

**CHIEF EDITORS**

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# SPI MANIFESTO

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**VALUES**

*We truly believe that SPI*

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**A | People** | **Must involve people actively and affect their daily activities**

NOT to show-off or be focused on management alone



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**B | Business** | **Is what you do to make business successful**

NOT to live to deploy a standard, reach a maturity level, or obtain a certificate



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**C | Change** | **Is inherently linked with change**

NOT continuing as we do today



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**PRINCIPLES**

*We trust that the following principles support the values*

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**People**



Know the culture and focus on needs

Motivate all people involved

Base improvement on experience and measurements

Create a learning organisation

**Business**



Support the organisation's vision and objectives

Use dynamic and adaptable models as needed

Apply risk management

**Change**



Manage the organisational change in your improvement effort

Ensure all parties understand and agree on process

Do not lose focus

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# What is this?

In September 2009 a group of experts in Software Process Improvement (SPI) from all over the world gathered in connection with the EuroSPI Conference for a workshop at Universidad de Alcalá in Spain.

EuroSPI's mission is to develop an experience and knowledge exchange platform for Europe where SPI practices can be discussed and exchanged and knowledge can be gathered and shared.

At the workshop 15 experts presented their 'wisdom' grounded in many years of process improvement experience. Based on the presentations, 30 workshop participants brainstormed core values and principles specifically for process improvement. Via affinity analysis and group thinking exercises we ended up with a manifesto for SPI. At the end of the workshop 4 values and 14 principles were identified. Among the group of participants, authoring responsibilities were distributed on a voluntary basis backed by personal justification. Some values and principles were focused on by more than one volunteer.

By mid-October 2009 all the contributions were available to the editors, who edited the document thoroughly. A number of principles were written with considerable overlap so it was obvious that they should be consolidated. The same consolidation needs were applied to one of the values.

The editors restructured the documented and edited the text so that it introduces itself in a uniform style. The result was a document with three core values and eleven principles. This document was ready in November 2009. Eight reviewers read the resulting document and commented thoroughly. Finally all the comments were ad-

dressed in this final version from January 2010, including a joining of two principles and a shorter formulation of the principles – so the final document consists of three values and ten principles.

A final review was performed by Tim Kasse.

## Manifest – what is that?

A 'manifest' makes things clear and obvious or evident. This manifest gives expression to state-of-the-art knowledge on SPI. It is based on hundreds of person-years of practice and experience from organisations worldwide.

## What to use the manifest for?

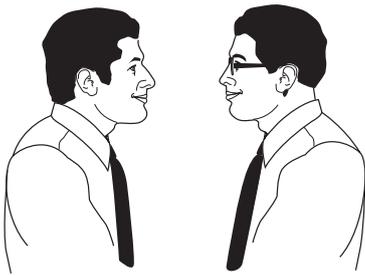
You can use the manifest to obtain knowledge on SPI. It will help you to remember what is important about Software Process Improvement? Each value and the consequent principles are written so you can easily place yourself into the problem and its context. Short explanations for each value are provided that can further augment your understanding. Each value also has some relevant examples that will make it easier to learn and remember the values and principles.

You can use the manifest when you are responsible for planning a SPI project. The third manifest value states that SPI is actually really about change. Thus, you can apply the principles in your SPI project that will support the necessary corresponding change in the organisation.

We hope you enjoy reading the manifesto and find the contents useful.

Jan Pries-Heje and Jørn Johansen

# We truly believe that SPI must involve people actively and affect their daily activities



## A.1 Context and problem

In the last decade we have seen the growing of ivory towers in many organisations, using ‘magic’ tools and models to paint process diagrams. However, in most of these organisations, the projects and services did not really use these processes. So the ivory towers have had limited success as drivers of SPI, and it is now time to bring SPI to the people who will be most affected.

## A.2 Value explained

Business success depends on the competitiveness of an organisation.

The competitiveness of every organisation is based on the knowledge, engagement and commitment of the people working in it.

SPI is a tool to improve the competitiveness of organisations.

