It’s time for maintenance

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ÉTS
Le génie pour l’industrie

Can you recognize these names ?

- Clojure
- Ocaml
- Haskell/Clean
- Scala

One too many ?

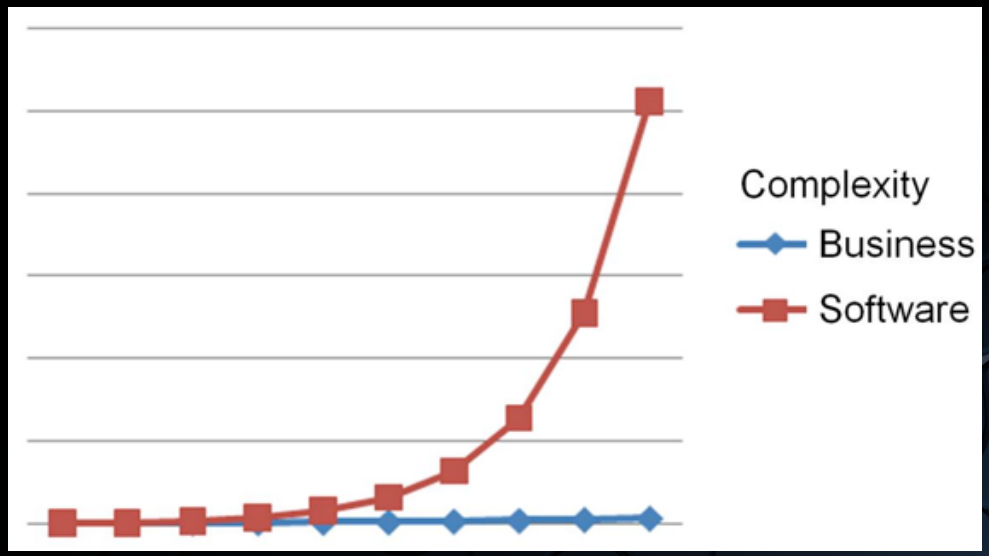
- More than 700 languages in service

- They all have:
  - Similarities
  - Input/Output
  - Conditionals
  - Data structures
  - Strengths/ Weaknesses

Dreaming of the day we will have only one programming language

- We will all learn it in school
- Every supplier will try to improve it
- We can all hope to master it for life
- One can work on any software
- There are no more resource issues
- We hope it is open source and free

