Business Case Systems Engineering

Outcome of the SSSE Round Table
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Abstract: What is the Business Case for Systems Engineering? How is the Business Case justified? This was the topic of the round table in Systems Engineering on April 10th, 2017 and the outcome is presented in this paper.

Introduction

Systems Engineering (SE) has grown but its popularity has still not spread as widely as some of the authors would wish. Therefore, in an earlier brainstorming session, topics for a roundtable were collected. The Business Case for SE was one such topic.

The questions referred to above, were discussed at the SSSE roundtable in Systems Engineering during a meeting held at the Aarbergerhof, Bern, on April 10th, 2017. This paper presents the method and the outcome of the discussion.

Method

The authors met and split into two groups. They spent 20 minutes discussing the question "What is the Business Case for System Engineering and how is it justified? Afterwards each group summarized their conclusions and presented them to the other group.

A definition of the term business case was given as follows:

*„Ein **Business Case** untersucht ein bestimmtes Geschäftsszenario hinsichtlich dessen Rentabilität einer Investitionsmöglichkeit.[1] Er dient zur Darstellung und Abwägung der prognostizierten finanziellen und strategischen Auswirkungen der Investition. Dabei findet ein Vergleich verschiedener Handlungsoptionen statt. Eine immer gegebene Handlungsoption ist die Beibehaltung des Status-quo.*
In der Praxis wird ein Business Case oft auch im Vorfeld eines Projekts angewendet, um die Wirtschaftlichkeit des Projekts zu untersuchen und die Auswirkungen auf das Geschäft darzulegen.[2] Durch eine Analyse von Nutzen, Aufwendungen und Risiken trägt er dazu bei, dass die Ressourcen von Unternehmen auf die erfolgversprechenden Projekte konzentriert werden." [1]

„A business case provides justification for a proposed business change or plan, and typically outlines the allocation of capital and resources required to implement the proposed business case. A successfully presented business case can act as an impetus for moving forward with a new, alternative plan of action, or it may simply provide a consistent message, or unified vision for future business decisions and operations. A well-drafted business case will expose major or implementable solutions for conquering a business problem, issue or goal in order to provide decision makers with multiple options to choose from.." [2]

Results

Group 1: It's all about money

The first group justified the business case for system engineering with the statement: "more money" They considered the question from the perspective of a CEO, where the business case for SE is seen as a black box:

Applying SE principles typically results in increased standardization and coordination of documentation. **Organizing the documentation** makes it easier to identify any high cost elements within a system. Once such high cost drivers have been identified they can be dealt with, leading ultimately to cost reduction, increased margin and **more money**.

A further benefit of **organizing the documentation** is that technical risks are identified sooner and can be transferred to business risks. Finding and handling technical risks earlier reduces the probability that a project will encounter technical issues late in development. Finding and dealing with such problems early reduces development costs, meaning increased margin and **more money**.

Finally, SE leads to a **common interdisciplinary approach and understanding**. Having team members with an overview across different disciplines leads to more goal-oriented solutions, resulting in better time-to market, increased competitiveness and **more money**.

Group 2: Customer satisfaction

The second group looked at the question a bit differently. They found that the main business case for SE is to be able to implement a successful system.

This, of course, leads directly to the question: **What is a successful system?**

Group 2 decided that a system is successful if it fulfills its purpose, is sustainable and is successfully validated, resulting in happy customers. Essentially, a successful system is one that stakeholders are willing to pay for, and that they would buy again.

Why do you need SE to implement a successful system?
An interdisciplinary setup is essential to **identify system interactions and interfaces**. If system interfaces are correctly recognized and modelled then the probability is much higher that a system will fulfill its purpose. When a system is developed according to SE principles then the entire system lifecycle is taken into account, guaranteeing **system sustainability**.

Finally, industry experience shows that applying SE significantly increases the probability of a technical project being successfully realized on time, within budget and meeting specifications and constraints.

In the course of the discussion the question came up; what part of SE is not covered by the project manager?

Group 2 found that although at first glance there is a certain amount of overlap between the responsibilities and aims of a project manager and that of a systems engineer there are, in fact, a number of differences. Both have an overview of the entire system development and are concerned with whether a system meets its specifications, but their focus is somewhat different. A project manager focuses more on the financial and time budget as well as resources. The systems engineer focuses on the interfaces between components and their interactions.

Conclusion & Outlook

Within 20 minutes both two groups found a number of factors that could form the basis of a business case for systems engineering.

More money and **customer satisfaction** are the 2 main drivers identified by the two groups. One unresolved issue from this session is how to implement SE more widely so other companies gain from the benefits.

One offline suggestion from an author is to look at the "return on investment investigations" documented in this PhD thesis
http://www.hcode.com/seroi/documents/SE-ROI%20Thesis-distrib.pdf

References

[1] https://de.wikipedia.org/wiki/Business_Case
[2] http://www.wikihow.com/Write-a-Business-Case