actor characteristics specified to public transport scenario.
Step 4 (Figure 16)	Assuming the operator company generates market pull for more sustainable buses, a bus manufacturer could in principle consider the uptake of the technology of the focal venture. However, if they did, the focal venture would lack manufacturing capability to produce the necessary energy conversion module so a chemical equipment manufacturer would need to be added in between.	Adding two missing middle Actors to the main value chain.
Step 5 (Figure 17)	Despite the bus value chain being complete, the ecosystem overall is not yet complete due to the lack of fuel supply. A parallel value chain must therefore be added, including Actors in producing the fuel and in enabling its tanking to buses.	The value chain for supplying the main critical complementary product to vehicles (i.e., the fuel).
Step 6 (Figure 18)	The team considers each Actor from the point of view of the EVP and determines that the Dependence and Risk assessments of multiple Actors are potentially problematic for future uptake. These problems would require special attention from the technology team in the future, especially concerning critical Actors.	Risk and Dependence grade added for each Actor. Critical Actors emphasized with red asterisk.
Step 7 (Figure 19)	Implied in the argumentation earlier are several enforcing relationships that (in theory) could make the ecosystem function successfully. These include for example the way a political decision for much more sustainable city transportation could trigger several other Actors to new kind of behavior.	Select Relationships emphasized on the EPM.

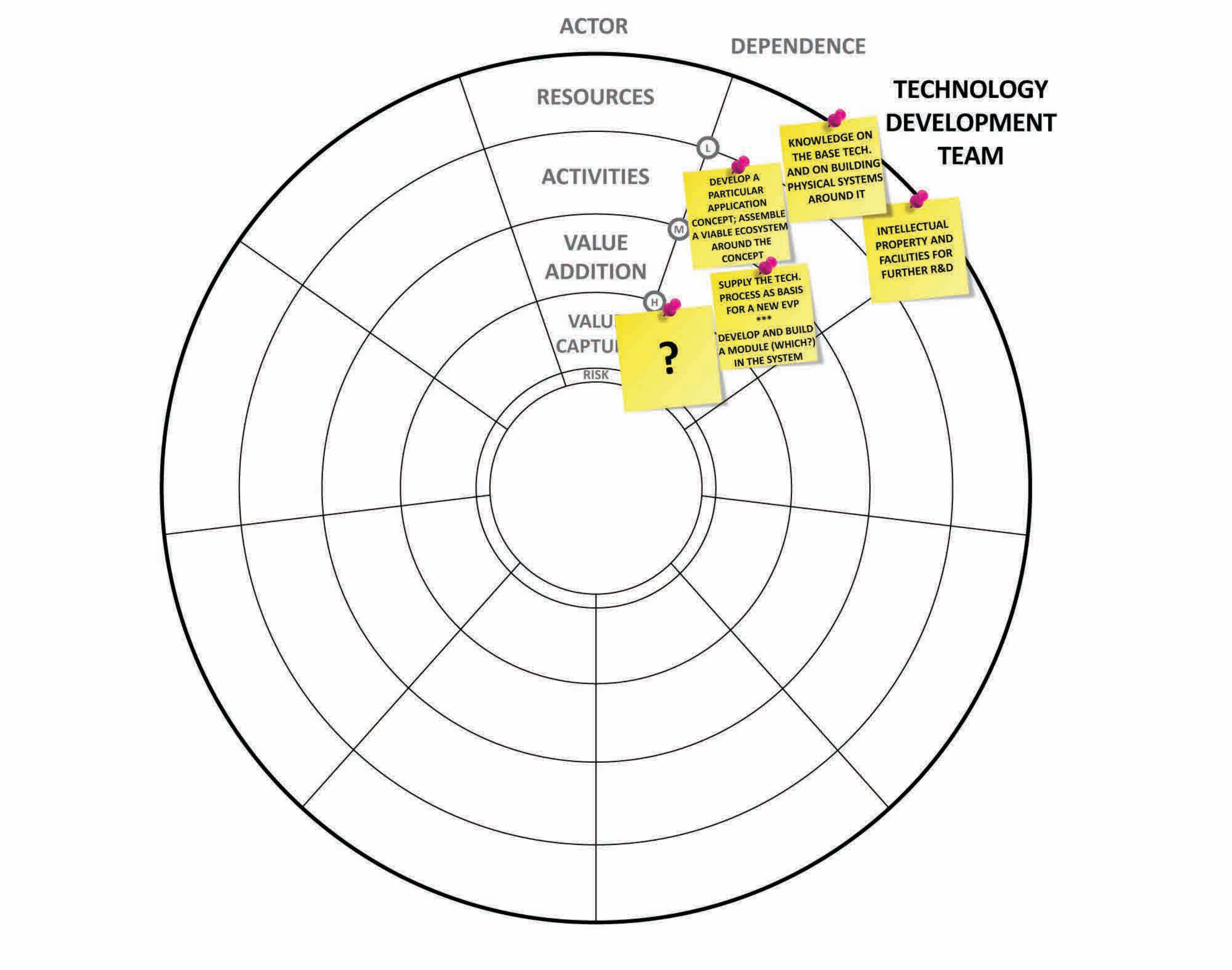

Figure 12. General characteristics of the focal venture mapped

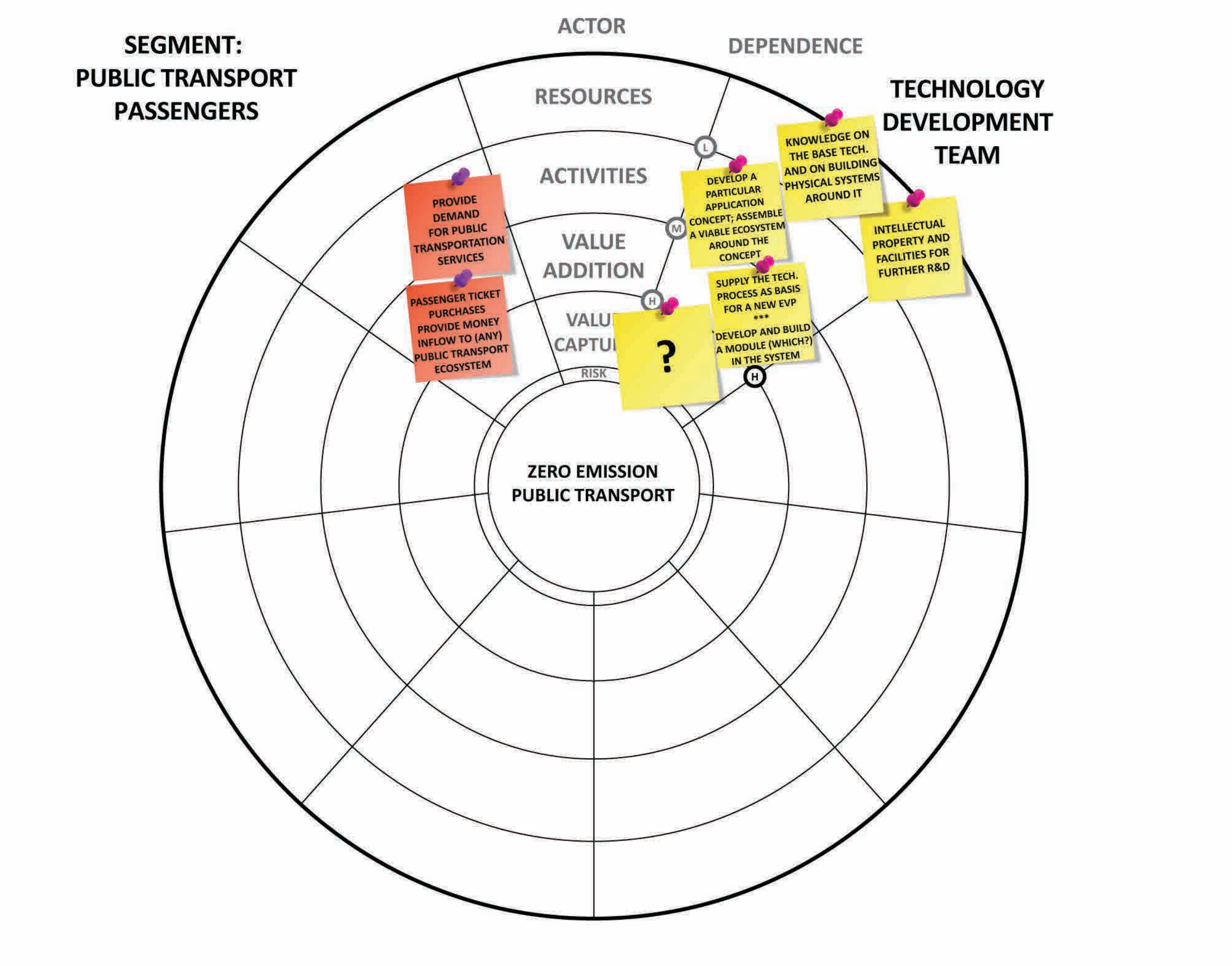

Figure 13. Added EVP and User segment for a particular application which defines this scenario