While we wait for a unified programming language



http://www.capgemini.com

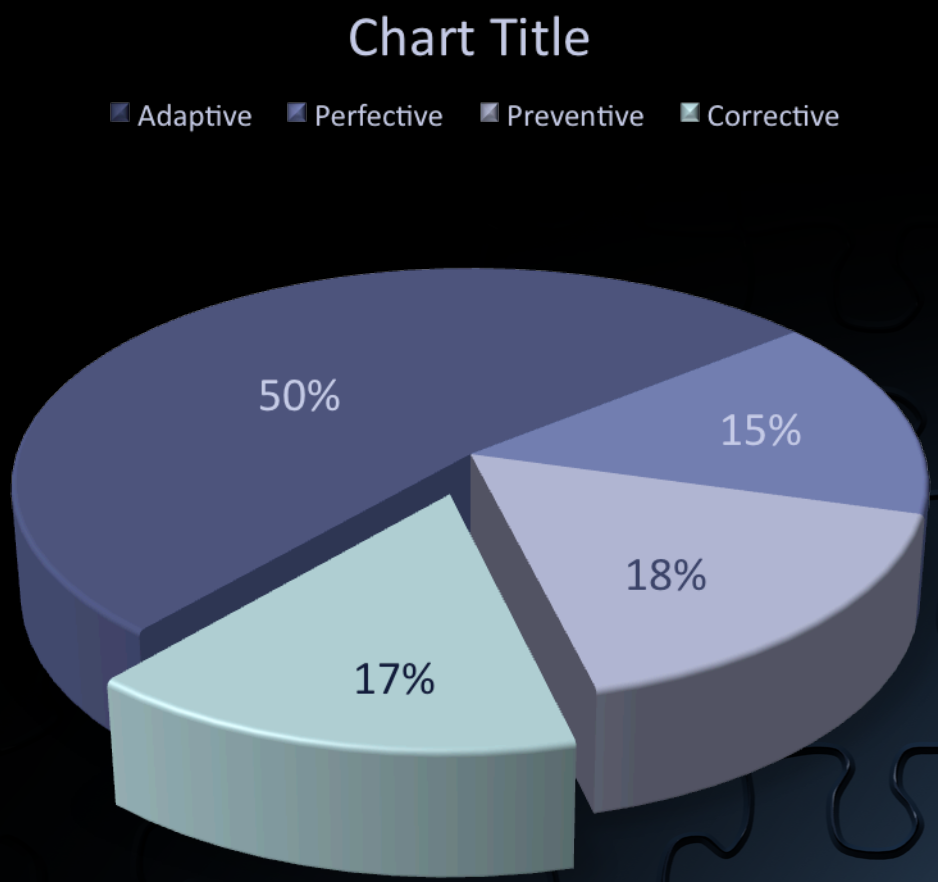
Software Maintenance in numbers

- Estimated at 70 billion (USD)
- 200 Billion lines of Cobol still in service
- The amount of source code maintained doubles every 7 years

