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“Who never walks safe where he sees men’s tracks makes no discoveries.”

J.G. Holland

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The last section found within the research study is the appendix section comprising of the research study ethics and research study questionnaire.

APPENDIX

“If you make people think they will thinking, they will love you; but if you really make them think, they will hate you.”

Don Marquis

The appendix section of the research study includes the:

1. Research study ethics, which include:
 - The application form to the Faculty committee for research ethics and integrity.
 - The approval letter from the Faculty committee for research ethics and integrity.
2. Research study questionnaire that was used to obtain information on the research study problem statement.

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APPENDIX A – Research study ethics

“In a changing world we must be prepared to change with it.”

Benjamin Franklin

Approval for the research study was obtained from the Faculty committee for research ethics and integrity. The committee considers and makes recommendations on the ethical nature of research conducted in the Faculty of Engineering, Built Environment and Information Technology in which:

- People, individually or in groups, and/or animals are involved.
- Research could have an influence on the environment.

The application form for approval of a research project as well as the approval letter received from the Faculty committee for research ethics and integrity are included below:

APPENDIX

University of Pretoria etd – Giesing, I (2003)



5th of June 2003

Dear Sir/Madam,

APPLICATION FOR APPROVAL OF A RESEARCH PROJECT

1. **Applicant's name:** Ilse Giesing
2. **Postal address:** P.O. Box 10592, Johannesburg
2000
3. **E-mail address:** ilseg@dex.co.za
4. **Telephone number:** (011) 644-6546
5. **Fax number:** (011) 644-6501
6. **School in Faculty:** Information Technology
7. **Research project title:**
User perceptions related to identification through biometrics within electronic business.
8. **Date of submission:** 5th of June 2003
9. **Study leader:** Dr. H.H. Lotriet

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Compiled by: Ilse Giesing
Submitted in fulfilment of the requirements for the degree MAGISTER COMMERCII (Informatics) in the Faculty of Economic and Management Sciences at the University of Pretoria.

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10. **Other specialist services:** None

11. **Research study particulars:**

□ **Problem statement**

The identification of user perceptions related to identification through biometrics within electronic business

□ **Research study objectives**

- Important factors that influence user adoption in Electronic Business.
- Why identification plays such an important role in Electronic Business.
- Important factors that influence user perceptions related to biometrics as an identification system within Electronic Business.

□ **Key terms**

Information Technology, Information Systems, Electronic Commerce, Biometrics, Digital certification, Digital certificate, Identification, User adoption, Cultural barriers, Security and privacy considerations and Legal aspects and implications.

□ **Experimental methods/measuring instruments**

Interpretive research has been selected so that the research study's problem statement can be exploratory tested. The interpretive research will be done by means of a questionnaire.

□ **Materials/Apparatus**

For the purpose of the research study a questionnaire will be used to collect the relevant data. The format of the questionnaire was that of closed (restricting the participant to selecting an answer from a list of possible answers) and open (allowing the participant to supply an appropriate answer) questions relating to the following sub-sections:

- Demographic information.

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-
- Background information on Internet usage and concerns.
 - Biometrics as an identification method.
 - User adoption and perceptions.
 - Additional comments.
- **Profile of research subjects/target group/animals/environmental factors**
- An Information Technology organization by the name of DexData Technologies Pty (Ltd), also known as DexIT, was selected for the research study exploratory field study section by means of interpretive research and morphological analysis methods. The Dex Group of companies is a global Information Technology-based organization that runs mission critical systems for financial services, healthcare managers and security application clients. DexIT was originally established in 1982 to provide brokers and insurers with the systems, data and analyzing tools required to make underwriting decisions. DexIT was the first to offer an on-line quotation for Personal Lines Insurance on the Internet. Having developed the world's most advanced encryption technology, DexIT information security and verification products provide innovative solutions in the fields of security. DexIT's unique **two-dimensional (2D)** barcode is revolutionising the fight against fraud and shrinkage. Their information security and verification products apply to various media such as reproducible and non-reproducible **two-dimensional (2D)** symbologies, smart cards, magnetic cards, touch memory and telecommunications. In the last **six** years, they have used their skills and intellectual property to grow into South Africa's leading provider of security solutions based on technologies such as **two-dimensional (2D)** barcodes, biometrics, and encryption. DexIT were the first to explore machine-readable identity-solutions using facial, signature and finger biometrics embedded in machine-readable **two-dimensional (2D)** barcodes placed on an identity card. The reason for selecting DexIT, as the research site for the research study, and specifically their information security and verification company known as Dex Security Solutions (DSS) is because they are a South African pioneer in

