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How to Find the Right Scope for Open Source Developments?

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Working on joint open source solutions with heterogenous stakeholders requires a common understanding about the problem and the scope. The Kano model can be adapted and utilized to generate such an understanding for so-called commodities.

INTRODUCTION

When talking about open source software (OSS), it is important to understand the background and motivation of the community. This is particularly important when the OSS has its origin in a commercial environment.

While commercial OSS is often provided by a single stakeholder (see Riehle[1]), it can also be the work of a heterogeneous group of stakeholders. Such a broad group of stakeholders is working together in the Open Logistics Foundation.[2] The Open Logistics Foundation is an industry-funded open source foundation focused entirely on OSS developments for logistics, transportation, and supply-chain management. Since its launch in late 2021, the foundation has been providing technical and organizational services for collaborative open source work. In the case of the Open Logistics Foundation, many of these stakeholders are companies that develop software for their own use and based on their own needs. These companies do not primarily originate in the software or IT-infrastructure sector, but they use or offer software to support technical or organizational processes in non-IT areas. While OSS components may not be part of their core business model and do not directly contribute to revenue generation, they heavily rely on software to provide commercial services. This software is either used

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FROM THE EDITOR

Welcome back to our "Open Source" column! One of the bigger challenges for peaceful and productive open source collaboration is to agree on what to work on. Participating companies generally want to focus on what is competitively not differentiating. But how do you find out what that is? In this instance of our column, Nettsträter and Brehler explain how the logistics companies in the Open Logistics Foundation have solved this puzzle. Important insights ahead! As always, stay healthy, stay happy! —*Dirk Riehle*

for the organization and optimization of internal operational processes or as the interface to customers and subcontractors via platforms or apps. The services offered are often comparable with each other, resulting in similar requirements to the software.

The companies are normally competitors working in the same business and sharing a lot of customers. However, even in this competitive environment, there are efforts to cooperate as interoperability is more and more often mandatory. Furthermore, they collaborate to make their own software more reliable and to reduce the cost of this. Such a community can be described as a *user-driven-community* formed by competitors or rather as a *user-led open source consortium*.[3]

As the companies all use similar software and are at the same time competitors sharing the same market, the selection of topics and applications to be developed collaboratively can be quite challenging. Here, we focus on so-called *commodities* and describe how the process of identifying commodities can be organized.

TALKING ABOUT COMMODITIES

In a user-driven community formed by competitors, the selection of components and applications, which should be developed together, must focus on nonmarket differentiating areas. Most areas of applications can be divided into nonmarket-differentiating basic functions and market-differentiating individual services (Figure 1). The individual services are typically offered to customers as a differentiator to the competitors. The customer has a direct benefit or can profit from value-adding services accompanying the actual service. The individual services are developed by the companies on their own or at least without a direct involvement of competitors. Such individual services are often not suitable to be jointly developed as OSSs in such a community, as this can have a direct impact on the revenue strategy.

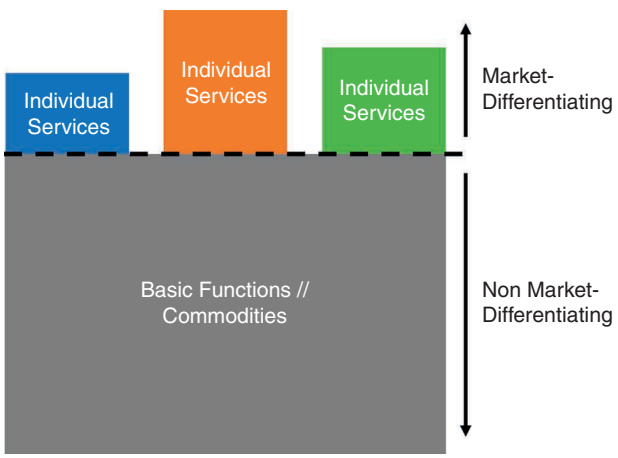

FIGURE 1. Commodities versus individual services.

In contrast, the basic functions, referred to as *commodities*, are essential for basic operations, internal organization, and optimization. These commodities are not sold to customers as they are either for internal use only or consist of state-of-the-art functionalities that customers are unwilling to pay for. Additionally, commodities are typically used within existing systems and are not directly visible to end customers. However, these commodities have one thing in common: they enable increased efficiency and foster collaboration through widely accepted and shared standards.

