

# Development of a digital ecosystem using the example of Amazon

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## About the presenter

- I completed my bachelor's and master's degree in industrial engineering.
- The focus of the master's degree is energy and resource management.
- Since July 2020 I have been working as a doctoral researcher at the Institute for Software and Systems Engineering at the Clausthal University of Technology.
- In general I am interested in topics like Software and Systems Engineering, Circular Economy, Sustainability, Business models, digital ecosystems and lifecycle engineering.

## Agenda

Introduction

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Technology portfolio according to Pfeiffer et al. and further criteria

Example of Kiva Systems

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## Introduction

- Digital ecosystems are becoming more important in research and practice, because of the digital transformation.
- Amazon acquires technologies through acquisitions that are integrated into its own business model. This procedure affects the company's digital ecosystem.
- How can the future development of Amazon's digital ecosystem be predicted?
- To answer this question, we will begin by taking a closer look at the previous development. Future developments are forecast on the basis of these results.

# Amazon's digital ecosystem

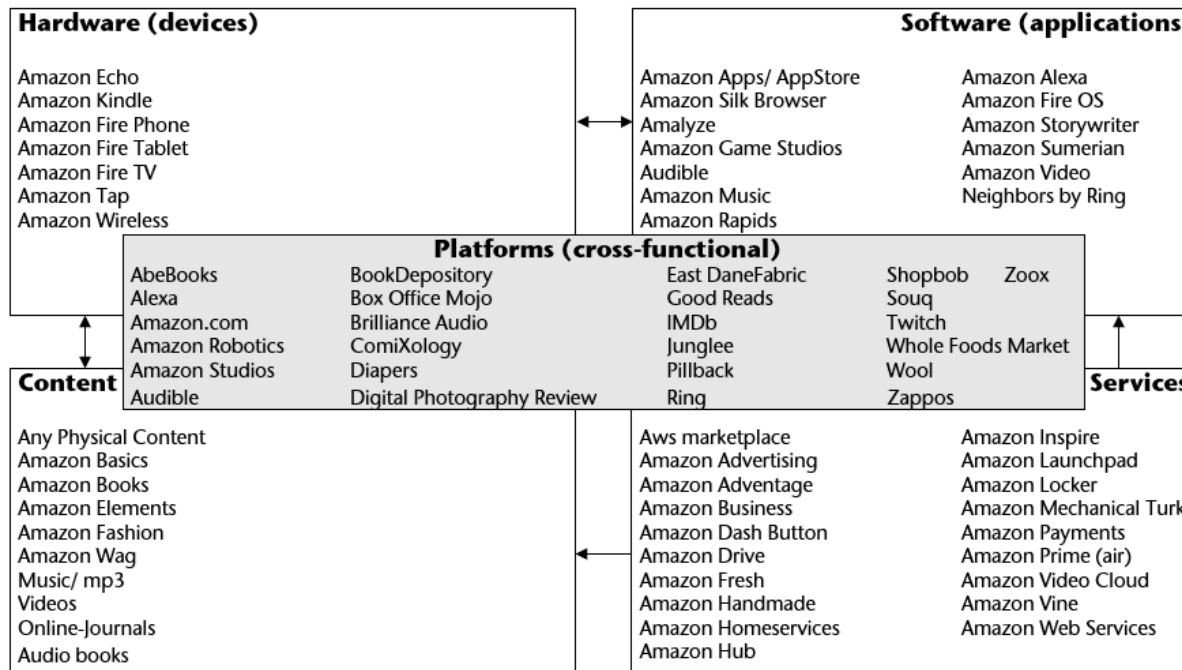


Figure 1: The digital ecosystem of Amazon (adapted from [11])

## Technology portfolio according to Pfeiffer et al. and further criteria

- The focus of the analysis should be based on technologies, because software, hardware, content and services build the digital ecosystem.
- The Technology-Portfolio of Pfeiffer et al. is chosen, because it is in contrast to different technology-portfolio approaches empirically proved.
- The technology-portfolio analysis is typically used to value new technologies and to make an investment decision based on the results.
- During the analysis, technologies are positioned in a two-dimensional matrix.
- This involves comparing technologies with competing technologies.

## Technology portfolio according to Pfeiffer et al. and further criteria

- Depending on the position of the technology, different recommendations for action are made.
- A distinction is made between the investment area, the selection area and the disinvestment area.
- In a work of Perspectives4You, criteria were used to determine the attractiveness of the technology and the strength of resources.

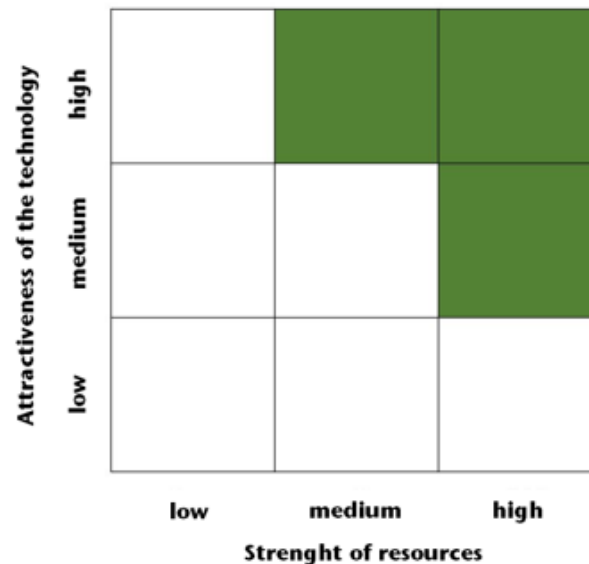


Figure 2: Technology-portfolio: investment area (adapted from [7]).

