

# Postmodernism in e-Government

Arief Ramadhan<sup>1</sup>, Dana Indra Sensuse<sup>2</sup> and Aniati Murni Arymurthy<sup>3</sup>

<sup>1</sup> Faculty of Computer Science, University of Indonesia  
Depok, 16424 , Indonesia

<sup>2</sup> Faculty of Computer Science, University of Indonesia  
Depok, 16424 , Indonesia

<sup>3</sup> Faculty of Computer Science, University of Indonesia  
Depok, 16424 , Indonesia

## Abstract

Postmodernism does not have a standard definition. However, this paper tries to formulate the characteristics of postmodernism based on various ideas from some postmodernism figures. There are five characteristics of postmodernism which successfully formulated. Based on these five characteristics, this paper looks at the differences between postmodernism with its predecessor, that is modernism. In addition, this paper identifies that postmodernism is strongly influenced by the development of Information and Communication Technologies (ICTs). This paper also tries to show the reciprocal relationship between postmodernism and ICTs. It can be argued that postmodernism is not only influenced by the development of ICTs, but also influence the development of ICTs. Specifically, this paper succeeded in showing the existence of the five characteristics of postmodernism on one of the emerging science in the ICTs, namely e-Government. There are two e-Government matters were observed, i.e. e-Government systems development process, and e-Government content delivery.

**Keywords:** *Postmodernism, Information and Communication Technology, e-Government.*

## 1. Introduction

Postmodernism does not have a standard definition. Even the AllAboutPhilosophy.org said that the effort to define postmodernism would violate the postmodernist's premise that no definite terms, boundaries, or absolute truths exist. Similar opinion was also expressed in [1] that no universal truths and no grand unifying themes in this postmodern world.

There are many figures closely associated with Postmodernism. In this paper, we look at the four figures in Postmodernism, i.e. Jean-Francois Lyotard, Jean Baudrillard, Michel Foucault, and Jacques Derrida. We

choose that four figures because we found that the results of their thinking can be found in e-Government.

### 1.1 The Characteristics of Postmodernism

The term postmodernism was first appeared in 1979 through the books published by Jean-Francois Lyotard which is entitled *The Postmodern Condition* [2]. In that book, Lyotard argues that the emergence of computers and Information and Communication Technologies (ICTs) has radically transformed the social order of contemporary Western society [4].

Lyotard characterized postmodernism as “incredulity towards meta-narratives” [7]. That there is no longer one big story to which all of society may subscribe [7]. Lyotard emphasizes the importance of context, arguing that decisions should be made based on local circumstances and conditions [6]. That Lyotard's thinking could be called as the rejection of meta-narrative. We consider this rejection of meta-narratives as one of the characteristics of postmodernism.

The rejection of meta-narratives could mean there is no grand narrative for all conditions. But, as revealed in [7], the absence of a single, overriding grand narrative does not mean that decisions may be taken without reference to any external referent. Rather, in place of a single privileged master narrative, we must contend with many localized small narratives, and reconcile them in making a decision [7].

One other characteristic of postmodernism is hyperreality. This is in line with what was stated in [4], that drawing on semiotic theory, Jean Baudrillard argues that the resulting continuous and ever-changing flood of signs and simulations has led to a hyper-real society where the

distinction between the real and the unreal has become meaningless [4]. That condition can be called hyperreality. As presented in [8], hyperreality is the condition suggesting that, as humans, we construct our own realities and that these realities are a product of our imaginations, ingenuities, fantasies, and pragmatic needs.

The next characteristic of postmodernism is the existence of social construct. This is in line with the idea that suggested by Michel Foucault. As presented in [4], for Foucault, meaning - whether in a text or a natural or social phenomenon - is not discovered, as positivists believe, but constructed. Moreover, in [4], it also being presented that Foucault argued that knowledge is not objective, to be measured in terms of its supposed correspondence to an external reality. Rather, it is a social construct, the product of the shared beliefs and interpretive practices (what Foucault called the discursive rules) shared by a particular community at a particular social point in space and time [4].

In addition to social constructs, another characteristic of postmodernism that can be drawn from the Foucault's thinking is the existence of power relations. Foucault argued that the dynamics of discursive practice—the rejection, acceptance, reaffirmation, and reinvention of truth claims—are both the product and the producer of power relations [4]. Moreover, for Foucault, knowledge and power are inextricably linked, two sides of the same coin [4]. Any acceptance of a knowledge claim as valid or true by a discourse community generates power-knowledge (*pouvoir-savoir*) within that community and will affect the subsequent sense-making processes of members of that community [4].

