

## Improved Fagan Inspections and Continuous Process Improvement

In the fast paced worlds of software and hardware development, most organizations are faced with a compelling need to:

- Reduce cycle time
- Improve quality
- Reduce costs
- Improve productivity



Michael Fagan created the Fagan Defect-Free Process™ (of which Fagan Inspections are a key part) to address these requirements. And it works!

Our 3-day course engages every member of the development team: managers, software engineers, writers, system analysts, quality assurance analysts, and testers. Classes involve development teams and managers — leading to the fastest implementation and realization of benefits.

We help you find defects early in the development cycle and fix them at minimum cost, thereby reducing higher rework costs later, shortening development time, increasing productivity and shipping at least 10X fewer defects to users.

Contact us to begin self-perpetuating process improvements throughout your development organization that will prevent future product defects *before* they happen.

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**RECOMMENDED** by the Software Engineering Institute/CMMI of Carnegie Mellon University.

"We're finding lots of process improvement ideas that prevent future defects from being created in the first place." - Jim Sartain, Director of Software Engineering Processes, Intuit

Michael Fagan Associates is located in Mountain View, California, in the heart of Silicon Valley. With the global economy and its many communication options, we can set up one of our courses wherever your company is located. Michael and our Associates regularly travel all over the world teaching our courses.

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## What We Do

Michael Fagan Associates conducts 3 day training classes with software development teams, bringing together the whole team responsible for creating the product, including:

- software engineers
- testers
- quality and process engineers
- project managers and supervisors
- business analysts

The methods covered in the class have been successfully applied to all phases of the product life-cycle from requirements through development, testing, product maintenance, and service. Our goal is immediate implementation of the methods and skills that we teach starting the day after class so that the results can also be immediately achieved.

The Fagan Defect-Free Process involves changing and improving how the whole development organization works. This means the team of managers, analysts, designers, developers, testers, maintainers, documenters, etc., must understand how to use this process and how it will help them achieve these goals.

Change takes time! Our course will take you through the steps needed to make these changes in your organization. Having proven its effectiveness in class, almost all organizations implement what they learned starting the day after class.

Since the training case studies involve actual products that the team is developing, real work is done during the class and real work issues are addressed. For these reasons, managers need to be involved in the class itself. The Fagan Defect-Free Process successfully adds function to new or existing code of a very diverse set of products in a broad spectrum of businesses, including:

- Communications
- Embedded Systems
- Medical devices
- Financial applications
- E-commerce applications
- Computer Hardware and Software
- National Defense
- Aircraft systems and production
- Mathematical model

We use English prose for requirements and design, and a wide selection of software languages including Visual Basic, COBOL, FORTRAN, C, C++, C#, PERL, and several proprietary

operating system languages. **AGILE, SCRUM, Waterfall, PSP and TSP** work processes have all enjoyed improvement.

Participating organizations range from SEI PMM/CMM maturity levels-1 to 5. (Yes, SEI Level-5 organizations have improved their processes right in the class!) Company sizes range from 24 to 4000 engineers and managers trained so far. Work groups within these companies range from two up to several hundred working on the same project.

This process is applicable to almost any work products - if it can have a defect, this process can improve it.

- **Proposals and Quotes**
- **Project Plans**
- **Requirements**
- **System Architecture**
- **Functional Specifications**
- **Software (Logic) and Hardware Design**
- **Hardware Schematics**
- **Code**
- **Legacy Software (Involving a variety of notations, methods (including OO), and coding languages (C, C++, Java, HTML, PERL, Ada, Assembler, etc.)**
- **Test Plans and Cases**
- **User and Process Documentation**
- **Installation Specifications**
- **Training plans and materials**
- **SYSGEN and Site Installation Procedures for Systems and Field Engineers**

## **Our Process**

**The Fagan Defect-Free Process is the only complete method that includes the necessary infrastructure to establish and maintain a defect-free process!**

**It is composed of three interdependent components:**

- 1. Formal Process Definition**
- 2. Fagan Inspection Process**
- 3. Continuous Process Improvement**

**FORMAL PROCESS DEFINITION is a method of defining the work process in terms that make it measurable and manageable by its users.**

**The goal of this component is to reduce the number of defects injected in the first place. It also channels the developer's activity more effectively, enabling them to create their work products with less effort.**

**Your development processes already in place do not have to change - they are just made crisper and clearer through this process to ensure defect-free flow from marketing and requirements through development through to customer use.**

**The whole organization is involved in the development process which helps to focus efforts and reduce rework. Without our method of formal process definition in place, implementing inspections on their own are often doomed to less effective inspections (or failure) over the long term due to time pressure, neglect and lack of understanding.**

**The FAGAN INSPECTION PROCESS consists of 7 operations. Naturally, it is formally defined. Its objectives are to: Find all the defects in the work product that is examined, and Find all the Systemic Defects in the process that created defects in the work product.**

**Inspections are performed on requirements, design (software and hardware), code, test plans and cases, project plans, quotes and proposals.**

**CONTINUOUS PROCESS IMPROVEMENT involves removing Systemic Defects from the work process as they are found by inspections or other operations in the life cycle. Successive iterations reduce the number of injected defects and increase the percentage of detection of those that are injected. Systemic defects are the most costly forms of defects to an organization. Removal of these is critical to reducing costs and shortening the development life cycle.**

