IT Managers’ Perspective on Technical Debt Management

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Abstract: The proposed talk is based on an article published in the Journal of Software and Systems in 2023 [WB23].

Technical Debt (TD) is a term for software solutions that are beneficial in the short term but impede future change. Previous research on TD indicates various management-related causes. We analyze the perspective of IT managers on TD since they usually have a major influence on deadlines, the project’s budget, and setting up a TD management (TDM) process. To achieve this, we obtained and analyzed data from 16 semi-structured interviews and a three-person focus group discussion. We found that all IT managers understood the TD concept. They considered TDM to be an essential topic, though almost none of them had set up a TDM process so far. We identified three major IT managers’ concerns regarding TDM: communicating about TD, establishing a TDM process, and dealing with vintage systems, i.e., old legacy systems. We developed a model specifying causes and consequences visible to business stakeholders, causal chains, and vicious cycles. Our research identifies new research gaps and demonstrates to practitioners that investing in a TDM process may be beneficial. It provides the V4CTD model of Visibility, Cycles & Chains of Causes & Consequences of TD, which extends the TD conceptual model and facilitates communication on TD with business stakeholders.

Keywords: Technical Debt, Technical Debt Management, Technical Debt Causes, Technical Debt Consequences, Technical Debt Communication, Legacy Systems

1 Summary

The term technical debt (TD) is a metaphor used to explain how swiftly delivering software results in the need for code rewrites later. A single instance of TD can be described as a construct beneficial in the short term, which hinders further development and maintenance of the software in the long term [Av16].

In our study, we analyze the IT managers’ perspective on TD. Previously, various researchers found that the effectiveness of Technical Debt Management (TDM) is related to IT managers and their knowledge and overview of TD [RK19]. Junior et al. identified a lack of research on the business perspective of TD [JT22]. IT managers are usually in direct contact with the business stakeholders and may have a good understanding of the business managers’ perspective on TD.

We interviewed 16 IT managers and had one three-person focus group discussion. Using various coding mechanisms, we identified the IT managers’ knowledge, their three main concerns regarding TD(M), and their perceived potential improvements.
We gathered the following major insights:

- The TD metaphor is used as an ambiguous informal term and is not helpful in business communication.
- There are causes and consequences on different visibility levels for business stakeholders, IT managers, and development teams, which might result in miscommunication.
- We propose to extend the TD conceptual model to include chains and cycles of causes and consequences.
- To improve developer communication and increase the overall awareness of TD, an established TDM process is essential.
- To overcome the status quo bias, IT managers need more guidance on establishing a TDM process, preferably through using already established processes and simple methods.
- Research on how to migrate vintage systems (i.e., systems from the 90s / old legacy systems) and on the possibility of keeping and changing them seems to be still lacking.

With regards to the second and third topics, we extended the conceptual model of TD [Av16] and created the V4CTD model of *Visibility, Cycles & Chains of Causes & Consequences of TD*. This model explains the relationships between various causes and consequences. Additionally, it can be used to prepare a three-minute pitch to explain a project’s TD issues to a business stakeholder.

2 Data Availability

The additional material is publicly available at Zenodo (https://doi.org/10.5281/zenodo.7436973).

References