http://users.jyu.fi/~koskinen/smcosts.htm

Software Maintenance Effort

By Dr. Ian Sommerville



Enhancements account for 65% of the effort

Correcting failures account only for 17% of the effort

Growing Software Maintenance Issues

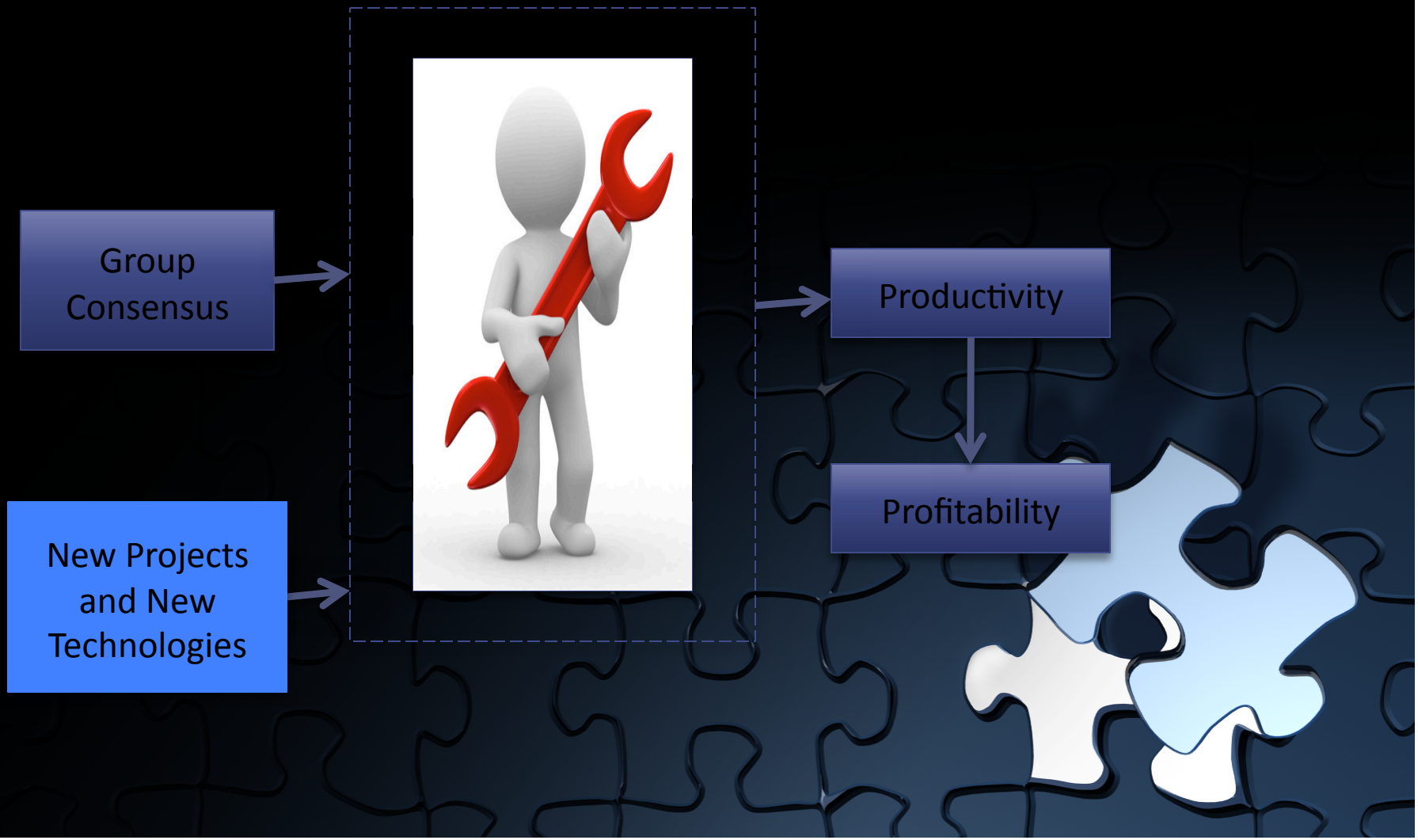
Survey of 6,000 executives

- SOFTWARE MAINTENANCE
  - 87% Uncomfortable with their current coding skills
  - 80% Do not know how to improve maintenance productivity
  - 75% Experience growing number of failures in production year over year
  - 38% Resort to outsourcing

