

# IEEE Computer Society/Software Engineering Institute Watts S. Humphrey Software Process Achievement Award

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The IEEE Computer Society/Software Engineering Institute Watts S. Humphrey Software Process Achievement (SPA) Award is presented to recognize outstanding achievements in improving the ability of a target organization to create and evolve software-dependent systems. The award need not be made each year, and multiple awards may be made in a single year.

The SPA award is named for Watts S. Humphrey, known as the "Father of Software Quality." Humphrey, following a long career with IBM, served at the SEI from 1986 until his death in 2010. He dedicated the majority of his career to addressing problems in software development, including software quality, programmer motivation and commitment, team process discipline, and how organizations can best support these. During Humphrey's tenure at the SEI, characteristics of best practices at the individual, team, and organizational levels were identified that laid the groundwork for the Personal Software Process, the Team Software Process, the Capability Maturity Model (CMM) for Software and, eventually, CMM Integration (CMMI). In 2005, Humphrey received the National Medal of Technology for his work in software engineering.

*"We have found by applying to software the principles that made the industrial revolution possible, software engineering teams can achieve improvements in quality, predictability, and productivity that exceed our wildest dreams." –Watts S. Humphrey*

The award may be presented to an individual or a group. Recipients are most often employees of the target organization. If not, recipients may work for an organization that provided software engineering process improvement benefits to the target organization. For example, the recipient organization may

be an organization that provides services related to software engineering process improvement to the target organization, or it may be an association that supports activities related to software engineering process improvement that benefit one or more target organizations. The target organization may be for-profit, not-for-profit, or non-profit; may be an industrial, academic, or government organization or foundation; and need not be based in the United States.

The achievements being recognized can be the result of any type of process improvement activity. In particular, they need not be based on a specific framework, model, or body of software engineering principles, practices, techniques, or methods.

The award nomination may be submitted by a group, or nominees may nominate themselves. Award nominations must be seconded by a senior executive of the organization in which the nominated individual or group works and supported by a 12-page nomination package. The nomination package is comprised of a 2-page overview and up to 10 pages of supplemental information that shows how the nominee's productivity improvement is, to an exceptional degree, **significant, measured, sustained, and shared**.

The award will be announced and recognized by both the IEEE Computer Society and the Software Engineering Institute (SEI). Recipients will receive an engraved, commemorative plaque at a conference in which they present their accomplishments. Recipients will also be required to produce an SEI technical report describing their accomplishments.

More information about the nomination and award process, deadlines, and past recipients can be located at <http://www.computer.org/web/awards/humphrey-spa>. Questions should be directed to the [SPA Award Coordinator](#).

### **Award Committee Members**

#### **Chair, Mike Konrad, Software Engineering Institute**

Bill Curtis, CAST Software

Gerd Hoefner, Siemens Technology India

Narayana Murthy, Infosys Limited

Dieter Rombach, Fraunhofer IESE

Ed Weller, Integrated Productivity Solutions, LLC

Michele Falce, SPA Award Coordinator, Software Engineering Institute

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## Overview

The SPA Award is given to individuals or groups to recognize the excellence of their work.

To nominate an individual or group, you must submit nomination material specifying the nominee, describe the nominee's software engineering process improvement work, and make a case for why the nominee's work has led to productivity improvements. The nomination material must be accompanied by letters and signed by an individual with the appropriate responsibility and authority, certifying agreement to several award conditions. Nominations must be submitted to the SPA Award Coordinator as outlined in the Award Schedule.

Nominations are evaluated by an Award Committee consisting of senior, knowledgeable, and experienced software engineering process improvement professionals. The restricted length of the nomination package generally does not allow a fully adequate description of the nominee's activities and results, but it should provide enough information for the Award Committee to determine that the criteria are likely to be satisfied. Nominees that pass this initial screening review are then engaged in focused interactions with the Award Committee to elicit more detail about the nominee's achievements. A positive decision requires that the nominee satisfy the award criteria to an exceptional degree. In the case of a negative decision, the Chair of the Award Committee provides an explanation, a detailed list of deficiencies, and advice regarding a resubmission in the future.

The Award Schedule is designed to provide recognition of the recipient's accomplishments and to ensure dissemination of the recipient's experiences and lessons learned throughout the relevant researcher and practitioner communities. A recipient is mentored by a committee member to assure the creation of a high-quality SEI technical report and effective, high-quality presentations, which will be delivered to the researcher and practitioner communities.

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## Criteria

The SPA Award nominee's productivity improvement must, to an exceptional degree, be significant, measured, sustained, and shared.

- To be **significant**, the work must have a demonstrated impact on the target organizations' software engineering results (e.g., productivity increases, defect density for software reaching integration and test decreases, or rework percentage decreases, and by how much). It should also consider, as pertinent, the impact on the target organizations' management, workforce, and system development and maintenance processes (e.g., cycle time to address emergency tickets decreases and percentage of tickets correctly fixed on first try increases, and by how much).
- To be **measured**, the work must include the collection of data used to guide the work and clearly demonstrate its impact. Concrete software engineering process improvement goals, factors, and

metrics must be defined. The work must involve assessing the cause-and-effect relationship between changes (e.g., to the organization's processes, training, and tools) and their impact (to reduce defect density, reduce cycle time, or increase productivity).