Figure 14. Adding the direct customer-facing Actor and the origin of their mandate to operate

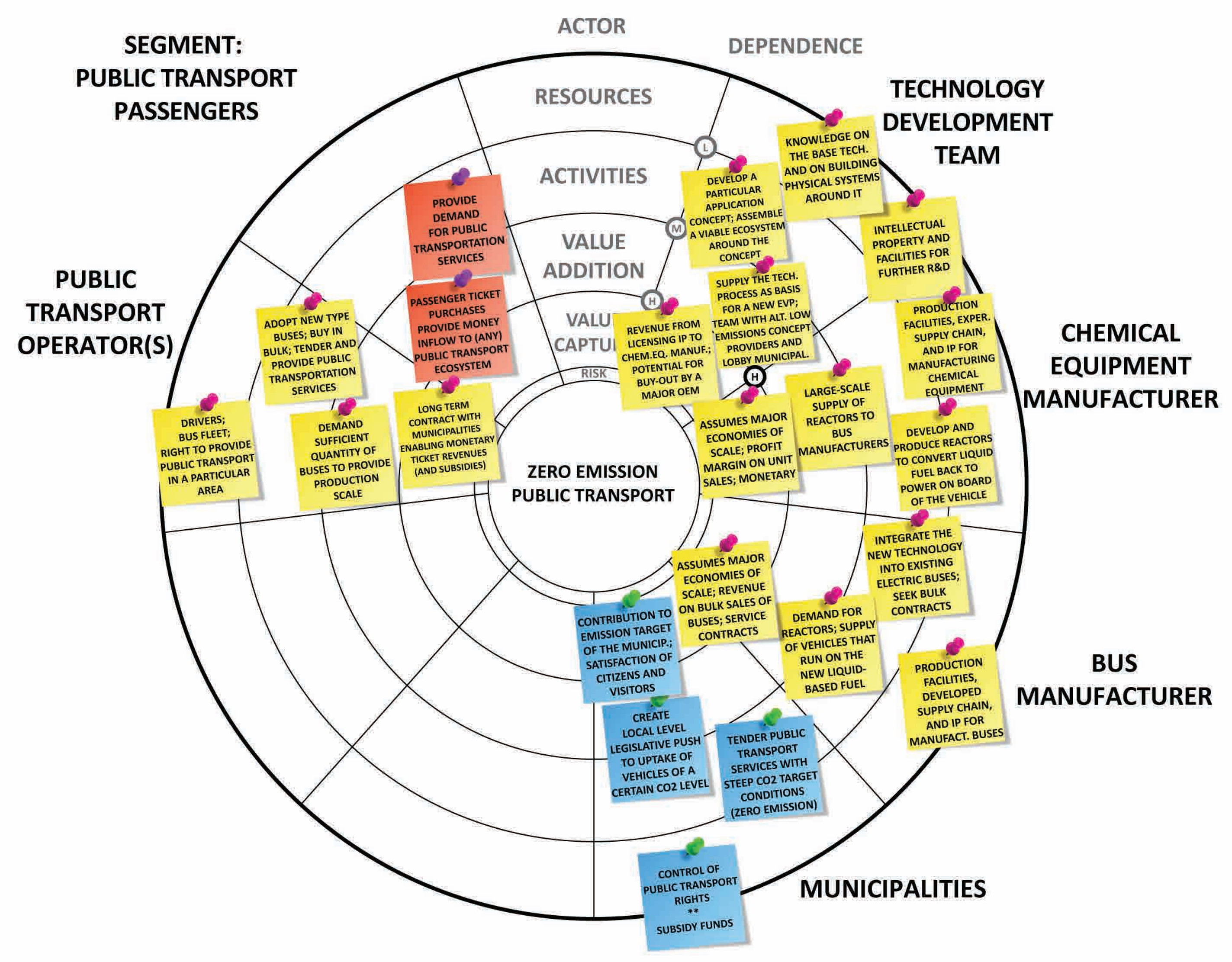

Figure 15. Finalizing the main stages in central value chain (i.e., vehicles + operating them)