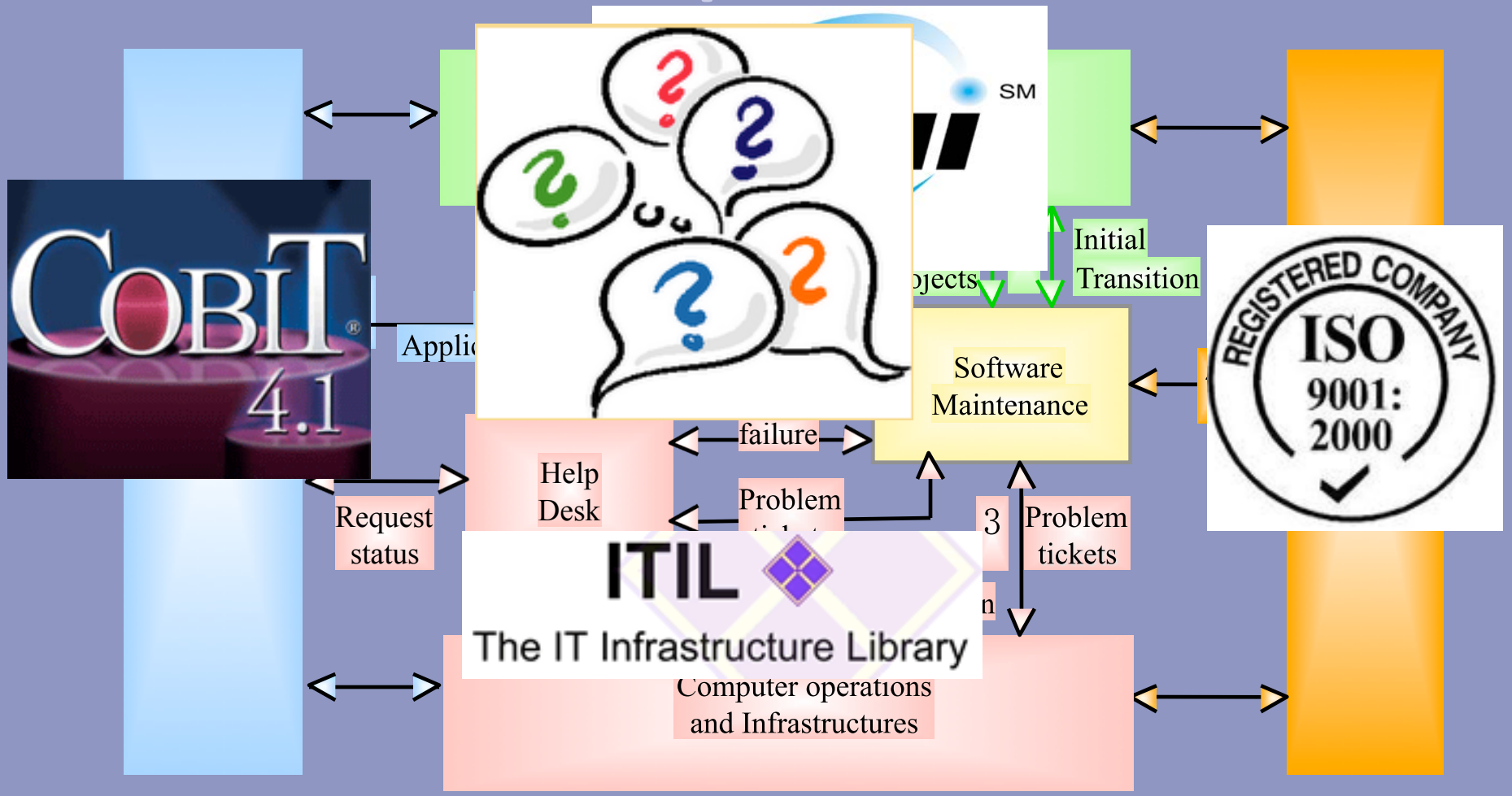
http://www.infoworld.com

Software appears everywhere

CIO's/CEO's/CFO's management focus



Context of Software Maintenance



No existing solution for maintenance

SOFTWARE DEVELOPMENT

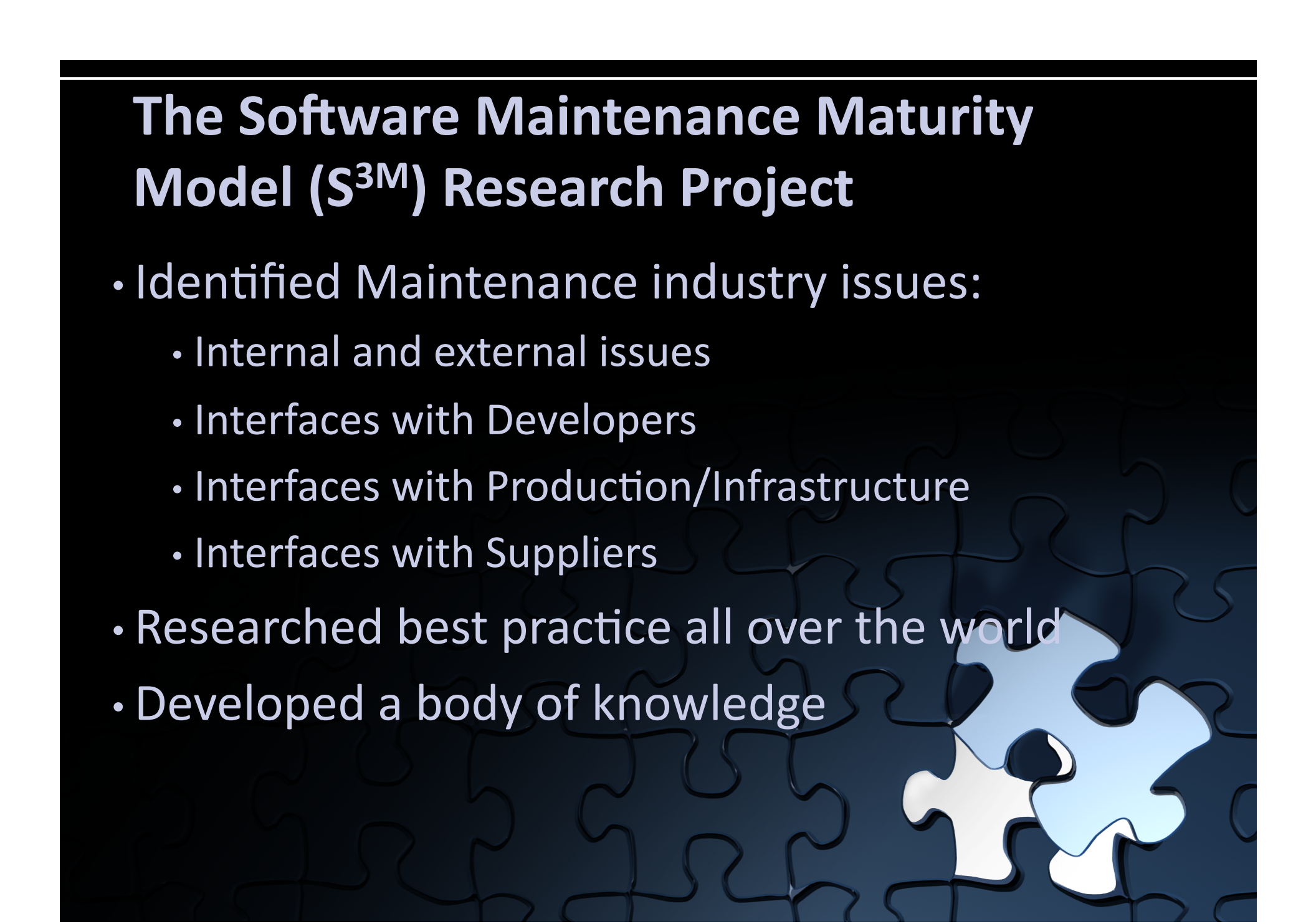
- Focus on:
  - Projects are planned
  - There is a management committee
  - Lasts a few months
  - Requires a group of people
  - Managed by Project/Program management techniques
  - Has a beginning and an end