Another characteristic of postmodernism is all meaning is contextual and based on difference. As stated in [4], Derrida argues that since all meaning is contextual and based on difference, any philosophical or social theory that claims to uncover a fundamental truth is inherently flawed. Derrida has raised one term called deconstruction. This term can be understood as a theory and method of reading and analytic inquiry that aims to undermine the logic of opposition within texts [5]. Furthermore, in [3], it was revealed that deconstruction is used in not only both literary and philosophical texts but also political institutions. Deconstruction examines meaning and the potential ways that meaning is constructed in a text and the ways in which it can be understood [9]. Derrida argued that all text contain assumptions based on prior knowledge and the subjectivity of the author.

It can be concluded from some of the explanation above that postmodernism is characterized by five points, i.e. the

rejection of meta-narratives, the emergence of hyperreality, the existence of social construct, the existence of power relations, and all meaning is contextual and based on difference.

## 1.2 e-Government

e-Government is the use of Information Technology (IT) by public sector organizations [21]. Other definition of e-Government is public sector use of the Internet and other digital devices to deliver services, information, and democracy itself [22].

e-Government is also an Information System (IS) [21]. However, e-Government is different from ordinary IS that is generally targeting the private sector. The main orientation of e-Government is the accessibility of information by the public, rather than financial income [21].

The letter "e" in e-Government means "electronic". In this case, "electronic" can be in the form of a computer, a television, or mobile devices. Not just "electronic" in the physical sense, but also the technology used, for example using website through the internet or using Short Message Service (SMS).

## 1.3 Objectives

This paper tries to formulate the characteristics of postmodernism based on observations of various ideas of some postmodernism figures. Furthermore, based on all these characteristic, this article tries to see the difference between postmodernism with its predecessor, that is modernism.

This paper also tries to show the reciprocal relationship between postmodernism with ICTs, that postmodernism is not only influenced by the development of ICTs, but also influence the development of ICTs, especially in ICTs development and ICTs research.

Moreover, specifically, this paper also tries to show the reciprocal relationship between postmodernism with one of the emerging science in ICTs, that is e-Government. There are two e-Government matters were observed, i.e. e-Government system development process, and e-Government content delivery. The discussion will be done by checking the existence of the characteristics of postmodernism, which has been formulated in the previous section, in these two e-Government matters.

## 2. From Modernism to Postmodernism

In this section, it will be observed the differences between postmodernism with its predecessor, that is modernism. Some articles which reveal the differences between them are presented in this section. It can be identified that the characteristics of postmodernism, which have been mentioned in the previous section, are also the factors that distinguish postmodernism with modernism.

It could be argued that postmodernism is a continuation of modernism and trying to deny modernism. Postmodernism presented itself as a more open-minded, democratic, and culturally pluralistic alternative to the elitist, essentialist, Western and male-oriented era of modernism [11]. Moreover, in [11], it is presented that instead of the grand narratives of modernity, which despite the experience of fragmentation and alienation continued to construct a unified view of the world and the self based on the stabilizing power of reason, reality, and the human subject, postmodernism emphasized the decentering and endlessly differentiating forces of discourse, history, and the individual self, destabilizing all attempts at totalizing systematic thought, and replacing overarching teleological concepts with the heterogeneous multiplicity of cultural and personal narratives.

In modernism, there is belief that we can find ultimate truths and organize the world according to rational principle using clever code [14]. In fact, as already mentioned earlier, postmodernism does not recognize the ultimate or absolute truth.

Epistemologically, modernism is more objectivism, while postmodernism is more social subjectivism [15]. This opinion is strengthened by the statement suggested in [14], that in postmodernism there is no objective reality because everything is colored by the lens of individual subjectivity.

In [15], a lot of differences between modernism and postmodernism are presented. As revealed in [15], if modernism proclaimed the death of God, then postmodernism proclaims the death of self. This occurs because postmodernism maintains that truth is created by a social group for its own purposes and then forced on others in order to manipulate and suppress them [15]. Moreover, the modern age is the age of reason, empiricism and science [15]. Whereas, the postmodern age is the age of relativity and, recently, the newest form of postmodernism, the age of holism and interdependence, followed [15].

The statement about differences between modernism and postmodernism can also be found in [18], that is the basis for modernism is conformity, boundaries, and security.

However, postmodernists focus on possibilities and do not define things concretely [18].