We believe that such commodities are very well suited for joint open source developments. The process of developing components and software together enforces a common understanding and consensus about the process and requirements among all stakeholders. Furthermore, this allows companies to share work, costs, and risks, while also increasing the acceptance of the developed solutions through joint development within a broader community. The avoidance of monolithic solutions results in fewer interfaces to develop and maintain, which can also lead to reduced costs in the ongoing operation of the software.

But how to identify such commodities within a heterogeneous community?

ADAPTING AN ESTABLISHED METHOD

To identify commodities that are suitable for OSS, the well-known Kano model, initially described in Kano et al.,[4] and visualized in Figure 2, can be adapted and used, for example, in ideation workshops.

In general, the Kano model describes the relationship between the achievement of certain characteristics of a product and the possible satisfaction of customers. It allows the

systematic collection, evaluation, and consideration of customer needs and expectations in product development. The model distinguishes among basic needs, performance needs, and delighters. *Basic needs* are fundamental and self-evident, and customers only become aware of them when they are not met. The fulfillment of basic needs does not satisfy the customer, but the nonfulfillment of basic needs leads to great dissatisfaction. They are not suitable for differentiation in the market. *Performance needs* are conscious to the customer and directly influence satisfaction or dissatisfaction and are therefore market relevant. *Delighters* distinguish a product or service from the competition by their presence. These characteristics are highly relevant for differentiation in the market.

This model can be used within an ideation workshop to identify commodities. One should focus on a specific use case or topic. Within this topic, the goal is to identify and gather typical features, components, and services with the participation of all workshop attendees. To achieve this, one can begin with a brief introduction to the topic and then conduct a brainstorming exercise to get input from each participant. The outcome is usually a list of potential features, components, services, or even problems in current systems. Additionally, this phase helps to build consensus on the scope of the use case, determining what should be included in the use case and what should not.

After this initial ideation phase, the Kano model can be utilized to map the identified items to basic needs, performance needs, and delighters. Discussions are often necessary since the assignment of items is influenced by individual experiences and backgrounds. In cases where participants disagree, the items are placed in the highest zone indicated (from basic needs as the lowest zone over performance needs to delighters as the highest zone). At the end of this phase, one should have a consensus on the basic needs and an overview of performance needs and delighters. In the search for commodities, only the basic needs are of interest. Since the basic needs have already been established through consensus, there is a clear overview of which parts of the discussed topic can be developed by competitors in a collaborative open source process.

As a result, at the end of the workshop, there is a better understanding of the use case itself, all related services, and a first assessment of which parts are suitable for OSS development by the stakeholders themselves.

USING THE METHODS, AN EXAMPLE FROM LOGISTICS

The Open Logistics Foundation is primarily focused on identifying and elaborating commodities for all kinds of logistics companies, such as logistics service providers, shippers, forwarders, ports, and airports, also including software vendors or software platform operators. Currently, there are three working groups focusing on different topics, such as electronic transport documents, air cargo data exchange, and customs processes. Each working group is working on commodities that have been clearly identified and agreed upon by the stakeholders. In addition to the working groups, we also work on ideation topics. Part of the process for working on ideation topics is to clearly identify commodities and find a common agreement on them. Ideation topics can become working groups, but they need a clear description of the common problem (commodity), ideas for a common solution, and a group of companies willing to jointly work on the topic. We used the described methodology in several workshops with

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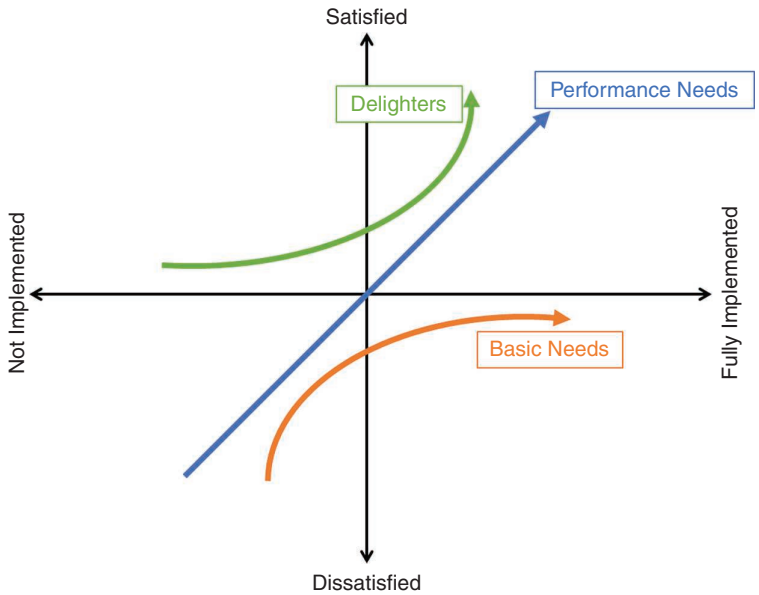

FIGURE 2. Typical visualization of the Kano model.