SOFTWARE MAINTENANCE

- Focus on:
  - Maintenance Requests (MR's) come in on an irregular basis
  - MR's are reviewed at operational level
  - Not managed by a project management process
  - Priorities change
  - Small size

The Software Maintenance Maturity Model (S^{3M}) Research Project

- Identified Maintenance industry issues:
  - Internal and external issues
  - Interfaces with Developers
  - Interfaces with Production/Infrastructure
  - Interfaces with Suppliers
- Researched best practice all over the world
- Developed a body of knowledge



The Software Engineering Body of Knowledge (IEEE Computer Society)

1. Software Requirements
2. Software Design
3. Software Construction
4. Software Testing
5. Software Maintenance
6. Software Configuration Management
7. Software Engineering Management
8. Software Engineering Process
9. Software Tools and Methods
10. Software Quality

IEEE COMPUTER SOCIETY

www.swebok.org

Other Disciplines

- **Cognitive science**
- **Computer engineering**
- **Mathematics**
- **Project management**
- **System engineering**
- **Management & MIS**

Study of all CMM proposals

1991	Bootstap
1992	Trillium
1993	CMM©
1994	**Camélia**, automated testing (Kra94)
1996	TMM (Bur96), **Zit96**, Dov96
1997	Som97
1998	Esi98, Top98, Baj98
1999	Wit99, Vet99, Sch99
2000	**Cob00**, Str00, Bev00, Lud00
2001	**Kaj01d & 01e**, Ray01, Sch01, Luf01, Tob01, Sri01
2002	**CMMi©**, **Nie02**, Mul02, Vee02, Pom02, Raf02, Sch02, Ker02, Cra02

Context of the S^{3m} research project

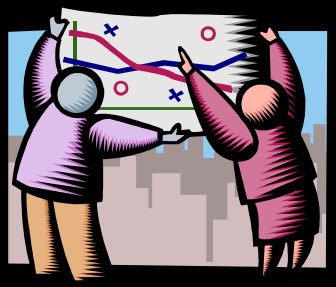
- Objectives
  - Fill a gap in existing improvement models as small maintenance is not covered adequately
  - Alert the industry and influence the normalization activities of ISO 15504
- State of the project
  - Project was completed in 2008

Timeline of the S^{3m} research project

- 1995 – First proposal by Dr. Abran
- 1999 – Model trialed by the telecom industry
- 2002 – Extended mapping to ITIL, CMMi and CobIT
- 2005 First publication of S^{3m} by Dr. April (Germany)

Iterations from 1995 to 2008

- Understand the maintenance area



- Look in references to find processes, activities and best practices

- Look for an architecture to create domains and KPAs

- Decide practices to be included in the model and their maturity level

- Build and refine the model architecture

- Validate by conducting case studies

- Review the results with sponsors and experts

- Improve model as necessary

Initial Partners (Europe)

- Stéria
- CIIBA
- Foreign affairs
- French Defense
- Vérilog
- The Equipment ministry
- Renault
- Peugot

Initial Partners in America

- Bell Canada
- Treasury dept. of Government of Quebec
- International Affairs
- LGS Consultants
- CRIM
- Freescale USA
- IBM

Ensure Alignment to CMMi

CMMi Process Domains	S3M Process Domains
Process Management	Process Management
Project Management	Maintenance Request Management
Engineering	Evolution Engineering
Support	Support to Evolution Engineering