Bringing this together, we believe it becomes clear, that only active involvement of the people working in an organisation ensures the success of an SPI initiative from the business perspective!

Successful SPI is based on actively involved people having sufficient information and training.

## A.3 Hints and examples

The modern organisation paradigm is a change from experts solving problems and trying to force change on organisations to the organisation’s people solving problems and changing the organisation together. Japanese improvement efforts such as Kaizen have demonstrated this convincingly in the 20th century. More recently, we also see this in the growing success of agile development approaches.

Enablers for success in modern organisations include people making full use of their experience, taking responsibility for change on their project and throughout their organisation, and using and improving the processes they have helped to define.

# We truly believe that SPI is what you do to make business successful



## B.1 Context and problem

The software process creates software. Software Process Improvement means activities that improve the way of creating and implementing software.

However, many people believe that they don't need processes in order to build and ship software products. This belief may be the source of most resistance to change met by SPI professionals. But the fact is that you cannot create software without process.

Another problem is when 'process' is seen as 'somebody else's process description.' This again leads to the misconception that one can do without process. Software should not be created without process; however, what is important is that you have process that fits the need of your projects and your business.

## B.2 Value explained

Process descriptions are just words – we believe the process should bring value to the business. To have success with SPI we must ensure that improvement recommendations are targeted to the actual business-related objectives, rather than compliant with a generic standard. We must also close the gap between 'the process' and 'how the work is really being done'; we believe that words and actions consistently should communicate the unity of the two – not the decoupling.

## B.3 Hints and examples

Use today's implemented processes as an agreed baseline for process improvements.

Understand the business objectives in order to ensure that suggested improvements will be effective in supporting these.

Always refer to the process description as a representation of the process.

Communicate how standards and models is meant to support SPI.

This continuous communication at all levels of management and practitioners helps managers and practitioners to understand how and why they need to support the SPI activities.

If you are using a maturity model to inspire improvement, you should respect that at maturity level 3, the process belongs to the organisation. At maturity level 2, the process belongs to the project. And at maturity level 1, the process belongs and exists at the individual level.

# We truly believe that SPI is inherently linked with change



## C.1 Context and problem

Only in a perfect world is there nothing to improve. We believe that all improvement involves change; for the individual, the project, and the organisation.

We know that it is difficult for people to accept or adopt change, because they are comfortable doing things the way they always have, even if it costs them overtime or loss of social interaction.

Never the less, we need to face the need for change when doing SPI.

## C.2 Values explained and interpreted

So Software Process Improvement means change!

Realising this means an organisation must ensure that the process improvement infrastructure has a change management component in it.

It is essential for an organisation to launch a process improvement initiative and to obtain measurable business results together with satisfied employees.

## C.3 Example

An IT organisation in a predominantly Asian culture wanted to enact a SPI program and achieve CMMI Maturity level 3 at the same time. One change required was to institutionalise peer reviews. But practitioners did not want to review colleagues' work and offer input that suggested major defects were found and needed to be corrected. Peer review training was repeated every six months, while videotaping the consultant coaching a live peer review. After three years, the results of using peer reviews could not be cost justified. The consultant explained to the CEO that if major defects were not found in peer reviews, but by the organisation's customers, everyone would lose face, including the top managers. Jobs could be lost as well. The CEO then appointed top middle managers to serve as coaches, and encouraged all project members to participate in peer reviews, concentrating on the most costly major defects. When the practitioners saw management's commitment to change, and saw that no one was getting fired or being demoted because they found and reported major defects, they participated willingly. The product quality went up, jobs were kept, profits increased, and lifestyles improved due to less time needed in finding defects. After a successful assessment, the CEO declared that this cultural change was the most significant event in the process improvement initiative.

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# From values to principles

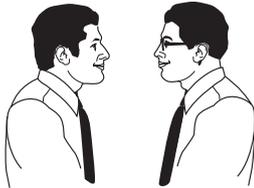


A value is something that deserves to be held up because of its importance or worth. People, business focus and a belief that organisational change is at the core of Software Process Improvement are the values that we have prioritised.