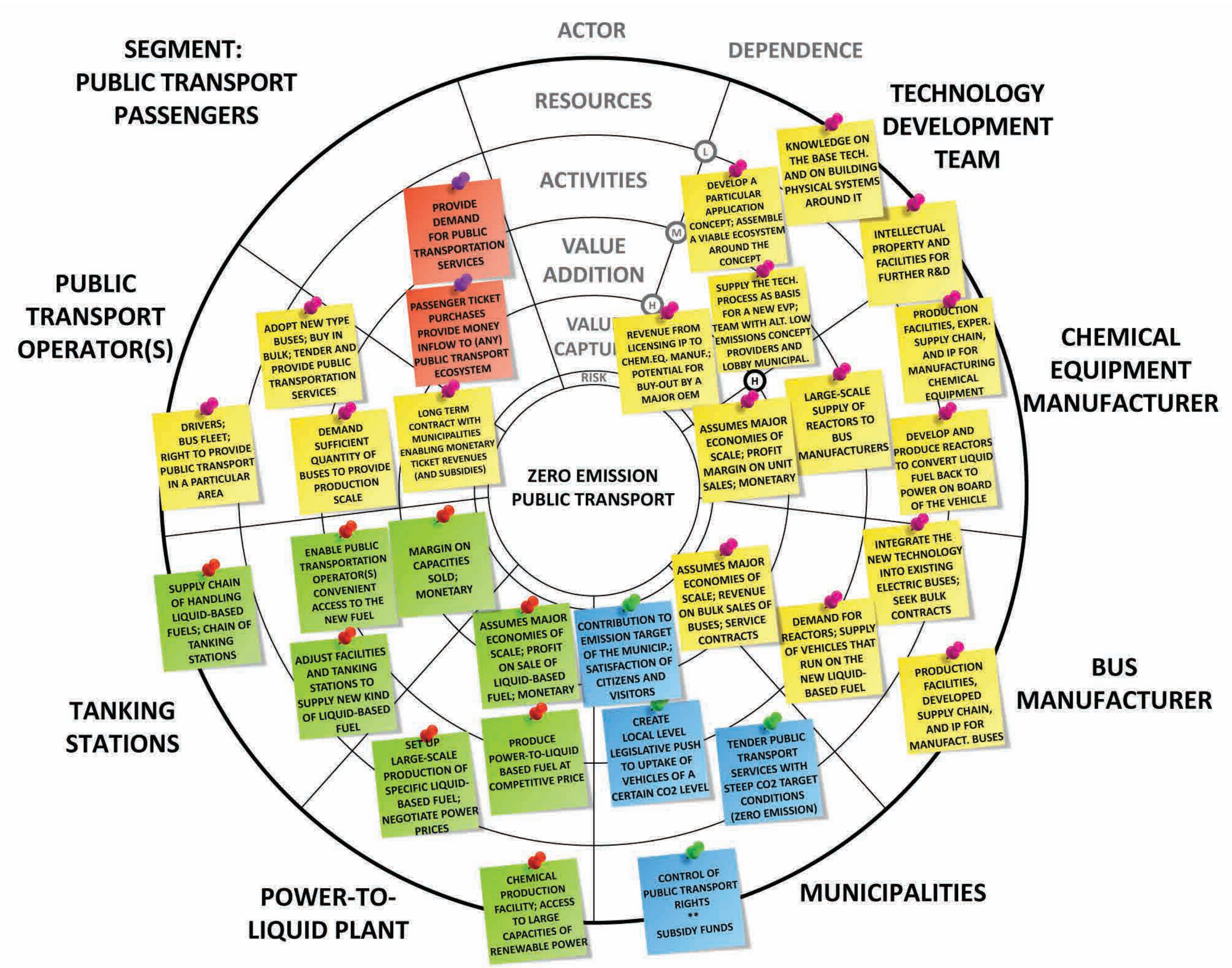

Figure 16. Adding a parallel value chain for fuel supply

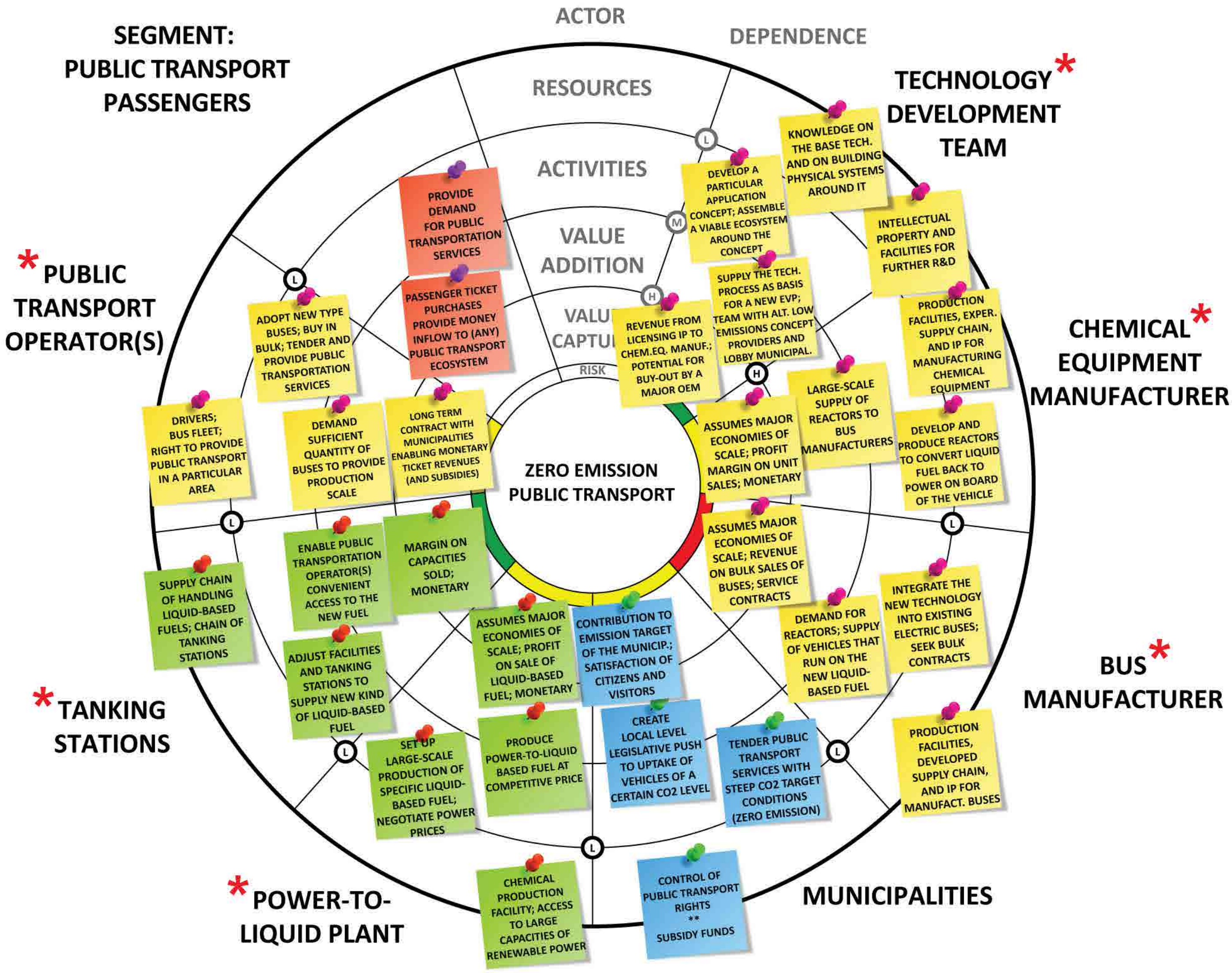

Figure 17. Considering Risk and Dependence of each Actor

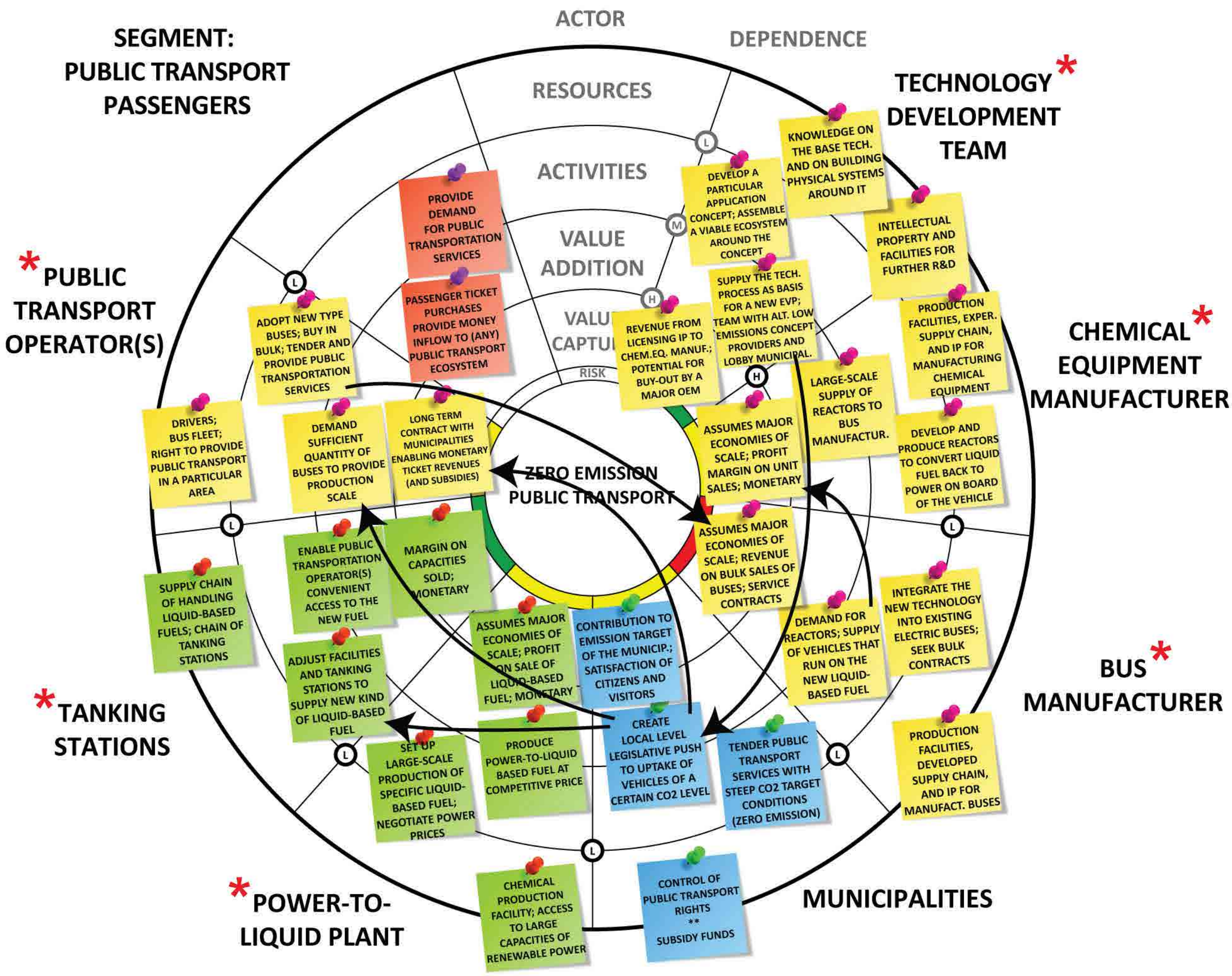

Figure 18. Adding relationship arrows to emphasize certain key mechanisms in how the ecosystem could become operational

Example #2 – modeling an ecosystem to reflect and redevelop it

The second example originates from a managerially oriented instance of ecosystem modeling where the purpose of the exercise was to evaluate the effectiveness of a nascent ecosystem constellation in order to develop strategies for its improvement. Here, the modeling is in that sense both retrospective/descriptive as well as prospective/prescriptive at the same time. The results of the backward-looking exercise in analyzing what was already a functional ecosystem are included in Figure 19, while Figure 20 outlines a potential intervention to the functional ecosystem.