S3M – Processes unique to maintainers

S3M Process Domains	Key Process Areas of Software Maintenance
Process Management	1- Maintenance Process Focus 2- Maintenance Process/Service definition 3- Maintenance Training 4- MaintenanceProcess Performance 5- Maintenance Innovation and deployment
Maintenance Request Management	1- Request & Event Management 2- Maintenance Planning 3- Monitoring & Control of maintenance requests 4- SLA & Supplier Management 5- Quantitative Maintenance Management
Evolution Engineering	1- Transition 2- Operational Support 3- Evolution & Correction of software 4- Verification and Validation
Support to Evolution Engineering	1- Configuration Management 2- Process and Product Quality Assurance 3- Measurement, Decision Analysis 4- Problem Management and Causal Analysis 5- Rejuvenation/Retirement Engineering

Lets look at 3 case studies

The transition Process

- Transition from development to maintenance is key to software quality. How do you ensure it is done properly ?

Trends of Maintenance Services

- Trending maintenance services over time allows to better allocate where effort should be dedicated as well as explaining clearly where the investment is made.

Benchmarking Maintenance

- Benchmarking (the activity of comparing with others) allows you to assess your productivity compared to others. With the ISBSG open database you can contact others, in your industry, to share practices.

There are many proposed practices in the S3M model. We have chosen three to give you an example of what you can learn from reading the model practices.

Register free at www.s3m.ca and contact Bankware Global in Korea to obtain more details about using the model in your organization.

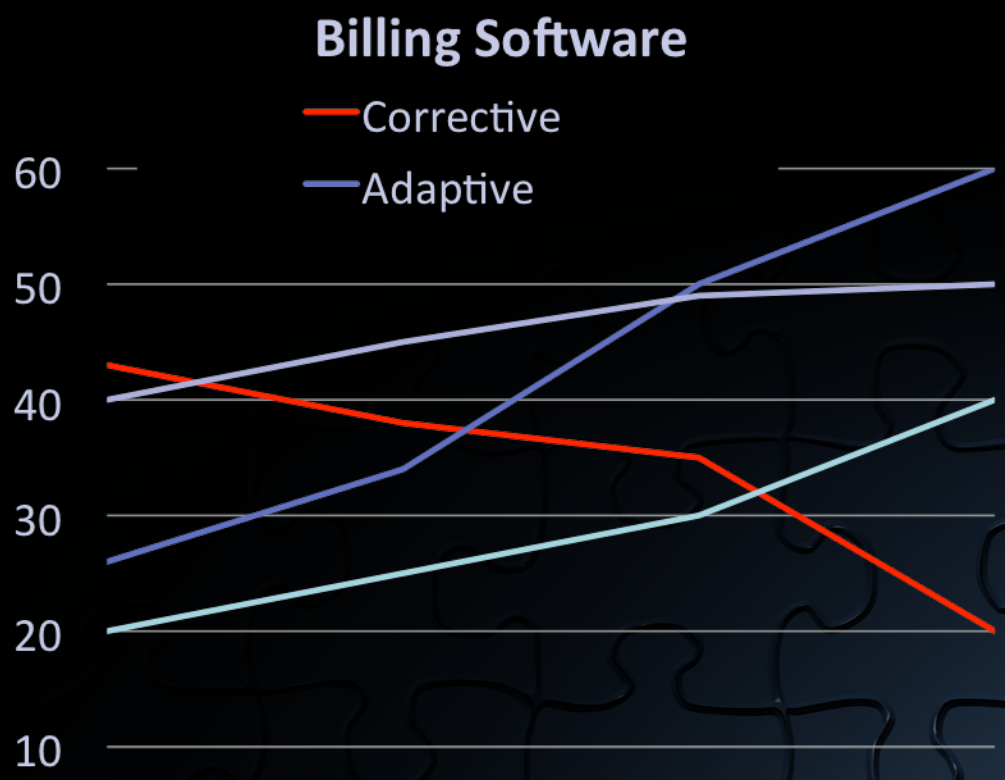
An example of best practice

Example 1: The transition Process

- Level 0 : No notion of transition
- Level 3 : The transition process is deployed and checklists/signoffs are used at each stage of development
- Level 1 : Transition is done individually
- Level 4 : Transition results are assessed in terms of number of MR's at delivery time and production failures
- Level 2: Transition is defined for all IS/IT groups and part of project plans

