



**UNIVERSITI PUTRA MALAYSIA**

**BACKUS-NAUR FORM BASED SCRIPT DEFINITION LANGUAGE  
FOR MULTIMEDIA PRESENTATION DOCUMENT**

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**BACKUS-NAUR FORM BASED SCRIPT DEFINITION LANGUAGE FOR  
MULTIMEDIA PRESENTATION DOCUMENT**

**By**

**MAYA SILVI LYDIA**

**Thesis Submitted in Fulfilment of the Requirement for the Degree of Master of  
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Universiti Putra Malaysia**

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## DEDICATION

*Dedicated especially to:*

*Papa and Mama...*

*Thank you so much for the encouragement, love, and patience, and pray that enable me to finish this thesis.*

*Thanks to Kak Dewi, Bang Taufik, my cute niece and nephew Dita and Ariq, my sister Dhona and brother Yudi...for their support and good time we spent together.*

*I Love You All*



Abstract of thesis presented to the Senate of Universiti Putra Malaysia on fulfilment of the requirement for the degree of Master of Science

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The integration of the text, graphic, audio, video and animation on the desktop promises to fundamentally challenge the old models of the printed document as the basis for information exchange. A multimedia document is a specification activity that can be used to coordinate the presentation runtime of the media objects. Several language that support the multimedia document exist today, for example HTML (HyperText Markup Language) and SMIL (Synchronized Multimedia Interaction Language). HTML is an SGML (Standard Generalized Markup Language) based standard document model that defines syntax to enrich text pages with structural and layout information. The dynamic modification to structure, layout and content of an HTML document are allowed using a



scripting language which is known as DHTML (Dynamic HyperText Markup Language). SMIL is the web format for multimedia document, which is based on XML (eXtensible Markup Language).

Driven by the use of the text markup tags in the multimedia document, the Script Definition Language or simply SDL is developed. The SDL is a definition language for multimedia document that provides a specification to include multimedia elements, such as text, image, animation, audio, and video. The structure of the SDL is described using the Extended Backus-Naur Form (EBNF). In the EBNF, one way to determine the semantic of the language is achieved by derivation. The standard method to derive the semantic of the language in EBNF is using a parse tree.

The multimedia document proposed is called the script document. There is a browser called the Script Multimedia Presentation (SMP) system, which is developed to generate the presentation output. The browser system scans the input file and produces error messages if it does not fulfil the specification. Each of the input documents derives a parse tree to show that the syntax follows the specification. Only the valid input document derives a valid parse tree and produces output. This can be concluded that the input document should strictly follow the SDL specification in order to generate the multimedia presentation.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**BAHASA DEFINISI SKRIP UNTUK DOKUMEN PERSEMBAHAN  
MULTIMEDIA BERASASKAN BENTUK BACKUS-NAUR**

Oleh

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Pengintegrasian teks, imej, audio, video dan animasi dalam komputer meja menjanjikan cabaran kepada model dokumen bercetak yang lama sebagai asas dalam pertukaran maklumat. Dokumen multimedia ialah satu aktiviti penspesifikasian yang digunakan untuk menyelaraskan masa pelaksanaan persembahan objek-objek media. Beberapa bahasa yang menyokong dokumen multimedia yang sedia ada hari ini sebagai contoh iaitu HTML (*HyperText Markup Language*) dan SMIL (*Synchronized Multimedia Interaction Language*). HTML ialah model dokumen piawai berasaskan SGML (*Standard Generalized Markup Language*) yang menerangkan sintaks untuk memperkaya halaman teks dengan maklumat mengenai kedudukan dan struktur.

Pengubahsuaian secara dinamik kepada struktur, kedudukan dan kandungan sesebuah dokumen HTML adalah dibenarkan dengan menggunakan bahasa penskriptan yang dikenal sebagai DHTML (*Dynamic HyperText Markup Language*). SMIL adalah untuk dokumen multimedia yang mempunyai format *web* berasaskan XML (*eXtensible Markup Language*).

Diilhami penggunaan teks tandaan *markup* dalam dokumen multimedia, *Script Definition Language* atau SDL dibangunkan. SDL ialah satu bahasa definisi bagi dokumen multimedia yang menyediakan spesifikasi untuk memasukkan elemen-elemen multimedia seperti teks, imej, animasi, audio, dan video. Struktur SDL ditakrifkan menggunakan Bentuk *Backus-Naur* Lanjutan (EBNF). Satu cara untuk menentukan semantik bahasa dalam EBNF adalah melalui penurunan. Kaedah piawai dalam menurunkan semantik bahasa dalam EBNF adalah menggunakan pokok huraian.