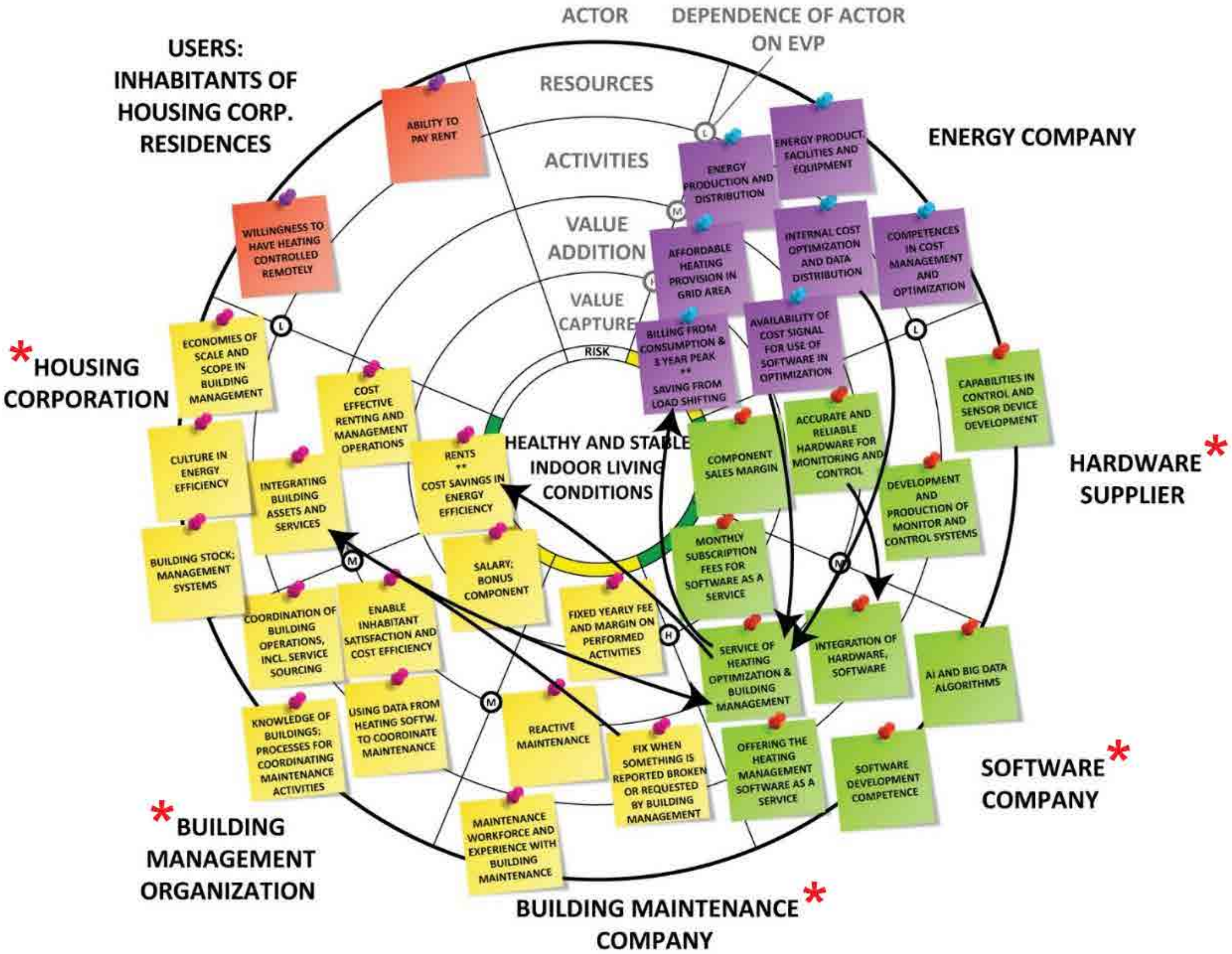

Figure 19. The innovation ecosystem at the end of a pilot period of a new heating service

The case originates from the pilot period of a nascent ecosystem in the field of demand side management in residential heating. Namely, in collaboration with a manufacturer of automation and communication equipment, a software company in Finland developed a software-hardware package (henceforth: 'solution') that landlords can implement in their properties for automatic heating control, based simultaneously on the conditions in the building (the demand) and the prices on the energy market (the supply). The solution provides stable and healthy indoor conditions, while delivering energy savings to the landlord, as well as grid balancing capacity to energy suppliers. Because accomplishing the full potential of the demand response functionality of the solution assumes swift removal of any faults in buildings, as a necessary complementary functionality, the solution also performs fault detection in building elements and sub-systems.

The solution was adopted by a major housing corporation and implemented over a two-year pilot period. Ecosystem modeling was used here as a reflection upon that period to summarize any structural shortcomings in the ecosystem composition, and then to consider strategies for alleviating any issues. One identified shortcoming concerns the use of data from the solution to improve actual maintenance. The modeling exercise indicated three likely reasons: (1) the maintenance organization lacks the competencies to analyze the rich data; (2) the maintenance organization is not incentivized toward energy efficiency by their contract structure; and (3) while the solution data would allow for proactive maintenance, the value capture logic of maintenance organizations leads them to reactive maintenance only. Second, members of the building management organization who govern maintenance operations found it difficult to work with the solution, underperforming on their task to coordinate maintenance in an accurate and timely manner. Third, responsibilities between the Actors were somewhat ill-determined. For instance, there have been unnecessary site visits where representatives of the software company or the maintenance organization were present for failures in each other's domain.

While the pilot was still rather successful, these shortcomings collectively prevented it from reaching full potential, particularly with regard to delivering the total cost savings. The modeling process here entailed first mapping the ecosystem as it was structured during the pilot (Figure 19), analyzing the shortcomings of the existing system and then proceeding with identifying alternatives for how the ecosystem should be restructured. In particular, three alternatives to restructuring were identified.

Figure 20 presents one of these three alternatives where the intervention would entail the introduction of an additional actor to the ecosystem to take over these tasks of the building management organization and the maintenance company that concern interacting with the solution. Referring to this actor as the 'Technical maintenance organization', it would include personnel and tools specifically tuned for proactive (as opposed to reactive) building maintenance and timely repairs based on full utilization of the data generated by the solution. Correspondingly, the organization would be compensated based on the achieved performance of the buildings. As such, the responsibilities concerning the solution would be shifted to the new actor, reducing the dependence of the ecosystem on the previous underperformers.

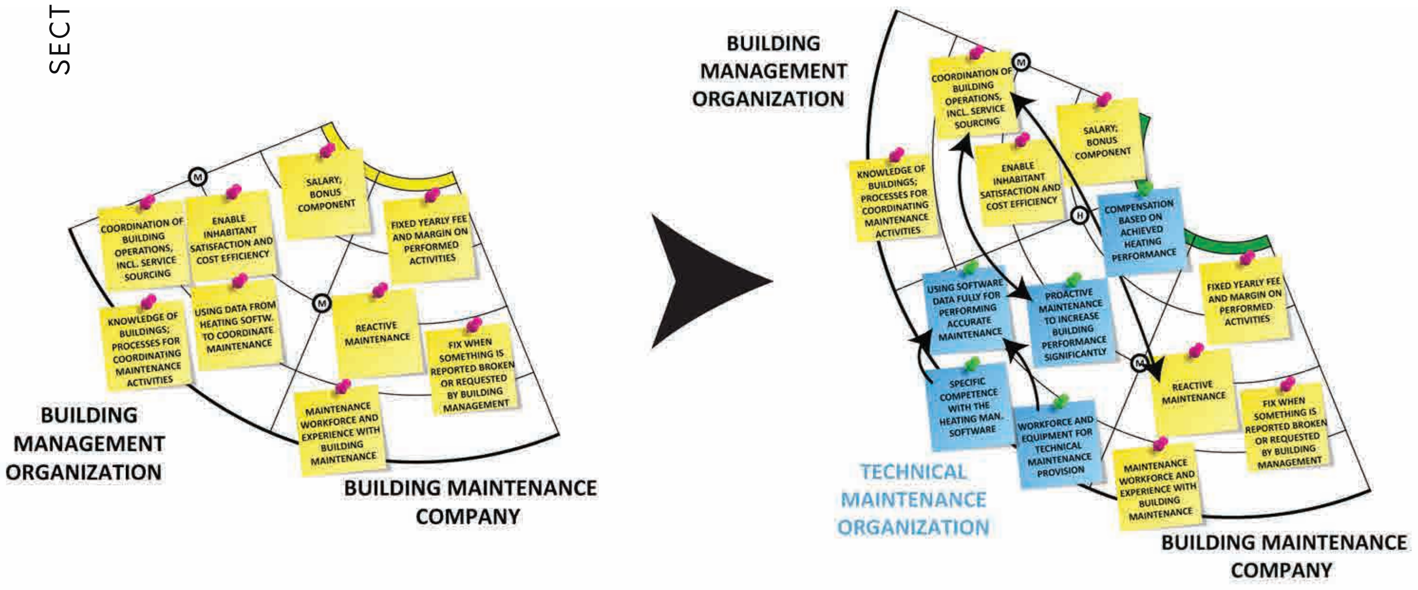

Figure 20. An alternative for restructuring the ecosystem

Example #3 – modeling ecosystems descriptively to learn and compare

To illustrate a third major use context for the EPM, we present here an academic/educational example where the EPM is used to model two existing ecosystem constellations for the purpose of describing and comparing them. This means the exercise was purely retrospective and performed from the point of view of an outsider to the ecosystem. In particular, we observe here how two ecosystem integrator firms—a recent entrant and an incumbent, both in the position of energy retailers—achieve a similar value proposition toward similar market segments, but do so via structurally different ecosystem compositions. The firms are respectively referred to as EneRe1 (Figure 21) and EneRe2 (Figure 22).