These three values are further elaborated into ten principles. A principle is something that can serve as a foundation for action. You can use the ten principles to govern your personal behaviour in relation to Software Process Improvement work.

On the following pages each of the principles are detailed. There is a header giving the principle in short – easy to remember we hope. Then there is an explanation, and last, but not least, there is an example illustrating or applying the principle.

# Know the culture and focus on needs



## 1.1 Explanation

It is very important to ensure the alignment of SPI initiatives and organisation culture.

Personal values are learnt implicitly from the very childhood and mould the behaviour of individuals as members of groups.

The culture of an organisation is fundamentally embedded in human behaviour and expressed through norms (explicit or implicit rules) that the organisation uses to express behavioural expectations and indications of appropriate and inappropriate attitudes and behaviours. These rules also affect interactions with others.

When implementing SPI it is crucial to take the organisational culture into consideration in order to gain commitment and avoid resistance.

The organisational culture is a shared system of meanings, values and practices by the employees in the organisation. Practices (symbols, heroes, rituals) are distinguishable characteristics of the organisational culture that have a deeper meaning for the members of an organisation; but usually invisible to outsiders at a glance. Values on the contrary are qualities, principles and behaviours considered morally or intrinsically noble, valuable and desirable by the members of the organisation. Cultural values are deeply ingrained and rather resistant to change resulting in conflict if ignored.

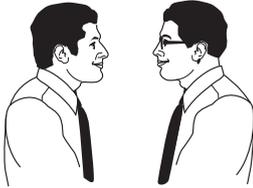
The way SPI initiative is introduced is imperative for success.

## 1.2 Example

In the company of a manufacturer of electronics, project managers played a key role which they were keenly aware of. A new top manager was hired into the company and immediately tried to change the way estimation and planning were carried out. He purchased new project management tools and insisted these to be used by all projects. However, nothing happened.

What the top manager was not aware of was that the impact of the retired CEO had left deep marks on the culture. To signal the death of 'old manufacturing' and the beginning of the new 'information age' all the machines for clocking in and out were taken down and the CEO (now retired) ceremoniously had one of the machines buried in the company garden. Everybody had heard or seen this burial. This was why the projects and project managers totally ignored the new top manager's initiative. Nothing happened until a point in time where it was realised that in this culture, project managers were 'king'. Thus when a workshop was called where project managers themselves discussed and decided what problems they were actually facing, as well as which one was worth pursuing, then the SPI initiative gained speed.

# Motivate all people involved



## 2.1 Explanation

To define processes in a 'highly sophisticated' process group and to believe this will be accepted by the people who have to live these processes will never work.

Instead use the experience of the functional experts to define and improve those parts of the process that affect them in their daily work. Empower the functional experts to define the necessary skills and to bring the right mix of competences on board in order to achieve real value.

Motivation and support by the management is imperative. To be motivated for process improvement, one should be able to see what is in it for oneself. Management can also consider the use of performance incentives to retain and reward. Coordination and cooperation between all levels of management and practitioners will ensure a widely accepted process and the commitment of all people.

Provide the necessary resources like training, equipment and coaching support to all people who have to use the processes. Give them the opportunity to understand and accept the purpose of the processes.

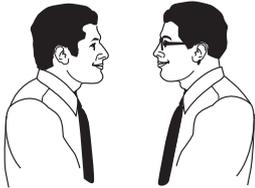
## 2.2 Examples

**Example 1:** The process management team had the task to update the standard processes in order to satisfy the demands of a process reference model like SPICE. The team added missing activities and work products without respecting if they could be implemented in the projects. Involve the functional experts in the improvement activities from the start to avoid any mismatch in advance.

**Example 2:** The project team has been asked to implement a new release of the internal standard development process. They are provided with only a link to the process descriptions which they are expected to read and implement. To improve motivation and increase the chance of success for the SPI initiative, conduct training for those projects that have to use the new version. Training might include highlighting the improvements from the last version and giving examples on how to implement them.

