Determinants of Process Runtime in Financial Transaction Processing

The efficient processing of financial transactions remains one of the major challenges of financial institutions' IT departments. This challenge is driven by a set of technical and organizational factors which are typically not under full control of the financial institution and its IT department. However, it is highly relevant for the IT management to understand how these diverse factors influence their systems' processing efficiency. Such insights can then be used to further improve efficiency of the corresponding transaction processing systems (TPS).

Against this background, this article presents an analysis of transaction processing (trade booking) within the middle office of a major investment company (Figure 1). In this context, processing of transactions is time-critical since other units such as book keeping, risk management or fund customers need to be informed timely about recent trades. Therefore, the transaction processing needs to

be performed efficiently, i.e. without any avoidable delays. In our analysis, we identified and measured four different factors that positively and negatively affect process runtime on the basis of a hazard function model regression and 29,200 actual trade bookings within the middle office to explore the impact of the following factors:

First, IT system usage and automation enables the middle office to increase process runtimes by increasing straight through processing (STP) rates, i.e. to avoid manual intervention. This can be achieved by designing and deploying an efficient TPS. For two subsystems of the deployed TPS, we found that automated processing can significantly reduce process runtime by nearly 90%. However, the potential of full automation is limited due to other factors that delay further processing.

Second, external factors including brokers and custodians can significantly affect process run-

time. This is because these institutions deliver additional information needed (e.g. broker confirmations and fees). Our results show that brokers and custodian banks can both, positively and negatively affect process runtime and that there is a significant difference between the two organizations.

Third, the different processing requirements of subasset classes were found to influence processing runtime. For example, the processing of a specific class increased processing time by more than 250% compared to an average runtime.

Finally and forth, we also explored the impact of fund managers at the front office. Here, both positive and negative effects have been observed but only at lower levels of significance.

In summary, our study illustrates how both, internal and external factors, affect process runtimes and provides detailed information on where to put additional efforts and IT budgets in financial transaction processing. This research has been conducted in collaboration with researchers and industry partners of the E-Finance Lab. Further detailed findings are provided in Muntermann, J.; Weber, M.C.; Wondrak, C.: Measuring IT System Value with entity-specific Factors influencing Process Runtime Efficiency. Forthcoming in: Proceedings of the 11th International Conference Wirtschaftsinformatik; Leipzig, 2013.
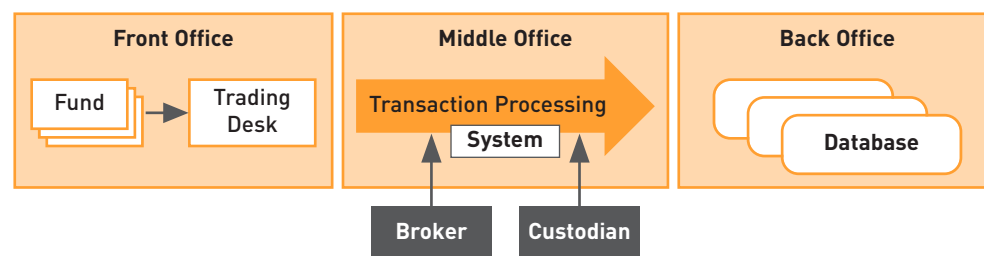

Figure 1: Process Flow in the Front, Middle and Back Office of an Investment Company

Prof. Dr. Jan Muntermann
Chair of
Electronic Finance
and Digital Markets,
University of Göttingen

Prof. Dr. Jan Muntermann holds the Chair of Electronic Finance and Digital Markets since October 2010. His academic work focuses on financial Decision Support Systems and IT governance. He graduated in Business Administration at the University of Frankfurt and acquired his PhD at the Institute of Information Systems. From 2008 to 2010 he was a Junior Professor at the E-Finance Lab in Frankfurt and since then he has been a research project partner of several E-Finance Lab projects.

"The E-Finance Lab fosters both, highly relevant and rigorous research. It provides a unique environment that facilitates interdisciplinary research which is conducted in close collaboration with key players of the financial industry".