

Information Quality in Web-Based eCatalogue

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Information Quality in Web-Based eCatalogue

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ABSTRACT

Catalogues are important business strategy as they can provide customers with product descriptions and assist who have buying interest to not go through the floor areas and shelves, browsing aimlessly, trying to locate items that are of interest. Printed catalogue are cumbersome to use, require large storage areas, become dated soon after publication, and make search and comparison activities very difficult. The situation is further worsen when the quality of information provided is not regularly updated and is below customers' expectations. eCatalogue has the potential to offer assistance to customer, and improve information quality. Therefore, an eCatalogue was developed in this study where 30 potential customers tried the proposed eCatalogue for a certain period. Nine information quality dimensions, which are Accuracy, Precision, Currency, Timeliness, Reliability, Completeness, Conciseness, Format, and Relevance, were used to measure the eCatalogue. Based on a three point scale (where 1= disagree and 3= agree), respondents agree that the information in the eCatalogue are somewhat current (mean =2.27), precise (2.20), accurate (2.17), reliable (2.17), and concise (2.17). However, they are not sure about the timely (2.00) and relevant (2.07) dimensions. Also they agree to some extent, the eCatalogue format is satisfying (2.20). Overall mean of quality measure is (2.15), which is indicates that the quality of information in the developed eCatalogue should be improved.

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TABLE OF CONTENTS

PERMISSION TO USE.....	III
ABSTRACT.....	IV
ACKNOWLEDGEMENTS.....	V
LIST OF TABLES.....	VIII
LIST OF FIGURES.....	X

CHAPTER 1

1.1. INTRODUCTION	1
1.2. BACKGROUND	1
1.3. PROBLEM STATEMENT	3
1.4. OBJECTIVES	4
1.5. EXPECTED CONTRIBUTION	4
1.6. SCOPE OF THE STUDY	4
1.7. FRAME WORK OF STUDY	6
1.8. STRUCTURE OF THESIS	7
1.9. SUMMARY	7

CHAPTER 2

2.1. INTRODUCTION	8
2.2. eCATALOGUE	8
2.2.1. FORMATS OF eCATALOGUE	10
2.2.2. eCATALOGUE DISADVANTAGES	12
2.3. eCATALOGUE IN E-COMMERCE	12
2.4. FEATURES COMPARISON	20
2.5. INFORMATION QUALITY IN eCATALOGUE	22
2.5.1. DIMENSIONS OF IQ	22
2.6. IMPLICATIONS OF THE LITERATURE REVIEW	23
2.7. SUMMARY	24

CHAPTER 3

3.1. INTRODUCTION	25
3.2. eCATALOGUE DEVELOPMENT AND ELEMENTS	25
3.2.1. PLANNING	29
3.2.2. ANALYSIS	31
3.2.3. DESIGN	33
3.2.4. IMPLEMENTATION	34
3.2.5. PROMOTION	35

3.2.6. INNOVATION	36
3.3. QUALITY OF INFORMATION	36
3.4. SUMMARY	38

CHAPTER 4

4.1. REQUIERMENTS OF eCATALOGUE	40
4.1.1. USE CASE DIAGRAM	43
4.1.2. USE CASE SPECIFICATION	45
4.1.3. SEQUENCE AND COLLABORATION DIAGRAMS	56
4.2. SYSTEM DEVELOPMENT	72
4.3. ARCHITECTURE OF THE eCATALOGUE	72
4.4. USER INTERFACE OF eCATALOGUE	73
4.5. SUMMARY	83

CHAPTER 5

5.1. INTRODUCTION	84
5.2. PROFILES OF RESPONDENTS	85
5.3. USER EVALUATION	86
5.4. SUMMARY	87

CHAPTER 6

6.1. DISCUSSION	88
6.2. FUTURE STUDIES	89
6.3. CONCLUSION	90

REFERENCES 91

LIST OF TABLES

Table 2.1: Feature Comparison of Printed Catalogue and eCatalogue	21
Table 5.1: Profiles of Respondents	85
Table 5.2: Descriptive Statistic for eCatalogue Evaluation	87