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the field of information security, identification and verification technology. Dex Security Solutions (DSS) places a strong focus on the development of its own intellectual property, which forms the basis of most of its solutions. To ensure that they remain on the cutting edge of the fast-moving security world, Dex Security Solutions (DSS) has established a dedicated research and development (R&D) business unit. The research study will add tremendous value to their research and development (R&D) business unit with regard to their biometric identification (fingerprint verification) units that can be integrated with Electronic Business's identification and/or security systems.

12. Further particulars

Over a period of **two** months, starting in June 2003, the questionnaire was distributed amongst eighty employees of DexIT. The employees all have a sound Information Technology background and comprised analyst programmers, business analysts, network specialists, system operators, technical specialists, account and/or sales executives, project managers, division managers and top management of the organization. The questionnaire was used to determine the opinions and/or perceptions of the employees of DexIT with regard to the research study problem statement presented to them within the questionnaire. A focus group was used to obtain additional perceptions and attitudes on the research results obtained out of the questionnaire. The users were assured that their response would be treated as confidential and they were offered the opportunity to receive the result of the thesis once completed.

13. Publishing/Application of results: M.Com Informatics thesis

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Hereby I, *Ilse Giesing*, in my capacity as IT Manager, that:

- ❑ Research subjects will be informed, information will be handled confidentially, research subjects reserve the right to choose whether to participate and, where applicable, written permission will be obtained for the execution of the project.
- ❑ No conflict of interest or financial benefit, whether for the researcher, company or organization, that could materially affect the outcome of the investigation or jeopardise the name of the university is foreseen.
- ❑ Inspection of the experiments in loco may take place at any time by the committee or its proxy.
- ❑ The information I furnish in the application is correct to the best of my knowledge and that I will abide by the stipulations of the committee as contained in the regulations.

Signed: Ilse Giesing

Date: 2003/06/05

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Reference number: IT/EBIT/01/2003 18 June 2003

Dr HH Lotriet

Department of Informatics

UNIVERSITY OF PRETORIA

Dear Dr Lotriet

**FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY
THE APPLICATION OF YOUR STUDENT (I GIESING) REFERS**

1. I hereby wish to inform you that the research project titled: “User perceptions related to identification through biometrics within electronic business”, has been approved by the Committee. This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Codes of Research Ethics of the University of Pretoria, if action is taken beyond the approved proposal.
2. According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of any member of the Faculty Committee who will deal with the matter.
3. The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

Prof. J.J. Hanekom

Chairman: Faculty Committee for Research Ethics and Integrity

FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION
TECHNOLOGY

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Compiled by: Ilse Giesing

Submitted in fulfilment of the requirements for the degree MAGISTER COMMERCII (Informatics) in the Faculty of Economic and Management Sciences at the University of Pretoria.

APPENDIX B – Research study questionnaire

“An original writer is not one who imitates nobody, but one whom nobody can imitate.”

De Chateaubriand

The questionnaire that was used to obtain information on the research study problem statement: **The identification of user perceptions related to identification through biometrics within electronic business**, is included below:



20th of June 2003

Dear Sir/Madam,

USER PERCEPTIONS RELATED TO BIOMETRIC IDENTIFICATION

I am currently busy conducting my M.Com degree in Informatics at the University of Pretoria. The M.Com degree in Informatics requires that a thesis be completed on a topic within the Information Technology field. I have chosen “**User perceptions related to identification through biometrics within electronic business,**” as my research study topic.

