



Software Engineer Pathway

Value, Flow, Quality (VFQ) is Emergn's approach to work-based education. It allows people to learn and adopt new, modern ways of working to deliver products, services, or ideas to market.

VFQ focuses on outcomes rather than the rollout of any one specific methodology. It's founded on the principle that lasting change requires transformative learning so people can acquire the best skills that apply to their work.

Our approach is influenced by the 70:20:10 Model for Learning and Development. Learning is not an isolated activity that is carried out separate from the workplace. Work and learning are intermingled, and the 70:20:10 model provides a framework for thinking outside the classes/courses/curriculum mindset of learning and focusing on the entire spectrum – workplace, social and formal.

We take a blended approach to deliver education based on the idea that different people learn in different ways. The most impactful learning happens when people understand things and apply those concepts directly in their work.

70 20 10

IN WORK LEARNING

COACHING

EDUCATION



The goal of any organization is to serve a marketplace with valuable products and services. Today, the competitive edge of an organization is based on how quickly and effectively the company can take their ideas and bring them to market. Do the ideas meet the needs of the customer? Have they solved their problem? Will our architecture scale? Does our DevOps culture allow us to respond to the market quickly?

The demand for software engineers who are connected to user needs is on the rise. Many companies are struggling to hire in the talent at the pace required, and have decided to develop internal capability. Basically, the modern, learning organization needs entrepreneurial engineers who can deliver in an Agile way.

This pathway is a practical, work-based education program that helps people working in and around software development to acquire the skills and competencies to define, develop and launch product, services and features that satisfy the needs of the customer. Participants will learn how to practically use techniques and tools to engineer products based on the principles of Value, Flow and Quality.

Deliver in an **Agile** way

Why the Software Engineer Pathway works

- The learning journey and assessment will result in software engineers who are fully competent and confident as Agile and Engineering Practitioners, able to deliver real benefits to the business
- The pathway is supported by the latest VFQ content
- The pathway and context-specific assignments allow participants to develop their own solutions to the specific challenges of taking ideas to market
- The discipline of the regular work-based study groups maintains momentum and engagement with the learning
- The pathway requires participants to test ideas and assumptions, rapidly and effectively, which we get reviewed in study groups
- The pathway teaches a deep understanding of the Agile principles and practices in the context of the customer, market and product lifecycle and how these principles and practices benefit an organization
- The participants are supported throughout their learning journey by experts from Emergen

Benefits of the Software Engineer Pathway

- The pathway enhances the skills of existing talent within the organization, reducing the dependency on external skills and capabilities
- The organization benefits from the very start of the pathway by participants practically applying their learning. Throughout the pathway, they build on initial ideas, creating a rich learning experience around their own specific context
- Participants learn how to apply Agile principles and build quality into their products whilst always keeping the customer in mind
- Feedback will be incorporated sooner through validated learning which will allow products to get to market faster
- Participants will learn how to effectively work with integration and requirements to deliver value to the customer by applying engineering excellence – this helps build the DevOps culture required
- Developing this culture and internal capability of Agile engineering excellence is key to sustaining and rolling out new products and services through the rest of the organization

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Pathway **objectives**

Following the guiding principles of Value, Flow and Quality (VFQ) to deliver value early and often, optimize flow of work end to end for faster delivery and discovering quality through fast feedback, this pathway is designed to teach and validate through practical exercises that help solve real work-based problems.

On completion of this pathway, participants will be able to confidently:

- Apply a thorough understanding of Agile principles and how engineering practices support these
- Analyze and explain how software engineering environments support fast delivery of high quality software
- Analyze and apply techniques to break-down work to effectively manage technical and market risks
- Identify, select and apply engineering approaches to enhance end-to-end work flow
- Implement techniques and practices that provide and improve upon the necessary feedback loops to build quality software products
- Evaluate and apply engineering techniques that ensures software quality over time

Who is this pathway for?

The VFQ Software Engineer Pathway (SEP) is designed for people who are active key contributors in the production of software. The pathway is exclusively designed for developers, engineers and architects that have practical experience in writing software.

This pathway is for people who are looking to improve the way their own organization develops products and services, quickly and with outstanding quality. Participants will benefit from learning about the principles of Value, Flow and Quality and how to apply techniques and practices based on the principles, to take great products and services from idea to market.

It does not mandate the use of any specific technology and is designed to enhance generalist software engineering competence, rather than deep specialist knowledge.

Time allowance

This pathway is designed to maximize the outcomes by applying the learning to real work while taking into consideration the demands on people's time.

