

DISTRIBUTED MULTIMEDIA FRAMEWORK USING CORBA ON
JAVA TECHNOLOGY WITH MICROSOFT ACCESS
AND IBM DB2 DATABASE

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MASTER OF SCIENCE
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TECHNOLOGY WITH MICROSOFT ACCESS AND IBM DB2 DATABASE**

AHMAD SHUKRI BIN MOHD NOOR

**Thesis Submitted in Fulfillment of the Requirement for
the Degree of Master of Science in the Faculty of Science And Technology
Kolej Universiti Sains Dan Teknologi Malaysia**

October 2005

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Dedication

This work is dedicated to God, who provided me with the strength to carry on during the completion of this thesis. Secondly to my parents and family, who with their love and support have encouraged me throughout my graduate study.

October 2005

Chairperson : Professor Md Yuzli Mohd Saman, Ph.D.

Member : Professor Mustafa Mat Deric, Ph.D.
Muhd Sarif Abd. Manap M.Sc.

Faculty : Science And Technology

Over the last decade, multimedia computing has grown from a specialist field into a pervasive aspect of everyday computing systems. Methods of programming and handling of multimedia information have evolved considerably over this period. Particular challenges for multimedia computing come from the mobility of the modern computer user, whose wide-ranging levels of connectivity require that applications adapt to various settings.

Over the same period, the field of distributed computing has enabled the growth of component-oriented computing, where software systems are constructed in a generic manner using well-defined components. Experience has indicated that it is both beneficial and feasible to support multi-media applications in distributed object middleware architectures such as the Object Management Group's CORBA, RMI or DCOM.

Abstract of thesis presented to the senate of Kolej Universiti Sains Dan Teknologi Malaysia in fulfillment of the requirement for the Degree of Master of Science.

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Over the last decade, multimedia computing has grown from a specialist field into a pervasive aspect of everyday computing systems. Methods of programming and handling of multimedia information have evolved considerably over this period. Particular challenges for multimedia computing come from the mobility of the modern computer users, where wide-ranging levels of connectivity require that applications adapt to remain effective.

Over the same period, the field of distributed computing has enabled the growth of component-oriented computing, where software systems are constructed in a generic manner using well-defined components. Experience has indicated that it is both beneficial and feasible to support real-time multimedia applications in distributed object middleware architectures such as the Object Management Group's CORBA, RMI or DCOM.

Currently, however, there are little supports for multimedia database applications within either distributed computing platforms or object-oriented systems. This thesis attempts to address the needs for object-oriented middleware support for distributed multimedia systems. The approach combines a multimedia component model with a provision for multimedia information and interaction. The methodology in this study uses CORBA as the middleware technology. More significantly, to handle multimedia database applications in distributed environments, inherent supports for adaptation and reconfiguration within the middleware platform are studied. This thesis describes the design of such a framework and elaborates in detail the ways in which the platform attempts to enhance performance and configurability of multimedia database application in a standard open operating system within distributed environment.

Two application models have been developed, which represent a generic framework for adaptation to other problem domains. They are named (a) Hybrid Model and (b) ORB Model. Using the Java Programming Language and Java Media Framework System, the applications systems have demonstrated the high performance and configurability of the models in a standard open operating system within distributed environment. In this study, the Hybrid Model has been shown to produce better performance than the ORB Model.

Abstrak thesis yang dikemukakan kepada Senat Kolej Universiti Sains Dan Teknologi Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains.

**RANGKAKERJA MULTIMEDIA TERAGIH MENGGUNAKAN CORBA
DIATAS JAVA TEKNOLOGI DENGAN PANGKALAN DATA MICROSOFT
ACCESS DAN IBM DB2.**

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Oktober 2005

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Sejak sedekad yang lalu perkomputeran multimedia telah berkembang dari suatu bidang pakar kepada keseluruhan aspek sistem komputer seharian. Dalam pada itu, kaedah-kaedah pengatucaraan dan pengendalian maklumat multimedia telah berkembang dengan maju. Cabaran-cabaran khusus untuk perkomputeran multimedia datang dari mobiliti pengguna-pengguna komputer moden, yang mana pelbagai tahap perhubungan memerlukan suatu penyesuaian applikasi-aplikasi untuk terus berkesan.

Pada masa yang sama bidang perkomputeran teragih telah membolehkan perkembangan perkomputeran berdasarkan komponen, yang mana system perisian dibina dalam satu kaedah umum menggunakan komponen yang telah didefinisikan dengan baik. Pengalaman telah menunjukkan kebaikan dan kemungkinan untuk menyokong applikasi-aplikasi multimedia dalam masa-nyata didalam senibina pertengahan objek yang teragih seperti Common Object Request Broker Architecture (CORBA).

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Namun begitu pada masa ini ,hanya sedikit sokongan yang ada untuk aplikasi pengkalan data multimedia, samada dari segi pelantar perkomputer teragih ataupun system yang berdasarkan objek. Tesis ini cuba untuk menyatakan keperluan sokongan berdasarkan objek pertengahan untuk sistem-sistem multimedia yang teragih. Pendekatan yang mengabungkan suatu model komponen multimedia dengan penyediaan untuk interaksi and maklumat multimedia. Terutamanya untuk meyokong aplikasi-aplikasi pengkalan data multimedia di dalam persekitaran teragih. sokongan warisan untuk penyesuain dan penyusunan kembali didalam pelantar pertengahan juga dikaji. Tesis ini menerangkan suatu rangka bentuk untuk suatu rangka-kerja dan menerangkan dengan terperinci cara-cara yang mana pelantar itu cuba untuk meningkatkan keupayaan dan kebolehan penyusunan semula aplikasi pangkalan data multimedia dengan sistem pengendalian terbuka yang standard didalam persekitaran teragih

Terima kasih kepada Allah, keluarga dan rakan-rakan.

Dua model aplikasi telah dibangunkan yang mewakili rangka kerja umum untuk disesuaikan kepada ruang lingkup masalah yang lain. Ia namakan sebagai (a) Hybrid Model and (b) ORB Model. Menggunakan pengatucaraan Java dan sistem Java Media Framework, system aplikasi-aplikasi itu telah menunjukkan keupayaan yang tinggi dan kebolehan penyusunan semula model-model dengan sistem pengendalian terbuka yang standard di dalam persekitaran teragih. Di dalam kajian ini, Hybrid Model telah menunjukkan keupayaan yang lebih baik berbanding ORB Model.