Please assist me with my thesis by completing the below questionnaire, it should not take more than 20 minutes of your time. Your response will be treated as confidential. Please complete the entire questionnaire. The answers are about perceptions and there are no right or wrong answers.

Your input is critical in ensuring that an objective research conclusion is reached and I thank you for your time and participation. The results of the thesis will be made available on request.

Regards

Ilse Giesing

Tel: (011) 644-6546

Fax: (011) 644-6501

E-mail: ilseg@dex.co.za

APPENDIX

**USER PERCEPTIONS RELATED TO BIOMETRIC IDENTIFICATION -
QUESTIONNAIRE**

Please complete the following questionnaire. Select only one option most applicable to your situation.

Section A: Demographic information

1. Are you?

- Male
- Female

2. How old are you?

- Under 21
- 21 – 25
- 26 - 30
- 31 - 35
- 36 - 40
- 41 – 45
- 46 – 50
- Over 50

3. What is your preferred home language?

- English
- Afrikaans
- Other (Please specify) _____

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4. What is your highest educational qualification?

- Standard 8
- Matric
- Relevant professional job training
- Diploma/Post graduate diploma
- B degree
- Honours/Masters/Doctors degree
- Other (Please specify) _____

5. In which industry do you work or provide a service to?

- Tele-communications
- Manufacturing/Electricity
- Mining
- Healthcare
- Government
- Retail
- Travel/Entertainment
- Financial services
- Other (Please specify) _____

6. How many years experience do you have in your industry? _____

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7. What best describes your occupation?

- Analyst programmer
- Business analyst
- Network specialist
- System operator
- Technical specialist
- Account and/or sales executive
- Project manager
- Division manager
- Top management
- Other (Please specify) _____

8. Does your job require the use of a PC?

- Daily
- Occasionally
- Never

Section B: Background information

9. How long have you been connected to the Internet?

- Not connected at all
- Less than 3 months
- Between 3 – 12 months
- Between 12 – 36 months
- More than 3 years

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10. Where do you connect to the Internet?

- At work
- At home
- At work and home
- Not connected at all

11. How frequently do you use the Internet?

- Regularly
- Occasionally
- Seldom
- Almost never

12. What do you use the Internet for? (Select all applicable options)

- General browsing
- E-mail
- On-line purchasing
- Education/research/gathering information
- Commercial activities e.g. e-banking
- Other (Please specify) _____

13. What type of Internet user do you consider yourself to be?

- Expert
- Average
- Novice

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14. Do you have any general concerns when using the Internet? (Select all applicable options)

- Trust amongst participants
- Security concerns
- Privacy considerations
- Fraudulent transactions
- Legal implications of transactions
- Customer service
- Other (Please specify) _____
- None

15. If you have any concerns related to the Internet, how in your opinion can they be resolved?

16. Do you conduct e-banking?

- Yes
- No

17. How frequently do you use e-banking?

- Regularly
- Occasionally
- Seldom
- Almost never

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18. What do you use e-banking for? (Select all applicable options)

- Regular (scheduled) payments
- Adhoc payments
- Balance enquires
- Inter-account transfers
- Other (Please specify) _____

19. What are your concerns with regard to e-banking?

20. Do you purchase items on-line on the Internet?

- Yes
- No

21. How frequently do you use on-line purchasing?

- Regularly
- Occasionally
- Seldom
- Almost never

22. What type of on-line purchasing do you do? (Select all applicable options)

- Leisure (CDs, books, etc)
- Food
- Education
- Holiday arrangements
- Other (Please specify) _____

23. What are your concerns with regard to on-line purchasing?

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24. Do you conduct e-transactions on behalf of your organization?