LIST OF FIGURES

Figure 1.1: Research Framework	6
Figure 2.1: HTML eCatalogue	10
Figure 2.2: FTP eCatalogue	11
Figure 2.3: eCatalogue for Treating Customers as Individuals	16
Figure 2.4: Eng Hup Seng eCatalogue	17
Figure 2.5: High Quality Image Catalogues	18
Figure 2.6: Mobile eCatalogue System	20
Figure 3.1: Decembers Methodology	26
Figure 3.2: Planning Representation	29
Figure 3.3: Analysis Representation	32
Figure 3.4: Design Representation	34
Figure 3.5: Implementation Representation	35
Figure 4.1: Use Case	44
Figure 4.2: View News Sequence Diagram	57
Figure 4.3: View News Collaboration Diagram	58
Figure 4.4: Submit Comment Sequence Diagram	59
Figure 4.5: Submit Comment Collaboration Diagram	60
Figure 4.6: Search for Product Sequence Diagram	61
Figure 4.7: Search for Product Collaboration Diagram	62
Figure 4.8: Contact us Sequence Diagram	63
Figure 4.9: Contact us Collaboration Diagram	64
Figure 4.10: Login Sequence Diagram	65
Figure 4.11: Login Collaboration Diagram	66
Figure 4.12: Manage Product Sequence Diagram	68
Figure 4.13: Manage Product Collaboration Diagram	69
Figure 4.14: Manage Comment Sequence Diagram	70
Figure 4.15: Manage Comment Collaboration Diagram	71
Figure 4.16: eCatalogue Architecture	72
Figure 4.17: Home Page Layout	75
Figure 4.18: Comment Page Layout	76
Figure 4.19: View Page Layout	77
Figure 4.20: Login Page Layout	78
Figure 4.21: Control Panel Page Layout	79

Figure 4.22: Manage Comment Page Layout	80
Figure 4.23: Manage Products Information Page Layout	81
Figure 4.24: Manage eCatalogue Information Page Layout	82

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter provides a general idea about the background of the study, problem statement, objectives, expected contribution, scope of the study, research framework, and structure of thesis.

1.2 Background

Electronic catalogues (eCatalogues) are rapidly becoming an increasingly important part of electronic commerce (Georgantis et al, 2002) and is the means by which the user views and interacts with the supplier's information (Baron et al., 2000). eCatalogue, in simple terms provides an electronic equivalent of an empty paper catalogue that can then be populated with your own product details, allowing customers to make purchases on-line using a shopping basket (Opportunity Wales, 2001).

The BNet Business Dictionary defines eCatalogue as a listing of available products that can be viewed in an electronic format, for example, on a Web site, and can include information such as illustrations, prices, and product descriptions. eCatalogue is also about showcasing products or services online, via the web, through websites (BDigital, 2003). Even a company's web page that provides a short list of its products is an eCatalogue. Also in eCatalogue web site there is a concentration on information

The contents of
the thesis is for
internal user
only

References

- Adamczak, S. (2003). *computer-aided systems for manufacture and measurment of machine elements*. kielce: project PL-1. Pages 301-310.
- Astralys. (2008). Retrieved May 25, 2009, from Astralys: (<http://www.astralys.com.sg/services/e-catalogue.asp>).
- Bahrami, A. (1999). *Object Oriented System Development*, McGraw-Hill, United States of America.
- Bailey, J. & Pearson, S. (1983). Development of a Tool for Measuring and Analyzing Computer User Satisfaction, *Management Science*, Vol. 29, No. 5, 530-545.
- Baron, J., Shaw, M., & Bailey, A. (2000). Web-based E-catalog Systems in B2B Procurement. *Communications of the ACM*, Vol.43, No.5.
- BDigital (2003). eCatalogue. Retrieved on 16 Mei 2005 from <http://www.bdigital.biz/index.php?pageid=376>
- Bennett, S., McRobb, S., & Farmer, R. (2002). *Object-oriented System Analysis and Design 2 Edition*. UK, McGraw Hill.
- Brody, F. (1999). On risk, Convenience, and Internet Shopping Behavior, *Communications of the ACM*, vol. 43, no. 11, pp.98-105.
- Ciocca, G., Gagliardi, I., & Schettini, R. (1999). A content-based image retrieval system with learning capabilities, *IEEE Multimedia Systems 99, IEEE Computer Society*, Vol. II,1028-1029.
- Ciocca, G. Schettini, R.& Zuffi S. (2003). Open-Ended Search in High Quality Image Catalogues. *Istituto Tecnologie Informatiche Multimediali Consiglio Nazionale delle Ricerche Via Ampere 56, 20131 Milano, Italy*.

Choi, S., Stahl, D., & Whinston, A. (1997). *The Economics of Electronic Commerce*. Indianapolis. Retrieved 2 Feb. From <http://scholar.google.com/scholar?q=Meanwhile,+ecommerce+can+be+defined+as+a+subset+of+e-business&hl=en&um=1&ie=UTF-8&oi=scholar>.