**Example 3:** A customer required that a new ISO standard process was to be followed. This process, however, was not integrated in the organisation's standard process. Only the project manager knew about the requirement and tried to implement it on the project without additional resources. To improve and motivate the use of this new ISO standard, management should have empowered the project manager to lead the improvement cycle for the next process version and take into consideration any update derived from the new ISO standard. The management should also provide the project manager with an assistant to deal with his main activities within the project in order to ensure that the project manager has enough time to take care of the process improvement activities.

# Base improvement on experience and measurements



## 3.1 Explanation

As processes are what people do, any SPI effort must optimise their 'dooning' (day-to-day business). The conditions for optimisation can be set, but only the individual can change actions. Thus you need individual competences, readiness and willingness to learn and optimise actions.

- Readiness is obtained through experience from your own actions, as well as input or visible measurements of process capabilities. The quality of readiness sets the quality of the learning!
- Competence sets your ability to reflect on your actions based on experience, input and measurements. The result of the reflection is new knowledge that will change your future actions.
- Willingness motivates you to step through the learning cycle. It is influenced by e.g. culture, personality, incentives, requests or orders.

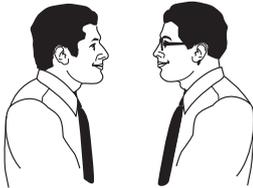
## 3.2. Examples

**Example 1:** A developer gets feedback that his code has too many defects. Time reports show above average time being used by a developer for bug fixing of his own code. A respected peer can help to improve the developer's testing ability, and can offer to 'pair test' with the developer to teach him new tricks.

**Example 2:** Measurements show that the primary origin of defects is requirements. The SPI group therefore initiates a root-cause analysis and decides this to be the next focus area for SPI work.

**Example 3:** A manager sees market reports showing that the company is less innovative than competitors are. New processes are implemented to make product innovation possible and from that day, the manager starts to request innovation in all steps.

# Create a learning organisation



## 4.1 Explanation

Create a learning organisation that continuously facilitates the learning of its members and shares practical process experience across projects.

A practice accepted by all levels of staff representing useful core knowledge in a learning organisation has the following three distinctive features:

- For developers it has practical value to improve the existing development work, and can be demonstrated by development examples.
- For managers it helps to save time and cost and to increase quality (improvement factor  $x$ ). This can be multiplied in many projects, thus enabling a multiplying benefit of the improvement factor  $x$ .
- For assessors it helps to demonstrate improved capability.

Such a highly valued good practice should be disseminated across projects.

## 4.2 Example

It is easy to just know the standard. It is, however, tough to develop a process achieving all the distinctive features (listed above).

In an engineering company many projects were based on the same core system/software (same product line). All projects were analysed and 90% of the product functions identified to be used across the products. The main goal for the improvement initiative was to decrease replications by controlling the knowledge across projects. In the improvement project a generic re-usable system and

software specification along with a re-usable test scope were created. The improvement project then delivered (1) a specification useful for the engineers, (2) a solution saving 90% of the documentation effort for the requirements work, and (3) higher capability levels in requirements management.

# Support the organisation's vision and business objectives



## 5.1 Explanation

Dr. W. Edwards Deming stated in most of his books and lectures: 'Process improvement should be done to help the business – not for its own sake.'

Process improvement initiatives should at the minimum be able to demonstrate the following:

- Traceability to the organisation's vision statement.
- Clearly stated business objectives that support the vision and are able to guide the organisation's and project's efforts to produce measurable results.
- Measurement and analysis objectives that are aligned with established 'information needs' and business objectives.
- Objective results that can be used in making business judgments and taking appropriate corrective actions.

## 5.2 Example

In a Scandinavian ICT company the headquarter had formulated a vision of eliminating defects by going for maturity level 5. In a local subsidiary some outside consultants had defined some 'vital few actions' to improve; where defects and maturity level were not mentioned! These two aims worked against each other so no improvement took place. This changed when it was finally decided to align the local and the central by locally aiming for maturity level 2.