- Yes
- No

25. How frequently do you conduct e-transactions on behalf of your organization?

- Regularly
- Occasionally
- Seldom
- Almost never

26. What is the nature of your organization's e-transactions?

27. What are your concerns with regard to your organization conducting e-transactions?

28. Which of the following, in your opinion, will improve transaction security on the Internet? (Select all applicable options)

- User-id and password verification
- User-id, password and PIN verification
- Biometric verification (e.g. fingerprint verification, retinal scanning, iris scanning, face recognition, voice recognition and signature verification)
- Digital certification
- Encrypted data transfer
- Legislation (ECT Act.)
- Information availability of the participants
- Other (Please specify) _____
- None

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29. In your opinion, do you think that user identification and verification are important in Electronic Business? Please expand your answer.

30. In your opinion do you think that traditional identification methods such as user-id, password and PIN verification are sufficient and should be adequate for future use in business transactions over the Internet? Please expand your answer.

Section C: Biometrics

31. Do you have any knowledge about biometric methods (e.g. fingerprint verification, retinal scanning, iris scanning, face recognition, voice recognition and signature verification)?

- Basic
- Average
- Good
- Expert
- None

32. How would you feel about making use of biometrics (e.g. fingerprint verification, retinal scanning, iris scanning, face recognition, voice recognition and signature verification) as a possible means of identification?

33. Would your feeling differ depending on the type of biometrics used as an identification method (e.g. fingerprint verification, retinal scanning, iris scanning, face recognition, voice recognition and signature verification)? Please expand your answer.

APPENDIX

34. Would you feel more comfortable using biometrics solely in a work environment rather than in a home environment? Please expand your answer.

35. Would you feel more comfortable using biometrics solely in a home environment rather than in a work environment? Please expand your answer.

36. Would you prefer a certain biometric identification method above another (Rate in order of precedence)?

- Fingerprint verification
- Retinal scanning
- Iris scanning
- Face recognition
- Voice recognition
- Signature verification
- None

37. What type of information would you like to receive before starting to use biometrics as an identification system?

38. Do you think that a biometric identification system combined with Electronic Commerce could provide additional benefits to you as user? Please expand your answer.

39. Would biometric identification reduce your concerns with regard to e-transacting on the Internet?

- Yes
- No

APPENDIX

40. How would biometric identification address your concerns with regard to e-transacting on the Internet? Please expand your answer.

41. Are there any concerns that will not be addressed by biometric identification within Electronic Business?

Section D: User adoption

From a “user” perspective:

42. Which factors would prevent you, as an individual, to adopt biometrics as an identification system?

43. Which factors would motivate you, as an individual, to adopt biometrics as an identification system?

44. When will you, as an individual, adopt biometrics as an identification system?

- As a brand new innovation
- Entering the market as a beta version
- Being implemented by various organizations
- Well established in the market
- Being used for a substantial period of time
- Never

45. In your opinion, as an individual, (user of the biometric identification system) how should the implementation of identification through biometrics in Electronic Business be handled to ensure success?

APPENDIX

From a “developer/implementation” perspective:

46. Which factors, in your opinion, would prevent an organization from implementing biometrics as an identification system?

47. Which factors, in your opinion, would motivate an organization to implement biometrics as an identification system?

48. When, in your opinion, will an organization adopt biometrics as an identification system?

- As a brand new innovation
- Entering the market as a beta version
- Being implemented by various organizations
- Well established in the market
- Being used for a substantial period of time
- Never

49. In your opinion, from a developer/implementation perspective, how should the implementation of identification through biometrics in Electronic Business be handled to ensure success?

Section E: Additional comments

50. Where else, in your opinion, would biometric identification be of use outside Electronic Business?

51. Do you have any additional comments that you would like to add?

APPENDIX

52. Would you be interested in receiving a copy of the thesis results?

- Yes
- No

I thank you for the time that you took in answering the questionnaire.