The South African Institute of Computer Science and Information Technology

The 1997 National Research and Development Conference

Riverside Sun
Vanderbijlpark
13 & 14 November

Hosted by

Potchefstroomse Universiteit vir Christelike Hoër Onderwys

The Department of Computer Science and Information Systems
Potchefstroom University for Christian Higher Education
Vaal Triangle Campus

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Edited by L.M. Venter & R.R. Lombard
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and
Information Technology

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Towards 2000

Riverside Sun
Vanderbijlpark
13 & 14 November

Edited by
L.M. Venter
R.R. Lombard
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The views expressed in this book are those of the individual authors
Foreword

This book contains a collection of papers presented at a Research and Development conference of the South African Institute of Computer Scientists and Information Technologists (SAICSIT). The conference was held on 13 & 14 November 1997 at the Riverside Sun, Vanderbijlpark. Most of the organization for the conference was done by the Department of Computer Science and Information Technology of the Vaal Triangle Campus, Potchefstroom University for Christian Higher Education.

The programming committee accepted a wide selection of papers for the conference. The papers range from detailed technical research work to reports of work in progress. The papers originate mainly from Academia, but also describe work done in and for Industry. It is hoped that the papers give a true reflection of the current research scene in Computer Science and Information Technology in South Africa. Since one of the aims of the conference is Research development, the papers were not subjected to a refereeing process.

A number of people spent numerous hours helping with the organization of this conference. In this regard, we wish to thank the members of the Organizing committee, and the Programming committee who had very little time to screen the abstracts and compile the program. A special thanks goes to the secretary of the department, Mrs Helei Jooste, whose very able work was interrupted by the birth of her first child.
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Object-oriented Business Modelling and Re-engineering

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Keywords: Object-oriented analysis, Business Re-engineering, Migration, Client/Server

Financial industry and manufacturing are the main customers in migrating existing applications into client server environments. This paper helps in identifying the candidates for migration and suggests a method for migration. Business evolution and existing application architecture influence its sequence of steps. The most frequently applications moved down from mainframe solutions are: sales, order entry, material requirements planning, executive information systems, finance, ledgers. Re-engineering will proceed in the following sequence in a one-by-one move from an old application to a new one, but never in an all-at-once go.

1. The application logic is split into objects, wrapped and re-allocated according to businesses processes across several platforms
2. The data locations and movements follow the application logic—not as previously, where a quasi-'eternal' enterprise database dictated business processes and application logic.

Those are the migration steps:
1. Quantify the added value of each migrated or newly computerized function, its performance gain and resulting cost reductions
2. Understand and document the business reasoning behind each application. Deduce the high level application logic from the business reasons and logic. Start with the external business context.
3. Differentiate the functions of the application logic in order to prepare for a split. (e.g., in an airline crew scheduling the separation between local data access, data storage and update suggested an effective split)
4. Does the current application reflect the business logic? If not, redesign from scratch.
5. Decide on the split between server and client according to the guideline below.
6. Exploit the modularity of existing applications in order to attribute front-end interface functions to clients and back-end database functions to servers.

The guideline for choosing the right server will consider the work situation and the number of users per servers: For personal use up to 30 users the server will be on a high-power PC or a RISC workstation. High power RISC machines will serve workgroups and large department up to 100 users, while Superminis and Database machines support large enterprises up to 1000 users per server. The cheapest expansion of server performance is most often a parallel processor.

Sizing of servers and client machines will follow two iterations: firstly, balancing system component capability, load parameters and performance goal and secondly, optimizing design.

From the beginning of any re-engineering effort it must be borne in mind that small LAN servers have their weak point in communications during development and operation while large distribution projects have their bottleneck on operational management. Standards for management of applications, transactions, system and data administration are absent or rudimentary only. Standards for network management, however, exist on the level of network management protocol (SMNP for TCP/IP), ISO API for management tools, common management interface protocol (CMIP) and vendor consensus (HP and IBM) for large systems. The management support services should include minimally: echoing test messages, transaction status reports, log of activities and automatically documenting the updating software releases, tracing facilities.

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