IVAR JACOBSON INTERNATIONAL

Software Development Moves from a Craft to an Engineering Discipline Using the Essence Standard

Asian Telecommunications Equipment Vendor Successfully Achieves Rapid and Sustainable Agile Transformation

- Scaling Agile to 1200 people within nine-months
- Reduction of delivery cycle time from 3 months to 1 month
- Reduced defect rates during operations
- Increased automation – continuous integration and delivery
- Reduced cross-product integration lead-time

Global Telecomm and Networking Organization Overview

As one of the world's largest networking and telecommunications equipment and services companies, with over 100,000 employees and annual sales revenue in excess of $30 billion, this company has experienced tremendous growth over the years. As the company expanded, its internal IT Division was struggling to keep up with demand. It recognized that it required a new approach towards software development and hence a new journey towards a modern, agile development method began.

The IT Division develops and operates a wide range of business products including finance and accounting, HR, ERP and CRM solutions that support its various business units. These products involve both packaged software and in-house software with complex integration dependencies. Product teams range from 10 to 200+ people, and development varies from maintenance to new product development.

Moving from a traditional waterfall approach to an agile way of working would not be easy and in 2013 they decided to engage with Ivar Jacobson International (IJI) to assist them with their agile transformation. IJI was chosen because of its expertise in large-scale agile transformation and its thought leadership. SEMAT's Essence[1] and IJI's sustainable change model[2] were central to the equipment provider's agile transformation strategy and success.

The Power of SEMAT and Essence

One of the first and most prominent outputs from the SEMAT community is Essence – a standard that defines the smallest set of concepts that are common to all software projects to help embed agile professional practices and governance across an organization for sustainable, scalable and responsive solution delivery.

"IJI helped us introduce large-scale agile solutions tailored to our specific needs."

The Essence standard helps teams navigate through many of the complex challenges common in software development delivery - from helping teams identify and engage with the right stakeholders at the right time in the right way, to making health and progress visible to all in a language that everyone can understand. It helps team move from software as a craft to engineering and put them onto a path of continuous learning.

Essence was utilized at the equipment provider:

- as a model to determine which product teams should adopt agile practices first
- to drive continuous improvement of working practices
- to capture and communicate new working practices as modular units of capability improvement at the heart of a continuously evolving body of knowledge