The guided learning time to read, attend workshops and complete activities based on the VFQ modules is 40 hours for this course. The time estimated for practical application of the concepts in the assignments part is 120 hours.

The pathway is planned for 16 weeks with one scheduled 2-hour session every week.

16 wks

DURATION

40 hrs

GUIDED
LEARNING

120 hrs

MANDATORY
& OPTIONAL
ASSIGNMENTS

Cohort size

Because we are optimizing for learning, we limit each cohort to a maximum of 12 people, with a minimum of 8. We've found that doing this gives everyone a chance to ask questions and discuss and share ideas for changing the way teams work.

The pathway is built to support both the in-classroom format and remote delivery. The syllabus and learning objectives are the same, but the interactions and activities are tailored to suit the particular delivery format.

Please note that the work-based assignments and some session activities are built around peer reviewing and collaboration. Therefore, it is imperative that participants have the ability to collaborate closely (at least in pairs).

Course evaluation

On completion of the learning pathway, the participants will be assessed based on the quality of completed work-based assignments.

The work-based assignments consist of 4 mandatory assignments. The main one is a journal of change in which the participant captures the current context and records events and insights throughout the education program. Details of programming improvements need to be submitted for other mandatory assignments.

There are a selection of optional assignments are for the participants to choose from and complete a subset of.

The participants need to submit work-based assignments totaling 12 credits (where one credit should roughly correspond to 10 hours of work).

Pathway outline

We kick-off with a half-day workshop to develop a shared understanding of the guiding principles and give an overview of the rest of the pathway. It is also used to gather expectations of the course and ascertain the skills and capabilities within the group to ensure the activities and assignments will be appropriate.

Each weekly learning session will be a mixture of discussions, activities, explorations and case studies.

Participants will be expected to have completed pre-reading and be prepared to present learning activities and updates on assignments, as these will be discussed during the 2-hour sessions.

The first 4 modules will focus on the underpinning mindset and underlying principles of Agile. This will allow you to reflect on your own individual context through new lenses.

The subsequent 6 modules will focus on software development and the work-based assignments.

12 credits

MANDATORY AND OPTIONAL ASSIGNMENTS

120 hrs

TIME TO COMPLETE ASSIGNMENTS

Pathway outline

WEEK 1

Kick-off workshop

Starts with the pathway overview and exercises for participants to understand and learn about each others context. It also covers the VFQ Foundations which includes concepts about the need for change, as well as the benefits of delivering early and often.

Value Flow Quality

WEEK 2

Why change?

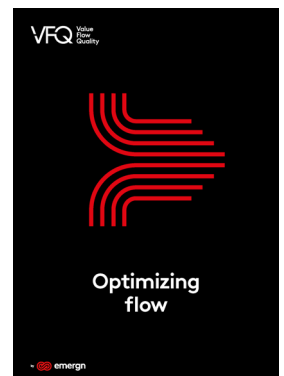
- Why change
- Debate the case for change
- Learning activity: Context paragraph



WEEK 4

Optimizing flow

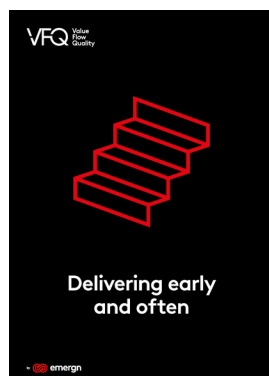
- Optimizing the whole
- Identifying dependencies
- Learning activity: Waste analysis and description of end-to-end flow



WEEK 3

Delivering early and often

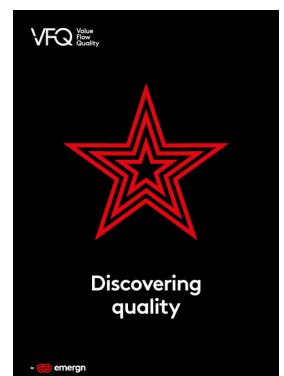
- Story maps
- What is value?
- Technique for decomposition based on value
- Learning activity: Story mapping exercise



WEEK 5

Discovering quality

- Feedback loops in product development
- Technical vs market risks
- Learning activity: Describe your feedback loops



WEEK 6

Assignment review

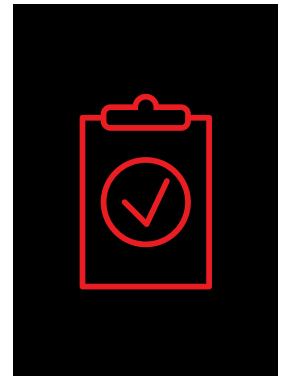
Progress report and feedback on work-based assignments.