An example of Maintenance Best Practice

Example 2: Trends of maintenance services (maturity level 3)



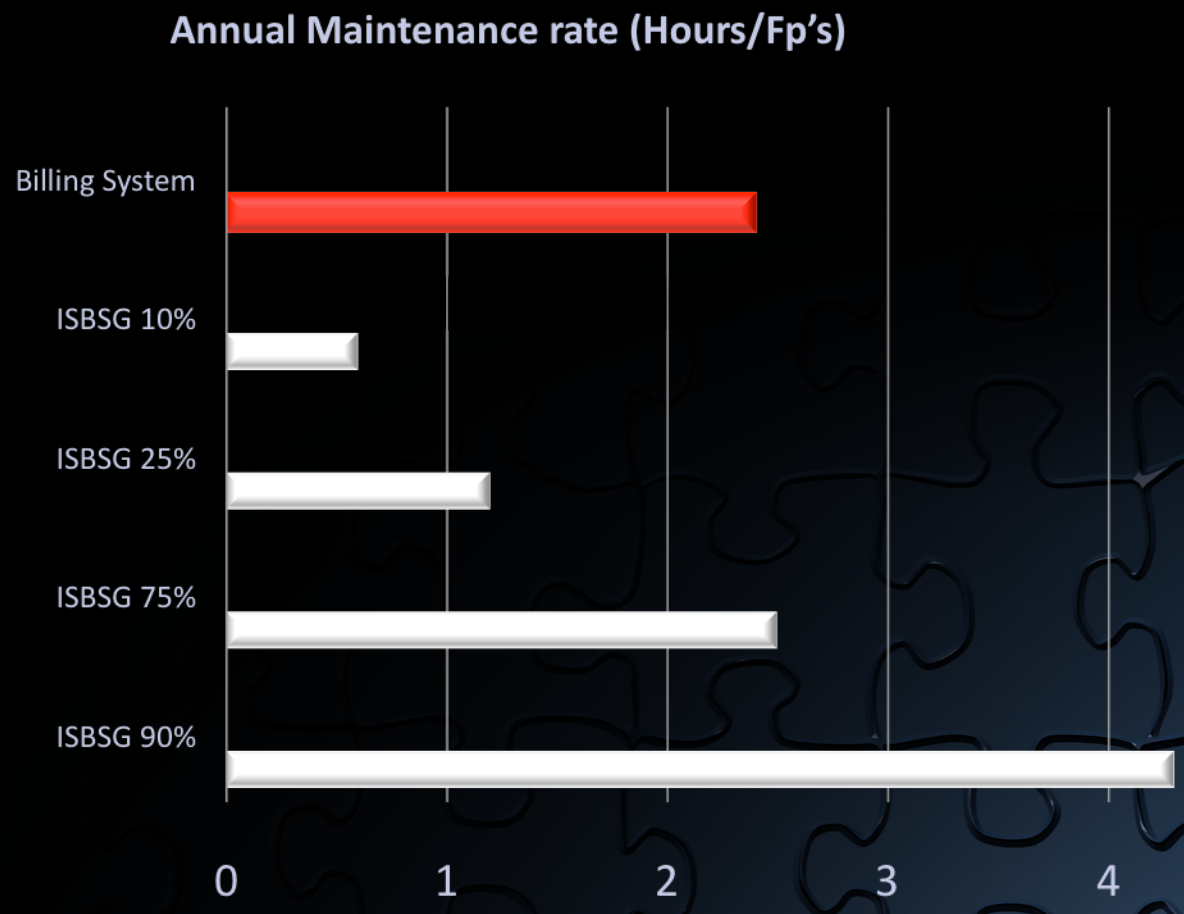
-Use ISO14764 maintenance Categories to collect efforts

-Compare trends of different systems (internally)

-Customers can see where the effort is spent

Maintenance Best Practice

Example 3: Benchmarking Maintenance (maturity level 4)