- To be **sustained**, the work must lead to a continuing impact on the target organizations' software engineering activities. In particular, the work should result in well-documented support (e.g., in the form of coaching, training, tools, measures, and obtaining feedback on changes) for effective process performance and continuous software engineering process improvement.
- To be **shared**, the insights, experiences, and proven practices stemming from the work must have been made available beyond the target organizations. This could, for example, be to other parts of larger organizations within which the target organizations are subunits. It could, additionally or alternatively, be throughout software engineering process improvement communities in which the nominee and target organizations participate.

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## Eligibility Requirements

The SPA Award may be presented to nominees that meet the following requirements:

- The award may be presented to an individual or a group. Recipients are most often employees of the target organization. If not, the recipient may work for an organization that provided software engineering process improvement services to the target organization. For example, the recipient's organization may be an organization that provides training or process measurement consulting to the target organization, or it might be an association that supports activities related to software engineering process improvement that benefit one or more target organizations.
- Because software engineering process improvement activities are normally group activities, a nominee is usually a team of professionals. However, to recognize work within small organizations or within organizations that do not formally define a software engineering process improvement-related team, a nominee may be an individual or a small, informal group.
- The target organization may be for-profit, not-for-profit, or non-profit; may be an industrial, academic, or government organization or foundation; and need not be based in the United States.

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## Nomination Materials

The nomination material must contain an overview that consists of no more than two pages identifying the nominee, briefly describing the nominee's software engineering process improvement-related work, and concretely demonstrating the work's impact and excellence.

This overview must identify the following:

- the nominee, the target organizations, and the nominee's relationship to the target organizations

- one to three individuals who will represent the nominee organization in any award-related activity
- a point of contact for interactions between the Award Committee and both the nominating and nominee organizations

In addition, and most importantly for demonstrating award-winning work, the overview must, with respect to the target organizations, do the following:

- define the goals for the nominee's software engineering process improvement work
- describe the work briefly and succinctly
- summarize evidence that the work met the goals and had a positive effect on the target organization
- summarize the work's direct impact and significance (e.g., in terms of productivity and quality improvements)
- summarize the work's indirect impact and significance to the software engineering process improvement community at large

The overview must be supplemented by no more than 10 additional pages of graphs, figures, tables, or other supporting data and explanatory material and be written in coherent, readable English. These additional pages should provide more details of how the nominee satisfies the evaluation criteria. The evaluation questions used by the Award Committee (see the end of this document) may be used as a guide for the structure and content of this supplementary material.

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## Conditions

A nomination must be seconded by a senior executive from the nominee's organization. If the target organizations are different from the nominee's organization, then the nomination must also be seconded by a senior executive from each of the target organizations. In addition to seconding the nomination, these senior executives must agree to the following:

- None of the data and information in the nomination material is proprietary or confidential.
- On request, the nominee will provide additional detailed data and information regarding the software engineering process improvement-related work. If any of the additional data and information is proprietary or confidential, it will be clearly marked as such.
- If selected as an award recipient, the nominee will make a presentation at a conference to be selected by the SEI and the IEEE Computer Society and, in particular, be available to receive the commemorative plaque when the award is announced.
- All data and information that the Award Committee uses as the basis for an award will be published in the SEI technical report, perhaps in some modified form mutually acceptable to the Chair of the Award Committee and the award recipient.
- If an on-site visit is required (the Award Committee will use teleconferencing technology where possible), all travel expenses will be reimbursed by the nominee's organization and/or the target

organizations, with international travel reimbursed for one award committee member at business-class airfare rates.

- Committee members will not be required to return the nomination material, any non-proprietary or non-confidential material submitted in response to requests for additional information, or any non-proprietary or non-confidential material distributed during a site visit.

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## Evaluation Process

For each nomination, the following steps are completed:

- The Award Committee evaluates the degree to which the nominee's work satisfies the award criteria for significant, measured, sustained, and shared improvement.
  - To evaluate whether the work is significant, the committee considers as factors not only the breadth and depth of the work's deployment throughout the target organizations (e.g., the number of projects that have benefited) but also the certainty of the connection between the software engineering process improvement work and achievement of the target organizations' performance goals (e.g., the strength of the link between the work and the improvements in productivity and quality). If a heterogeneous set of organizations (or projects) have different business goals (or different improvement starting points), it may not be sensible to aggregate deployment or impact data across organizations. In this case, the nominator should select a small set of individual organizations (possibly three to five) and report specifically the work for these.
  - To evaluate whether the work is measured, the committee considers factors such as the breadth to which the data demonstrate the improvement (e.g., the measurement of customer satisfaction factors as well as workforce capability-related factors), the depth of the data regarding the improvement (e.g., the consideration of defect containment as well as defect incidence data), and the use of well-defined measures to demonstrate the improvement (e.g., the definition of a concrete measure relating planned vs. actual project effort).
  - To evaluate whether the work is sustained, the committee considers factors such as the work's level of documentation (i.e., whether the results of the work are described in informal memoranda, internal reports, or organizational standards), the likelihood that the results achieved to date are permanent (e.g., as indicated by the support of senior executives), and the likelihood that there will be additional improvements in the future (e.g., as indicated by establishing procedures for collecting, considering, and implementing process improvement suggestions).
  - To evaluate whether the work is shared, the committee considers factors such as the degree to which the work has directly affected other organizations (e.g., the number of other organizations using methods influenced by the nominee's work) and the extent to which the nominee's work has impacted (or will impact) the nominee's local and global software engineering