# Use dynamic and adaptable models as needed



## 6.1 Explanation

“All models are wrong – some are useful” (Quote from George E.P. Box).

Models do not depict the real world. Models just represent a simplified view of reality. Typically this view condenses good and bad experiences from organisations around the world for a specific scope.

SPI in general is not tied to any model. SPI first and foremost is tied to the organisation’s business objectives and needs. Models like CMMI, SPICE, Six Sigma or standards like ISO 9001, techniques like SCRUM, agile methods, or lifecycle models like Waterfall, Incremental, Spiral, V-Model, or many other models may contain valuable input for your improvement effort. However, experience has shown that in many cases you cannot just follow one model to get the best results. Instead models and the ideas built into them can and should be combined to achieve business objectives in the best way possible way.

The way to go about using models is first to understand your specific challenge and current process capability. Then use appropriate models – or parts of them - as needed.

If required by your customer/market, then use the models to improve your processes rather than as a checklist without sense.

Each model represents a tool box helping to resolve specific challenges of a specific organisation. However, a fool with a tool is still a fool and a fool with a process can make a more organised mess.

Finally the best models with highest utility are dynamic models. They have built-in ways to take circumstances and contingencies into account, and they change behaviour dependent on the status of your improvement effort.

## 6.2 Examples

Pries-Heje & Baskerville have developed a number of technological rules that you can follow to decide whether a model is good for you. Here are some examples.

**Example 1:** If you want to improve software processes in a situation where you: (1) Believe that ‘Best practices’ for an improvement area can be identified. (2) Trust the usefulness of practices from another organisational or national setting. (3) Agree that your improvement effort will be alike to what other companies have done; you are not special in relation to this. Then choose a universally applicable model, such as CMMI or ISO 15504 (SPICE). If not then choose a situated model, such as Juran or Six Sigma.

**Example 2:** If you want to improve software processes in a situation where you: (1) Need a vision to motivate and give direction to your improvement effort. (2) Believe there is one and only one path to a future desirable state. (3) Agree that your improvement effort should be directed by one single vision – and not balance many organisational activities and resources as to optimise performance. Then choose a directing model, such as Six Sigma, or ISO 9000. If not then choose a balancing model such as Juran or Balanced Scorecard.

# Apply risk management



## 7.1 Explanation

Any improvement effort may go wrong or not work as expected. Fundamentally it is a good idea to be proactive and think 'what could go wrong' before it does go wrong. It is a good idea because it gives us a chance to avoid or prevent problems that may hurt us badly in the future.

In improvement practice we have often seen that the biggest risk in a SPI project is the complete lack of risk management. When we analyze widely accepted project management standards (like Project Management Institute (PMI) standard) we see that risk management is an integral part of successful project management. Therefore we strongly recommend that you thoroughly identify, carefully evaluate, and effectively mitigate the risks of SPI projects.

## 7.2 Examples

Many check lists exist for a risk assessment. Let us have a look at some example risks:

- **Lack of management commitment**  
We often find SPI initiatives cancelled by the management, although the assessment reports disclosed weaknesses in the process system. This issue was normally not evaluated and no mitigation actions were implemented.
- **Lack of process performer involvement**  
We often find processes developed in and published by an ivory tower group. Some organisations identified this risk and developed successful strategies to fight this risk: One way involved the training of process performers and effectively and timely feedback on process usage.

# Manage the organisational change in your improvement effort



## 8.1 Explanation

Real improvement requires real people to really change behaviours. Thus process improvement is about organisational change. The simplest depiction of organisational change is the three-step model: Unfreeze – Move – Freeze.

To unfreeze for process improvement you have to make the organisation receptive to change. The organisation must realise that there is a need for change: typically, by identifying a problem of relevance to the individuals in the workforce. This first step is called unfreezing because if you do not take the time to create organisational receptivity, the organisation will behave like a block of ice; it will naturally resist change.