## 3. Postmodernism and ICTs

Lyotard argues that the emergent ICTs have undermined existing, modernist conceptions of knowledge and legitimacy [4]. Similar opinion was also expressed by Baudrillard. As stated in [4], Baudrillard argues that while the modernist period of the 19th and first half of the 20th centuries was dominated by industrialization, mass production, and commodification, contemporary postmodern society has become a postindustrial mass-media society where the emergence of new information and communication technologies allows the virtually unlimited reproduction and transmission of signs and symbols [4].

If we explore the idea of Lyotard and Baudrillard, it can be seen that the development of ICTs greatly affect the emergence of postmodernism. This is also strengthened by the statement suggested in [16], that today, however, it is the postmodern condition within which communication takes place—a condition also known as the information society, for many of the critical features of postmodernity are the effects of the use of new information technologies. Moreover, as presented in [10], that technology creates new realities, virtual and interactive, postmodernism provides a framework within which such realities can be grasped and understood. Many of our postmodern sensibilities are concretized through technological possibilities [10].

However, we saw that postmodernism is not only influenced by ICTs, but also influence ICTs, especially in ICTs development or ICTs research. To support our opinion, in this section, we will present various research articles that link postmodernism with ICTs. The articles being selected are the articles that discuss more about the influence of postmodernism in the ICTs and not about the influence of ICTs in postmodernism.

The study of postmodernist perspective on the management of IS / IT function have been done in [12]. In that study, it is used a postmodern "deconstructive" mode to analyze the mission statement of one IS / IT organization, completed with interviews with employees of that IS / IT organization.

Other research that links postmodernism with ICTs is carried out in [13]. This research said that the web generator is closely related to postmodernism. In this research, it is reviewed some literature that shows the

relationship between hypertext, one of the main part of the web generator, with postmodernism.

In [20], it is presented that two particular postmodernist developments, namely social constructionism and a newly reworked pragmatism, have significant and serious implications for IS research. The advantage for IS researchers in accepting a social constructionist/pragmatist viewpoint is that the pragmatist notion of “truth” is very helpful for Management and Information Systems research in that it provides a means of evaluating propositions, models and theories in terms of their practical relevance and usefulness [20].

In [20], it also identified that suitable approaches to IS research under a social constructionist/pragmatist perspective or viewpoint could include ethnography, qualitative survey by interview and in depth case study. Under a social constructionist/pragmatist perspective insight and creativity are seen as more important than trying to specify and follow a “perfect” set of procedures including coding methods, inter-coder reliability and the like [20].

Liao, in [19], explains about post-modern teaching practice mode which consists of construction, transformation, and management. In that paper, it was suggested that the teaching portfolio can be used to implement the post-modern teaching mode, and preferably to be done digitally. Since, like what was revealed in [19], that in face of the post-modern information competitive environment, if incumbent teachers wish to stay competitive and intern teachers hope to be recognized in the future education field, it is important that they possess sufficient knowledge and skills in applying information technology in their teaching profession. Therefore, teachers must learn to process the digitalized data for the electronic portfolio through information technology [19].

The research on postmodernism and software engineering, that is described in [7], it can be said quite comprehensive in discussing the influence of postmodernism in the ICTs. In [7], it is stated that a number of recent developments in software engineering share a number of common attributes, that they are avoid a unifying theme or plan, that they focus on negotiation between different concerns, and exhibit a high level of context sensitivity. That paper argue that these developments are evidence of a postmodern turn in software engineering.

Not only describes the various evidence related to various software development methods, namely agile methods, aspect-oriented programming, design patterns, or good enough software, in [7], it is also described a variety of

other evidence. For example, in that paper it is argued that efficiency and correctness, the grand narratives of the software development discipline, are no longer an effective or useful guide to practice [7]. The paper was also revealed that in software design and engineering, for example, postmodern development is more likely to be concerned with existing software products, the values of development and client organizations, the expertise and experience of the development staff, rather than seek to impose an overarching methodology [7]. Various other evidence in the software programming technology, which is associated with the four key software responses to postmodernism: neoclassicism, eclecticism, antimodernism, hypermodernism also described in that paper, for example, JAVA and C# are considered to represent neoclassicism, and Perl that considered to represent eclecticism. At the end, that paper propose some potential prospects for conceptual modelling faced with the spectre of this postmodern turn.