WEEK 9

Assignment review

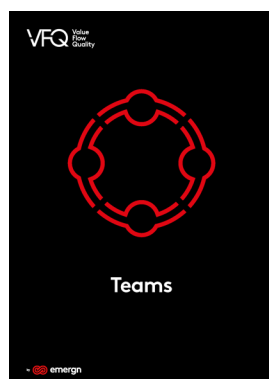
Progress report and feedback on work-based assignments.



WEEK 7

Teams

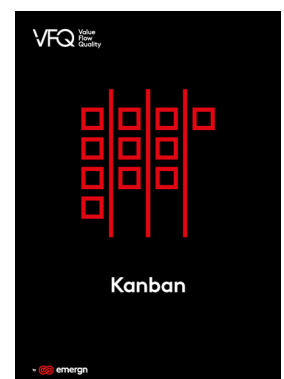
- Attributes of high performing teams
- Team composition
- T-shaped competencies
- Learning activity: e.g. conduct sharing experience



WEEK 10

Kanban

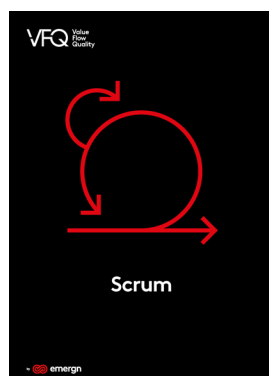
- Kanban and a focus on Value, Flow, Quality
- Workflow visualization
- Learning activity: e.g. report on continuous improvement



WEEK 8

Scrum

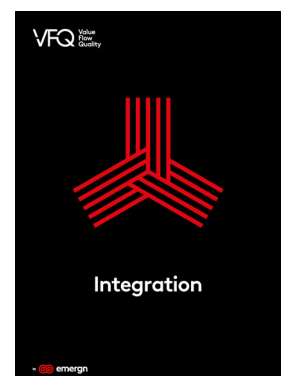
- Scrum and a focus on Value, Flow, Quality
- Estimation techniques
- Burndown charts
- Learning activity: e.g. demonstration or definition of done



WEEK 11

Integration

- Standards vs autonomy
- Integration behaviors
- Continuous integration and delivery
- Data and persistence concepts
- Learning activity: e.g. continuous delivery



WEEK 12

Assignment review

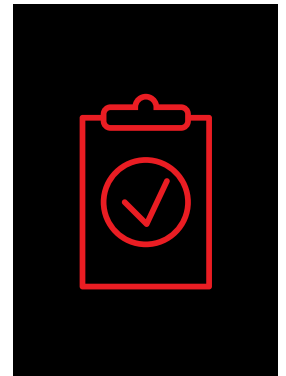
Progress report and feedback on work-based assignments.



WEEK 15

Assignment review

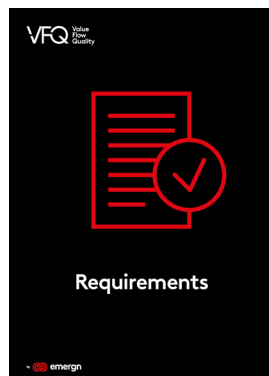
Progress report and feedback on work-based assignments.



WEEK 13

Requirements

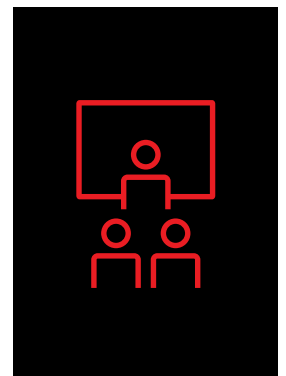
- Agile requirements gathering
- Non-functional requirements
- Decomposition
- Learning activity: e.g. user story writing



WEEK 16

Assignment presentation

Participants present their assignments to the course tutor and an appointed Emergn assessor for approval.



WEEK 14

Adapting Agile

- Patterns of Agile success
- Managing technical debt
- Code quality
- Learning activity: e.g. source control best practices



Work-based assignments overview

According to the 70/20/10 principle, the majority of learning is obtained by practical on-the-job experiences solving real problems. For the work-based assignments to be assessed they need to demonstrate the ability to command and apply the necessary techniques in the software development process.

In general, we are looking for the following when evaluating the assignments:

- Documented evidence of the concept being applied and implemented in the organization
- Clear explanation of how the assignment ties to the principles of Agile
- Controlled and structured experiments
- Effort levels and resolutions that are appropriate for the situation at hand

Participants are encouraged to select a variety of assignments from different modules in the syllabus and to collaborate with their team members and learning peers.



For more information about the VFQ Software Engineer Pathway, or any of our other pathways and programs, please contact us or visit emergn.com

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