process improvement communities (e.g., in terms of presentations in professional society meetings).

- The Award Committee decides whether the nominee's work satisfies all of the criteria to at least a minimal degree. If this is not the case, a detailed list of deficiencies is sent to the nominator and nominee accompanied by advice regarding a resubmission in the future. If the work at least minimally satisfies all of the criteria, then a detailed list of questions and issues is sent to the nominee.
- The Award Committee interacts with the nominee to gather information addressing the questions and issues. If the Award Committee feels it is necessary (and, recently, this has been the exception rather than the norm), they may conduct an on-site visit to interact with the nominee and personnel from the target organizations.

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## Recipient Support Process

The following steps occur after a proposal is approved by the IEEE Computer Society and the SEI:

- The Award Committee consults with the recipient to confirm recipient's availability to present at a conference selected by the SEI and the IEEE Computer Society.
- The Award Committee identifies a member to mentor the recipient in preparing high-quality conference presentations and a high-quality SEI technical report regarding the recipient's "improvement journey" and the resulting insights, experiences, and proven practices.
- The SEI announces the recipient(s), presents the commemorative plaque, introduces the recipient'(s)' presentation, and promotes the recipient'(s)' work and its implications for the conference attendees' work.
- The Chair of the Award Committee facilitates publication of the SEI technical report to coincide with the second-occurring conference and makes arrangements for delivery of an honorarium upon completion of the report.

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## Resubmission

Achievements that have previously been recognized by an award may not be re-nominated. All other nominations may be resubmitted in any subsequent year. Any submission that has previously been declined must address the deficiencies outlined by the Chair of the Award Committee.

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## Previous SPA Award Recipients

SPA Award recipients are required to produce an SEI technical report that describes their accomplishments, their "improvement journey," and the resulting insights, experiences, and proven practices. Here are the reports written by previous recipients.

- [IEEE Computer Society/Software Engineering Institute Watts S. Humphrey Software Process Achievement \(SPA\) Award 2016: Nationwide](#), Will J.M. Pohlman.
- [IEEE Computer Society/Software Engineering Institute Watts S. Humphrey Software Process Achievement Award 2016: Raytheon Integrated Defense Systems](#), Neal Mackertich, Peter Kraus, Kurt Mittelstaedt, Brian Foley, Dan Bardsley, Kelli Grimes, Mike Nolan.
- [IEEE Computer Society/Software Engineering Institute Software Process Achievement \(SPA\) Award 2009](#), 2009. Satyendra Kumar and Ramakrishnan M., Infosys Technologies, Ltd.
- Productora de Software S.A. (PSL), 2006
- [Software Process Improvement Journey: IBM Australia Application Management Services](#), 2004. Robyn Nichols and Colin Connaughton, IBM Australia Application Management Services
- [An Integrated Approach to Software Process Improvement at Wipro Technologies: veloci-Q](#), 2002. V. Subramanyam, Sambuddha Deb, Priya Krishnaswamy, and Rituparna Ghosh, Wipro Technologies
- [Software Process Achievement at Tinker Air Force Base, Oklahoma](#), 1999. Kelley Butler and Walter Lipke, Oklahoma City Air Logistics Center, Directorate of Aircraft, Software Division, Test Software and Industrial Automation Branches
- [Software Process Improvement Works!](#) 1998. Pat Ferguson, Gloria Leman, Prasad Perini, Susan Renner, and Girish Seshagiri, Advanced Information Services, Inc.
- [Hughes Aircraft's Widespread Deployment of a Continuously Improving Software Process](#), 1997. Ron R. Willis, Robert M. Rova, Michael D. Scott, Martha I. Johnson, John F. Ryskowski, Jane A. Moon, Ken C. Shumate, and Thomas O. Winfield, Raytheon Systems Company
- [Raytheon Electronic Systems Experience in Software Process Improvement](#), 1995  
Blake Ireland, Ed Wojtaszek, Dan Nash, Ray Dion, and Tom Haley, Raytheon Electronic Systems
- [Software Process Improvement in the NASA Software Engineering Laboratory](#), 1994  
Frank McGarry and Rose Pajerski, NASA/Goddard Space Flight Center  
Gerald Page and Sharon Waligora, Computer Sciences Corporation  
V. Basili and M. Zelkowitz, University of Maryland



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