**Introduction**

DevOps takes many of its principles from Lean Manufacturing and also the Three Ways (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). Both Lean and DevOps have a concept known as the value stream upon which the Three Ways act. For the technology value stream we can think of it as the process needed to change a business theory into a service or feature enabled by technology and delivering value to customers.

The First Way allows quick left-to-right-flow of work from Development to Operations and then customers (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). The Second Way calls for fast and consistent flow of feedback from right to left for any stage of the value stream. The Third Way permits the creation of a disciplined experimentation and risk-taking in order to allow new things to be learned whether it be from failures or successes. The remaining sections take a closer look at various concepts that affect the application of the Three Ways on the technology value stream.

**Limit Work in Process**

Research has shown that completing even simple tasks becomes more difficult with the introduction of multitasking (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). The more complex the task, the worse effect multitasking has on productivity. By limiting the amount of work an engineer is allowed to do at any given time, the amount of context switching that must be done is minimized and the cognitive load is reduced. Furthermore, limiting work in process (WIP) can allow engineers to see problems in other areas and even help in eliminating those issues thereby improving the overall flow.

**Eliminate Hardships and Waste in the Value Stream**

Anything that causes delays for the customer of value delivered by the development stream can be thought of as waste or hardship (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). These are typically things that could be bypassed without changing the result. The following 9 categories are examples: partially completed work, extra processes, extra features, task switching, waiting, motion, defects, nonstandard or manual work, and heroics.

**Enable Optimizing for Downstream Work Centers**

Lean describes the most important customer as being the next step downstream (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). Optimizing work for these customers means maintaining empathy for their problems so that we can more easily identify the problems preventing a fast and smooth flow. For the technology value stream, this means designing for operations where things like performance, stability, security, etc. are prioritized as highly as are user features. Doing so creates quality at the source that can be repeated on new projects.

**Institutionalize the Improvement of Daily Work**

Teams may not have enough time or authority to improve their everyday processes (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). This means that problems do not get resolved and they may become worse over time. Problems and technical debt can become so bad that the only work being performed is workarounds. Instead, time should be reserved to focus on eliminating problems.

**Transform Local Discoveries into Global Improvements**

There must be a way of communicating local learnings and discoveries to the remainder of the organization so that everyone can benefit from the knowledge (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). When this occurs, anyone doing similar work does so with the benefit of the knowledge of those that came before.

**Leaders Reinforce a Learning Culture**

Leader’s role should be to encourage conditions where teams can discover greatness in daily work (Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N., 2021). Leaders should emphasize the value of learning and problem-solving, which resembles the scientific method. Goals should be explicitly stated and form the basis of shorter-term goals that can be performed by establishing target conditions at the value-stream (e.g., “minimize lead time by 5% next month”). This target is the frame for the scientific experiment that follows for how to achieve the goal.

**Source**

Kim, G., Humble, J., Debois, P., Willis, J., & Forsgren, N. (2021). *The DevOps Handbook (2nd ed.)*. IT Revolution.