## The Course

**Our three day course is designed for groups of 24 people organized into six teams of four. A team comprises engineers and managers who work on the same projects.**

**A detailed lecture is provided on Improved Fagan Inspections and Continuous Process Improvement. Roles are then assigned to each inspector/team member for the following tasks**

**CASE STUDY I: A case study is performed by each team to inspect real product code that they bring to the class. Results are analyzed and presented to the class.**

**CODE INSPECTION: Economics are calculated from the case study data showing NET saving of effort, and ROI of the inspections.**

**MANAGEMENT REVIEW: Each team inspects real product requirements that they bring to the class. Results are analyzed and presented to the class. Each team presents a problem that will inhibit them from implementing what they have learned starting right after the class, and what they will do remove the problem. Senior management attends these presentations. Immediate introduction and improvements are expected.**

**The effectiveness in finding defects of Fagan Inspections is metrically calibrated.**

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## RESOURCES:

- 1. A History of Software Inspections by Michael Fagan, sd&m Conference 2001**
- 2. The Best Influences on Software Engineering, IEEE Software,, January/February 2000**
- 3. Advances in Software Inspections, IEEE Transactions On Software Engineering, July 1986**
- 4. "Design and code inspections to reduce errors in program development," by Michael Fagan, IBM Systems Journal, Vol. 15, No. 3, pp. 182-211 Copyright 1976 by International Business Machines Corporation. Reprinted with permission of the IBM Systems Journal, Vol. 15, No. 3**

## Clients

Clients can find and contain over 90% of all life cycle operational defects (defects that would otherwise be found by testing or through customer use) by inspection, before testing even begins. Teams leave our class quite capable of achieving these results immediately after class.

Clients report similar results after completing our course:

- **50% Reduction in Cycle Time** (much of this is due to reducing test time and effort)
- **10 - 20x Reduction in customer reported defects**
- **50% Increase in meeting schedules and maintaining budget**
- **2x Increase in Productivity**
- **40 - 60% Improvement in Customer Satisfaction.**

Our continuous process improvement has helped over 100 clients in 15 countries, including:

- **Abbott Laboratories**
- **ADP**
- **AGL- Australian Gas & Light**
- **Alcatel**
- **BAE Systems UK — World's 2nd largest defense contractor**
- **Bayer**
- **Boeing**
- **CISCO**
- **Discover Card**
- **FISERV**
- **Ford Motor Company**
- **General Dynamics**
- **Hewlett-Packard (HP)**
- **IBM**
- **Intuit**
- **Internal Revenue Service (IRS)**
- **Lockheed Martin — World's largest defense contractor**
- **Morgan Stanley**
- **Motorola**
- **National Bureau of Statistics**
- **Pitney-Bowes**
- **SAS — A Fortune 500 Best Company**
- **Shape Data**
- **Siemens**
- **Texas Instruments**
- **UNISYS**
- **Various National Defense/Security Entities**

## About Us



**Michael Fagan is founder and CEO of Michael Fagan Associates and the creator of Fagan Inspections and the Fagan Defect-Free Process™.**

**As a product development manager at IBM, Michael created the Fagan Inspection Process for use on his own projects. Over the years, this has been enhanced and expanded into the the Fagan Defect-Free Process™, incorporating Formal Process Definition, and reinforcing the Continuous Process Improvement aspect of the Inspection Process.**

**Using the inspection method, he was also able to use its metrics to monitor projects and keep them on track. The methodology developed by Michael Fagan is credited with dramatically reducing the number of defects in software and hardware products, increasing the feature content per release, shortening cycle time, increasing customer satisfaction, improving development processes, accelerating SEI/CMM maturity in organizations, and significantly reducing costs.**

**Michael Fagan has 20 years of experience in IBM as a line manager of software development, engineering development, and manufacturing. In addition, he was: manager of programming methodology for IBM's DP Product Group (Worldwide); the first software senior technical staff member in IBM's T.J. Watson Research Laboratory; a member of the Corporate Technology Staff; and one of the founder members of the IBM Quality Institute.**

**IBM awarded Michael Fagan the largest individual Corporate Achievement Award for creating the Fagan Inspection and promoting its implementation in IBM's laboratories around the world and in industry.**

**Based upon his research and development of methods that shorten cycle time, reduce cost, and improve quality, he has established an international reputation. Due to these accomplishments, he has been an invited speaker at many national and international conferences on software engineering and management. Previously, Michael Fagan was a Visiting Professor in the Department of Computer Science and a member of the Graduate Council of the University of Maryland.**

**Our Associates have used the same principles they teach in their own work experience as software and/or hardware engineers and middle to upper level managers of development organizations. They handle both technical and management issues as they arise in the class and have also been specially trained by Michael Fagan to teach the Fagan Defect-Free Process.**

**Michael Fagan Associates was formed in 1989 to teach others how to use this method successfully. We continue to refine our methodology and maximize its efficiency.**

**Our training course is capable of introducing a rapid and lasting implementation in all types of organizations, producing impressive results in the product or release on which they were working starting the day after training was completed.**

**Client products include systems programs, applications, data base programs, applications, hardware designs, systems and applications requirements and object oriented tools.**