Dokumen multimedia yang dicadangkan disebut sebagai dokumen skrip. Satu pelayar yang disebut sebagai sistem Persembahan Multimedia Skrip (SMP) dibangunkan untuk menjanakan output persembahan. Sistem pelayar tersebut akan mengimbas fail input dan mengeluarkan mesej kesalahan apabila ia tidak memenuhi spesifikasi. Setiap dokumen input akan menjanakan sebuah pokok huraian untuk menunjukkan sama ada sintaknya mengikuti spesifikasi ataupun tidak. Hanya dokumen input yang sah sahaja yang boleh menjanakan pokok huraian dan menghasilkan output. Ini boleh disimpulkan bahawa dokumen input haruslah mengikuti spesifikasi SDL supaya boleh menghasilkan persembahan multimedia.

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## TABLE OF CONTENTS

	<b>Page</b>
<b>DEDICATION</b>	<b>ii</b>
<b>ABSTRACT</b>	<b>iii</b>
<b>ABSTRAK</b>	<b>v</b>
<b>ACKNOWLEDGEMENTS</b>	<b>vii</b>
<b>APPROVAL SHEETS</b>	<b>ix</b>
<b>DECLARATION FORM</b>	<b>xi</b>
<b>LIST OF TABLES</b>	<b>xv</b>
<b>LIST OF FIGURES</b>	<b>xvi</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xix</b>
<b>CHAPTER</b>	
<b>1 INTRODUCTION</b>	<b>1</b>
1.0 The Role of Multimedia in Information Presentation	1
1.1 Multimedia System	3
1.2 The Transformation of Information Industry	6
1.3 Problem Statement	9
1.4 Objectives of Study	11
1.5 Scope of Study	11
1.6 Thesis Organization	12
<b>2 LITERATURE REVIEW</b>	<b>13</b>
2.0 Introduction	13
2.1 Basic Concept of Multimedia System	13
2.2 Main Properties of Multimedia System	16
2.3 Media Types in Multimedia System	20
2.3.1 Text	20
2.3.2 Image and Graphic	23
2.3.3 Video	25
2.3.4 Audio	29
2.3.5 Animation	31
2.4 The Classification of Multimedia Presentation System	36
2.5 Review of Existing Multimedia Presentation System	38
2.5.1 Microsoft PowerPoint	38
2.5.2 Director by Macromedia	38
2.5.3 Authorware by Macromedia	41
2.5.4 An Automatic Generation of Multimedia Presentation	42
2.6 HTML (HyperText Markup Language)	46
2.7 Extensible Markup Language (XML)	48
2.7.1 XML Versus HTML	49



2.7.2	XML Specification in Extended Backus-Naur Form (EBNF)	52
2.8	Language Generation	53
2.8.1	The Fundamental of Backus-Naur Form (BNF)	55
2.8.2	Derivations	59
2.8.3	Parse Trees	60
<b>3</b>	<b>METHODOLOGY</b>	<b>64</b>
3.0	Introduction	64
3.1	Conceptual Model	64
3.2	System Development Approach	66
3.3	SDL Compared to HTML and XML	67
3.4	Specification of Script Definition Language (SDL)	69
3.4.1	Syntax for Script Document	69
3.4.2	Syntax for Title	70
3.4.3	Syntax for Body Document	71
3.4.4	Syntax for Text	72
3.4.5	Syntax for Image	76
3.4.6	Syntax for Audio	77
3.4.7	Syntax for Video	77
3.4.8	Syntax for Animation	78
3.5	An Example of a Script Document Construct	78
<b>4</b>	<b>SYSTEM DESIGN</b>	<b>85</b>
4.0	Introduction	85
4.1	Modules Design	85
4.2	Design Concept	88
4.2.1	Introduction Window	92
4.2.2	Script Editor Window	93
4.2.3	Presentation Browser	94
4.3	Algorithms of Script Multimedia Presentation System	95
4.3.1	Main Process	96
4.3.2	Get_Sentence Function	96
4.3.3	ReadArahan Procedure	98
4.3.4	Procedures applied to Text Element	99
4.3.5	Procedure to Display Image	105
4.3.6	Procedure to Display Gif Animation	106
4.3.7	Procedure to Embed the Audio	108
4.3.8	Procedure to Embed the Video	109
4.3.9	Modules in SMP System	110
<b>5</b>	<b>IMPLEMENTATION AND RESULT</b>	<b>112</b>
5.0	Introduction	112
5.1	Implementation of Media Objects in Visual Basic	112
5.1.1	Text	112