December, J. (2008). *Developing Information Content for the World Wide Web* <http://www.december.com/web/develop/overview.html>

Dennis, A., Wixom, H., & Tegarden, D. (2005). *System analysis and design with UML version 2.0: an object-oriented approach with UML, 2nd edition*. Hoboken, NJ: John Wiley and Sons, Inc.

Digitsmith. (2005). *Ecommerce definition and types of ecommerce*. Retrieved Feb, 3, 2009, from (<http://www.digitsmith.com/ecommerce-definition.html>).

DZNet. (2007). *E-Commerce*. Retrieved March 13 2009. From (<http://dictionary.zdnet.com/definition/e-commerce.html>).

E-Business Technology Institute (2005). Retrieved on 27 March 2009, from (<http://www.eti.hku.hk/eti/web/waec/ecatalog.html>).

eCatalogue (2009). *eCatalogue*, retrieved on 20 March 2009, from (<http://ecatalogue.com.au/about.htm>).

Eriksson, H., & Penker, M. (1998). *UML Toolkit. USA*, John Wiley & Sons, Inc.

Fairchild, M. (1997). *Color Appearance Models*, Addison Wesley, USA.

Faloutsos C., Barber R., Flickner M., Hafner J., Niblack W., & Petrovic D. (1994) Efficient and effective querying by image content, *Journal of Intelligent Systems*, 3.231-262.

Gartner Research (2001). Procurement: An Overview of Electronic Catalog Commerce. In The Cardonet Exchange.
<http://www.gartner.com/webletter/cardonet/index.html>

Georgantis, N., Koutsomitropoulos, A., Zafiris, A., & Papatheodorou S. (2002). A Review and Evaluation of Platforms and Tools for building e-Catalogs. *Proceedings of the 35th Hawaii International Conference on System Sciences, Hawaii.*

Giancarlo, L. (2000). Types of e-commerce: B2B, B2C, C2C, C2B. Retrieved Feb, 3, 2009. From (<http://gandalf.it/offline/off26-en.htm>).

Gill J. & Salton G. (1999). *Introduction to modern Information Retrieval*, McGraw-Hill. United States of America.

Gill M. & Salton G. (2004). *Introduction to modern Information Retrieval*, McGraw-Hill. United States of America.

Hesterbrink, C. (1999). E-Business and ERP: Bringing two Paradigms together. Retrieved May 15,2009, from PriceWaterhouse Coopers website: <http://www.pwc.com/>

Hoffer, A., George, F. & Valacich, S. (1999). *Modern Systems Analysis and Design (2nd Edition)*. United Kingdom : Addison Wesley Longman.

Hoffer, J. A., George, J. F & Valacich, J. S. (2002). *Modern Systems Analysis and Design (3rd Edition)*. Upper Saddle River, New Jersey: Prentice Hall.

Hoffman, L. & Novak, P. (1996). Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations, *Journal of Marketing*, 60, (3), 50-68.

Holmes, M. (2009). The Multiple Dimensions of Information Quality. Muhlenberg College Allentown, PA 18104, retrieved on 3 April 2009. From (<http://www.muhlenberg.edu/depts/abe/business/miller/mdiqual.html>).

- House of Representative (1999). *Systems Development Life Cycle*, pp. 1-12.
- Huang T., Lee W., & Wang Y. (1999) *Quality Information and Knowledge*. New Jersey: Prentice Hall.
- Huang T., & Lee W., et al. (1999). *Quality Information and Knowledge*. Upper Saddle River: NY, Prentice Hall PTR.
- Jacobson, I., Christerson, M., Johnsson, P. & Overgaars, G. (2004). *Object-oriented Software Engineering: A Use Case Driven Approach (revised)*. Harlow, England: Addison-Wesley.
- Kalata, K. (2003). *Introduction to ASP.NET*. Course Technology. New Delhi, India.
- Kahn, K. & Stong, M. (1998) Product and Service Performance Model for Information Quality: *Proceedings of the 1998 Conference on Information Quality*, Cambridge, MA: Massachusetts Institute of Technology.
- Kothari, C. (1995). *Research Methodology, Methods and Techniques*. Delhi: Wiley Eastern Limited.
- Kwok, S., Yang, C., & Tam, K. (2004). Intellectual property protection for electronic commerce applications. *electronic commerce research*, 5(1). Retrieved Feb 10, 2009. From (<http://www.csulb.edu/web/journals/jecr/issues/20041/Paper1.pdf>).
- Maria, M. (1998). Electronic Commerce via Personalised Virtual Electronic Catalogues. Intelligent Interactive Technologies Group, retrieved on 20 March 2009, from (<http://www.cmis.csiro.au/I2Tech/Projects/DDD/>).
- Milosavljevic, M., Tulloch, A. & Dale, R. (1996). Text generation in a dynamic hypertext environment. *In Proceedings of the Nineteenth Australasian Computer Science Conference*, pp. 417--426. Melbourne, Australia.

