1 Introduction

Product portfolio management has a long history in economics. Its origins go back to the financial theory of Harry Markowitz. In 1952 Markowitz developed an approach how to compose an optimal securities portfolio under uncertainty. Portfolio in this context means the sum of all financial assets of an investor. Over time the idea was transferred to strategic business units being part of a portfolio.[1] Very popular portfolio approaches in strategic management are the matrices of The Boston Consulting Group (also known as "BCG-matrix") or McKinsey (also known as "McKinsey Business Screen" or "McKinsey Matrix") or Cooper's New Product Development Management specialized on new product development. An overview of these as well as basics of product portfolio management is provided in section 2.1 and 2.2.

Next to theses tools there are a couple of less-well known approaches addressing the entire process from product development over day-to-day portfolio management up to portfolio elimination. Two resent representatives of these are discussed and evaluated in this paper in sections 2.3 and 2.4.

Additionally, insights into practical usage of portfolio management approaches or tools are provided on a most recent basis to get an understanding how and with what effects portfolio management is applied in today's business practice (section 3).

Building upon this analysis a practice-oriented approach is suggested incorporating a dynamic view and management of the actual product portfolio being regularly compared to what the future portfolio should look like. A number of tools already well established are suggested to manage this "As-is versus To-be balance".

Result is a pragmatic approach to product portfolio management to be understood as a basis for practitioners. It has to be adjusted to individual needs.

[1] Markowitz (1952)

2 Product Portfolio Management

2.1 Definitions and Basics of Product Portfolio Management

In a generic and pretty abstract sense a **product** is a physical good or a service that carries value for an individual or an organization and thus can be subject to market transactions.[2] The most important criterion to distinguish a product from an individual/stand-alone solution in the context of this thesis is repeatability.[3] A product is designed to satisfy the needs of *numerous* users with similar needs ("the market") whereas an individual solution serves "just" the specific needs of *one* customer. In simple words "lot size 1 = individual/stand-alone solution", "lot size n = product". Consequently, the observation horizon is much longer for a product.[4] Figure 1 illustrates this difference.

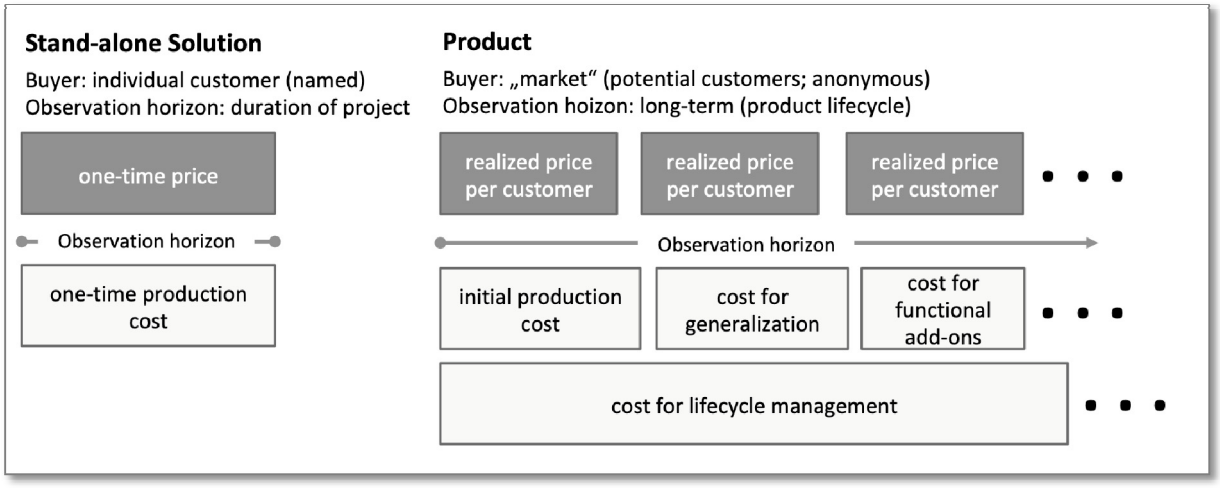

Figure 1: Stand-alone Solution versus Product
Source: Own figure according to Grimm, Schuller, Wilhelmer (2014)

In this sense a project (approach) (or the process to come to a certain outcome) can also be a product depending on the ability to serve multiple customers. For example, a project (methodology/approach) to develop an IT-system is a product once it is used for many

[2] Pepels (2013), p. 1. In this paper the terms product and service are used synonymously.
[3] There are numerous other product classifications in the literature. However, describing these in more details would go beyond the scope of this doctoral thesis. Details can be found e.g. in Pepels (2013), Grimm, Schuler, Wilhelmer (2014) or Herrmann, Huber (2013)
[4] Grimm, Schuller, Wilhelmer (2014), p. 5 et seq.

customers. The same applies to pre-configured/standardized services such as application management for certain software packages.[5]

The characteristic of repeatability obviously has significant implications especially for the management of a product compared to that of a single solution, e.g. financials of the respective business cases, complexity of the solution design, differences in marketing and sales activities and lifecycle management and the corresponding costs. The latter is very important in the ICT-industry[6] due to the dynamics of the market. Lifecycles can be as short as 6-12 months for e.g. mobiles or smart phones or 2 years for software until the next release is available to the market.[7]

Although the definition of "product" as used in this paper seams quite intuitive it can be very difficult in practise to exactly differentiate what the actual product is. In a dynamic market like the ICT-market new products or variants are introduced quickly, some products are offered directly to the market and at the same time as part of a combined product or service. Sometimes, one and the same product or service is offered with a different branding and accordingly a different tariff structure. In practise this leads to different approaches how to differentiate products. For example, one could define a product by the customer's perception: A product is what the customer perceives as a product (customer-oriented classification). Or the outcome of a specific production process is defined as "product" (production-oriented classification). Or – very pragmatic – a product is what has its own ERP product number.[8]

Product portfolio shall be defined as a combination or conglomerate of different but comparable products that are jointly investigated and interrelated with each other.[9] According to Amelingmeyer (2009) this thesis uses the term **product portfolio management** as the systematic and consolidated view of all products of a company (the product portfolio) in order to plan, prioritise, select, coordinate and control them. Thus, product portfolio management has to be established along the dimensions strategy, organization,

[5] See Herzwurm (2009), p. 27 et seq.
[6] ICT = Information and Communication Industry (combined IT and Telecomminication Market)
[7] Grimm, Schuller, Wilhelmer (2014)
[8] Amelingmeyer (2009), p. 5 et seq. or Schepp, Herold, Schmahl (2009), p. 128 et seq.
[9] Wendt (2013), p. 99. A study amongst 500 enterprises in Germany showed that 3 out of 4 companies use the portfolio analyses to plan and steer their business (see Packmor (2009), p. 65).