From several previous descriptions, we can conclude that postmodernism was also influence the ICTs development or ICTs research. This indicates that there is a reciprocal relationship between postmodernism with ICTs. Currently, the development of ICTs has been extremely extensive. One of the developments of ICTs is the emergence of e-Government. Thus, we also assume that postmodernism can be influenced and influence e-Government.

#### 4. Postmodernism in e-Government

In this section, it will be identified the presence of the characteristics of postmodernism on e-Government. There are two e-Government matters were observed, i.e. e-Government systems development process, and e-Government content delivery.

##### 4.1 Postmodernism in e-Government System Development Process

The first thing that needs to be made in developing an e-Government system is to determine the e-Government strategic planning. There are six steps of e-Government strategic planning as being mentioned in [21]. Those steps are [21] : (1) Create e-Government planning structures/roles, (2.a) Audit information system, (2.b) Get guidance from organizational strategy, (3) Set e-Government objectives and principles, (4.a) Determine e-Government systems architecture, (4.b) Determine e-Government organizational architecture, (5) Disseminate and plan e-Government actions, and (6) Manage, evolve, and review e-Government strategy.

As revealed in [21], that in the first step, it may be established a special body which can be called as e-Government Steering Group. This e-Government Steering Group may consist of senior staff or other powerful stakeholders from various parts of the organization, together with some technical advisors [21]. The scope of work of the e-Government Steering Group are setting the scope of, and commissioning the e-government strategy; taking necessary strategic decisions relating to e-government systems (such as those presented during strategic planning); communicating the e-government strategy to the rest of the organization; ensuring the necessary resources are in place to achieve strategic objectives, and allocating those resources; and monitoring and controlling the overall development and operation of e-government within the organization, and checking this against stated objectives [21].

Related to one of the tasks of e-Government Steering Group, which is setting the scope of e-Government strategy, we see, in doing this task, it can appear as a social construct process, which is one characteristic of postmodernism. The members of the e-Government Steering Group can argue and compromise with each other to determine a shared e-Government strategy. Although e-Government Steering Group has a leader, the role or the objective from each of its members will be very influential in the decision-making. Furthermore, the process of social constructs also can occur in the step 3 and step 4 of six steps of e-Government strategic planning.

Meanwhile, related to step 2.b, Heeks suggests that it can be argued that public sector organizations can not have objectives [21]. Heeks stated that they are social constructs, not living beings, and therefore there is no such thing as an organizational objective [21]. Instead, there are the objectives of individuals within the organization [21]. These individuals may form coalitions where they perceive their objectives and interests to overlap [21].

e-Government actually more about people and politics than about technology and rationality [21]. e-Government is more political, because it involves several groups that have objective and values, and there are some important and expensive resources involved in it [21].

There are two main factors related to organizational politics, i.e. the strength (power) and the influence [21]. When an e-Government system was introduced, then all stakeholders involved will try to influence each other using the power they have [21]. This is another characteristic from postmodernism, that is power relations, as expressed by Foucault.

There are many type of power attached in an individual or organization. However, the most major type of power in postmodernism is the genetic power, as expressed in [16], that political scientists and communication scholars studying the conditions of modernity explored instrumental power (control over the material world), structural power (control over rules and institutions), and symbolic power (control over ideas); postmodern attention has turned in addition to the study of genetic power (control over the informational bases of materials, rules and institutions, and ideas).

A postmodern IT manager must be able to innovate and have creative ideas in the development of e-Government system. As stated in [19], that post-modernism promotes a continuous renovation and insatiability, with the spirit of self breakthrough not confining to a form or pursuit of fixed results, and explores the possible, multiple paths of innovation.

However, being able to innovate and have creative ideas are not enough. As can be inferred from [21], that when an IT manager has a good idea in the application of e-Government system, the idea would be difficult to be implemented if he could not influence his supervisor, his IT staff, politicians or others. Therefore, an IT manager must have the communication skills, negotiation skills, and the most important, influencing skills [21].

IT manager in the development of e-Government systems can communicate, negotiate, and influence in the form of narrative writing. As stated in [20], narratives can be a rich and compelling resource for informing decisions on information systems design and implementation. This ability to give the reader an understanding of the context of a situation of (say) another person in an organization is potentially far more useful than the results of a statistically grounded survey or model, because a story leaves the reader free to infer multiple and implicit links between the potential decisions being made and the impact on those who will experience the consequences of those decisions [20].

