The South African Institute for Computer Scientists and Information Technologists

ANNUAL RESEARCH AND DEVELOPMENT SYMPOSIUM

23-24 NOVEMBER 1998
CAPE TOWN
Van Riebeek hotel in Gordons Bay

Hosted by the University of Cape Town in association with the CSSA,
Foreshore campus University for CHE and
The University of Natal

PROCEEDINGS

EDITED BY
D. PETKOV AND L. VENTER

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The South African Institute for Computer Scientists and Information Technologists

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PROCEEDINGS

EDITED BY
D. PETKOV AND L. VENTER

SYMPOSIUM THEME:
Development of a quality academic CS/IS infrastructure in South Africa

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FOREWORD

The South African Institute for Computer Scientists and Information Technologists (SAICSIT) promotes the cooperation of academics and industry in the area of research and development in Computer Science, Information Systems and Technology and Software Engineering. The culmination of its activities throughout the year is the annual research symposium. This book is a collection of papers presented at the 1998 such event taking place on the 23rd and 24th of November in Gordons Bay, Cape Town. The Conference is hosted by the Department of Information Systems, University of Cape Town in cooperation with the Department of Computer Science, Potchefstroom University for CHE and Department of Computer Science and Information Systems of the University of Natal, Pietermaritzburg.

There are a total of 46 papers. The speakers represent practitioners and academics from all the major Universities and Technikons in the country. The number of industry based authors has increased compared to previous years.

We would like to express our gratitude to the referees and the paper contributors for their hard work on the papers included in this volume. The Organising and Programme Committees would like to thank the keynote speaker, Prof M.C Jackson, Dean, University of Lincolnshire and Humberside, United Kingdom, President of the International Federation for Systems Research as well as the Computer Society of South Africa and The University of Cape Town for the cooperation as well as the management and staff of the Potchefstroom University for CHE and the University of Natal for their support and for making this event a success.

Giel Hattingh, Paul Licker, Lucas Venter and Don Petkov
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A CONCEPTUAL MODEL FOR THE ADOPTION AND USE OF CASE TECHNOLOGY

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Abstract

The software crisis has been well documented. Software is being delivered late, over budget and full of residual faults.

In an attempt to solve these problems, CASE technology has been developed. CASE technology provides computer-aided support for every phase in the software development process. The developers of CASE technology claim that these tools will increase software development effectiveness, in terms of the quality of the developed systems, and the productivity of the developers. This claim is confirmed by most empirical studies in the literature which indicate a positive rather than negative impact of CASE technology on the software development process.

In light of the above, it is surprising that the actual use of CASE technology has been much less than one would expect. It is reported by Kemerer that one year after introduction, 70% of the CASE technology are never used, 25% are used by only one group and 5% are widely used but not to capacity. Many other studies emphasise this trend. CASE technology is very costly, and this non use phenomenon causes organisations to suffer large financial losses.

Thus although CASE technology can improve the software development process, it is not used by the software development community. A conceptual model was developed to address this contradiction. The model is based on research in information system implementation, the innovation diffusion theory, organisational theory, and the economics of technology standards. CASE technology is viewed as a contingent innovation, meaning that a primary adopter (i.e. IT manager) has to make a decision to adopt CASE technology, and then a group of secondary adopters (i.e. system developers) has to adopt and use the CASE technology. Because CASE technology is viewed as a contingent innovation, the meso level of innovation theories is applied, rather than the micro or macro levels.

Prior research on CASE technology adoption, has mainly been descriptive. This model offers a theoretical orientation and attempts to explain factors affecting adoption and use of CASE technology.