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## Example of Kiva Systems

- The Pfeiffer Technology Portfolio was combined with other criteria and applied to the Amazon case.
- The technology of the Company Kiva System is analysed. Kiva Systems was acquired by Amazon in 2012.
- The Technology of the competitor GreyOrange is shown in blue.
- The Kiva Systems' technology is shown in red and the position is clearly in the investment area.

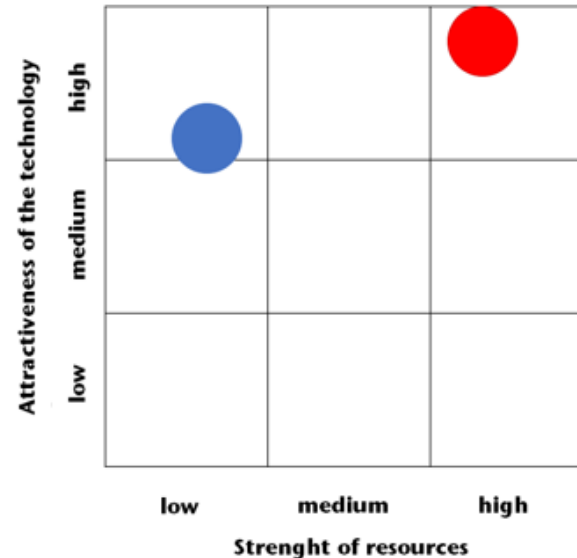


Figure 3: Technology-portfolio of the Kiva Systems technology (adapted from [7][14]).



## Overview of all considered technologies

- A total of six technologies acquired through Amazon were analysed.
- Five technologies are in the grey ellipse.
- In green is a technology that Amazon discontinued after a few years.
- All long-term successful companies can be found in the investment area.

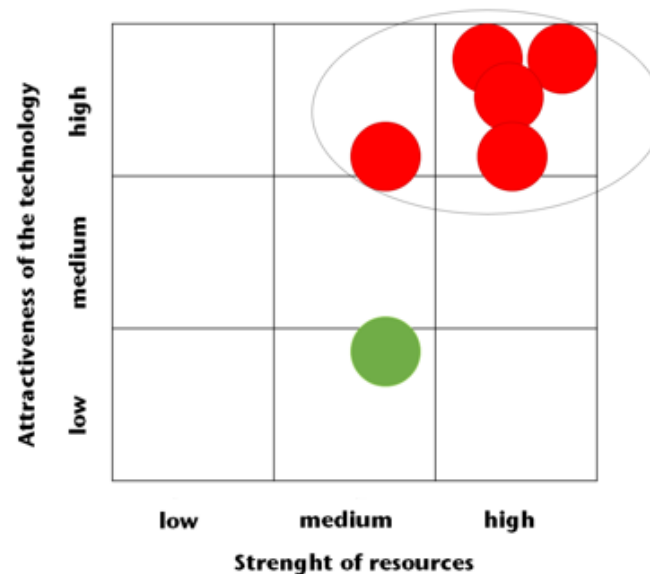


Figure 4: Technology-portfolio of six chosen technologies (adapted from [7][14]).

## Amazon and the health market

- The improvement of the health care could be one of the huge challenges that Jeff Bezos is looking for.
- There has been already a report, that Amazon, Berkshire Hathaway and JPMorgan Chase are working together to decrease spendings in the health care sector.
- It is assumed that entering the healthcare market could make sense, because Amazon could expand its own product range and would receive even more customer data.

## Example of future development in the health market

- The focus of the analysis of the future development lies on the technology of Sword Health
- The company offers digital physiotherapy
- Using the method applied to the previous development leads to reasonable results. That is why the same method applied to the development in the future is also analysed.
- The position of the Sword Health technology is marginal better.

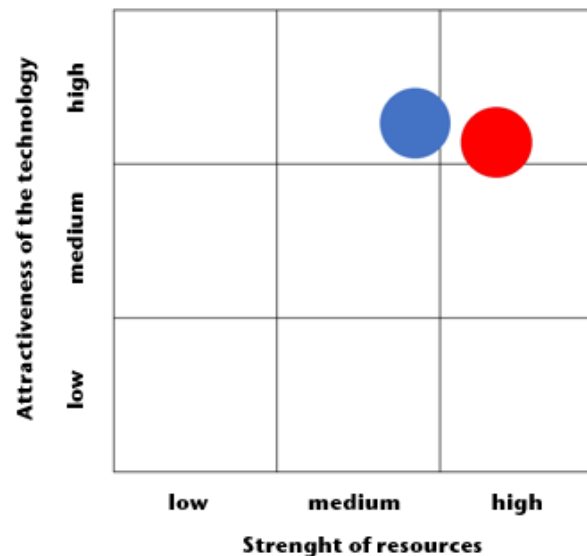


Figure 5: Technology-portfolio of the Sword Health technology (adapted from [7][14]).

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## Discussion

- The results of this analysis are not binding and should be viewed as recommendations for actions, suggestions or trends, rather than general rules.
- Using more factors or different methods might generate different results.
- The appropriateness of this method in this context should be proved with further analysis.
- Technologies are classified that can only be viewed from an external perspective in this paper.
- The determination of the values on the basis of the data could be carried out in further work by different persons to prove whether similar results are obtained.

## Conclusion

- The digital ecosystem of Amazon could be explained and presented.
- The previous development of the company could be examined with the help of the portfolio analysis.
- The acquisition of Sword Health has been identified as a possible alternative.
- A method from the financial decisions was applied to the acquisition decisions of Amazon and produced meaningful results.
- Results should be understood as recommendations for actions and not as standard strategies or real processes.
- Analysis could be extended to include other factors in further work.

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