Mood, M., Graybill A., & Boes, C. (1988). *Introduzione alla statistica*. McGraw-Hill.

Mursec, B. & Ploj, A. (2001). Expert system OPTIS for optimization of cutting conditions and modern information systems of selection of tools and cutting conditions in cutting processes, *Strojarstvo*, 43, no. 4/6, 169-175.

Mursec, B. (2000). Integral model for the selection of optimal cutting conditions in the computer aided tool management system, doctor's thesis, University of Maribor, Faculty of Mechanical Engineering, Maribor.

Ng, S. F. (2001) e-Travel catalogue application for tourism in Malaysia. Masters thesis, Universiti Utara Malaysia.

Opportunity Wales (2001). eCatalogues: What is an eCatalogue? Retrieved on 16 Mei 2005 from www.opportunitywales.co.uk/txt/0-0-0/8-0-0/glossary/glossary_a.htm.

Pagegangster (2009). Pagegangster PDF Converter, retrieved on 21 March 2009, from (<http://www.pagegangster.com/eng/>).

Pairin, K. & Keng, S. (1999) Measuring information quality of web sites: development of an instrument , *Proceedings of the 20th international conference on Information Systems*: 279 – 285.

Pass G., Zabih R., & Miller J. (1996). Comparing Images Using Color Coherence Vectors. *Proc. Fourth ACM Multimedia 96 Conference*.

Peng Y. (2002). Information Quality of the Jordan Institute for Families Web Site. A Master's paper for the M.S. in I.S. degree. July, 2002.

Petrelli D., Stock O., Strapparava C., & Zancanaro M. (1997). Augmented space: Bringing the physical dimension into play. In *Proceedings of the Flexible Hypertext Workshop, held in conjunction with the 8th ACM International Hypertext Conference*. pp. 24-29. Southampton, UK.

Ravden S., & Johnson G. (1989). *Evaluating Usability of Human Computer Interfaces: a Practical Method*. UK: Ellies Horwood Ltd Chicheste.

Refsdal, A. (2008). *Extending UML Sequence Diagrams to Model Trust-Dependent Behavior with the Aim to Support Risk Analysis*. 197(2): 1529

Rountev, A. & Reddoch, M. (2006). *Static control-flow analysis for reverse Engineering of UML sequence diagrams*. 31(1): 96 – 102.

Sabbata P., Zuffi S., Correia A.I., Benatti G., Fantin S. (2000). An architecture for a high-quality electronic catalog on the Internet. Proc. of the SPIE vol. 3964 Internet Imaging, San Jose.

Sami, I. (2006, May). From B2C to C2C e-commerce. Retrieved Feb, 3, 2009, from [http://www.groundswell.fi/sim/academic/\(sim\)%20From%20B2C%20to%20C20e-commerce.pdf](http://www.groundswell.fi/sim/academic/(sim)%20From%20B2C%20to%20C20e-commerce.pdf).

Schmuller, J. (2002). *SAMS teach your self UML in Hours*. SAMS Publishing, Indiana.

Silva, D. & Paton, W. (2003). *UML: The Unified Modeling Language for Interactive Applications*. Retrieved from: <http://scholar.google.com/scholar?q=UMLi:%20The%20Unified%20Modeling%20La>

Stokes M., Anderson M., Chandrasekar S., & Motta R. (1996). A Standard Default Color Space for the Internet – sRGB, <http://www.w3.org/Graphics/Color/sRGB>.

Strong M. , Lee W. (1997). “Data quality in context.” *Communications of the ACM* 40(5): 103-110.

Valarie, Z., Parasuraman, A. & Leonard, B. (1990). *Delivering Quality Service: Balancing Customer Perceptions and Expectations*. The Free Press, New York.

Wang, Y. and Strong M. (1996). "Beyond accuracy: What data quality means to data consumers." *Journal of Management Information Systems* 12(4): 5-34.

Wang, Y. (1998). "A product perspective on total data quality Management." *Communications of the ACM* 41(2).

Wired (2008). Powerful e-Catalogue Tool: Treating Customers as Individuals. Retrieved on 25 March 2009. From (www.wired.co.nz).

Zacker, C. (2004). *Managing and Maintaining a Microsoft Windows Server 2003 Environment*. Microsoft Press. United States of America

Zerzelidis, A. & Wellings A. (2005). *Requirements for a real-time .NET framework*. *Sigplan Not*, pages = 41-50. <http://doi.acm.org/10.1145/1052659.1052666>.