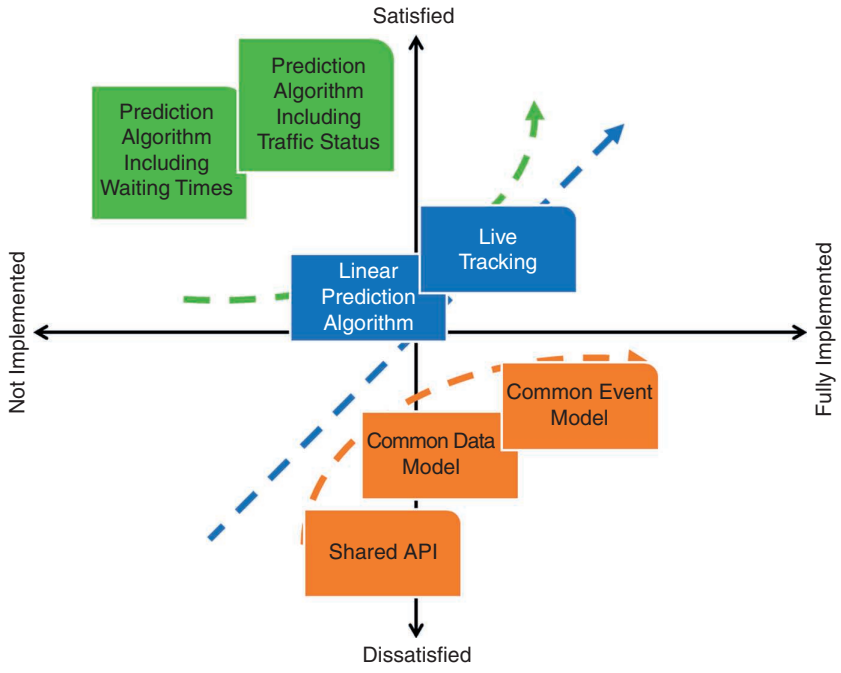

FIGURE 3. Simplified mapping of services and components for track and trace and ETA.

different stakeholders to define the scope of ideation topics.

An example from the logistics industry is the discussion of track and trace and an estimated time of arrival (ETA) service for tracking goods in transit. *Track and trace* describes the tracking of goods throughout the entire transportation process. Relevant information includes the current order status, (geo-)location, and proof of delivery. This information must be exchanged between several supply chain partners, such as shippers, carriers, forwarders, and customers. ETA is based on track-and-trace information and provides a forecast of the delivery time to the customer. In addition to process-related information, ETA algorithms often include external factors, such as traffic information or historical data to optimize the estimate. Both topics are interrelated, so it is important to clearly understand which parts are commodities and which can be market differentiators. The main goal of the workshop was to identify all kinds of possible data models, components, and services within these two applications and to group them into individual (market-differentiating) services and commodities.

The outcome of the workshop showed a clear distinction between commodity services, fulfilling basic needs, and individual services, which were identified as market-differentiating by the participants. For track-and-trace application programming interfaces (APIs), common data models and common event models were named as *basic needs*: The need to be the same for all participants in a supply chain to allow the exchange and usage of data. In contrast, specific algorithms to calculate ETA, including different parameters, were defined as possibly market-differentiating, because detailed prognoses are a clear benefit to end customers of the transport services. Figure 3 shows a simplified illustration of the mapping. The relevant commodities are shown in orange at the bottom of the Kano model in Figure 3.

The described process focuses on the joint identification of commodities among all stakeholders. Doing this before discussions about concrete developments, needed roles, and specific requirements helps a lot in getting a common understanding and identifying a target corridor that is acceptable for everyone. Using the Kano model in an "inverted" way can make it much easier to identify commodities, especially in joint workshops, and to not focus on individual services or single ideas of one stakeholder.

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