EneRe1 maintains a market platform where a prominent feature is the choice provided to consumers on which exact sustainable energy producer to buy their energy from. As such, energy is effectively decommoditized by creating a previously missing link between the profiles of agents on either side of the market. This implies a mutual agreement on transparency and assumes an added effort on the supply side in profiling themselves. The supplier side of the market is populated here predominantly by farmer-entrepreneurs, who require substantial quantities of energy themselves, but not necessarily at the same moments when generation assets, such as wind turbines or solar panels, are actively producing. The participation in the market platform of EneRe1 provides the farms with an effective means to hedge against this intermittency of renewable (power) generation: sell upon excess and buy upon shortage. Furthermore, the premium priced purchase contract provided by EneRe1 gives suppliers a clear incentive to invest in capacity exceeding their own needs. Meanwhile, in actual purchases of energy, EneRe1 relies on a B2B broker firm, which acts also as consultant to the supply side in investing in new generation assets. However, EneRe1 places little emphasis on empowering the household level consumers to become energy prosumers, or to invest in generation assets on their own properties.

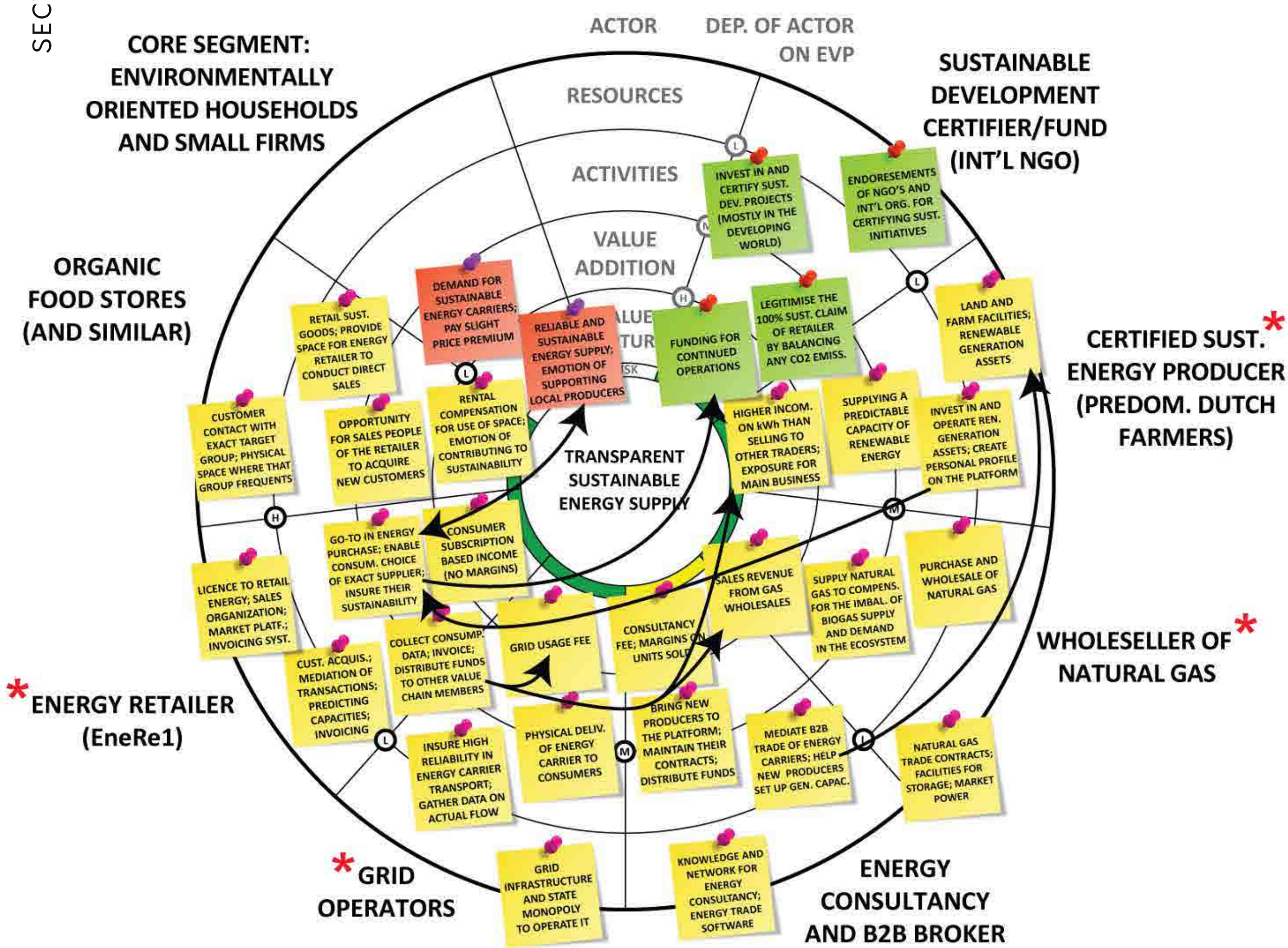

Figure 21. Ecosystem of a recent entrant energy retailer (EneRe1)

Meanwhile, in delivering a very similar value proposition, EneRe2, has sought different kinds of strategic partnerships. First, in partnering with a crowdfunding platform, they mediate the possibility for consumers to collectively purchase large scale renewable generation assets, the return on investment of which effectively reduces the energy bill of the consumer. For this scheme to work, however, the consumer must have their electricity contract with EneRe2. Here, we find thus a complementarity between the value capture mechanisms of the energy retailer and the crowdfunding platform. Similarly, EneRe2 uses its direct relationship with consumers to mediate the installation of micro-generation assets and efficient appliances. Both of these activities are preceded by consultancy of EneRe2 toward the consumers with regard to assessing the potential benefits of such equipment. As such, EneRe2 is particularly active on the demand side of the market, empowering consumers to become prosumers and/or to reduce their energy consumption.

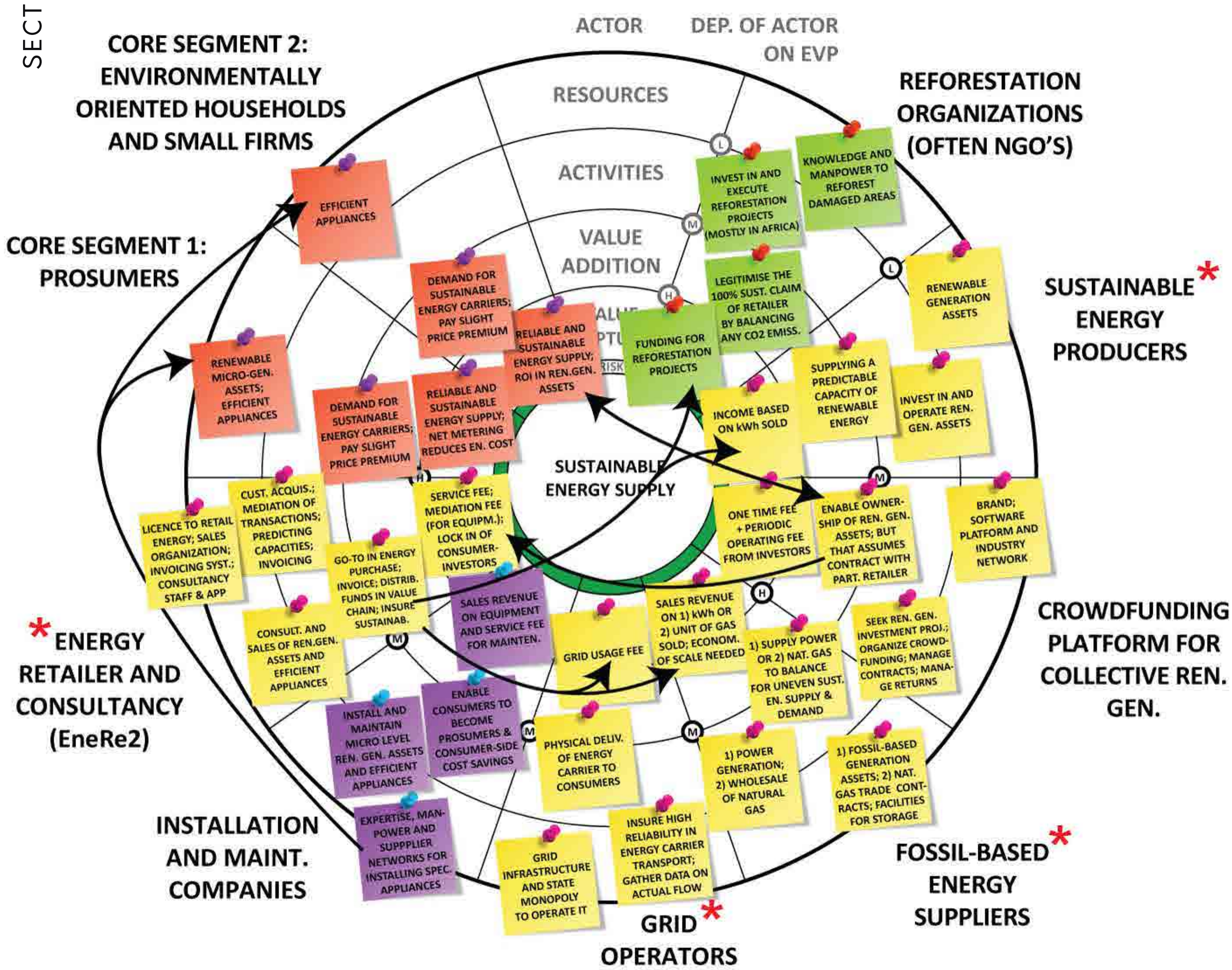

Figure 22. Ecosystem of an incumbent energy retailer (EneRe2)

