and managers, and how does these requirements suit with the fundamental model of software certification.

7. Conclusion

A framework and model that may be used to certify software based on product quality approach has been presented in this paper. The model, SCM-*prod* is a practical model of certification, which has been evaluated and tested, in real case studies involving three large organizations in Malaysia. These practical applications were conducted in 2007. We have repeated the software assessment and certification in one of these organizations in year 2009. The results showed that after two years there was not much different from the first result as explained in section 4. The industrial applications determine that the model is practical and can be applied in the real practice. The significant advantage of this model is that it can be tailored and flexible to the organisation's requirements. Therefore, the working model can be developed based on organisation's demands and constraints. Second advantage of this model is the involvement of users in the certification process that justify the confirmation of user expectation and requirement for software quality. With the involvement, the certification process is moving towards user-centred approach.

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9. References

[1] B. Kitchenham, and S.L. Pfleeger, "Software quality: The elusive target", *IEEE Software*, January, 1996, pp. 12-21.

[2] J. Voas, "Software's secret sauce: The "-ilities". *IEEE Computer* (November/December),2004, pp. 14-15.

[3] P.J. Denning. "What is software quality?", *A Commentary from Communications of ACM,* January, 1992.

[4] J.H. Yahaya, A. Deraman, and A.R. Hamdan, "Software product certification model: Classification of quality attributes", *The First Regional Conference of Computational Science and Technology (RCCST 07), Kota Kinabalu,* 2007, pp. 436-440.

[5] J.H. Yahaya, A. Deraman, and A.R. Hamdan, "Software Certification Model Based on Product Quality Approach", *Journal of Sustainability Science and Management,* 3(2), December 2008, pp. 14-29.

[6] J.H. Yahaya, A.Deraman, F. Baharom, and A.R. Hamdan. "Software Certification from Process and Product Perspectives", IJCSNS International *Journal of Computer Science and Network Security,* Vol. 9 No. 3, March 30 (2009). ISSN: 1738-7906.

[7] J.H. Yahaya, A. Deraman, and A.R. Hamdan, "Software Certification Implementation: Case Studies Analysis and Findings", *The 3rd International Symposium on Information Technology 2008 (ITSim2008),* 26-29 August, 2008, Kuala Lumpur, Vol. III, pp. 1541-1548.

[8] IEEE: IEEE standard for a software quality Metrics Methodology, http://ieeexplore.ieee.org/xpl/standards.jsp, 1993. Access date: 20 August 2005.

[9] D.L. Parnas, "Software Aging." *IEEE,* 1994.

[10] F. Baharom, A. Deraman, and A.R. Hamdan. "A Survey on the current practices of software development process in Malaysia." *Journal of Information and Communication Technology (Journal of ICT)* Volume 4, 2005, pp. 57-76 (ISSN :1675-7505).

[11] J. Voas, "The Software Quality Certification Triangle". CrossTalk, *The Journal of Defense Software Engineering*, November 12-14, 1998.

[12] A. Deraman and J. Yahaya, "The Architecture of an Integrated Support Tool for Software Product Certification Process" *Journal of Information & Systems Management* Volume 1, Number 1, March 2011, pp. 46-56.

[13] W. Suryn and A. Abran. "ISO/IEC SQuaRE. The Second Generation of Standard for Software Product Quality", *IASTED 2003-SEA 2003*, November 3-5, 2003 Marina del Rey, CA, USA.