5.1.2	Image	114
5.1.3	Audio and Video	116
5.1.4	Animation	117
5.2	Interface Design of the SMP System	120
5.3	Script Documents and the Parse Trees	124
<b>6</b>	<b>CONCLUSION AND FUTURE RESEARCH</b>	<b>135</b>
6.0	Introduction	135
6.1	Conclusion	136
6.2	Future Work	138
	<b>REFERENCES</b>	<b>139</b>
	<b>BIODATA OF THE AUTHOR</b>	<b>142</b>

## LIST OF TABLES

<b>Table</b>		<b>Page</b>
1.1	The Category of Authoring Tools	5
1.2	Document Composition Mechanisms and Metaphors	8
2.1	Features of PowerPoint	40
2.2	Features of Director by Macromedia	42
2.3	Icon Components of Authorware	44
2.4	The Summary of the HTML tags	48
2.5	Summary of the XML Markup	51
4.1	Visual Basic File Types	89
4.2	List of Color Setting Used in SMP System	102



## LIST OF FIGURES

<b>Figure</b>		<b>Page</b>
1.1	The Outline Example of a Presentation Prepared in PowerPoint	7
2.1	Video Signal	26
2.2	Example of MIDI System Configuration	32
2.3	An Example of Cell Animation	35
2.4	An Example of Path Animation	35
2.5	An Example of Slide Layout in PowerPoint	41
2.6	Director Working Space	43
2.7	Authorware Presentation Workspace	45
2.8	Multimedia Resource Browser	46
2.9	Summary of XML Specification in EBNF	54
2.10	Parse Tree for $A:=B*(A+C)$	62
2.11	Two Distinct Parse Trees for $A:=B+C*A$	63
3.1	Conceptual Model of Script Multimedia Presentation System	65
3.2	Alternative to Prespecification	70
3.3	Summary of The SDL Specification Rule	79
3.4	An Example of the Script Document	84
4.1	Module Design of SMP System	87
4.2	VB Development Environment	89
4.3	The Properties Window	90
4.4	Interface Design of Script Multimedia Presentation	91



4.5	Algorithm for the SMP System	92
4.6	Algorithm for Introduction Window	93
4.7	Algorithm for Script Editor Window	94
4.8	Algorithm for Presentation Browser Window	95
4.9	Algorithm for Main Process	97
4.10	Algorithm for Get_Sentence Function	98
4.11	Algorithm for ReadArahan Procedure	100
4.12	Algorithm for Change_FontColour Procedure	101
4.13	Algorithm for Display_Title Procedure	102
4.14	Algorithm for Change_FontName Procedure	103
4.15	Algorithm for Change_FontSize Procedure	104
4.16	Algorithm for Change_FontStyle Procedure	104
4.17	Algorithm for Display_Image Procedure	106
4.18	Algorithm for Gif_Animation Procedure	107
4.19	Algorithm for Play_Animation Procedure	108
4.20	Algorithm for Get_Audio Procedure	109
4.21	Algorithm for Get_Video Procedure	110
4.22	Algorithm for Open_File Module	111
4.23	Algorithm for Close_File Module	111
5.1	Properties of Textbox in Script Editor Form	113
5.2	The Implementation of the Command in Label Properties	115
5.3	The Property of the Image Box	116
5.4	Multimedia MCI Control	117

5.5	The Properties of the “ <i>Anigif</i> ” Control	119
5.6	The Introduction Window of SMP System	121
5.7	The Script Editor Window of SMP System	122
5.8	The Presentation Browser Window of SMP System	123
5.9	Input Box	123
5.10	An Example of the Incomplete Script Document	125
5.11	Parse Tree for the Incomplete Script Document	126
5.12	An Example of the Complete Script Document	127
5.13	Parse Tree for the Complete Script Document	128
5.14	The Output of the Valid Script Document	133



## LIST OF ABBREVIATIONS

2D	2-Dimensional
3D	3-Dimensional
Anigif	Animation Gif
ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange
AVI	Audio Video Interleave
BNF	Backus-Naur Form
CCIR	The International Consultative Committee on Broadcasting
CIF	Common Intermediate Format
CSG	Constructive Solid Geometry
CTR	Computer Technology Research
DHTML	Dynamic HyperText Markup Language
DTD	Document Type Declaration
DVI	Digital Video Interaction
EBNF	Extended Backus-Naur Form
GIF	Graphic Interchange Format
GIFCON	Gif Construction
GUI	Graphical User Interface
HDTV	High Definition Television
HTML	HyperText Markup Language
ISDN	Integrated Services Digital Network