Finally, because demand of renewable energy is not always matched by immediate supply, both retailers have partners supplying fossil fuel based energy. This is in obvious friction with the value propositions of providing 100% sustainable energy. There is thus a need to compensate somehow for the use of fossil fuels, which is done by channeling the price premium received from consumers on sustainable electricity to supporting sustainability projects. For both EneRe1 and EneRe2, such projects are located in developing countries, though the parties on the receiving end of the support link are different.

FAQ

How to model ecosystems as an external observer?

Modeling with EPM requires a relatively thorough understanding of the way each Actor conducts their business, but also how the ecosystem as a whole operates (or, is expected to operate). Modeling an ecosystem that involves an industry and/or Actors that are not well known to you can therefore be challenging. The best approach in this situation is probably to gather data from more than one of the Actors (ideally all of them) and attempt to combine them together to a holistic view of the ecosystem. Interviews with the representatives of the Actors are particularly useful for that purpose. Meanwhile, it is quite likely that an interviewee is not familiar with the 'innovation ecosystem' concept. While not exactly accurate, a strategy for the interviewer might then be to ask first about the 'value chain' of the company. This is a term that practicing managers are usually better acquainted with. It will not immediately provide a complete picture of the ecosystem, but when complemented later by a question about important 'parallel value chains', a more complete picture of the entire ecosystem can start revealing itself. Other useful questions in ecosystem-oriented interviews include for example: "Who else needs to succeed so that your product/service would become successful?" or "What would have to happen in other organizations so that you could become successful with your innovation?"

How to model an ecosystem that does not yet exist?

As is depicted also in Example #1, one of the major application areas of the EPM is the design of a new ecosystem. That means composing a constellation that does not yet exist in real life, most often in order to accommodate the success of a particular innovation that our own organization is attempting to develop and commercialize. There are at least two approaches to model ecosystems in a forward-looking exercise. First, if you are designing an ecosystem for an EVP that is in some other form already accomplished by an existing ecosystem constellation, the basis for a new ecosystem might be found in first modeling that other ecosystem, and then reconfiguring it towards a novel one. For instance, if the modeler represents a company that has invented a new kind of bus for public transport (example #1), they might first map the current public transportation ecosystem. Subsequently, the exercise might involve conceptually removing the current bus supplier and replacing it with one of their own, considering carefully the implications and strategies for doing so in real life. As such, the modeling process would essentially follow the expected real-world process of change in an existing network.

Alternatively, an ecosystem might be established around an EVP that has no current analogy. For instance, the EVP built by the company AirBnB constituted the creation of a market where there previously was none - i.e., remotely organized short-term stay at the property of another individual. In such an occasion, the consideration of which Actors in which kind of structure are necessary to accomplish the EVP can necessitate an entire business development exercise. Significant analysis of user needs and/or current market failures may be needed in order to put together an ecosystem constellation and it is particularly likely that the mapping exercise would benefit from modeling out more than one ecosystem version or scenario, which differ in terms of the features of the ecosystem and/or the implications it would have to accomplishing it in real life.

How to use the EPM in a physical workshop?

There are at least two effective techniques to use the EPM model as a physical (as opposed to a digital) modeling tool. Probably the most straightforward of these is to simply print the blank canvas out on paper size A3 or larger, and then use small post-it notes to gradually fill in the elements of the model. The use of post-its, as opposed to writing on the canvas, allows you to relatively quickly change content, or the positions of content without the need to rewrite the entire model on a new sheet. We have supported this approach by placing printable canvas versions of the EPM at the end of this guidelines document.

Meanwhile, especially in situations where ecosystem modeling involves representatives of different Actors that are designing and analyzing a (novel) ecosystem constellation together, another excellent approach for using the EPM is to model it by the LEGO® SERIOUS PLAY® (LSP) methodology (see for example Blair and Rillo, 2016). This entails gradually building a physical model of the ecosystem using Lego blocks. The key benefit we have experienced in using the LSP in the context of ecosystem modeling is that the building of an ecosystem structure with LEGO-blocks is a highly inclusive process that explicitly creates understanding between the involved parties. Furthermore, the LSP can take advantage of the opportunity to add a third special dimension to the EPM where the intra-actor building blocks are represented as components in a 3D-building which itself constitutes an island (marking an Actor).

With the Actors each represented as LEGO islands, they can be repositioned swiftly and the relationships between them rebuilt quickly, making the LSP a favored approach to rapidly prototyping ecosystem constellations. See an example outcome of a LEGO-based ecosystem modeling session in Figure 23.