Introducing IJI's Sustainable Change Model

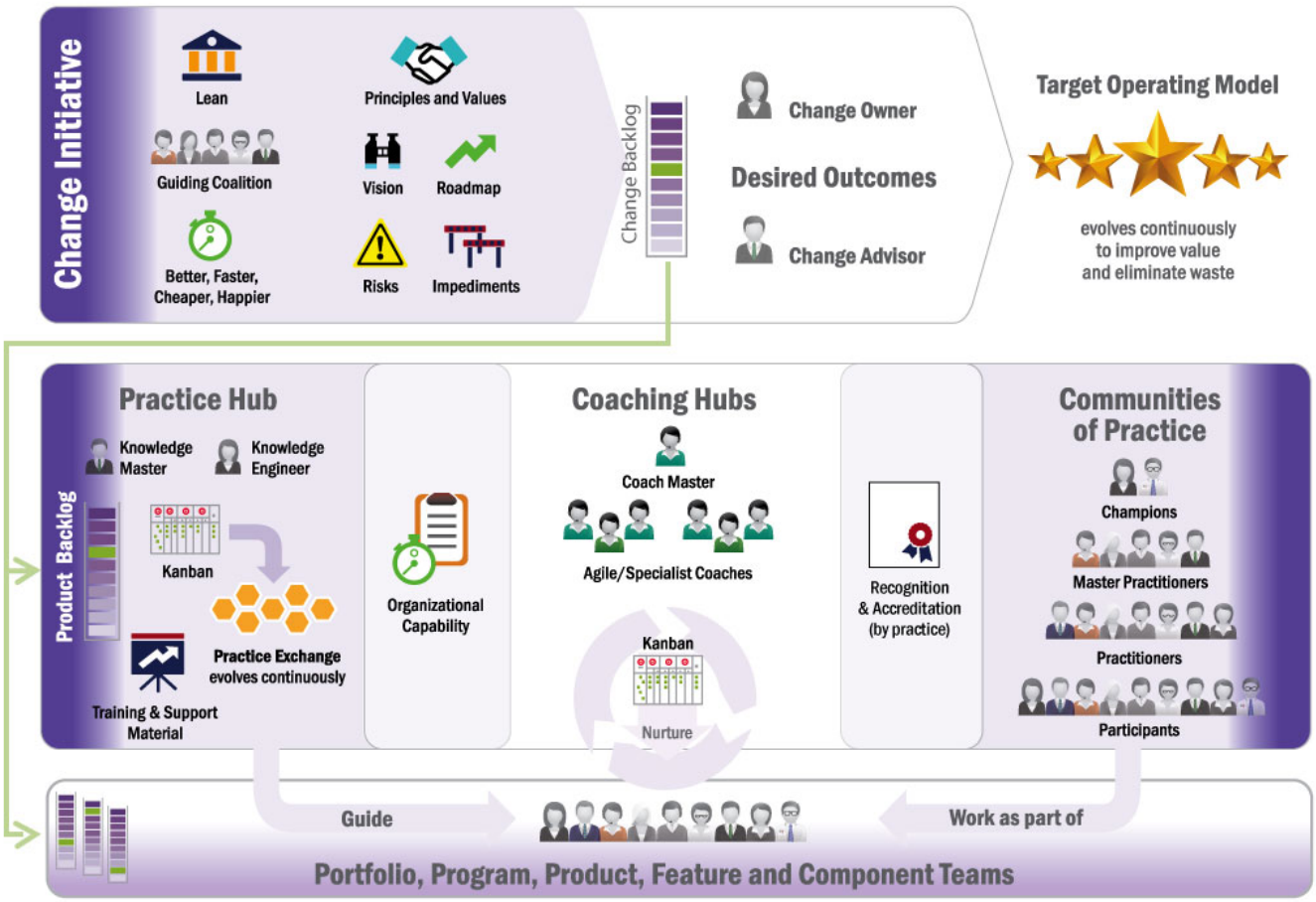

Figure 1: IJI's Sustainable Change Model

IJI consultants utilized their Sustainable Change Model, helping to ensure that the change initiative provided clear direction and that improvements were aligned to business vision and goals.

IJI's sustainable change model was used to:

- establish the Guiding Coalition to drive the transformation
- create a Practice Hub & Exchange to capture and share effective practices
- build a Coaching Hub for coaches to share experiences and lessons learnt
- grow Communities of Practice to embed the transformation as a continuous and self-sustaining improvement process.

Coaching from Top to Bottom

IJI consultants worked with the internal process department to formulate a transformation strategy with the objective of introducing an agile operating model based on SEMAT's Essence and IJI's sustainable change framework.

The strategy and the "to-be" operating model were communicated to executives, department heads, line managers and other key stakeholders to gain consensus and establish a common vision. At the same time, there was on-going work to improve development, test capabilities and infrastructure, including the establishment of a continuous integration/delivery environment.

The strategy and operating model established the foundation for the transformation process, which included 400 people in the first phase (4 months, 8 products) and another 800 people in the second phase (5 months, 12 products).

The teams participating in the first agile transformation phase delivered immediate benefits and built confidence with senior executives. Almost all teams cut their delivery cycles from three months to one month and also improved levels of quality (measured as the number of production defects).

This successful achievement gave confidence to the entire organization to move to the next phase, involving more complex scenarios with many-to-many relationships, such as multiple stakeholder groups requiring multiple requirements sets impacting multiple software systems.

Practice Based Approach

The organization adopted an agile way of working through a practice-based approach, i.e. product teams changed their way of working one practice at a time. **Figure 2** shows the practice architecture. At its foundation lies Essence, the software engineering kernel. On top of which are a set of practices:

- scrum practice for small teams
- super Scrum practice for large teams 50+
- requirements practice for agile collaboration with business representatives
- continuous Integration and Delivery (CI/CD) practice to automate integration and deployment
- contracting practice for giving work orders to contractors and collaboration with contract staff
- architecture practice for working with new products, and major architectural improvements
- testing practice to facilitate the testing of multiple products, reducing regression testing effort, and defect prevention
- integration practice to manage the complex integration relationships between the product teams running agile or traditional approaches.

"Organizational siloes were torn down and we were able to shorten our end-to-end delivery cycle. SEMAT's Essence kernel brought our teams back to basics and laid the foundation for this agile transformation."

