BIGLEVER NEWSLETTER: **From the PLE Frontline**

Getting Started with Product Line Engineering – A View from the Inside Part 1: Introduction

Greetings from Paul Clements:

It can be difficult to decipher where to begin with your transition to product line engineering (PLE) practice. Choosing the right approach is crucial. Experience has taught us that creating a tangible, small-scale, operational pilot project is an invaluable way to plot a well-defined transition path, remove obstacles, and navigate a smooth course to PLE practice.

To this end, our customers tell us that one of the most powerful and insightful services offered by BigLever is the Getting Started Package. This highly popular program is uniquely designed to allow organizations to gain hands-on experience, using a practical and proven approach, by creating a pilot product line as the first step toward full PLE deployment. There's no better way to see powerful Second Generation PLE concepts brought to bear in your setting, on your portfolio.

Perhaps you're thinking about getting your PLE transition underway, or expanding PLE into other areas of your organization? If so, this newsletter series will give you a preview of how BigLever's getting started approach works. Regardless of your interest in our Getting Started Package, you'll get an inside view into how a growing number of companies are achieving focused, efficient, highly successful PLE transitions. For customers who have completed the Getting Started Package, we welcome your ongoing feedback regarding your experiences. We love to learn from your insights and – where appropriate – share them with others.

The heart of our approach is a three-day Getting Started Workshop, where BigLever comes to your organization and helps you build your pilot product line using Gears. I'll begin this three-part newsletter series with a short overview, so you can get a feeling for the major steps we follow in the workshop. Part 2 will explore the process in more detail, and I'll conclude the series in Part 3 with some observations.

The Getting Started Workshop is preceded by a short preparation phase that handles logistics, establishes which lifecycle assets we'll be working with and what tools you currently use to maintain them, and which stakeholders from your organization should participate.

About this Newsletter Series

As BigLever Software's Vice President of Customer Success, Dr. Paul Clements helps BigLever customers understand and apply the latest product line engineering (PLE) approaches, create optimized deployment plans, and establish successful ongoing PLE practices.

In this *From the PLE Frontline* newsletter series, Dr. Clements shares his unique insights, observations, and valuable lessons learned from interactions and collaboration with customers.

We appreciate your interest and welcome your feedback regarding your organization's PLE challenges and issues.

Video: Introduction to Product Line Engineering

Have you ever wanted to explain PLE in a nutshell to colleagues, co-workers or decision-makers in your organization?

This new introductory video – Product Line Engineering for Systems and Software – conveys both the technical and strategic business impact of PLE, in a way that crosses all organizational boundaries.

Featuring some of the industry's most notable PLE deployments, this 11-minute video provides a concise view into how PLE is changing the fundamentals of how companies create, maintain, evolve, and compete with their product lines.

>> View the video.

SPLC Best Paper Award

The International Software Product

The workshop follows a structured but flexible three-day agenda with this progression:

1. Capture the module architecture.

We work to understand the decompositional architecture of the products. What are the major "chunks" and, for each, what are its major "chunks"? It's rare that a company doesn't know this, although it might not always be written down. We elicit this because the hierarchical product line that we aim to build over the next three days will often, to a large degree, mirror that structure. For each node, we'll build a product line. For each line between two nodes, we'll connect two production lines together. Thus, where your architecture lays out a system of systems, our workshop will construct a product line of product lines.

Once we've captured that structure, it's illustrated on a whiteboard as a tree and used as a progress indicator throughout the rest of the workshop.

2. Choose a node to model.

We choose one of the leaf nodes as our starting point. Our choice might be guided by the experts in the room, or suggestions from the group about which area has rich or well understood differentiating features. Or, we might choose a node that has a particularly challenging asset associated with it (such as a complicated requirements specification). For that node, we build a production line – more on this in Part 2 of the series. The production includes the capability to configure at least one lifecycle asset – requirements, for example – that corresponds to the chosen part of the architecture.

Our goal is to complete this step by lunch on the first day.

3. Repeat until done.

We move on to other product lines in our hierarchical structure, and other assets. We wire together the individual production lines, using the Gears imported production line construct, until we have completed as much of our hierarchy as needed to illustrate and apply all of the important methodological and technological aspects of Gears and product line engineering.

Our "end game" is to create a product line for the root of our hierarchy, import all of its child product lines, actuate each product in the organization's portfolio, and show how the assets we've touched are automatically configured appropriately.

We like to achieve this by the end of the second day.

As we walk across our hierarchy, we aren't aiming for complete coverage of all the nodes in the tree, nor all the assets the organization works with, nor all of the features in any product line, nor all the potential variation points in any asset. Rather, we want to show enough in each area so that the participants have confidence that they can continue to build the models with completeness and fidelity after the workshop is complete.

Line Conference (SPLC) brings together leading PLE experts – including practitioners, researchers and educators – to discuss the latest innovations and advances in the industry.

At SPLC 2012, BigLever co-presented a case study paper entitled *Mega-Scale Product Line Engineering at General Motors*. This paper was selected by the program committee to receive the Best Paper Award for the conference's Industry Track, which provides practitioners the opportunity to learn from the experiences and notable successes of other practitioners in the field.

This case study highlights the innovative new Bill-of-Features™ approach that enables companies to address the myriad complexities that occur in the engineering of highly complex product lines. Analogous to the Bill-of-Materials, a term that is used in mechanical design to designate the listing of parts that characterize a product, Bill-of-Features is the listing of PLE features that characterize a product.

>> See the case study.

Additional PLE Resources

The following resources provide additional information regarding pragmatic, new generation PLE solutions, methods, and real-world deployments.

Overviews:

- Product Line Engineering Solutions for Systems and Software
- Reuse is an Event. Sharing is a Journey.

Case Studies:

- General Dynamics & U.S. Army
- Lockheed Martin
- HomeAway

Analyst Reports:

- Product Line Engineering: Underwriting ALM and PLM convergence

The workshop concludes with a summary briefing for interested stakeholders who were not able to attend – for example, managers or other key decision-makers. We help you construct the briefing, including a demonstration of what we accomplished.

Coming up in Part 2: How to build a production line.

Best Regards,
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- Managing Quality in Product Line Engineering: An Automotive Story

About BigLever

BigLever Software, Inc.™ is the leading provider of systems and software product line engineering framework, tools and services. BigLever's patented Gears™ solution enables organizations to reduce development costs and bring new product line features and products to market faster, enabling businesses to more reliably target and hit strategic market windows.

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