From some of the above explanation, it appears that there are two main characteristics of postmodernism can be identified in the e-Government systems development process, i.e. the social construct and the power relations. Other characteristic contained in the e-Government development process is the rejection of meta-narrative. This is in accordance with what is stated in the [21], that the context for all public sector systems – not just e-government systems but also management systems – is important. So it can be said that the strategy of e-

Government development in a government organization, will not be simply applied in other government organizations.

#### 4.2 Postmodernism in e-Government Content Delivery

In the case of e-Government content delivery, there are two characteristics of postmodernism that can be identified, i.e. hyperreality and all meaning is contextual and based on difference.

Content from e-Government system, can be delivered through various ICTs facilities. Official website or television are some ICTs facilities that commonly used by government to deliver the content of its e-Government system. This shows the movement of reality, from government as a resource to the citizens as recipients. It also demonstrates the existence of one characteristics postmodernism in e-Government, that is hyperreality.

Citizen generally can not know, why a content can exist in the e-Government system, and why it contains such content. Citizen generally do not have direct access to original sources of the content. This is in line with what was said in [2], that in postmodernism, hyperreality is the result of the technological mediation of experience, where what passes for reality is a network of images and signs without an external referent, such that what is represented is representation itself.

Furthermore, the content or data that is presented in the e-Government system also may have had an error. As stated in the [21], that data errors can occur at any stage in the information cycle, for example, during processing, storage, output or transmission between those stages.

In addition, the content that is presented in the e-Government system can be interpreted differently by users which read them. As stated in [17], postmodernism sees value in stories more than structures, the margins as much as the centre, the diverse and ambiguous as much as the certain and universal. This is related to the background and culture of the users that can vary within a country.

If the content contains sensitive issues, such as political or religious issue, it is a very big chance of the emergence of various different interpretations of the content's meaning. For example, when the content contains political news, then the user will try to link between the news content with the political background of government officials which deliver the news and the political condition within the country. This shows the existence of other characteristics

of postmodernism in the e-Government, that is all meaning is contextual and based on difference.

### 5. Conclusions

This paper has formulated the characteristics of postmodernism. There are five characteristics of postmodernism that have been successfully formulated in this article, i.e. the rejection of meta-narrative, the emergence of hyperreality, the existence of social construct, the existence of power relations, and all meaning is contextual and based on difference.

Based on those five characteristics, this paper has shown the differences between postmodernism with its predecessor, that is modernism. Various research that reveal the differences between modernism with postmodernism has been presented in this paper.

Furthermore, this paper has shown how the influence of postmodernism in the ICTs, that is by presenting the results of several articles that link postmodernism with ICTs. This is carried out to demonstrate the reciprocal relationship between postmodernism and ICTs, that postmodernism is not only influenced by ICTs, but also influence ICTs.

Furthermore, this paper successfully identifying the existence of five characteristics of postmodernism in e-Government. The rejection of meta-narrative, the existence of social construct, and the existence of power relations are appear in the e-Government systems development process. Meanwhile, hyperreality and all meaning is contextual and based on difference are appear in e-Government content delivery.

### References

- [1] D. Sumara, B. Davis, and L. Laidlaw, "Canadian Identity and Curriculum Theory: An Ecological, Postmodern Perspective", *Canadian Journal Of Education*, Vol. 26, No. 2, 2001, pp. 144-163.
- [2] G. Aylesworth, "Postmodernism", *The Stanford Encyclopedia of Philosophy (Winter 2010 Edition)*, Edward N. Zalta (ed.). [Online]. Available: <http://plato.stanford.edu/archives/win2010/entries/postmodernism/>, 2010.
- [3] L. Lawlor, "Jacques Derrida", *The Stanford Encyclopedia of Philosophy (Spring 2010 Edition)*, Edward N. Zalta (ed.). [Online]. Available: <http://plato.stanford.edu/archives/spr2010/entries/derrida/>, 2010.
- [4] M. R. Olsson, "Postmodernism", in *The Sage Encyclopedia of Qualitative Research Methods*, Vol. 1 & 2, L. S. Given, Ed. California, USA: SAGE Publications, Inc., 2008.