ISO	International Organization of Standardization
JPEG	Joint Photographic Experts Group
MCI	Multimedia Control Interface
MIDI	The Musical Instrument Digital Interface
MIPS	Music Information Processing Standards
MPEG	Moving Picture Expert Group
NTSC	National Television Systems Committee
ODA	Office Document Architecture
PAL	Phase Alternation Line
PI	Processing Instruction
PLV	Production Level Video
QCIF	Quarter-CIF
RTV	Real-Time Video
SDL	Script Definition Language
SEGAM	Séquentiel Couleur avec Mémoire
SGML	Standard Generalized Markup Language
SMDL	The Standard Music Description Language
SMIL	Synchronized Multimedia Interaction Language
SMP	Script Multimedia Presentation
VB	Visual Basic
VBP	Visual Basic Project
VR	Virtual Reality
W3C	World Wide Web Consortium

**WWW**      **World Wide Web**

**XML**      **eXtensible Markup Language**

# **CHAPTER 1**

## **INTRODUCTION**

### **1.0 The Role of Multimedia in Information Presentation**

The explosive growth of computer industry, the software system in particular has increased the demand for better software systems. Nowadays, parallel with the development of information technology, the use of computing power, as a means of spreading information to people will increase. However, popular application-development systems today support only the traditional data types common to commercial data processing, text, number and date. All of these are displayed in character forms, either as dot-matrix characters or the traditional cathode ray tube display screen (Harrison, 1995).

In recent years, the term multimedia has become a buzzword and has been used in many contexts. From a user's perspective, multimedia allows computer information to be represented in several data types. They are static 2-dimensional (2D) and 3-dimensional (3D) colour graphics; animated 2D and 3D colour graphics, audio, static images, full motion video, text and fonts.

The integration of these media into computer provides additional possibilities for the use of computational power currently available (for example, for interactive presentation of huge amount of information) (Steinmetz and Nahrstedt, 1997).



**Multimedia is a fast emerging basic skill that will be important to life in the twenty-first century (Hofsetter, 1995). In the sales presentation for instance, the use of colour, graphics to show the organization's financial performance will improve the effectiveness of the presentation itself. When used for the purpose of entertainment, the combination of several media, such as sound, graphics, images and animation will be beneficial enough.**

**In education, the use of 3D animated colour graphics in the presentation of certain parts of the subject will enhance the comprehension of students. Well-designed colour graphics can convey a tremendous amount of information in a very compact, memorable, and visually appealing form. The use of animation to add realism to artificial objects or surrealism to images of real objects will enhance the applications. Well-designed animations will also increase the memorability and retention of the multimedia information they display (Harrison, 1995). Audio is not only increasing the information retention but, also, provides ways to communicate with application users when their eyes are not fixed on their display screen.**

**The Information Workstation Group (1993), as cited by Hofsetter (1995), forecasts that multimedia will be a \$30 billion dollar industry by 1998: the top three applications will be entertainment (\$9.1 billion), publishing (\$4.7 billion), and education and training (\$4.3 billion). The growth of multimedia systems is also marked by the increase of the production of Multimedia PC's in United States. The selling of the CD-ROM players which was according to the Dataquest, in 1993, as much as 4.8 million CD-ROM,**

tripled the sales of the prior year has, strengthened the role of multimedia systems as a powerful media of enhancing information presentation. Computer Technology Research (CTR) 1992 also projects that multimedia computers will grow by a compound average growth rate of 82% to reach 15.5 million systems in 1995 (Hofsetter, 1995).

The way multimedia work to spread information to the people has been highlighted by Shuman (1998) in terms of multimedia presentation and standalone title. In the lecturing process, a lecturer uses a computer to explain his/her subject and show the simulation of certain parts of the subject. It is primarily a one-way linear communication process. This kind of information distribution is called multimedia presentations and involves a presenter and an audience of one or more persons. The presenter has control over the multimedia title. Many presentation packages use the multimedia approach in the market today, for example Harvard Graphics, PowerPoint etc.

On the other hand, stand-alone titles are those intended for use by individuals in one-on-one situations. The control of the presentation belongs to the user and he/she can determine what to view and review based on his/her needs. The primary differences between multimedia presentations and stand-alone titles are control and the amount of the interactivity that is involved (Shuman, 1998).

### **1.1 Multimedia System**

Multimedia promises to improve significantly the processing and retention of information by application users. However, a multimedia object in isolation is not