To move your improvement effort, a solution to the relevant problem that was identified during the unfreezing process should be proposed. In this stage there will be factors that promote the change and others that work as barriers to change. A very simple change tactic is to support the promoting factors and suppress the barriers.

The third step is to freeze, that is, to make sure that the change becomes a permanent part of how the organisation works. You freeze water to ensure a more permanent shape. Likewise, you 'freeze' the organisation to make the change permanent.

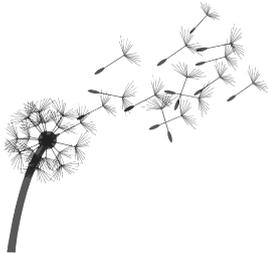
The strength of the Unfreeze – Move – Freeze model is its simplicity. It gives clear and simple prescriptive guidelines for implementing SPI induced change.

Many other – more complicated, and maybe more realistic approaches – exist. They may be management-oriented ('commanding'), focused on exploration and innovation, or even employee driven.

## 8.2 Example

An assessment in a large financial organisation had revealed that too many innovative tools and techniques from the method department were gathering dust on shelves. A task force project unfroze the organisation through a seminar with 25 participants that were all asked to bring one successful case and one failure case with them to the seminar. The assessment in the whole organisation together with the workshop unfroze the organisation. To move an 'implementation workshop' was created. Through an action research undertaking, the workshop concept was tested and improved. After five learning cycles the 'move' was over. Then a group of facilitators were found and educated. At the same time, the workshop, which was perceived as very successful, was made a mandatory part of the organisations project model. Together these things 'froze' the change.

# Ensure all parties understand and agree on process



## 9.1 Explanation

Better processes equal more money and better business. Process descriptions (should) contain information on how the organisation is making money.

Process descriptions are a snapshot of some important parts of the organisational common agreement on how the organisation works – and they are only valuable, if they are agreed upon by the workforce.

Process descriptions can be ‘packaged’ into models. The Capability Maturity Model ® Integration (CMMI) for example had descriptions of 22 process areas at five levels.

Process improvements constantly challenge the models and process descriptions. They are to be continuously optimised to reflect the state-of-the-practice in the organisation. If they get petrified – process improvement may grind to a halt.

To ensure ‘living’, operational and adaptive models and processes they have to be:

- Flexible and tailorable, that is, usable for different types of projects in an organisation.
- Expressed in a common language and visualised when possible.
- Based on communicated, understood, commonly agreed upon and supported improvement proposals, that lead to their development, deployment and continuous maintenance.

## 9.2 Examples

**Example 1:** A major software house was trying to establish a common process. Process action teams were formed to produce final process descriptions for a business manual (BM) consisting of all the processes to be performed by projects. It was, in fact, meant to be a company standard. After some time where the SPI group helped projects and project managers understand and use the BM, it became ‘the way we do things here’.

**Example 2:** A process management team was tasked to update the standard processes in order to satisfy the demands of a process reference model like SPICE. A problem could be created if any missing activity or work product was introduced without taking into account whether it could be implemented by the projects. In order to improve this situation, the project members were asked to provide feedback to the process management team about the problems during implementing the new process, including improvement proposals.

# Do not lose focus



## 10.1 Explanation

Define targets, plan the measures to reach the targets, and stick to the improvement plan.

Each improvement has to make a contribution to better fulfil the business goals and offer people motivation for changing their behaviour. Both aspects have to be considered during the establishment of the targets. Without business impact, it is not possible to get a budget for measures, and without involvement of the people, the measures will not lead to a change of behaviour.

After the definition of SMART (specific, measurable, ambitious, realistic, time-bound) objectives appropriate measures have to be agreed on with relevant key personal at all hierarchic levels. Once the actions to be taken are clear they have to be integrated into an improvement plan which is consolidated with the operational activities. Then improvement has to be followed with the same persistence as the daily business.

To follow an established improvement program, even in difficult situations with respect to economics or resources, proves to the people that improvement is essential for the organisation's vision, business objectives and customer satisfaction.