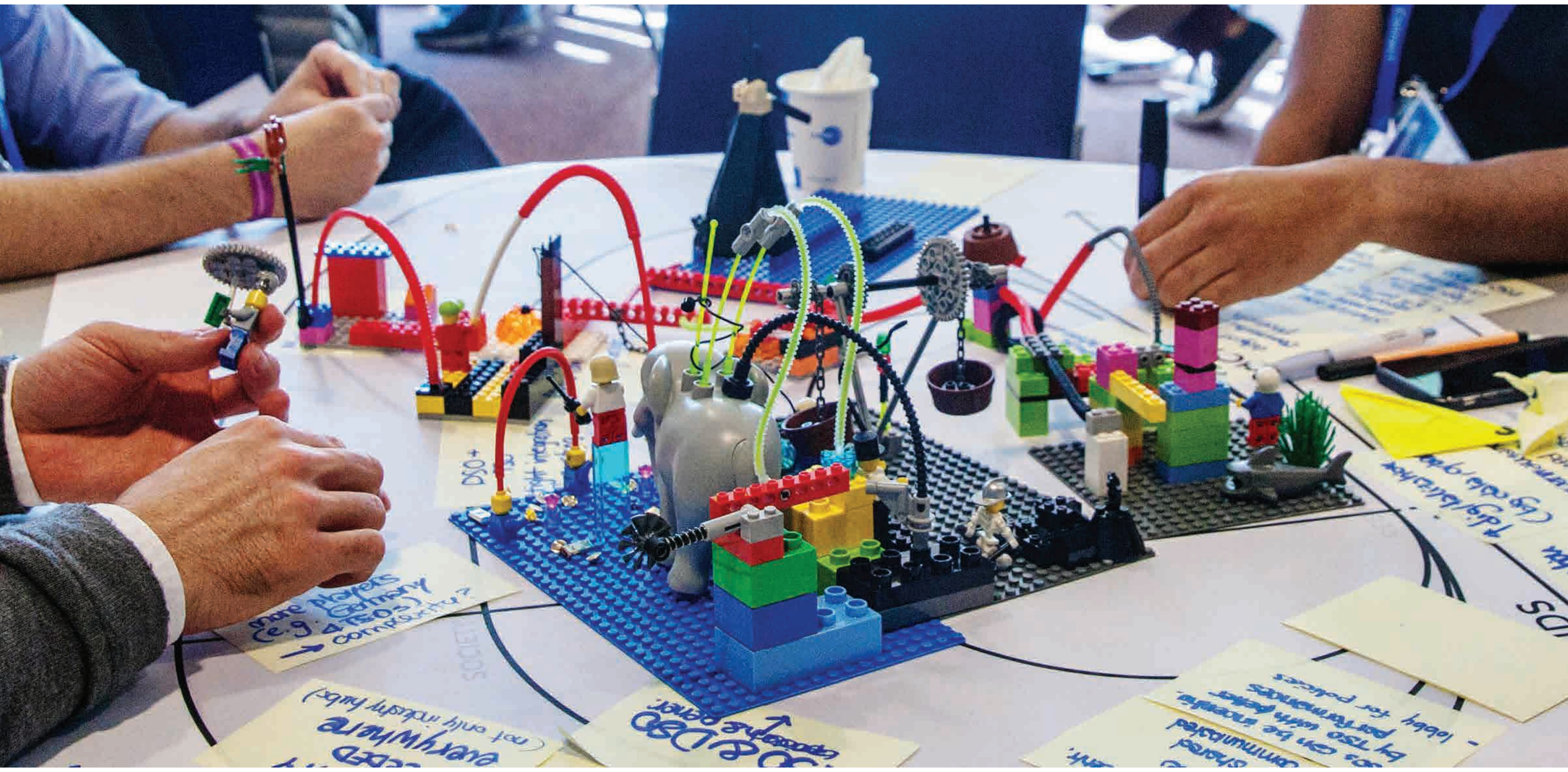

Figure 23. Example of ecosystem modeling with LEGO® SERIOUS PLAY®

However, LSP also comes with at least two shortcomings. First, because the various ecosystem components are represented not as words but as physical buildings, communicating the results of a modeling session to third parties may require comprehensive additional explanation. Second, in order to achieve maximum effectiveness of an LSP-based ecosystem modeling session, generally an experienced LEGO® SERIOUS PLAY® facilitator is suggested.

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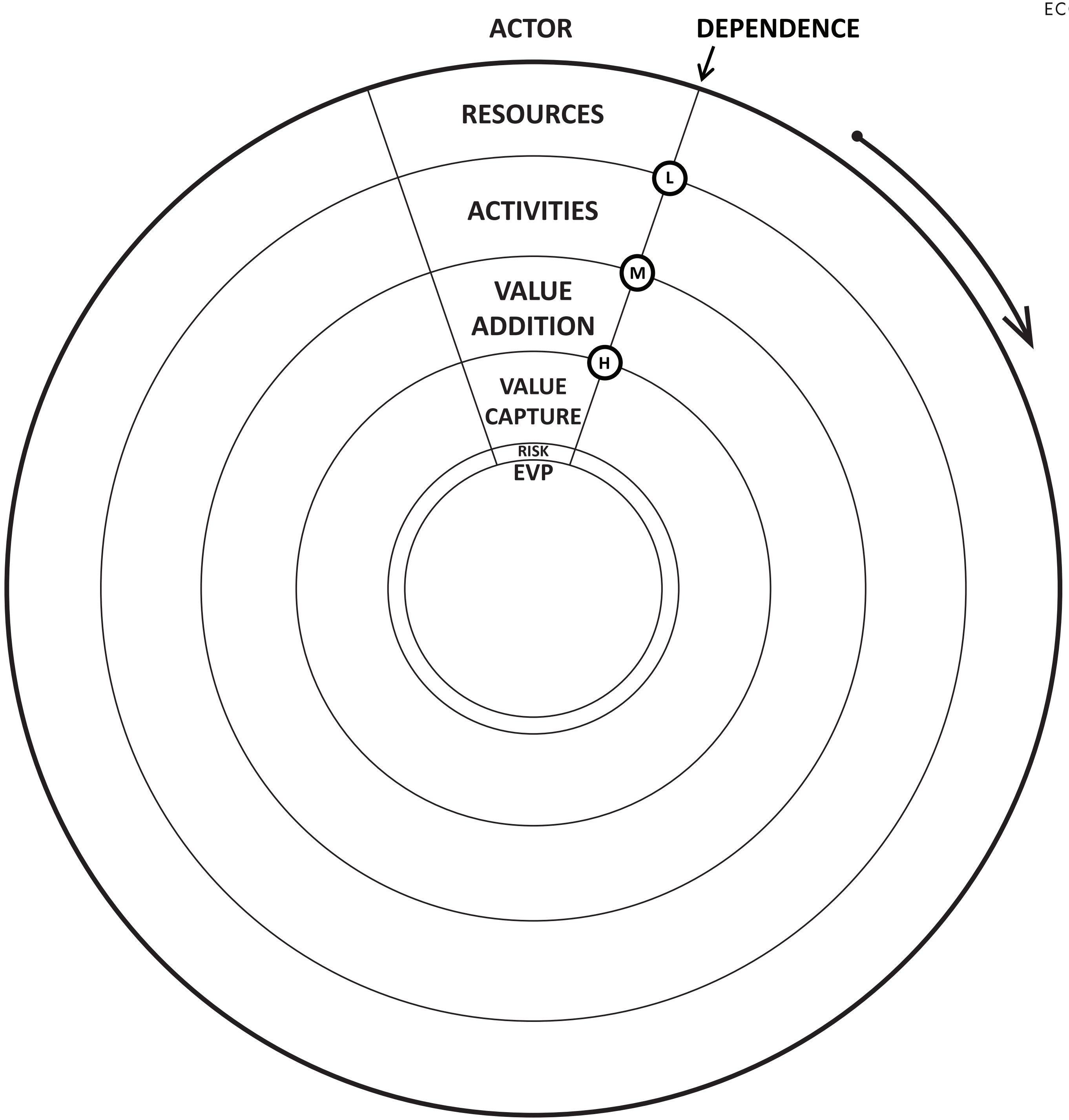
Templates

In the following four pages, you can find templates for using the EPM tool in practice. The templates include:

a - blank canvas of the EPM with no actor separation lines
b - blank canvas of the EPM divided to six sectors
c - blank canvas of the EPM divided to seven sectors
d - blank canvas of the EPM divided to eight sectors

If you wish to use any of the canvases to model ecosystems by hand, we suggest printing the particular sheet (pages 42, 43, 44 or 45 of this document) out in size A3 or bigger.