- [5] N. Gough, "Deconstruction", in *The Sage Encyclopedia of Qualitative Research Methods*, Vol. 1 & 2, L. S. Given, Ed. California, USA: SAGE Publications, Inc., 2008.
- [6] S. Hamid, "Between Orientalism and Postmodernism: The Changing Nature of Western Feminist Thought Towards the Middle East", *HAWWA*, Vol. 4, No. 1, 2006, pp. 76-92.
- [7] J. Noble and R. Biddle, "Postmodern Prospects for Conceptual Modelling", in *Conferences in Research and Practice in Information Technology*, Vol. 53, M. Stumptner, S. Hartmann, and Y. Kiyoki, Ed. Australia: Australian Computer Society, Inc., 2006.
- [8] A. Venkatesh, "Postmodernism Perspectives for Macromarketing: An Inquiry into the Global Information and Sign Economy", *Journal of Macromarketing*, Vol. 19, No. 12, 1999.
- [9] D. Nel, "Information Technology as an Agent of Post-Modernism", *Magister Commercii (Informatics) Mini-dissertation*, University of Pretoria, Pretoria, South Africa, 2006.
- [10] A. Venkatesh, R.R. Dholakia, and N. Dholakia, "New Visions of Information Technology and Postmodernism: Implications for Advertising and Marketing Communications", in *The Information Superhighway and Private Households: Case Studies of Business Impacts*, W. Brenner and L. Kolbe, Ed., 1995.
- [11] H. Zapf, "Cultural Ecology, Postmodernism, and Literary Knowledge", in *Redefining Modernism and Postmodernism*, S. Toplu and H. Zapf, Ed. Newcastle, England: Cambridge Scholars Publishing, 2010.
- [12] J. Pillay and R. Hackney, "Organisational Mission Statements: a postmodernist perspective on the management of the IS/IT function", in *Advanced Topics in Information Resources Management*, Vol. 2, M. Khosrow-Pour, Ed. USA: IGI Publishing, 2003.
- [13] E. Losh, "Assembly Lines: Web Generators as Hypertexts", in *Proceedings of the eighteenth conference on Hypertext and hypermedia*, ACM, 2007, pp 115-122.
- [14] K. Werbach, "Postmodern Knowledge Management", *Esther Dyson's Monthly Report Release 1.0*, Vol. 19, No. 6, 2001.
- [15] P. R. Singh, "Consumer Culture and Postmodernism", *Postmodern Openings*, Vol. 5, No. 5, 2011, pp 55-88.
- [16] S. Braman, "From the Modern to the Postmodern The Future of Global Communications Theory and Research in a Pandemonic Age", in *International and development communication: A 21st-century perspective*, B. Mody, Ed. California, USA: Sage Publications, 2003.
- [17] T. Cook and J. M. Schwartz, "Archives, Records, and Power: From (Postmodern) Theory to (Archival) Performance", *Archival Science*, Vol. 2, 2002, pp 171-185.
- [18] K. D. Jacobs and W. A. Kritsonis, "National Strategies for Implementing Postmodern Thinking for Improving Secondary Education in Public Education in the United States of America", *National Forum of Educational Administration and Supervision Journal*, Vol. 23, No. 4, 2006.
- [19] C. W. Liao, "Application of e-portfolio system to enhance teacher professional development", *Educational Research and Reviews*, Vol. 6, No. 3, 2011, pp. 251-258.
- [20] P. Marshall, "Social Constructionism with a Twist of Pragmatism: A Suitable Cocktail for Information Systems Research", on *Proceedings of 16th Australasian Conference on Information Systems*, 2005.
- [21] R. Heeks, *Implementing and Managing eGovernment An International Text*, London, USA : SAGE Publications, 2006.
- [22] D. M. West, *Digital Government Technology and Public Sector Performance*, New Jersey, USA : Princeton University Press, 2005.

**Arief Ramadhan** B.Sc in Computer Science (Bogor Agricultural University, Indonesia, 2005), M.Sc in Computer Science (Bogor Agricultural University, Indonesia, 2010), Ph.D Student in Computer Science (University of Indonesia), Research Assistant at University of Indonesia. Member of e-Government Lab at University of Indonesia.

**Dana Indra Sensuse** B.Sc in Geology (Bogor Agricultural University, Indonesia, 1985), M.Sc in Library and Information Studies (Dalhousie University, Halifax, Canada, 1994), Ph.D in Information Studies (Toronto University, Canada, 2004), Lecturer at University of Indonesia, Head of e-Government Lab at University of Indonesia.

**Aniati Murni Arymurthy** B.Sc in Electrical Engineering (University of Indonesia, 1973), M.Sc in Computer and Information Sciences (Ohio State Univ., Ohio, USA, 1981), Ph.D in Computer Science (University of Indonesia, 1997), Professor at Faculty of Computer Science in University of Indonesia, Lecturer at University of Indonesia, Head of Pattern Rec, Image Proc, and CBIR Labs at University of Indonesia.