Most improvement measures aim at changing human behaviour. People need motivation to change and have to be made aware that reluctance may lead to undesired consequences.

Companies which are consequent in SPI and do not lose focus will see several benefits:

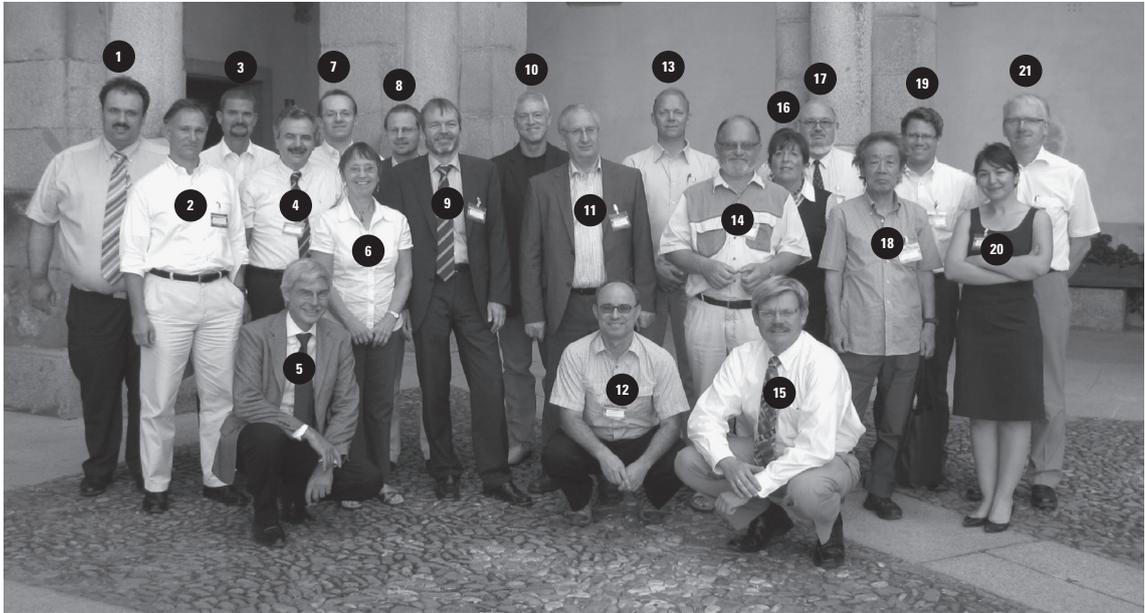
- Increased efficiency.
- Better product quality through better processes.
- Trust from customers because of high capability levels.
- Competitive advantages for new business.
- Employees who participate in SPI on an ongoing basis.

## 11.2 Examples

In many sectors, companies only get contracts if they agree on improvements in SPI. Some domains include not only the actual desired capability levels but enforce also the establishment of an improvement plan heading for higher levels at the end of the project.

Therefore almost all major suppliers have improvement programs ongoing. Financial crisis or constraints may lead to an internal re-evaluation of all process improvement activities and sometimes to a reduction of effort and even project delays. If companies do not stick to their improvement plans they will face problems mainly in two areas. First, in the tendering phase for new projects, they will have to state lower capability levels that may result in a loss of trust with the customer. Second, the employees will get the feeling that SPI is not a priority but a topic which the organisation only deals with if there is time and money remaining.

# Presenters, authors and reviewers



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It has been a very exciting and much more extensive task than foreseen to develop the SPI Manifesto. But most of all – it has been fantastic to work together with this team representing the most experienced people in process improvement from all over the world in an ongoing process for 4½ month. Thank you very much to all for the indispensable collaboration.

This result was initiated at the EuroSPI conference in Alcalá 2009. The next three years at the EuroSPI conferences workshops will be established to substantiate the values and related principles, and support these with experience and knowledge.

Please contact Jan Pries-Heje or Jørn Johansen for questions and comments, and follow the SPI Manifesto workshops the next years at the EuroSPI conferences.

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