High resolution versions of the post-it background image in six colors are available here: goo.gl/2nP5rM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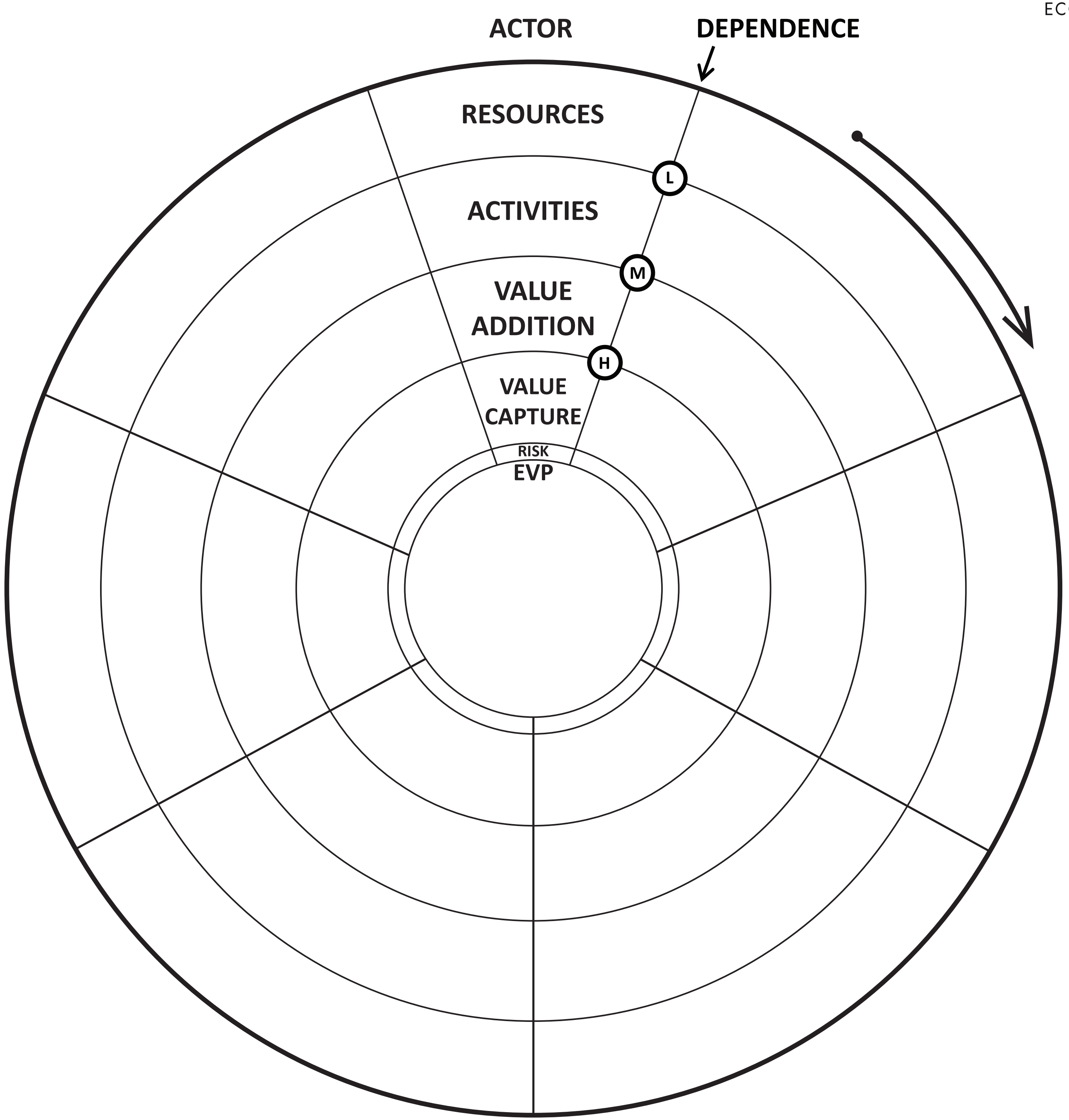
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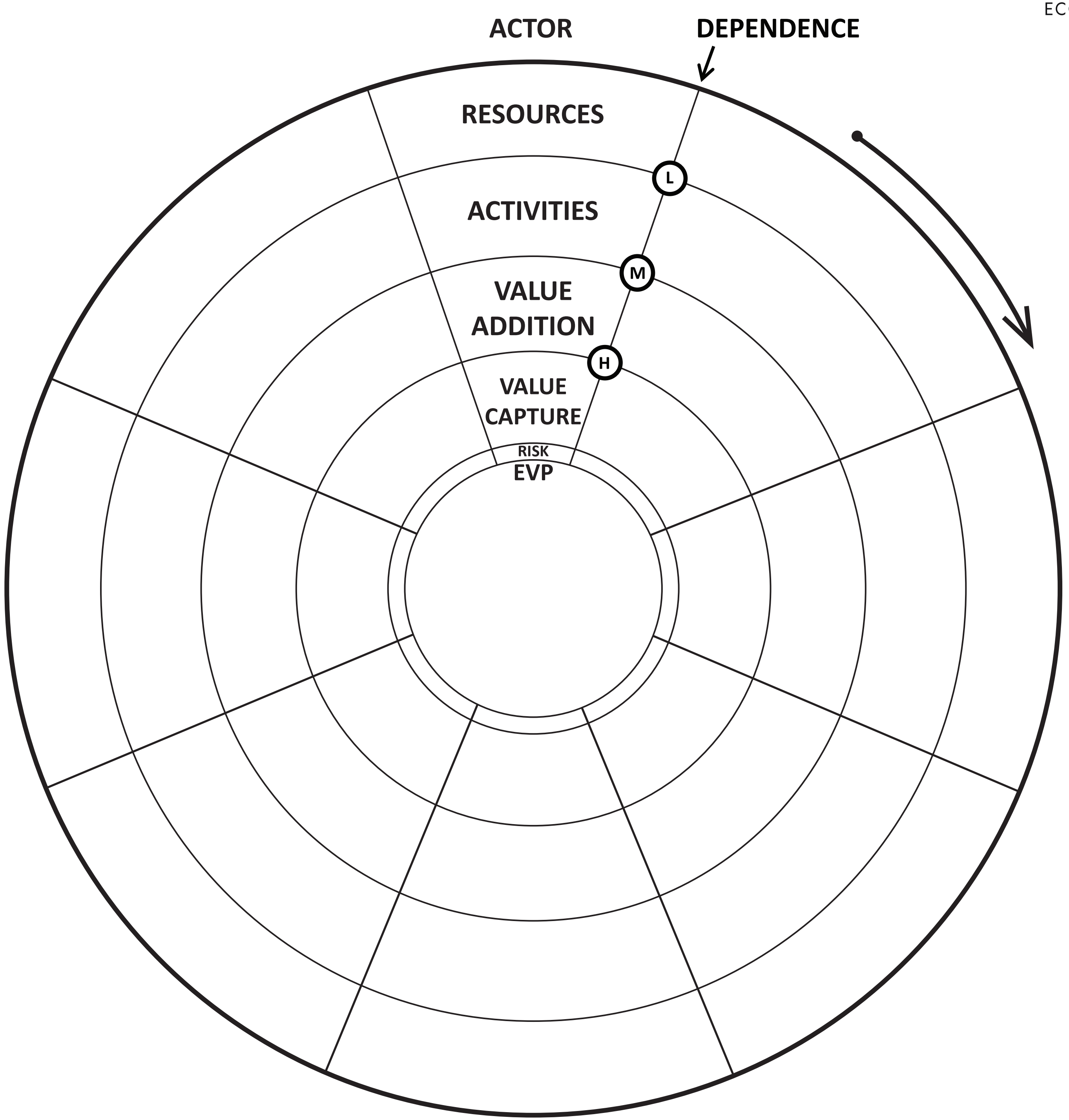
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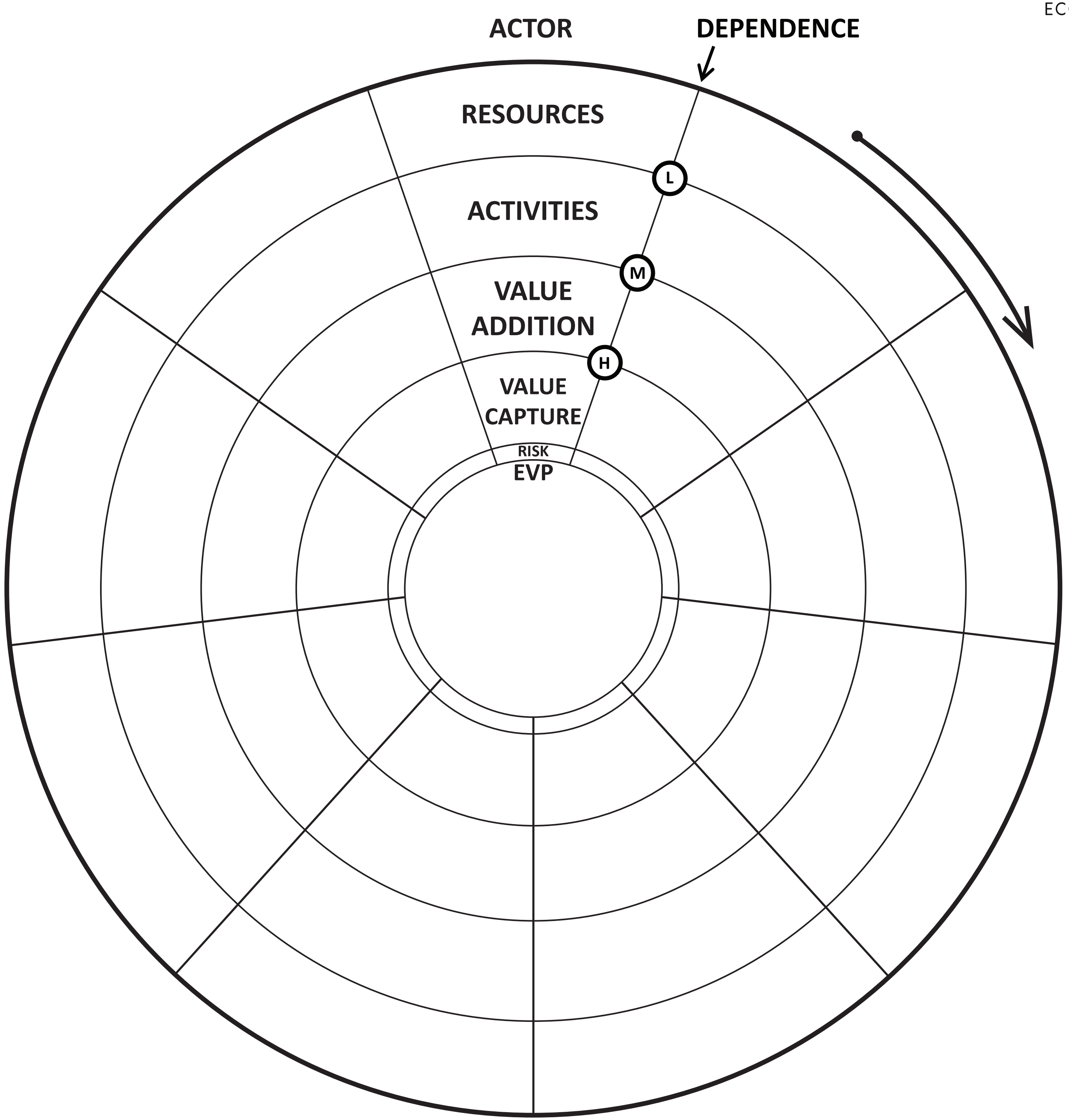
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