The Billing System productivity is assessed compared to other similar systems

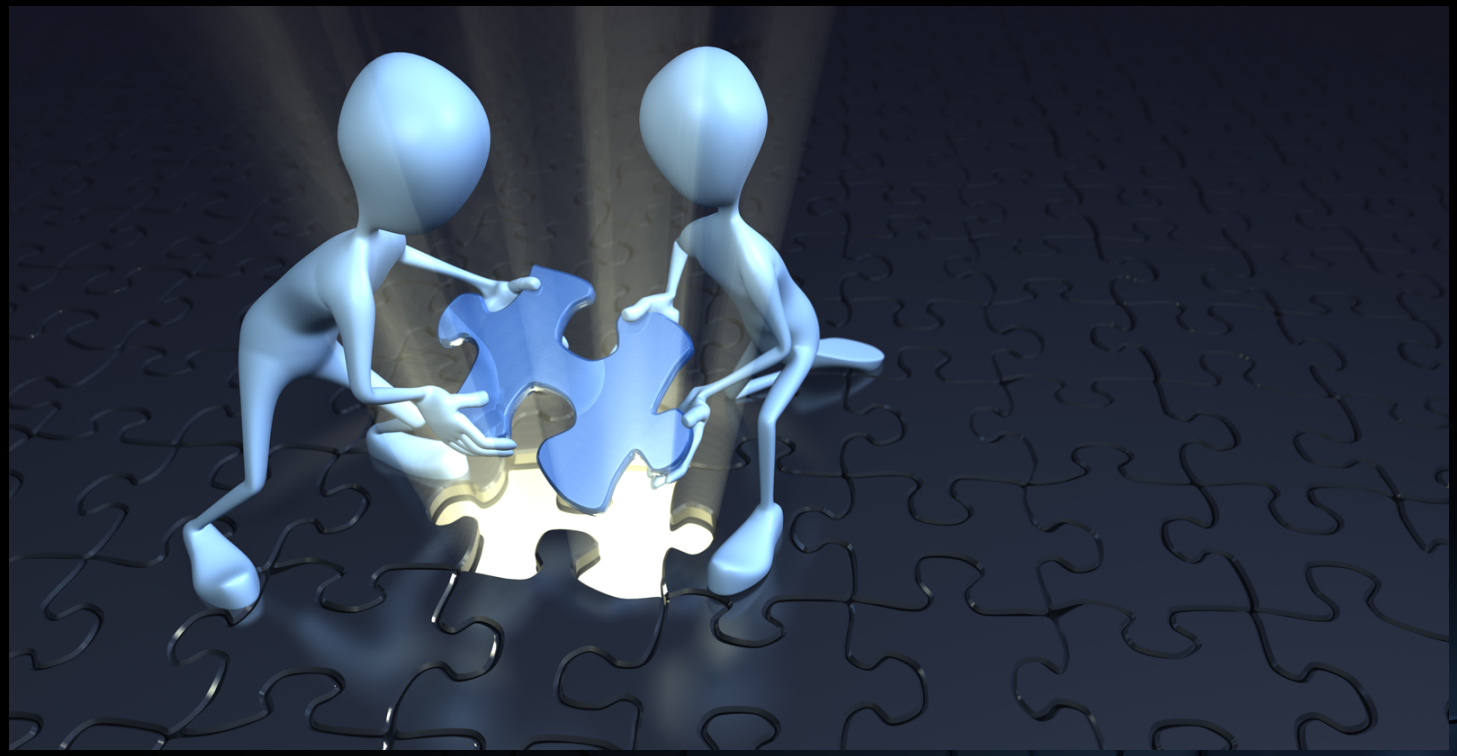
ISBSG is an open database (www.isbsg.org)

Many S3M registered users
That contribute to the model and
help organizations in their respective country

In summary

It's time for maintenance

Industry Problem	Software growth – This will not stop, in fact it accelerates
It's time for maintenance	Maintenance issues – Software is becoming more complex and small maintenance conducted daily is key to failure reduction
Weakness of proposals	The current models fall short – CMMI, ITIL, ISO9001 and CobIT are missing meaningful proposals for small maintenance improvement
There is a solution	S^{3m} is a solution – We have shown case studies of best practices applied in real situations
It's becoming popular	It is used – All types of industry all over the world
Try it yourself	See at www.s3m.ca and/or contact Bankware Global in Korea



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