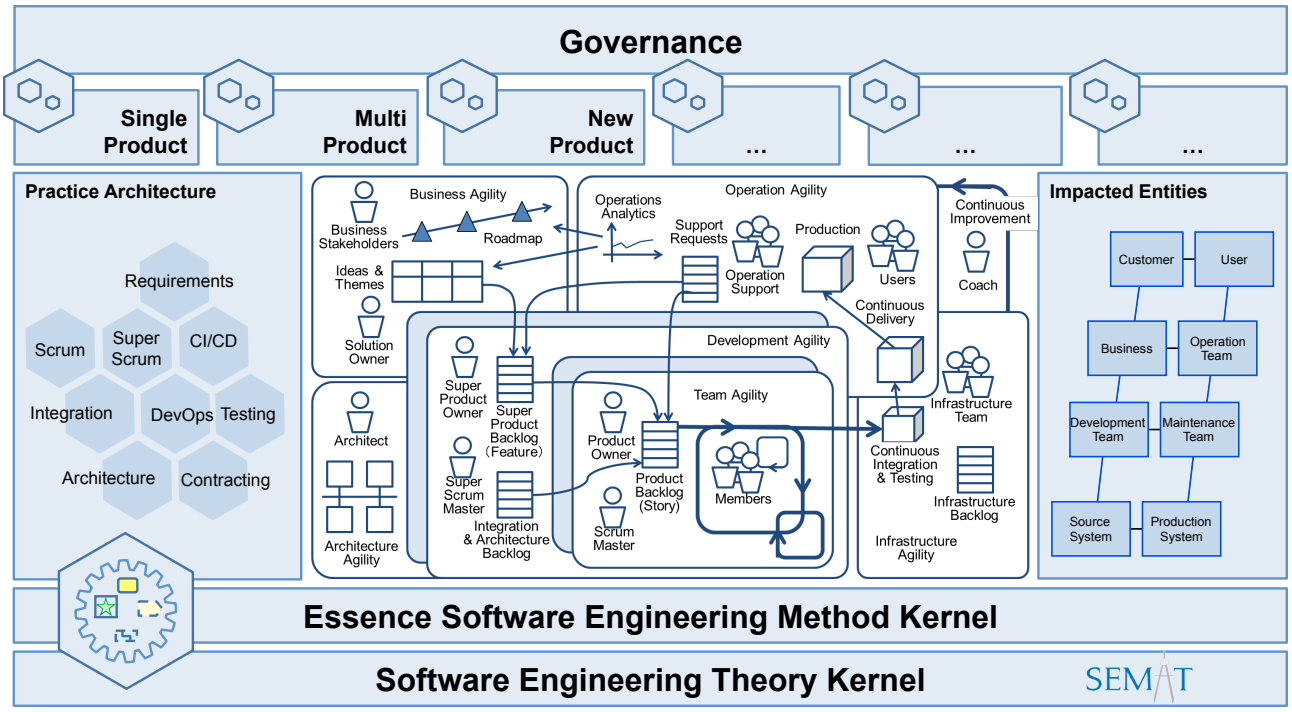

Figure 2 – Practice Architecture

The middle of Figure 2 shows a typical composition of these practices into an execution view. Different development scenarios e.g. single product development, multi-product development, new product development will use a combination of the above practices. These practices are mapped to physical entities to help teams understand the changes to their current way of working and organizational structure.

Practice Hubs

Practice Hubs include a knowledge base of practices and related material. The equipment provider used a platform to collect feedback and experiences, which were then shared through internal social network services. This was critical as they formed the body of knowledge that was retained and maintained after the IJI consultants completed their engagement.

The internal coaches were given the responsibility of maintaining practice descriptions and sharing them to the wider community through a weekly sharing session. These activities have become very important as they 'soften the ground' and make it easier to overcome resistance and inertia within the teams.

Measuring Progress and Improvements

IJI's Better, Cheaper, Faster, Happier (BCFH) approach was used to focus on the key important measures.[2] Data was collected on a regular basis: weekly, monthly and quarterly to evaluate the effects of the agile transformation. Data was reviewed for its validity and accuracy. Each month product teams would present their progress and improvement to their executives.

Challenges Encountered and Solutions

Key challenges encountered:

- organization silos and KPIs (Key Performance Indicators) that were not aligned to an agile mindset
- traditional and heavyweight governance procedures, reviews and checkpoints
- lack of progress towards establishing test automation capabilities
- poor collaboration between business representatives and development
- high contractor turnover rate
- wide range of development scenarios. Complex products with complex integration relationships
- achieving transformation across a very large organization.

Working together, the organization and IJI overcame these challenges by:

- defining new KPIs and checkpoints that better reflect desired outcomes and enable team empowerment and agile ways of working
- setting clear goals and providing coaching support for test automation
- setting work-in-progress limits to improve focus on getting priority deliverables completed and reduce cycle times
- coaching and educating business representatives in agile ways of working
- engagement with contractors to empower them to deliver higher value
- using a practice-based approach to allow teams to pick and adapt practices to meet their specific challenges and needs
- using coaching, sharing, and social networks to spread knowledge.

Outcomes

Within a very short timeframe, the partnership achieved significant quantifiable benefits, including:

- agile transformation of 1200 people within nine-months
- product teams transitioned rapidly to agile way of working and achieved a three-fold reduction in delivery cycle time
- business representatives were fully engaged in the development process
- organization silos were replaced with collaborative partnerships
- reduction of delivery cycle time from 3 months to 1 month
- the numbers of production defects were reduced dramatically
- reduced cross-product integration lead time
- increased automation – continuous integration and delivery
- end-to-end (business-development-operations) disciplined and agile way of working.

"The identified practices on top of the Essence kernel gave us an actionable path to improve each of our teams and successfully meet the needs of the business."

References

[1] Ivar Jacobson, Pan-Wei Ng, Paul McMahon, Svante Lidman, Ian Spence, "The Essence of Software Engineering: The SEMAT Kernel" in Communications of the ACM, Vol. 55, No. 12, December 1012.
http://www.ivarjacobson.com/resource.aspx?id=2126

[2] Ivar Jacobson International, Achieve Rapid and Sustainable Transformation with IJI's Agile Coaching Services, White Paper.
http://www.ivarjacobson.com/resource.aspx?id=2171

About Ivar Jacobson International

IJI is a global services company providing high quality consulting, coaching and training solutions for customers seeking the benefits of enterprise-scale agile software development.

We are passionate about improving the performance of software development teams, and maximizing the delivery of business value through technology.

Whether you are looking to transform a single project or program or your entire organization with lean and agile practices, we have solutions to suit your needs.

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