The University of York Department of Computer Science

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Model-driven software migration between microprocessors

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Abstract

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Acknowledgements

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Contents

1 Introduction

1.1 Background and Motivation

Bartels et al. define obsolescence as "materials, parts, devices, software, services and processes that become non-procurable from their original manufacturer or supplier" [1].

Obsolescence is especially problematic in avionics and military systems. These systems "often encounter obsolescence problems before they are fielded and always during their support life" [2]. This occurs since the life cycle of components is shorter than that of the system they are used in — in the defence/aerospace sectors, the typical life cycle of a system is 20-30 years or longer [3].

Obsolescence problems can be costly in these sectors. The US Navy estimates that obsolescence problems can cost up to $750 million annually [4]. Sandborn and Myers also show that sustainment costs (which includes costs related to obsolescence) dominate the system costs in the case of development of an F-16 military aircraft [5]. The cost of obsolescence is not just limited to these sectors as demonstrated by the cost breakdown of an office PC network. This too is dominated by sustainment costs [5].

Both software and hardware can be subject to obsolescence problems. However, strategies for obsolescence management have so far focused on hardware obsolescence problems. This is despite software obsolescence costs often equalling or exceeding that of hardware [6].

The Defence Science and Technology Laboratory (DSTL) have identified as a problem of particular interest "the migration of an entire software system from a legacy hardware platform to a modern more powerful platform" [**gerasimou2017technical**]. This report will address how this problem can be tackled using a model-driven engineering (MDE) approach.

1.2 Project Goals

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1.3 Project Scope

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1.4 Report Structure

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2 Literature Review

3 Methodology

4 Requirements

5 Design and Implementation

6 Evaluation

7 Conclusion

Bibliography

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